



Faculty of Economics and Tourism
"Dr. Mijo Mirković"



excelia
BUSINESS SCHOOL

The 11th International
Scientific Conference
**"New Frontiers in Economics
and Tourism - FET 2024"**
10th -11th October 2024
Pula, Istria, Croatia, EU

Conference Proceedings

Pula, Zagreb, 2025

GROATIAN ACADEMY OF SCIENCES AND ARTS /
HRVATSKA AKADEMIJA ZNANOSTI I UMJETNOSTI
Economic Research Division /
Odsjek za ekonomska istraživanja
Scientific conference papers volume 25 /
Znanstveni skupovi svezak 25
ISSN 2706-3801



Faculty of Economics and Tourism
"Dr. Mijo Mirković"



excelia
BUSINESS SCHOOL

The 11th International
Scientific Conference
**"New Frontiers in Economics
and Tourism - FET 2024"**
10th -11th October 2024
Pula, Istria, Croatia, EU

Conference Proceedings

Pula, Zagreb, 2025

Publishers:

Croatian Academy of Sciences and Arts
Trg Nikole Šubića Zrinskog 11, 10000 Zagreb, Croatia

Juraj Dobrila University of Pula
Faculty of Economics and Tourism "Dr. Mijo Mirković"
Preradovićeve 1/1, 52100 Pula, Croatia

Excelia Business School
102 Rue de Coureilles, 17000 La Rochelle, France

For the publisher:

Dario Vretenar, F.C.A.
Marinko Škare, rector
Amir Hasnaoui, Vice Associate Dean

Editors-in-Chief:

Goran Družić, F.C.A.
Croatian Academy of Sciences and Arts

Kristina Afrić Rakitovac
Juraj Dobrila University of Pula

Editors:

Morena Paulišić
Juraj Dobrila University of Pula

Danijela Rabar
Juraj Dobrila University of Pula

Tea Hasić
Juraj Dobrila University of Pula

Martina Basarac Sertić
Croatian Academy of Sciences and Arts

Language editor:

Aleksandra Godfrey (English)

Layout and Graphic Processing:

Robert Stanojević, Juraj Dobrila University of Pula, Publishing office

Prepress and print:

University Library, Juraj Dobrila University of Pula, Publishing office

Editions:

75 copies

ISBN 978-953-377-087-1 (paperback)
ISBN 978-953-377-088-8 (online PDF)

CIP available in digital catalogue of the University Library in Pula, number 160307011.

Website location: Official website of the Faculty of Economics and Tourism “Dr. Mijo Mirković”,
Juraj Dobrila University of Pula

The proceedings were published based on the Decision of the Committee for Publishing Activities
of the Juraj Dobrila University of Pula, Class:611-04/25-01/13, Reg. No.:143-01-15-25-1 of June, 10th
2025.

Copyright attribution CCBY

Others can distribute, remix, tweak, and build upon this work, even commercially, as long as they
credit the original creation.

June, 2025

PROGRAMME COMMITTEE

Marinko Škare, Juraj Dobrila University of Pula, Croatia

Ksenija Černe, Juraj Dobrila University of Pula, Croatia

Danijela Križman, Juraj Dobrila University of Pula, Croatia

Milford Bateman, Juraj Dobrila University of Pula, Croatia and St Marys University, Halifax, Canada

Luís Manuel Mendes Correia, Polytechnic Institute of Porto, Portugal

Diego Rodríguez Toubes Muñiz, University of Vigo, Spain

Irena Zavrl, University of Applied Sciences, Austria

Nina Drejerska, University of Life Sciences, Poland

Egon Žižmond, University of Primorska, Slovenia

Aleksandra Brezovec, University of Primorska, Slovenia

John Ebejer, University of Malta, Malta

Melanie Smith, Budapest Metropolitan University, Hungary

Nicola Camatti, Ca' Foscari University of Venice, Italy

Tijana Rakić, University of Brighton, United Kingdom

Gordan Družić, Croatian Academy of Science and Arts, Croatia

Manuel Benazić, Juraj Dobrila University of Pula, Croatia

Dragan Benazić, Juraj Dobrila University of Pula, Croatia

Daniel Tomić, Juraj Dobrila University of Pula, Croatia

Tea Golja, Juraj Dobrila University of Pula, Croatia

Robert Zenzerović, Juraj Dobrila University of Pula, Croatia

ORGANISING COMMITTEE

Marta Božina Beroš, Juraj Dobrila University of Pula, Croatia - Chair of the Organising Committee

Danijela Rabar, Juraj Dobrila University of Pula, Croatia

Kristina Afrić Rakitovac, Juraj Dobrila University of Pula, Croatia

Alen Belullo, Juraj Dobrila University of Pula, Croatia

Sanja Blažević Burić, Juraj Dobrila University of Pula, Croatia

Tea Hasić, Juraj Dobrila University of Pula, Croatia

Morena Paulišić, Juraj Dobrila University of Pula, Croatia

Ticijan Peruško, Juraj Dobrila University of Pula, Croatia

Saša Stjepanović, Juraj Dobrila University of Pula, Croatia

Nataša Urošević, Juraj Dobrila University of Pula, Croatia

Nikola Vojnović, Juraj Dobrila University of Pula, Croatia

Katarina Kostelić, Juraj Dobrila University of Pula, Croatia

Martina Basarac Sertić, Croatian Academy of Sciences and Arts, Croatia

Luc Beal, Excelia Business School, France

Mondher Bouattour, Excelia Business School, France

Amir Hasnaoui, Excelia Business School, France

Valentina Kirova, Excelia Business School, France

Tomasz Wołowiec, WSEI University, Poland

Suzana Laporšek, University of Primorska, Slovenia

All papers have undergone an international double-blind review.
All papers were presented at the conference.
The papers were reviewed by the Department of Social Sciences of the
Croatian Academy of Sciences and Arts.

CONTENTS

FOREWORD	1
FINANCE AND ACCOUNTING	3
MONETARY POLICY TIGHTENING AND STOCK MARKET INDICES: A COMPARATIVE STUDY OF THE UNITED STATES AND THE EUROPEAN UNION	5
MIHOVIL ANĐELINOVIĆ, ANA PAVKOVIĆ & LARA PASTUOVIĆ	
THE IMPACT OF CASHLESS PAYMENT TRANSACTIONS ON ECONOMIC GROWTH IN CROATIA	25
MANUEL BENAZIĆ, DEAN UČKAR & DRAGAN BENAZIĆ	
CENTRAL BANK DIGITAL CURRENCIES – BETWEEN PRIVACY REQUESTS AND SURVEILLANCE CONCERNS	53
MARTA BOŽINA BEROŠ & MARIN BEROŠ	
A BIBLIOMETRIC ANALYSIS OF MANAGEMENT ACCOUNTING AND INFORMATION SYSTEMS RESEARCH: SIX DECADES OF TRENDS	77
ANTONIJA PETRLIĆ	
DO CORPORATE SOCIAL RESPONSIBILITY ACTIVITIES TOWARDS EMPLOYEES AFFECT ECONOMIC VALUE ADDED?	105
ROBERT ZENZEROVIĆ, ADRIANA GALANT & KSENIJA ČERNE	
INVESTIGATING THE EFFECTS OF INTELLECTUAL CAPITAL EFFICIENCY ON NON-PERFORMING ASSETS OF INDIAN BANKS: A STUDY OF PRE-COVID AND DURING-COVID TIMES	119
SHRUTI BANSAL, NARINDER KAUR & MOHIT TANEJA	
HOW FAMILY PENSION INVESTMENT SHAPES YOUNG ADULTS' ATTITUDES TOWARD PENSION DISTRIBUTIVE JUSTICE	139
MARCIN BRYCZ & MARK BIERNAT	
TRANSFORMING COMPANY CASH FLOW MANAGEMENT THROUGH BLOCKCHAIN TECHNOLOGY	155
NINA HÄCK & BOJANA VUKOVLJAK	
EFFICIENCY OF THE LEASING INDUSTRY IN CROATIA BY DEA AND PROFITABILITY APPROACHES	189
TICIJAN PERUŠKO	

PENSION SYSTEM SUSTAINABILITY IN CROATIA: TRENDS IN THE EU CONTEXT	213
SABINA HODŽIĆ, TANJA FATUR ŠIKIĆ & NENSI BOŠNJAK	
MANAGEMENT, MARKETING AND ENTREPRENEURSHIP	237
EMPLOYEES AND SUPPLIERS AS BUILDING BLOCKS TOWARDS DEVELOPING RELATIONSHIP COMMITMENT IN HOTELS	239
JASMINA DLAČIĆ, KRISTINA ČRNJAR & MARIN LAZARIĆ	
THE ROLE OF INTERNAL MARKETING IN CREATING A MOTIVATING AND HAPPIER WORKPLACE FOR LOCAL PUBLIC SECTOR EMPLOYEES	263
ANA PAULA RODRIGUES, JOÃO CLAUDINO, ISABEL VIEIRA & DIDIANA FERNANDES	
IS THERE A GLASS CEILING IN THE HOTEL INDUSTRY IN CROATIA?	295
ANA MARIJA SIKIRIĆ SIMČIĆ, ALISA IVANČIĆ & SAŠA ČEGAR	
THE PROCESS OF DIGITAL TRANSFORMATION IN CROATIAN MUNICIPALITIES – LESSONS FROM A QUALITATIVE APPROACH	317
SANDRA BARAČ - MIFTAREVIĆ & MARKO PALIAGA	
GENDER DIMENSION OF STUDENTS' DIGITAL COMPETENCIES: SELF-EVALUATION VS PERCEIVED EMPLOYER EXPECTATIONS	347
ANA ŠTAMBUK & GORAN KARANOVIĆ	
UNRAVELLING DEFINITIONS AND CONTROVERSIES: A COMPREHENSIVE ANALYSIS OF SOCIAL INNOVATION, SOCIAL ENTREPRENEURSHIP AND SOCIAL ECONOMY	363
VIOLETA ŠUGAR, KRISTINA AFRIĆ RAKITOVAC & ROBERTA KONTOŠIĆ PAMIĆ	
HR MARKETING – THE EMERGING PARADIGM OF ORGANIZATIONAL RECRUITMENT AND LOYALTY RETENTION	385
MARIO BOGDANOVIĆ	
EDUCATION, HUMAN CAPITAL AND POPULATION AGEING IN ECONOMICS: A BIBLIOMETRIC ANALYSIS	409
EMA KELIN	
THE ORGANISATIONAL PROJECT MANAGEMENT MATURITY AS A CRITICAL SUCCESS FACTOR OF PUBLIC SECTOR PROJECTS: A REVIEW PAPER	427
SABINA LACMANOVIĆ	

GREEN AND DEVELOPMENT ECONOMICS	453
THE IMPACT OF ECONOMIC GROWTH AND RENEWABLE ENERGY CONSUMPTION ON GREENHOUSE GAS EMISSIONS IN EU COUNTRIES	455
FISNIK MORINA, SAUDA SKENDEROVIĆ & ADEM DRESHAJ	
NAVIGATING COMPETITIVENESS: ASSESSING WATER QUALITY INDEX FOR NAUTICAL TOURISM ON THE TISA RIVER IN SERBIA	489
MILANA PANTELIĆ, SANJA OBRADOVIĆ, TATJANA PIVAC, UGLJEŠA STANKOV& MARIJA CIMBALJEVIĆ	
INVESTING IN ENVIRONMENTAL PROTECTION: A CATALYST FOR GREEN ECONOMIC GROWTH IN EUROPE	507
DANIEL TOMIĆ	
FOREIGN DIRECT INVESTMENT DYNAMICS AND CEFTA'S INTEGRATION IN GLOBAL VALUE CHAINS IN THE 2020s	535
INES KERSAN-ŠKABIĆ	
CONTEMPORARY TOURISM CHALLENGES	557
MANAGING WORLD HERITAGE SITES IN CROATIA: CHALLENGES AND PERSPECTIVES FOR SUSTAINABLE TOURISM DEVELOPMENT	559
NATAŠA UROŠEVIĆ & MATTEO LEGOVIĆ	
EXAMINING ENVIRONMENTAL AWARENESS OF GENERATION Z: A STUDY FROM CROATIA	591
VANJA KRAJINOVIĆ	
TRIGGERS OF MEMORABLE DARK TOURISM EXPERIENCES: A PRELIMINARY CONCEPTUALISATION	607
SANJA DOLENEC	
EXAMINING STUDENTS' PERSPECTIVES ON SMART TOURISM DEVELOPMENT: THE CASE OF CROATIA	625
DANIJELA FERJANIĆ HODAK	
A METHODOLOGICAL FRAMEWORK FOR RESEARCHING AND PRESERVING SOUTH AFRICAN CULINARY HERITAGE	643
HENNIE FISHER & GERRIE DU RAND	

REGULATORY ISSUES IN A (DIGITAL) BUSINESS ENVIRONMENT	669
THE PERSONALITY RIGHT OF A LEGAL PERSON AND THE RIGHT TO COMPENSATION FOR NON-PROPRIETARY DAMAGE DUE TO BREACH OF CONTRACT	671
OLIVER RADOLOVIĆ	
IN SEARCH OF A STRATEGY FOR REGULATING DIGITAL TOURISM PLATFORMS: WHAT IS THE ROLE OF PRIVATE ENFORCEMENT MECHANISMS IN FACING CRITICAL ISSUES IN THE SHORT-TERM RENTAL MARKET?	699
ALESSANDRO PALMIERI	
REGULATING CRYPTO-ASSETS IN THE EU MiCA VS. MiFID: IS DELINEATION FEASIBLE UNDER ESMA DRAFT GUIDELINES?	713
IVANA PARAĆ & TOMISLAV JAKŠIĆ	

FOREWORD

"It is impossible to go backwards; the only possible and natural path is the one leading ahead. It means the path towards economic development, entry into full civilisation."

Mijo Mirković, PhD (1898-1963)

The 11th International Scientific Conference "New Frontiers in Economics and Tourism 2024 – FET 2024" was held on the 10th and 11th October 2024 at the Juraj Dobrila University of Pula, Faculty of Economics and Tourism "Dr. Mijo Mirković". The aim of the Conference was to bring together researchers, scientists, and students to present, exchange, and discuss new research ideas, expertise, perspectives, and findings on various aspects of contemporary developmental challenges. The Conference was organised in cooperation with the Croatian Academy of Sciences and Arts and Excelia Business School. It was held under the patronage of the President of the Republic of Croatia, Mr Zoran Milanović, and supported by Istria County, the City of Pula, and the Pula Tourism Office.

During the plenary session, distinguished international and domestic scholars delivered inspirational keynote lectures. Prof. Dr. Maria Gravari Barbas from Sorbonne University, coordinator of the UNESCO Chair "Tourism, Culture, Development" of the University of Paris 1 – Sorbonne and the UNITWIN network, presented a compelling lecture entitled "World Heritage, local development and the role of tourism. Perspectives from UNESCO World Heritage sites". Prof. Dr. Nawazish Mirza from Excelia Business School, La Rochelle, addressed the topic "Navigating the Waves of Sustainability: Challenges and Opportunities in Blue and Water Economies". Marina Tkalec, PhD senior research associate from the Institute of Economics Zagreb, concluded the Conference plenary session with a lecture entitled "Inflation inequalities - The Whats, The Whys, and The Hows". Following the plenary session, researchers from Europe, Asian countries and South Africa presented their newest work as part of the Conference's thematic sessions. The presentations addressed a wide range of timely and relevant topics,

including contemporary macroeconomic challenges, business management and entrepreneurship, strategic management and financial analysis, sustainability, corporate social responsibility, social economy and social entrepreneurship, heritage and cultural identity, current trends in tourism and marketing, inclusion and education, as well as digital transformation and innovation.

The Conference Proceedings comprise 31 peer-reviewed scientific papers, each having undergone a rigorous international double-blind review process. The collected papers contribute to the advancement of economic science by offering novel perspectives, research methods, findings, and reflections on issues facing modern economies and societies.

On behalf of the Programme and Organising Committees, we extend our sincere gratitude to all keynote speakers, authors, session chairs, and students for their professionalism, dedication, and enthusiasm. We also express our appreciation to the distinguished group of reviewers whose constructive feedback significantly enhanced the quality of the papers and the Conference Proceedings.

In conclusion, we hope the topics explored during this Conference will inspire further research, some of which we look forward to welcoming at our next conference.

Editors

**FINANCE
AND
ACCOUNTING**

MONETARY POLICY TIGHTENING AND STOCK MARKET INDICES: A COMPARATIVE STUDY OF THE UNITED STATES AND THE EUROPEAN UNION

MIHOVIL ANĐELINović

University of Zagreb
Faculty of Economics and Business
Zagreb, Croatia
mandelinovic@efzg.hr

ANA PAVKOVIĆ

A PhD Consulting
Zagreb, Croatia
ana@aphd.eu

LARA PASTUOVIĆ

University of Zagreb
Faculty of Economics and Business
Zagreb, Croatia
lpastuovic@net.efzg.hr

Paper Category: Original scientific paper

ABSTRACT

Monetary policy in both the European Union and the United States significantly influences economic conditions and stock market behaviour. This study examines the roles of the European Central Bank (ECB) and the Federal Reserve System (Fed) from 2008 to 2024, highlighting their responses to economic crises and inflation. Both institutions aimed to achieve price stability, economic growth, and full employment through measures like open market operations, asset purchases, and adjusting interest rates. During crises such as the global financial crisis and the COVID-19 pandemic, the ECB and the Fed employed expansionary monetary policies, including near-zero interest rates and quantitative easing. Conversely, starting in 2021, the Fed raised interest rates to curb inflation, influencing borrowing costs and investment decisions. The analysis demonstrates a strong correlation between interbank interest rates and stock market indices in both regions, showcasing the substantial impact of monetary policy on investor sentiment and asset valuations. These dynamics are particularly noticeable during monetary tightening or easing, affecting economic growth and stock market performance. Notably, from late 2022 to May 2024, despite successive interest rate hikes, the Euro Stoxx 50 and S&P 500 indices exhibited resilience and positive trends. This period highlighted the complex interplay between interest rates and market movements, driven by factors like sector-specific performances, geopolitical developments, and macroeconomic indicators. Sectors less sensitive to interest rate changes, such as technology, performed well, bolstering overall market sentiment. This study underscores the necessity for stakeholders to understand these relationships to anticipate market reactions and adjust investment strategies effectively. Policymakers also rely on such insights to assess the broader economic impact of their decisions, revealing the adaptability of financial markets in navigating varying economic conditions.

Keywords: Euro Stoxx 50, inflation, interest rate, monetary policy tightening, S&P 500, stock market indices

1. INTRODUCTION

The link between monetary policy, particularly changes in interest rates, and stock market dynamics has been the subject of extensive research. Central banks worldwide use interest rates as a tool to regulate economic activity, influencing borrowing costs, investment decisions, and ultimately, stock prices. Understanding the nature of this relationship is crucial for policymakers, investors, and economists alike. Previous studies have explored various transmission channels through which monetary policy affects stock markets. The interest rate channel highlights how changes in central bank policy rates influence market interest rates, impacting stock valuations. Mishkin (2010) identifies multiple channels, including credit and asset price channels, which amplify the effects of interest rate changes on stock market indices.

The aim of this study is to investigate the correlation between movements in interbank interest rates and stock market indices through regression analysis, leveraging existing theoretical findings. For the European Union, the study utilises the Euro short-term rate and the Euro Stoxx 50 stock index while, for the United States, it examines the Federal Funds Rate and the S&P 500 stock index. If a correlation exists, the objective is to ascertain its direction, specifically defining how stock indices fluctuate in response to changes in interest rates. The findings will reveal how the recent tightening of monetary policy has influenced stock market valuations, as reflected in stock index movements in the United States and the European Union. This study focuses on the period from 2022 to the first quarter of 2024 to analyse the short-term effects of monetary policy during the latest interest rate hike cycle. This period encompasses the most intense phases of monetary tightening and the corresponding market reactions, offering insights into recent trends.

The paper is structured as follows. The second section explores monetary policy in the European Union and the United States and examines its relationship with stock markets. The third section delves into an analysis of the impact of interest rates on selected stock indices in both the European Union and the United States. This section uses interest rate data and stock market indices to illustrate the relationship between monetary policy and stock market performance. The fourth section presents the conclusion of the study.

2. MONETARY POLICY IN THE EUROPEAN UNION AND THE UNITED STATES AND ITS RELATIONSHIP WITH STOCK MARKETS

Monetary policy plays a crucial role in shaping economic conditions and influencing stock markets in both the European Union and the United States. This section examines the monetary policies pursued by the European Central Bank and the Federal Reserve System, while also exploring the relationship between monetary policy and stock markets.

2.1. MONETARY POLICY OF THE EUROPEAN CENTRAL BANK AND THE FEDERAL RESERVE SYSTEM

This subsection explores the monetary policies implemented by the ECB and the Fed between 2008 and 2024, highlighting their responses to significant economic crises and challenges.

2.1.1. MONETARY POLICY OF THE EUROPEAN CENTRAL BANK FROM 2008 TO 2024

The European Central Bank is the main monetary institution in the euro area and the European Union (EU). The ECB has a hierarchical mandate, prioritising the primary goal of maintaining price stability. Once this primary goal is achieved, the ECB focuses on secondary objectives such as sustainable economic growth and full employment. Maintaining price stability involves ensuring low, stable, and predictable inflation, with a target inflation rate of 2% in the medium term, measured by the Harmonised Index of Consumer Prices (HICP) (ECB, 2024a). To achieve this primary goal of maintaining the inflation rate at 2%, the ECB uses three standard monetary policy instruments: open market operations, standing facilities, and minimum reserve requirements (ECB, 2024b).

Between 2008 and 2024, the European Central Bank (ECB) faced multiple crises, including the global economic crisis (2008-2009), the European sovereign debt crisis (2010-2013), the COVID-19 pandemic crisis (2020-2022), and the Russia-Ukraine war crisis (2022-present). To maintain financial stability and support economic growth, the ECB implemented both standard and unconventional monetary policy measures. During the global economic crisis, the ECB offered unlimited overnight liquidity and additional refinancing operations, introducing covered bond purchases in 2009.

The European sovereign debt crisis began in Greece in 2010 and spread to other southern eurozone countries. To stabilise the market, the ECB launched the Securities Markets Programme (SMP) in 2010 and later the Asset Purchase Programmes (APP), including the Asset-Backed Securities Purchase Programme (ABSPP) in 2014, the Public Sector Purchase Programme (PSPP) in 2015, and the Corporate Sector Purchase Programme (CSPP) in 2016. The ECB also introduced Outright Monetary Transactions (OMT), forward guidance, and Targeted Longer-Term Refinancing Operations (TLTRO) during this period (Varović, 2023).

During the COVID-19 crisis, the ECB took measures to ensure credit supply and stabilise the economy, including the Pandemic Emergency Purchase Programme (PEPP) and new refinancing operations. From 2021, the EU faced high inflation, peaking at 11.5% in October 2022, driven by the pandemic and rising energy prices due to sanctions on Russia. The ECB responded by ending quantitative easing and increasing key interest rates multiple times between 2022 and 2023 to control inflation, which has since decreased to 2.4%, with projections of reaching 2% by 2025. These measures significantly increased borrowing costs for banks, reduced credit demand, and ultimately helped curb inflation. Financial markets now anticipate a gradual reduction in these rates, although the ECB has not officially confirmed this.

2.1.2. MONETARY POLICY OF THE FEDERAL RESERVE SYSTEM FROM 2008 TO 2024

The Federal Reserve System is the central bank of the United States responsible for monetary policy. It uses three main instruments: open market operations, the discount rate, and reserve requirements. These instruments manage liquidity in the financial system, control inflation, and influence overall economic activity to achieve its dual mandate of maximum employment and price stability.

From 2008 to 2024, the Federal Reserve faced significant challenges necessitating frequent shifts in monetary policy and the use of instruments. These challenges stemmed from the global financial crisis, the COVID-19 pandemic, and subsequent high inflation rates in the U.S. During the severe recession from December 2007 to June 2009, the Fed implemented a robust expansionary monetary policy. Initially using traditional measures, it slashed the federal funds rate from 5.25% in September 2007 to a range of 0% – 0.25% by December 2008. Additionally, the Fed undertook unconventional measures like the Credit Easing Program and large-scale asset purchases (LSAP) to enhance credit flows and boost economic liquidity. From 2008 to

2014, the Federal Open Market Committee (FOMC) authorised three waves of quantitative easing (QE) to stabilise financial markets.

In pursuit of greater policy transparency, the FOMC began issuing the Statement on Longer-Run Goals and Monetary Policy Strategy in 2012, enhancing public trust in the Federal Reserve System's credibility and influencing future monetary policy expectations. As economic conditions improved after the global financial crisis, the FOMC raised the target range for the federal funds rate above the zero lower bound to 0.25% - 0.50%, marking the first increase since 2008.

Another pivotal shift occurred in 2020 with the onset of the COVID-19 pandemic. In response to mounting economic risks, the FOMC reduced the target range for the federal funds rate by 0.50 percentage points to 1.00% - 1.25% in March 2020. To mitigate economic downturns and support financial markets, the Fed implemented measures including reducing the federal funds rate range to 0.00% - 0.25%, purchasing U.S. Treasury securities and mortgage-backed securities through quantitative easing, introducing temporary lending facilities, and adjusting the reserve requirement rate to 0%. Furthermore, the Fed expanded its repo operations to enhance cash flow in the money market. To encourage lending, the Fed offered direct loans to banks through the discount window at a reduced interest rate of 0.25% (Fed, 2021). In addition, it eased regulatory capital and liquidity reserve requirements for banks and provided direct support to large corporations and small to medium-sized enterprises through bond purchases and loans.

Since June 2021, the United States has grappled with elevated inflation rates, driven by factors such as aggressive fiscal policy, supply chain disruptions, and energy price hikes amid the Russian-Ukrainian war. Inflation peaked at 9.1% in June 2022 based on the Consumer Price Index (U.S. Bank, 2024). Responding to inflation concerns, the Fed aggressively raised the federal funds rate range eleven consecutive times from March 2022 to July 2023. Additionally, from July 2022, the Fed significantly reduced the quantity and value of securities in its portfolio by an average of \$95 billion per month.

2.2. MONETARY POLICY AND STOCK MARKETS

Monetary policy has a critical role in influencing economic conditions through various channels, which can vary in effectiveness depending on the complexity and specific characteristics of a country's financial system. Mishkin (2010) identifies three primary transmission channels in modern financial systems: the interest rate channel, the credit channel, and the

channels related to other asset prices. Lovrinović and Ivanov (2024) emphasise that central banks often use nominal short-term interest rates as an indirect target of monetary policy due to significant fluctuations in money demand and weakening interdependencies between money supply, the real sector, and price levels. The interest rate channel is particularly important as it affects borrowing costs, investment decisions, and ultimately economic activity. However, the effectiveness of monetary policy through these channels can vary based on the specific economic context and financial structure of each country.

Central banks exert a significant influence in the economy by determining official interest rates, triggering a cascade of cause-and-effect relationships that significantly impact overall price levels. Through tools like open market operations and the discount rate, central banks shape interbank interest rates, thereby affecting both money market rates and the interest rates banks charge their clients. These adjustments not only shape public expectations about future interest rate movements but also influence medium- and long-term interest rates, which are partly determined by market forecasts of short-term rate fluctuations. According to Lovrinović and Ivanov (2024), fluctuations in short-term and long-term interest rates, changes in their spreads, shifts in credit volumes, and variations in money supply all contribute to movements in the prices of diverse financial and non-financial assets such as stocks, bonds, currencies, and real estate, ultimately influencing economic agents' decisions on borrowing, spending, saving, and investing, thereby affecting aggregate demand.

Stock prices are significantly influenced by monetary policy, making the relationship between interest rates and stock values a frequent subject of research. This topic has been explored for decades, with early studies like Flannery and James (1984) examining the interest rate sensitivity of stock returns and the maturity composition of nominal contracts for commercial banks and savings and loan associations. They found that common stock returns are correlated with interest rate changes, and this co-movement is positively related to the maturity difference between nominal assets and liabilities.

More recent studies continue to explore this relationship. Cotton (2022) studied the impact of interest rate hikes on stock prices in the US, the eurozone, and eight other developed nations during the monetary tightening period in 2022 using a high-frequency approach. The study found that a 1 basis point increase in five-year interest rates due to monetary policy changes reduced stock prices by 3.56 basis points. As interest rates rise, bonds

become more attractive investments, and the economy may face recession, resulting in lower stock prices, explaining the negative relationship.

In March 2022, the Fed raised the Federal Funds Rate target range for the first time since December 2018, causing stock indices to drop by 10% by April 2022 compared to the end of 2021. Significant price volatility was attributed to market uncertainty about future interest rates (Cotton, 2022). The research indicated that short-term interest rate increases have a much stronger effect on stock prices than long-term rate increases. Additionally, a flatter yield curve and higher price-to-earnings ratios amplify the negative impact of rising rates on stock prices (Blanchard, 2011). Eldomiaty et al. (2019) used the stock duration model to measure the sensitivity of stock prices to changes in inflation rates and real interest rates. Their findings indicate that while inflation rates negatively affect stock prices, real interest rates positively influence them. Additionally, changes in these rates significantly cause stock price fluctuations, with a notable adjustment speed to long-term equilibrium.

Ioannidis and Kontonikas (2008) studied 13 OECD countries from 1972 to 2002, confirming a negative correlation between interest rates and stock values. They found that a 1 basis point increase in short-term rates reduced stock prices by 1 to 2 basis points. This is explained by the discounted cash flow model, where higher rates increase the discount rate, reducing the present value of future cash flows. Bernanke and Kuttner (2004) concluded that stock markets react more strongly to unexpected monetary policy measures. They found that an unexpected 25 basis point reduction in the Federal Funds Rate increased stock prices by 1%, highlighting the negative relationship between rate changes and stock values.

When considering the intensity of monetary policy's impact on stock markets, it is crucial to account for market participants' expectations. Bernanke and Kuttner (2004) concluded that stock markets react more strongly to unexpected monetary policy measures than to anticipated ones. Their study, covering the period from 1989 to 2002 and focusing on the US stock market, found that an unexpected 25 basis point reduction in the Federal Funds Rate increased stock prices by 1%, reinforcing the negative relationship between rate changes and stock values. Different economic sectors also experience varied impacts; high-tech and telecommunications sectors show less sensitivity to rate changes compared to industrial sectors (Ehrmann and Fratzscher, 2004). Zhiteng and Ruoyu (2016) analysed the impact of short-term and long-term interest rate changes on stock prices in China, finding significant differences in how these rate changes affect the stock market. They emphasised the need for improved monetary policy

transmission mechanisms in the Chinese stock market. Cotton (2022) notes that, despite numerous studies indicating a negative relationship between interest rates and stock prices, definitive conclusions are difficult due to other influencing factors such as market expectations, sector classification, and economic conditions.

Bauer and Swanson (2023) reassessed the use of high-frequency monetary policy surprises to estimate the effects of monetary policy on financial markets and the real economy, addressing concerns about their exogeneity and relevance as instruments. Their study confirmed the predictability of these surprises, attributing it to the «Fed response to news» channel rather than a «Fed information effect,» and introduced orthogonalised surprises that produce stronger, more plausible impulse response functions when estimating macroeconomic effects. Laine (2023) estimated the effect of monetary policy on the term structure of stock market risk premia using analysts' dividend forecasts and dividend future prices. The study found that monetary policy easing raises the average risk premium, particularly through an increase in long-horizon risk premia. Thus, while stock prices and interest rates may move together in certain situations, the direction of this movement is often influenced by market expectations regarding future economic conditions.

3. ANALYSIS OF THE INTEREST RATE IMPACT ON STOCK INDICES

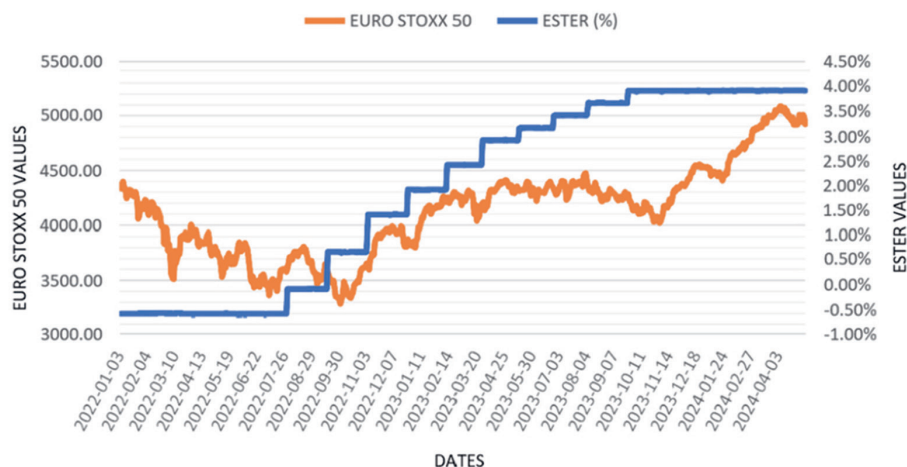
Regression analysis is employed to determine the correlation between movements in interbank interest rates and stock market indices. If a correlation exists, the objective is to determine its direction, specifically defining how stock indices fluctuate in response to changes in interest rates.

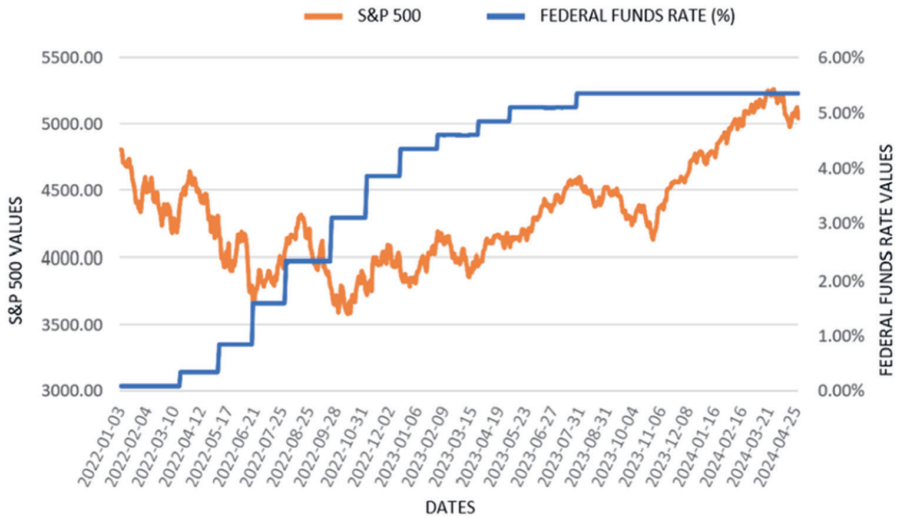
3.1. SELECTED INDICES AND RATES

The research on the impact of monetary policy tightening on stock market indices in the US and EU was conducted using daily data on reference interest rates and stock market indices. For the European market, the Ester interest rate and the Euro Stoxx 50 index were analysed, while for the US market, the Federal Fund Rate and the S&P 500 index values were observed. Ester is the average rate at which euro area banks borrow overnight deposits from other financial institutions without collateral, based on daily transaction data (ECB, 2024b). Data on the Ester interest rate was obtained from the European Central Bank database (ECB, 2024c), and data on the

Federal Fund Rate were sourced from the official Federal Reserve System website (FED, 2024). The Euro Stoxx 50, introduced in 1998, tracks the top 50 companies in the eurozone, covering eight countries (Börse Frankfurt, 2024; Stoxx, 2023). Daily values for the Euro Stoxx 50 and S&P 500 were retrieved from Yahoo Finance. The Federal Fund Rate (FFR) is the overnight loan rate between US prime banks, used by the Fed to guide monetary policy (FED, 2021). The S&P 500 measures the top 500 US companies by market cap, requiring a minimum of \$10 billion (S&P Global, 2023; Forbes, 2023). Figure 1 shows the daily values of the Ester interest rate and the Euro Stoxx 50 index for the European market, as well as the Federal Fund Rate and the S&P 500 index for the US market, from January 2022 to May 2024.

Figure 1. Euro Stoxx 50, Ester Rate, S&P 500, and the Federal Funds Rate from January 2022 to May 2024





Source: ECB, 2024; FED, 2024; Yahoo Finance, 2024a & 2024b

The Ester rate was negative until late July 2022, when the ECB raised reference interest rates to curb inflation in the eurozone, leading to an increase in the Ester rate. Despite further rate hikes by the ECB through to the end of 2022, the Euro Stoxx 50 index initially declined due to market uncertainty and the impact of the Russia-Ukraine war in February 2022. However, from December 2022 to March 2023, the index showed growth, partly due to better-than-expected financial performance in energy-dependent sectors as Europe quickly replaced Russian gas with American LNG and benefited from a mild winter. In 2023, the ECB raised reference rates six more times, yet the Euro Stoxx 50 index grew by 19% compared to the end of 2022. Given this shift from a negative to a positive trend, a separate regression analysis for 2022 will be conducted to understand the initial negative correlation.

On the other hand, the Federal Fund Rate was at 0.08% in the first quarter of 2022, with the first increase in March 2022. The rate increased seven times in 2022, reaching 4.33% by year-end. In 2023, the rate rose four more times, peaking at 5.33% in July 2023 and remaining at that level until the time of writing. Throughout 2022, the S&P 500 index fluctuated significantly, primarily showing a negative trend due to market uncertainty from the pandemic, high inflation, and rising interest rates. However, in 2023, and particularly in the first quarter of 2024, the index rose

significantly, reflecting a recovery in financial markets, reduced inflation, strong economic growth, and optimistic market expectations.

Table 1 shows the basic characteristics of the data series for the four analysed variables.

Table 1. Descriptive statistics of interest rates and indices

Indicator	EU		USA	
	ESTER	EURO STOXX 50	FEDERAL FUNDS RATE	S&P 500
Mean	1,9190	4124,6237	3,6344	4307,4121
Median	2,3990	4178,6550	4,5800	4273,5000
Coefficient of Variation	94,9750	10,0716	53,3978	9,1133
Standard Deviation	1,8225	415,4162	1,9407	392,5455
Range	4,5050	1804,3800	5,2500	1677,4000
Min	-0,5930	3279,0400	0,0800	3577,0000
Max	3,9120	5083,4200	5,3300	5254,4000

Source: ECB, 2024; FED, 2024; Yahoo Finance, 2024a & 2024b

3.2. RESULTS OF THE REGRESSION ANALYSIS

Regression analysis was conducted to determine the relationship between the movements of reference interest rates and stock indices. It also examines the connection between interest rate movements in the US and European markets, as well as the relationship between the indices in both markets. Correlation analysis investigates the direction and strength of these associations. Table 2 presents the results of a simple linear regression analysing the relationship between the Euro Stoxx 50 index (dependent variable) and the Ester interest rate (independent variable) from January 2022 to May 2024.

Table 2. Results of the regression analysis for the EU from January 2022 to May 2024

Dependent variable: Euro Stoxx 50				
Coefficient of Correlation (r)	0.76567998			
Coefficient of Determination (R^2)	0.586265829			
Observations	596			
Variable	Coefficients	Standard Error	t - statistic	p - value
Constant	3789.71892	15.91391077	238.138756	0
Ester	174.522654	6.015503611	29.0121435	6.26E-116

Source: Authors

The correlation coefficient of 0.77 indicates a moderately strong positive relationship between the interest rate and the index. The coefficient of determination shows that 58.63% of the variance in the dependent variable is explained by the regression model, suggesting an approximately satisfactory model fit. The regression coefficient (β) is 174.52, indicating that a 1% increase in the Ester rate results in an average linear increase of the Euro Stoxx 50 index by 174.52 euros. The p-value is significantly less than $\alpha = 5\%$, confirming that the Ester rate is statistically significant in the model, impacting the Euro Stoxx 50 value. The positive relationship, contrary to most findings, may be influenced by factors like expectations, sector classification of stocks, and economic trends. Thus, a shorter period regression analysis from June to December 2022 will be conducted, excluding the initial five months of constant rates for better model accuracy. A trend change in December makes it a suitable endpoint for analysis in Table 3.

Table 3. Results of the regression analysis for the EU from June 2022 to December 2022

Dependent variable: Euro Stoxx 50				
Coefficient of Correlation (r)	-0.288579714			
Coefficient of Determination (R ²)	0.08327825			
Observations	112			
Variable	Coefficients	Standard Error	t - statistic	p - value
Constant	3552.58503	12.30937127	288.608163	3.1022E-160
Ester	-71.857332	22.73148022	-3.1611374	0.002030696

Source: Authors

The analysis reveals a weak negative correlation of -0.29 between the Ester rate and the Euro Stoxx 50 index, confirming the initial hypothesis. The model explains only 8.33% of the variance, indicating low representativeness. The regression coefficient (β) of -71.86 shows that a 1% increase in the Ester rate decreases the Euro Stoxx 50 index by 71.86 euros on average. Despite a lower coefficient of determination, the p-value less than $\alpha = 5\%$ confirms the Ester rate's statistical significance. The p-value of 0.002, closer to the significance level, explains the expected lower determination coefficient. A similar analysis was conducted for the USA. The results for the entire period are shown in Table 4.

Table 4. Results of the regression analysis for the US from January 2022 to May 2024

Dependent variable: S&P 500				
Coefficient of Correlation (r)	0.305306445			
Coefficient of Determination (R ²)	0.093212026			
Observations	579			
Variable	Coefficients	Standard Error	t - statistic	p - value
Constant	4082.97095	33.03103985	123.610125	0
FFR	61.7534212	8.018442499	7.70142346	5.88604E-14

Source: Authors

The correlation coefficient of 0.31 indicates a weak positive relationship between the Federal Funds Rate and the S&P 500 index. The model's representativeness is lower compared to the EU model, suggesting that EU index values are less dependent on US interest rates. The regression coefficient of 61.75 shows that a 1% increase in the Federal Funds Rate results in an average linear increase of 61.75 dollars in the S&P 500 index. The p-value is less than the significance level of 5%, confirming the Federal Funds Rate as a statistically significant variable. A separate regression analysis for the period from March to December 2022 was conducted, starting from the first rate hike in March and ending in December due to a change in index trends from the beginning of the following year.

Table 5. Results of the regression analysis for the US from March 2022 to December 2022

Dependent variable: S&P 500				
Coefficient of Correlation (r)	-0.639391196			
Coefficient of Determination (R ²)	0.408821102			
Observations	190			
Variable	Coefficients	Standard Error	t - statistic	p - value
Constant	4272.66123	25.31686147	168.767413	3.4491E-207
FFR	-135.01452	11.84116352	-11.402133	3.13943E-23

Source: Authors

The relationship between the Federal Funds Rate and the S&P 500 index during the analysed period is negative and moderately strong, with a correlation coefficient of 0.63. The model explains 40.88% of the total variance in the index, indicating it is weakly representative but more so than the previous analysis from January 2022 to May 2024. A 1% increase in the Federal Funds Rate results in an average decrease of 135.01 dollars in the S&P 500 index. These results suggest that interest rate and stock index movements in the US and EU are quite comparable.

The statistical analysis results indicate that, in 2022, there was a negative correlation between the movement of the Ester interest rate and the Euro Stoxx 50 index on the European market, as well as between the federal funds rate and the S&P 500 index on the American market. This relationship

is explained by the negative impact of rising reference interest rates on the present value of stocks in these indices. As interest rates increased, bank rates also rose, prompting investors to shift their funds to less risky financial instruments, leading to negative changes in index values. This is particularly relevant to the European market due to its bank-centric structure and high tendency to invest excess funds in deposits. Market participants' cautiousness due to restrictive monetary policy and the potential for recession further influenced these movements.

From late 2022 to May 2024, the negative correlation between interest rates and stock indices weakened significantly. Despite continued increases in reference interest rates, both the Euro Stoxx 50 and S&P 500 indices exhibited positive trends. This shift can be attributed to various factors beyond interest rates, such as market expectations, the sectoral composition of the stocks in the indices, and overall economic conditions. As economic conditions improved in the US and EU from 2023, market participants revised their expectations regarding future inflation rates, economic cycles, and interest rates, driven by optimistic macroeconomic outlooks.

The positive movements in the Euro Stoxx 50 and S&P 500 indices can also be partly explained by their sectoral composition, with technology stocks, which are less sensitive to interest rate changes, being the most represented. Bernanke and Kuttner (2004) found that high-tech and telecommunications sectors react less to interest rate changes compared to cyclical and capital-intensive sectors, explaining the positive trends in these indices. Additionally, the indices consist of blue-chip companies that typically do not face liquidity issues or high leverage, making them less sensitive to interest rate increases. Investors' confidence in these blue-chip stocks contributes to the indices' resilience.

Regression analysis from January 2022 to May 2024 showed that the S&P 500 index is less sensitive to interest rate changes compared to the Euro Stoxx 50. Andelinović et al. (2021) found similar results when analysing the impact of the COVID-19 pandemic on American and European stock indices. The study concluded that European indices are more sensitive and less robust than American indices due to the market-oriented financial system in the US compared to the bank-centric system in the EU. The strong relationship between the movements of the Ester interest rate and the federal funds rate, as well as between the Euro Stoxx 50 and S&P 500 indices, can be explained by their arbitrage connection and the globalisation of capital markets, leading to synchronised index movements. Additionally, according to the IS-LM model, the financial sector in the US, being market-oriented, automatically adjusts to changes, resulting in a quicker short-term

adjustment and equilibrium in the LM curve, whereas the EU's bank-centric system experiences a slower adjustment.

It is important to note that, in addition to monetary policy, other factors significantly influenced stock index movements. The development of artificial intelligence technology was a key driver of growth in technology stocks in 2023, while macroeconomic factors such as avoiding recession, strong employment growth, and improved corporate earnings contributed to positive market sentiment. The market's anticipation of interest rate cuts in 2024 supported stock growth in late 2023. Geopolitical events, such as the Israel-Hamas conflict, affected market volatility, and the rise in U.S. Treasury bond yields influenced stock valuations (Martins, 2024), particularly in the technology sector. Strong financial results, especially from technology companies, further bolstered market growth. Additionally, global economic trends, including the slowdown in the Chinese economy and issues in their real estate sector, impacted global markets (Cashin et al., 2016; Euromonitor International, 2023), underscoring the complexity of factors shaping stock index movements.

This study has several limitations that should be considered. First, the relatively short timeframe of the analysis may limit the generalisation of results. Second, the use of a simple regression model does not account for all potential factors influencing stock indices. Future research could extend the analysed period and incorporate additional macroeconomic variables for a more comprehensive analysis. Additionally, the application of more sophisticated econometric methods could provide deeper insights into the dynamics of the relationship between monetary policy and stock markets.

4. CONCLUSION

Monetary policy in both the European Union and the United States is crucial for shaping economic conditions and influencing stock markets. The European Central Bank and the Federal Reserve System have distinct mandates focused on achieving price stability, economic growth, and full employment. Between 2008 and 2024, the ECB responded to economic crises with measures such as open market operations, asset purchases, and targeted refinancing operations. During times of economic stress, like the COVID-19 pandemic and inflationary periods, the ECB adjusted interest rates to manage inflation and stabilise the Eurozone economy. Similarly, the Fed implemented expansionary monetary policies during crises such as the global financial crisis and the COVID-19 pandemic, which included reducing the federal funds rate to near-zero levels and employing multiple rounds

of quantitative easing. In response to inflation pressures starting in 2021, the Fed raised interest rates to curb inflation, impacting borrowing costs and investment decisions across various sectors. Generally, higher interest rates tend to reduce stock market valuations as investors shift towards fixed-income securities. Understanding these dynamics is crucial for stakeholders to anticipate market reactions and adjust investment strategies effectively.

The analysis reveals a robust correlation between interbank interest rates and stock market indices in both the EU and US markets, emphasising the significant impact of monetary policy decisions on stock market behaviour. When central banks adjust interest rates, whether raising or lowering them, these changes reverberate through financial markets, influencing investor sentiment and asset valuations. This relationship is particularly evident during periods of monetary tightening or easing, where changes in interest rates can either stimulate economic growth or curb inflation, thus affecting stock market performance accordingly. Investors closely monitor these developments as they assess risk and allocate capital, while policymakers rely on such insights to gauge the broader economic impact of their monetary policy decisions.

From late 2022 to May 2024, despite successive interest rate hikes by central banks, including the ECB and the Federal Reserve, the Euro Stoxx 50 and S&P 500 indices demonstrated resilience and positive trends. This divergence from earlier negative correlations between interest rates and index movements underscores the intricate dynamics at play in global markets. Factors beyond interest rates, such as sector-specific performances, geopolitical developments, and macroeconomic indicators, played pivotal roles in driving the indices. Sectors less susceptible to interest rate fluctuations, such as technology, thrived during this period, buoying overall market sentiment. This period underscores the adaptability of financial markets to navigate varying economic conditions, influenced by both monetary policy decisions and broader economic trends.

BIBLIOGRAPHY

1. Anđelinović, M., Pavković, A. and Šegović, B. (2021), Utjecaj pandemije COVID-19 na burzovne indekse odabranih zemalja, *Notitia - časopis za ekonomske, poslovne i društvene teme*, 7(1), pp. 47-61. <https://doi.org/10.32676/n.7.1.4>.
2. Bauer, M. D. and Swanson, E. T. (2023), «A reassessment of monetary policy surprises and high-frequency identification», *NBER Macroeconomics Annual*, 37(1), pp. 87-155.
3. Bernanke, B.S. and Kuttner, K.N. (2004), What Explains the Stock Market's Reaction to Federal Reserve Policy? *The Journal of Finance*, 60(3), pp. 1221-1257. Available at: <https://www.federalreserve.gov/pubs/feds/2004/200416/200416pap.pdf>.
4. Blanchard, O. (2011), *Makroekonomija*, [5th ed.], Zagreb: Mate d.o.o.
5. Börse Frankfurt (2024), STOXX Europe 50, [online] Available at: <https://www.boerse-frankfurt.de/en/know-how/glossary/stoxx-europe-50> [Accessed 30 April 2024].
6. Cashin, P., Mohaddes, K. and Raissi, M. (2016), China's slowdown and global financial market volatility: Is world growth losing out? *IMF Working Paper*, WP/16/63, Asia and Pacific Department.
7. Cotton, C. D. (2022), Monetary Policy and Stock Prices, [e-publication] Available at: <https://www.bostonfed.org/-/media/Documents/Workingpapers/PDF/2022/cpp20221223.pdf> [Accessed 18 April 2024].
8. Ehrmann, M. and Fratzscher, M. (2004, May), Taking stock: Monetary policy transmission to equity markets (ECB working paper series, no. 354), Available at: <https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp354.pdf>.
9. Eldomiati, T., Saeed, Y., Hammam, R. and AboulSoud, S. (2019), The associations between stock prices, inflation rates, interest rates: Empirical evidence from stock duration model, *Journal of Economics, Finance and Administrative Science*, [online] Available at: <https://www.iiste.org/Journals/index.php/RJFA/article/download/34297/35269> [Accessed 6 July 2024].
10. Euromonitor International (2023), China's slowdown and deflation risks: Why it matters for the global economy, *Euromonitor International*, [online] Available at: <https://www.euromonitor.com/article/chinas-slowdown-and-deflation-risks-why-it-matters-for-the-global-economy> [Accessed 17 January 2025].
11. European Central Bank (2024a), Overview of the euro short-term rate (€STR), [online] Available at: https://www.ecb.europa.eu/stats/financial_markets_and_interest_rates/euro_short-term_rate/html/eurostr_overview.en.html#procedure [Accessed 25 June 2024].
12. European Central Bank (2024b), Transmission mechanism of monetary policy, [online] Available at: <https://www.ecb.europa.eu/mopo/intro/transmission/html/index.hr.html> [Accessed 22 June 2023].
13. European Central Bank (2024c), Euro short-term rate [data document], Available at: <https://data.ecb.europa.eu/data/datasets/EST/EST.B.EU000A2X2A25.WT>.

14. Federal Reserve System (2021b), Timeline: Federal Reserve Monetary policy, [online] Available at: <https://fraser.stlouisfed.org/timeline/monetary-policy-history#63> [Accessed 18 April 2024].
15. Federal Reserve System (2024), Federal Funds Effective Rate [data document], Available at: <https://fred.stlouisfed.org/series/FEDFUNDS> [Accessed 22 June 2023].
16. Flannery, M.J. and James, C.M. (1984), The effect of interest rate changes on the common stock returns of financial institutions, *The Journal of Finance*, 39(4), pp. 1141-1153.
17. Forbes (2023), What Is The S&P 500? How Does It Work?, [online] Available at: <https://www.forbes.com/advisor/investing/what-is-sp-500/> [Accessed 2 May 2024].
18. Ioannidis, C. and Kontonikas, A. (2008), The Impact of Monetary Policy on Stock Prices, *Journal of Policy Modeling*, 30(1), pp. 33-53. <https://doi.org/10.1016/j.jpolmod.2007> [Accessed 22 June 2023].
19. Laine, O. M. (2023), «Monetary policy and stock market valuation», *International Journal of Central Banking*, 19(1), pp. 365-416.
20. Lovrinović, I. and Ivanov, M. (2024), *Monetarna politika*, Zagreb: Ekonomski fakultet.
21. Martins, A.M. (2024), Global equity, commodities and bond market response to Israel-Hamas war, *Finance Research Letters*, 67, 105900.
22. Mishkin, F. (2010), *Ekonomija novca, bankarstva i financijskih tržišta*, [8th ed.], Zagreb: Mate d.o.o.
23. S&P Global (2023), S&P 500: The Gauge of the U.S. Large-Cap Market, [e-publication] Available at: <https://www.spglobal.com/spdji/en/documents/additional-material/sp-500-brochure.pdf> [Accessed 2 May 2024].
24. Stoxx (2023), Blue chip indices: Euro Stoxx 50, [e-publication] Available at: <https://www.stoxx.com/document/Bookmarks/CurrentFactsheets/SX5GT.pdf>.
25. U.S. Bank (2024), Federal Reserve focuses monetary policy on fighting inflation, [online] Available at: <https://www.usbank.com/investing/financial-perspectives/market-news/federal-reserve-tapering-asset-purchases.html> [Accessed 4 April 2024].
26. Varović, M. (2023), Prilagodba monetarne politike Eurosustava za vrijeme kriza, *Acta Economica Et Turistica*, 9(2), pp. 240-262. Available at: <https://hrcak.srce.hr/file/449672> [Accessed 18 April 2024].
27. Yahoo Finance (2024a), ESTX 50 [data document], Available at: <https://finance.yahoo.com/quote/%5ESTOXX50E/> [Accessed 30 April 2024].
28. Yahoo Finance (2024b), S&P 500 [data document], Available at: <https://finance.yahoo.com/quote/%5EGSPC/> [Accessed 30 April 2024].
29. Zhiteng, W. and Ruoyu, W. (2016), The impact of long- and short-term interest rate adjustments on stock prices, *Journal of Finance and Public Administration, Anhui University of Finance and Economics, China*.

THE IMPACT OF CASHLESS PAYMENT TRANSACTIONS ON ECONOMIC GROWTH IN CROATIA¹

MANUEL BENAŽIĆ

Juraj Dobrila University of Pula
Faculty of Economics and Tourism "Dr. Mijo Mirković"
Pula, Croatia
manuel.benazic@unipu.hr

DEAN UČKAR

Juraj Dobrila University of Pula
Faculty of Economics and Tourism "Dr. Mijo Mirković"
Pula, Croatia
dean.uckar@unipu.hr

DRAGAN BENAŽIĆ

Juraj Dobrila University of Pula
Faculty of Economics and Tourism "Dr. Mijo Mirković"
Pula, Croatia
dragan.benazic@unipu.hr

Paper Category: Original scientific paper

-
- 1 This paper is a result of scientific – research project “*The impact of artificial intelligence and new digital technologies on the financial market*”, supported by the Faculty of Economics and Tourism “Dr. Mijo Mirković”, Juraj Dobrila University of Pula. Any opinions, findings, and conclusions or recommendations expressed in this paper are those of the author and do not necessarily reflect the views of the Faculty of Economics and Tourism “Dr. Mijo Mirković” Pula.

ABSTRACT

The share of cash in total payment transactions around the world is constantly decreasing while its importance is being replaced by cashless payments. Recent studies have shown that the effects and benefits of cashless payments are multiple. First of all, cashless payments have a significant impact on economic growth, especially in recent years. Cashless payments encourage spending, thus stimulating economic activity. Transactions are faster, more convenient and more secure, which positively affects the consumption process and a company's business processes. On the other hand, cashless payments can reduce costs for businesses, increasing efficiency and profitability which in turn can also boost economic activity. Finally, cashless payments can create new business opportunities by expanding the customer base. In Croatia, the number and value of cashless transactions have been growing rapidly in recent years. Croatia's entry into the European union (EU), the COVID-19 pandemic, followed by lockdowns and joining the Economic and Monetary Union (EMU), certainly contributed to these strong trends. Therefore, the aim of this study is to explore the impact of cashless payment transactions on economic growth in Croatia. For these purposes, data on real GDP and the value of cashless payment transactions (including credit transfers, bill-paying services, direct debits, debits from the accounts by simple book entry, transactions using payment cards, cheques and acquiring payment cards) were used. The results indicate that an increase in the value of cashless payment transactions significantly and positively affects real economic activity in Croatia, and vice versa.

Keywords: cashless payment transactions, consumption, Croatia, economic growth

1. INTRODUCTION

Ever since the first appearance of the exchange of goods between the seller and the buyer, there has been an effort by the participants of the purchase transaction to reduce the costs of the sale itself. This implies enabling faster and easier transactions by using a generally accepted measure of value. Such transactions become more secure by using gold as a universal measure of value, but still do not provide protection against phenomena such as fraud and/or robbery. By replacing gold as a physical asset with a representative of gold in the form of a banknote, trading security was further increased, and transaction costs were reduced.

If we now skip the centuries of development of the trade and payment system, we arrive at the modern era, in which cashless means of payment have an increasing share. The reason for their introduction has remained the same, which is to facilitate transactions in such a way that they become faster, easier and safer, that transactions are carried out at lower costs due to increased efficiency, and that their introduction expands the base of potential users of transactions, i.e. encourages consumption which stimulates economic activity.

In the Republic of Croatia, the increasing usage of cashless means of payment was even more strongly emphasised following the entry into the EU and the EMU. More precisely, joining the EU has increased the degree of integration of the Croatian financial system with the European financial system by adopting European standards. This includes the adoption of the SEPA system, which has made non-cash payments faster and cheaper. Consequently, the number of online stores accepting card payments has increased and, according to data from the Croatian National Bank (2018), an increasing number of Croatian citizens use debit and credit cards. A particularly significant motivator for the use of cashless means of payment was the occurrence of the COVID-19 pandemic where, due to hygiene reasons, efforts were made to limit physical contact between transaction participants as much as possible (Mišić, 2021).

The subject of research in this paper refers to that component of the development of money forms that relates to the stimulation of economic activity in an economy. By expanding the base of potential transaction participants, it is a logical assumption that there will be an increase in the value of trade and, in order to meet such increased demand, it is necessary to increase production. The above-mentioned causal relationship in economic theory is explained by the positive effects of cashless transactions, such as the previously mentioned savings in time and costs. The increased demand

for goods and services tends to be satisfied by increasing production through additional investments, and their financing is facilitated by the existence of these same cashless financing channels. In addition to contributing to the fight against corruption, money laundering and other criminal activities, all these positive aspects of cashless payment transactions contribute to increasing the GDP of a country.

However, the increasing share of cashless payment transactions in the total financial transactions of an economy brings with it certain dangers. Ignoring the cost of implementing new digital technologies that enable increasingly widespread forms of cashless payment, as well as the issue of cyber security where the risk of cyber fraud inevitably increases, as well as the operational risk for the financial system in general, the strongest negative impact of new digital technologies lies in financial inclusiveness, i.e. the digital gap.

In order for new forms of cashless payment transactions to be available to a wider range of users, an increasing level of financial and IT literacy is required. It is futile in an economy that is limited in terms of internet availability, and in which a predominantly elderly population dominates, to expect significant economic growth through the introduction of new, more modern, forms of cashless transactions if users will not use them due to ignorance, misunderstanding or simply unavailability.

This dual impact of cashless payment transactions as a representative of new digital technologies in the financial sector was the impetus for conducting this research, which sought to investigate the impact of such transactions on the Croatian economic growth measured by real GDP for the analysed period from 2014 to 2023. The basic hypothesis which is put forward is that cashless payment transactions in general will have a positive effect on the realisation of real GDP, reflecting the view that the positive effect will prevail over the aforementioned dangers of the digital gap.

With this in mind, the paper is organised as follows: After this introductory part in which the subject and goal of the research are explained, there follows a chapter in which an overview of previously published works in the same field is given in order to obtain a basis for later comparison of results, as well as for drawing conclusions by comparing such results. The following chapters present input data, as well as methodological notes necessary when setting up a model that measured the impact of cashless payment transactions on real GDP in Croatia. The paper ends with a conclusion in which the economic implications of the obtained results are stated, and the hypothesis is confirmed.

2. LITERATURE REVIEW

The development of information and communication technology over the past decades has enabled the emergence of a wide range of cashless payment methods accepted by consumers due to their ease and simplicity of use, availability, and low costs. This has significantly contributed to the development of trade, consumption, and overall economy in individual countries. According to Statista (2024), in 2022, the majority of cashless transactions, approximately 37%, occurred in Asia, while around 21%, took place in Europe and North America, with the least number of transactions, about 6.1%, occurring in South America. Furthermore, based on the same source, the number of cashless transactions worldwide more than doubled in 2022 compared to 2016. Despite the increase in the number of cashless transactions, there are differences in consumer preferences regarding the use of cash and cashless payments (Statista, 2021). For example, 77% of consumers in South Korea prefer cashless payments, corresponding to 14% of transactions made with cash. On the other hand, in countries like Japan, Spain, and France, the percentage of consumers preferring cashless payments ranged from 60% to 70%, but due to payment restrictions, such as limitations on card payments for goods and services, the share of cash transactions ranged from 68% to 87%. Generally, based on the presented data, it can be expected that the trend of increasing use of various forms of cashless payments will continue in the future, leading to a reduction in cash usage in transactions and a shift towards cashless societies or economies.

According to the above mentioned, scientific literature has long been engaged in research on the impact of different forms of cashless payments on consumer behaviour as well as on economic development and growth. Micro-level studies on consumer behaviour primarily focus on identifying influential factors on the adoption of specific forms of cashless payments. These studies are based, on one hand, on the Technology Acceptance Model (TAM) (Davis, 1989), which explains the acceptance of new technology through dimensions of ease of use and perceived usefulness, expanded with selected factors such as perceived security and privacy, costs, trust, mobility, transaction speed, accessibility, compatibility, etc. (Matemba and Li, 2018; Kim, Mirusmonov and Lee, 2010). More recent studies, in explaining the adoption of new forms of cashless payments, utilise the Unified Theory of Acceptance and Use of Technology (UTAUT and UTAUT 2) models (Vankatesh, et al, 2003 and Vankatesh et al., 2012), which explain the adoption of new technology by end-users through four factors: performance expectancy, effort expectancy, facilitating conditions, and social influence. For example, Rahman Bahiri and

Ismail (2020) explain the adoption of cashless payments based on an extended UTAUT 2 model through seven factors: performance expectancy, facilitating conditions, social influences, innovativeness, perceived technology security, and hedonic motivation. Similarly, Balakrishnan and Mohd Shuib (2021) arrived at similar results using the UTAUT 2 model, explaining the adoption of cashless payments through perceived ease of use, usefulness, optimism, innovativeness, and lack of awareness. These five factors positively influenced users' readiness for cashless payments, which then, through perceived risk and intrinsic motivation as mediators, affected the adoption of cashless payment technology.

At the micro-level of examining the acceptance of cashless payments by B2B users, Rahman et al. (2022) used the TOE (Technological, Organisational, and Environmental factors) theoretical framework to explain the adoption of cashless payments through factors such as compatibility, management support, technological competence, competitive pressure, critical mass, and information intensity. The results of these previous studies provide a basis for explaining the acceptance of cashless payments by end-users and businesses and indirectly serve as a basis for explaining the impact of cashless payments on personal consumption as an important component of GDP.

According to this, numerous studies explore the impact of cashless payments on economic growth, which is also the subject of this paper. Existing research generally indicates the existence of an impact of the number and volume of cashless transactions on economic growth, measured by changes in GDP. However, there are inconsistent results regarding the varying strengths of the impact of different forms of cashless payments, which depend on the level of technology acceptance in individual countries, the development of infrastructure, financial authorities' policies, consumer preferences for certain payment methods, perceived risks or uncertainties of using new technologies, etc.

For instance, Hasan, Renzis, and Schmiedel (2012), using the General Method of Moments (GMM) model, found that electronic retail payments positively affect overall economic growth, consumption, and trade for 27 EU countries. According to the authors, the relationship between different forms of cashless payments was stronger for card payments compared to direct debit or credit transfers, while cheque payments had a minor impact on the analysed economic variables. Zandi et al. (2016), using the Pooled Least Square (PLS) method, found a significant positive impact of card penetration on consumption per capita for 70 analysed countries from 2011 to 2015. They extrapolated these results to changes in GDP and determined that increased card usage generated an additional 296 billion USD in consumption or a 0.1%

cumulative increase in GDP over the observed period. Developed countries experienced a higher GDP growth (0.04%) due to electronic payments, compared to developing countries (0.02%).

Tee and Ong (2016) investigated the impact of different forms of cashless payments on economic growth for five EU countries (Austria, Belgium, France, Germany, and Portugal). They used the Pedroni residual cointegration method and the Panel VECM (Vector Error Correction Model). The research results showed a causal relationship between different forms of cashless payments, indicating that the acceptance of one form of cashless payment affects the level of acceptance of another form in the short term. The impact of cashless payments on the economic growth of these five countries was only determined in the long term.

Yusuf (2016) applied the OLS (Ordinary Least Squares) method to determine a positive and significant impact of cashless payment forms (POS payments, mobile, website, and cheque payments) on economic growth for Nigeria. Mobile payments had a stronger impact on economic growth, while cheque payments had a slightly weaker effect. The author also concluded that the acceptance of cashless payments was not influenced by the decisions of financial authorities, but rather by user behaviour and acceptance based on the UTAUT 2 model. Similar results regarding the impact of digital payments on economic growth were found for the same country by Maraŕa (2022), using the ARDL (Autoregressive Distributed Lag) bounds test and Granger causality test for the period from 2011 to 2021. The results indicated that all forms of digital payments (POS terminal, ATM, web, and mobile payments) had a positive impact on economic growth in both the short and long terms.

On the other hand, Aldaas (2021) found no strong evidence confirming or refuting the general relationship between electronic payments and growth for a selected group of countries from 2014 to 2018, using correlation and regression analysis, considering various forms of electronic payments via different cards. Grzelczak and Pastusiak (2020) analysed correlation for the period from 2005 to 2018 for Western countries and Central and Eastern European countries and found significant positive correlations between the value of credit transfers, card payments, and economic growth measured as GDP per capita for both groups of countries, with higher correlation values for Western European countries. The values of e-money transactions had significantly higher correlations with economic growth for Western European countries than for Central and Eastern European countries. Direct debits and cheques had insignificant correlations with economic growth in Western European countries. The authors concluded that future analyses

of the impact of cashless payments need to consider differences in the development of individual countries.

Contrary results compared to the majority of studies were obtained for the Czech Republic by Srivastava and Režabek (2022). The authors employed four linear regression models due to different data sources and series. In the first regression analysis model, non-MFI payments had a negative and statistically significant impact on economic growth measured by changes in real GDP, while EFTPOS payments had a positive impact on economic growth, with a 1% increase in EFTPOS payment value leading to a 0.33% increase in GDP. According to the results of the second model, there was a significant negative impact of cheque payments on real GDP and a negative but insignificant impact of electronic transfers on GDP. The third regression analysis model found a significant positive impact of cash on the increase in real GDP. The authors concluded that digital payment forms may have some impact on economic growth, but it is not significant enough to justify a considerable expansion of cashless payment instruments beyond their current presence. They mentioned limitations regarding the sources and quantity of available data on cashless payments, emphasising the need for cautious interpretation of results.

Similar results were obtained by Tran and Wang (2023) using the panel regression method. The authors analysed the impact of various forms of cashless payments on economic growth for the group of G20 countries and Vietnam for the period from 2011 to 2022. The analysis found that debit and credit card payments, as well as e-money, had a negative impact on economic growth, unlike cheque payments, which were the only ones to have a positive impact on economic growth. The authors cite differences in economic structures and varying levels of pressure on the use of certain technologies as possible reasons for the differences compared to the results of previous studies conducted in other countries.

Regarding the impact of cashless payments on economic growth during and after the COVID-19 pandemic, Givelyn, et al. (2022) conducted a study for Indonesia based on monthly data from 2018 to 2022, using the ARDL (Autoregressive Distributed Lag) model. The research results indicated that debit and credit card payments did not have a significant impact on economic growth in the short or long term, while e-money had a significant positive impact. The overall impact of cashless payments on economic growth was positive, with a stronger effect during the COVID-19 pandemic compared to the pre-pandemic period. Another study conducted by Ferra and Ajija (2023) for five ASEAN countries using panel data regression methods for the period from 2012 to 2019. The research showed that payments via debit cards and

e-money had a positive impact on economic growth, unlike payments with credit cards and cheques.

A significant study on the impact of cashless payments on economic growth is the research conducted by Noman et al. (2023). They aimed to determine the impact of different forms of cashless payments on the economic growth of G7 countries (Canada, Germany, Japan, France, Italy, United Kingdom, and the United States) from 2012 to 2022, using the Panel ARDL (Autoregressive Distributed Lag) method. The results showed that, in the long term, all forms of cashless payments (card payments, e-money, credit transfer, and cheques) had a positive impact on economic growth measured by changes in real GDP for all G7 countries. Additionally, in the short term, card payments, cheque, and e-money positively affected economic growth, unlike credit transfers, whose impact in the short term was not statistically significant.

Regarding Croatia, to our best knowledge, besides the abstract² of Broz's work (2006), which states that electronic payments impact consumption and economic growth and that the impact depends on the elasticity of personal consumption, no relevant research on the impact of cashless payments on economic growth was found. This highlights the relevance and actuality of the subject of this study for the Croatian economy. Therefore, since the existing research indicates inconsistent results regarding the impact of both total and specific forms of cashless payments on economic growth, and since the analysed countries do not include Croatia, it is necessary to expand the existing knowledge in that context.

3. DATA

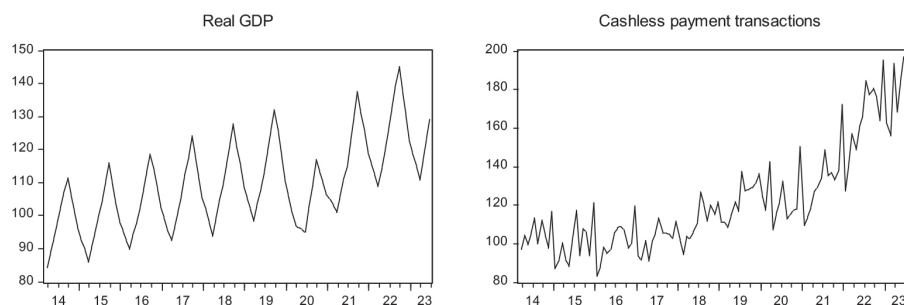
The main goal of this paper is to analyse the influence of cashless payment transactions on economic growth in Croatia. The data on real gross domestic product (*RGDP*)³ and the value of cashless payment transactions (*TRANS_VAL*)⁴ in Croatia are obtained from the International Financial Statistics (2024) and Croatian National Bank (2024) and are analysed on a monthly basis from March 2014 to June 2023. Their movements are shown on Figure 1.

2 According to our knowledge, the results were presented at the conference, but the paper has never been published.

3 Since Croatian Bureau of Statistics does not announce monthly data on the real GDP, but only quarterly, quarterly data are interpolated into monthly by using the linear interpolation method available in EViews (S&P Global Inc., 2022).

4 Including credit transfers, bill-paying services, direct debits, debits from the accounts by simple book entry, transactions using payment cards, cheques and acquiring payment cards.

Figure 1. Real GDP and cashless payment transactions (indices, 2015=100)



Source: own calculations, International Financial Statistics (2024) and Croatian National Bank (2024).

According to the Croatian National Bank (2024), it can be observed that, in the structure of total cashless payments transactions, the largest share relates to national credit transfers (with an average share of 75% from 2014 to 2022), international sent credit transfers (with an average share of 10% from 2014 to 2022), and international received credit transfers (with an average share of 9% from 2014 to 2022). From Figure 1 it is visible that both variables achieve an upward trend in the observed period. A significant increase in the value of cashless payment transactions is noticeable after 2017. This increase was driven by a strong growth in national credit transfers caused by the fact that they are used for higher value transactions and are a usual method for carrying out payments between companies, between companies and banks, payments between individuals, salary and pension payments, and similar transactions (Croatian National Bank, 2018). The increase in cashless payment transactions so far has been greatly influenced by the development of internet and mobile banking, as well as the development of card payments (Croatian National Bank, 2021). Additionally, the COVID-19 pandemic which began in late 2019 and was declared in early 2020 accelerated the process of digitalisation and consequently the number and value of cashless payment transactions. However, currency in Croatia remains the traditionally most prevalent method of payment for purchasing goods and services in retail but, in recent years, there has been a consistent trend of a slight decrease in the share of cash payments compared to card payments (Croatian National Bank, 2021). Furthermore, since mid-2012, the share of currency in circulation in the monetary aggregate M1 has been continuously decreasing with an average share of 17% from 2011 to 2025 (Croatian National Bank, 2025).

4. METHODOLOGY, EMPIRICAL ANALYSIS AND RESULTS

To analyse the influence of cashless payment transactions on economic growth in Croatia the general-to-specific VAR (Vector Autoregressive) modelling framework is applied. This framework consists of the Granger causality tests and impulse response functions analysis. The first step involves testing the degree of integration of time series. Specifically, models with nonstationary data can result in erroneous conclusions and estimation issues (Österholm, 2005). Therefore, the augmented Dickey-Fuller ADF test (Dickey, Fuller, 1979), Phillips and Perron PP test (Phillips, Perron, 1988), and KPSS test (Kwiatkowski et al., 1992) are considered and presented in Table 1⁵. To eliminate the influence of seasonal factors both series are seasonally adjusted⁶ and, for the purposes of variance stabilisation, series are expressed in logarithms.

Table 1. Unit root tests

Variable and test	Level		First difference	
	Constant	Constant and trend	Constant	Constant and trend
ADF test	Prob.			
LRGDP	0.8316	0.2171	0.0001	0.0006
LTRANS_VAL	0.9996	0.8367	0.0000	0.0000
PP test	Prob.			
LRGDP	0.8777	0.5175	0.0001	0.0006
LTRANS_VAL	0.9804	0.0482	0.0000	0.0001
KPSS test	LM-stat.			
LRGDP	0.997708	0.098919	0.075325	0.050832
LTRANS_VAL	1.059739	0.245893	0.330644	0.109187

Notes: "L" indicates logarithm of the variable. For the implementation of ADF test Schwarz information criterion has been implemented. KPSS test asymptotic critical values: constant: 1% level (0.739), 5% level (0.463), 10% level (0.347); constant and trend: 1% level (0.216), 5% level (0.146), 10% level (0.119).

Source: own calculations

⁵ The OxMetrics (Doornik, 2018) and EViews (S&P Global Inc., 2022) econometric packages are used for the multiple time series analysis.

⁶ Using the X12-ARIMA method.

The unit root test results suggest that both series are integrated of order $I(1)$, i.e. they become stationary after differencing.

For analysis purposes, “Autometrics” as an automatic computer implementation of general-to-specific modelling framework is applied. “Autometrics” as an automated procedure is based on the selection of regressors (coefficients, variables) that occurs in three stages (Doornik and Hendry (2018), Doornik and Hendry (2018a), Panday (2011) and Cunha and Pereira (2015)). The procedure starts with setting the general unrestricted model (GUM) while in the second stage, according to the selected significance level, insignificant regressors (coefficients, variables) are removed from the GUM until a consistent terminal model is obtained. Given that there may be several consistent models, in the third stage the selection of the terminal model is based on a tiebreaker. The methodology applied in this paper was chosen for several reasons. First, it is a relatively new and underrepresented methodology, which represents an additional scientific contribution to this research compared to other authors, as we were unable to find any papers in which this methodology is used to determine the impact of cashless payment transactions on economic growth. Therefore, the use of this methodology contributes to the robustness of the research results on this topic. Second, there is a significant difference between general-to-specific VAR modelling and classical VAR modelling. Although the estimation method is very similar, classical VAR model estimation starts with the determination of the number of lags in the model, whereas general-to-specific VAR modelling starts with setting the GUM that includes all possible lags. Third, even though in this paper a stationary VAR model has been estimated, it should be emphasised that for the purpose of the analysis, the accumulated impulse response functions will be applied. The accumulated impulse response functions investigate the cumulative effects of shocks over time. This means that cumulative impulse response functions show the total long-run effects of the shock on the variables in the model, which brings this methodology closer to the VEC (Vector Error Correction) methodology. However, it is important to note that, alongside the general-to-specific VAR models, there are also general-to-specific VEC models, thus leaving room for future research and additional analysis of the robustness of the results obtained. In recent years, automatic model selection algorithms gain popularity over classical modelling due to their time-saving advantages and added robustness in selection (Doornik (2008), Cunha and Pereira (2015) and Doornik and Hendry (2018)). The main disadvantages are associated with possible data-mining bias, the possibility of omitting significant variables etc.

The following initial unrestricted stationary VAR model is estimated:

$$y_t = A_1 y_{t-1} + \dots + A_p y_{t-p} + \dots + CD_t + u_t, \quad (1)$$

where $y_t = (y_{1t}, \dots, y_{Kt})$ is a vector of K endogenous variables, D_t is a vector of deterministic variables including constant and specified dummy variables, u_t is K -dimensional vector of residuals, while A and C are matrices of parameters of the model.

The vector of endogenous variables includes twelve lags of each variable in first differences, i.e. the cashless payment transactions and real GDP, while the vector of deterministic variables includes constant and several dummy variables for the breaks, mostly during the COVID-19 pandemic. The decision of using twelve lags of each variable is based on a one-year-window assuming that all the information needed to predict the next month values are included in a one-year period.

The "Autometrics" settings for the model estimation in the OxMetrics econometric package are set as follows (Doornik and Hendry, 2018):

- Target size (the significance level that is used for reduction): 0.05.
- Pre-search lag reduction: Active.
- Outlier and break detection: Impulse indicator saturation (IIS) to automatically create dummies for large residuals in the GUM.
- Back testing against: GUM 0.
- Tie-breaker: SC (Schwarz Criterion).
- Diagnostic tests p-value: 0.05 (5% significance level).
- GIVE: do reduced form first: Active.
- Estimation method: Ordinary Least Squares.
- Diagnostic test arguments: Default.

The diagnostic tests of the terminal model are shown in Appendix 1 and suggest that the model is adequately estimated with acceptable characteristics. There are no signs of serial autocorrelation, ARCH effects, non-normality, heteroscedasticity or functional form misspecifications.

F-tests of the terminal model in Appendix 2 show the significance on all regressors (except unrestricted), retained regressors, tests on the significance of each variable, tests on the significance of each lag and all lags up to 10. The results show that all retained regressors (except unrestricted) in the terminal model are highly significant. On the other hand, all individual

retained regressors, except the constant, are also highly significant. Tests on the significance of each lag and tests on the significance of all lags up to 10 likewise suggest that each lag in the terminal model including all lags together up to 10 is also highly significant.

In addition, the terminal model is tested by plotting the roots of companion matrix. The graph in Appendix 3 shows no roots laying outside the unit circle of the companion matrix, indicating that the terminal model meets the stability condition.

Graphical examinations are used to test parameter constancy by recursive graphics. The plots of 1-step residuals, 1-step Chow tests, break-point Chow tests, and forecast Chow tests for each equation and the whole system are shown in Appendices 4, 5, 6, and 7. It is obvious that 1-step residuals lie within 95% confidence intervals and that 1-step Chow tests, break-point Chow tests and forecast Chow tests values are significantly below 1% p-value. Based on the results it can be concluded that the terminal model satisfies parameter constancy.

To check the causality between variables, Granger causality/block exogeneity Wald tests are applied and shown in Table 2.

Table 2. VAR Granger causality/block exogeneity Wald tests (exclusion restrictions)

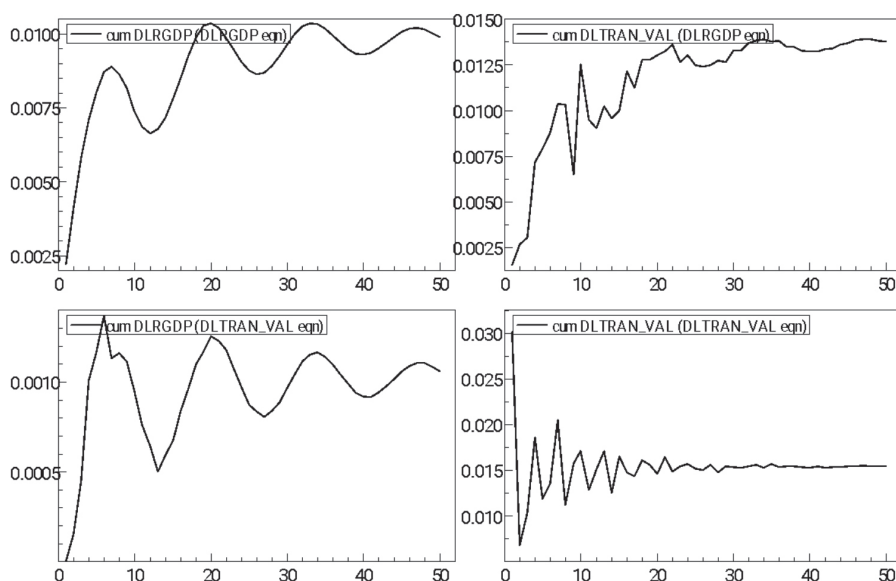
Null Hypothesis	Subset Chi ²	Prob.
DLTRAN_VAL does not Granger cause DLRGDP	17.301	0.0017
DLRGDP does not Granger cause DLTRAN_VAL	58.991	0.0000

Notes: “D” indicates first difference, while “L” indicates logarithm of the variable.
 Source: own calculations

The results indicate that cashless payment transactions cause real GDP and *vice versa*. Therefore, causality goes in both directions.

The analysis continues with the orthogonalised accumulated impulse response functions in order to analyse the dynamic interactions among the cashless payment transactions and real GDP. The impulse responses have been orthogonalised by introducing an innovation of one-standard deviation in the transformed model whereby the matrix of errors has been orthogonalised through the use of Cholesky decomposition. Figure 2 shows the results of orthogonal accumulated impulse response functions.

Figure 2. VAR orthogonal accumulated impulse responses



Notes: "D" indicates first difference, while "L" indicates logarithm of the variable.

Cholesky ordering.

Source: own calculations

It is noticeable that an increase in cashless payment transactions cumulatively increases Croatian real GDP, while on the other hand, an increase in the real GDP likewise cumulatively increases cashless payment transactions. In addition, it is possible to notice that the effect of real GDP on cashless payment transactions is stronger than the effect of cashless payment transactions on real GDP.

Since Cholesky decomposition is sensitive to the order of variables in the model, impulse response functions are generated with the reverse order. The obtained results, not shown here for the preservation of space, are identical, suggesting that the order of variables in the model does not affect the results.

According to the Granger causality tests and impulse response functions results, it can be concluded that cashless payment transactions have a positive impact on Croatian real GDP, and *vice versa*, whereas the effect of real GDP on cashless payment transactions is stronger than the effect of cashless payment transactions on real GDP.

5. THEORETICAL CONTRIBUTION OF THE RESEARCH

The results of the econometric analysis clearly indicate a significant and positive connection between cashless payment transactions and economic growth in Croatia. The obtained results show that an increase in cashless transactions cumulatively contributes to the growth of real GDP. Moreover, the results show a two-way causality: not only does a higher volume of cashless transactions contribute to GDP growth, but increased GDP additionally encourages the use of cashless payment methods.

These results are in line with the economic theory according to which digitalisation and modernisation of payment systems encourages consumption and investment through increased efficiency, security and speed of transactions. In particular, it builds on existing studies that have shown that electronic payments can stimulate economic growth through increased liquidity and reduced transaction costs.

The results obtained here are in line with most of the previous studies mentioned in the literature review. Summarising the above, the results obtained for Croatia confirm the findings of the studies by Hasan, De Renzis and Schmiedel (2012), Zandi et al. (2016), Tee and Ong (2016), Yusuf (2016), and Maraŕa (2022), which suggests that the greater use of cashless transactions is a strong economic driver that results in economic growth and an increase in GDP. The results obtained by researching the situation in Croatia are also in line with previous studies by Srivastava and Ŗeŕábek (2022) and Noman et al. (2023), who suggest that economic growth more strongly affects cashless payments than vice versa, confirming the established two-way causality.

By comparison with the results of the remaining research, it is possible to see that there are also cases in which it is necessary to monitor the causal relationship separately, i.e. in which the impact of cashless payments on GDP may vary depending on the specific form of cashless payment. These are studies by Tran and Wang (2023), Ferra and Aji (2023) or Givelyn et al. (2022). Since the research conducted here on Croatia considered the aggregate value of all non-cash transactions, there is room for further research to expand scientific knowledge in this regard, and this research shortcoming is certainly stated in the conclusion of the paper.

Regardless of this shortcoming of the conducted research, it is possible to make certain recommendations in terms of the practical implications of the research. Since it has been unequivocally established that cashless transactions have a positive impact on Croatia's economic growth, it is necessary to go further with continuous investment in digital infrastructure. By encouraging the digitalisation of payments in public institutions,

exempting or reducing fees for cashless payments, and encouraging small and medium-sized enterprises to accept digital payments, it is possible to achieve a reduction in transaction costs and also to encourage consumption that becomes simpler and easier.

While the cashless economy brings numerous benefits, there is a risk that certain groups of users will remain outside the financial flow (elderly population, people in rural areas, people with lower IT literacy). Therefore, it is essential to launch financial and IT literacy programmes to ensure citizens' ability to use digital tools, develop simple applications with intuitive user interfaces, and primarily encourage the development of internet infrastructure in all parts of the country (especially rural areas).

The mere existence of an internet infrastructure and simple intuitive applications is not enough. Users need to be protected from cyberattacks and fraud. The connection between the government and regulatory authorities is important, as they should set clear guidelines for the adoption of legal regulations that will protect users' personal data, protect consumer rights and define obligations for digital service providers. This requires a clear strategy for the development of digital payments to ensure the security and resilience of the payment system, i.e. contribute to ensuring long-term economic growth.

6. CONCLUSION

In all its forms, the payment system, and accordingly the forms of money, tended to increase its efficiency in such a way that more and more convenient forms, techniques and mechanisms for performing payment transactions were devised. This implied new emerging forms of money that could make the process of buying goods faster, easier, safer and generally more efficient. The modern payment system is characterised by a large share of cashless transactions as, currently, the most developed form of money that performs the process of exchanging goods most efficiently.

In numerous literature the influence of cashless payment transactions on the economic growth of a certain economy was investigated. The reason for this is the fact that increasingly efficient forms of payment raise the base of potential participants, thereby making goods more accessible to a wider range of consumers. This raises the demand for goods and consequently increases the need for investments to improve production. Ultimately, all this results in economic growth. On the other hand, the increase in cashless transactions, and in general new digital technologies in the financial sector, entails the potential danger of a digital gap that can leave a certain group of

consumers outside of new financial flows, reducing at the same time positive effects on economic growth.

To test the impact of cashless payment transactions on economic growth in Croatia, an automatic computer implementation of general-to-specific VAR (Vector Autoregressive) modelling framework, i.e. “Autometrics” is applied. The obtained VAR Granger causality test results indicate that causality between cashless payment transactions and economic growth in Croatia measured by real GDP goes in both directions. Hence, cashless payment transactions cause Croatian real GDP and *vice versa*. This conclusion is further confirmed by the impulse response functions analysis which showed that an increase in cashless payment transactions cumulatively increases Croatian real GDP and *vice versa*, whereby the effect of real GDP on cashless payment transactions is stronger than the effect of cashless payment transactions on real GDP.

The results of the conducted research for Croatia are consistent with previous studies on the impact of cashless payments on economic activity, except for the studies by Tran and Wang (2023) and Srivastava and Režabek (2022). In general, cashless payments have an impact on economic growth, with the influence depending on the type of cashless payment. However, this specific study did not analyse the impact of different types of cashless payments, which provides a basis for future research in this area.

The conducted research also has several practical implications for Croatian economic policymakers. Given that the research results indicate the influence of cashless payments on economic growth, policymakers should promote further digitalisation of payment transactions by investing in infrastructure and system security. Furthermore, it is necessary to enhance the population's digital literacy through various educational programmes and ensure the accessibility of digital payment systems for specific social groups (e.g., elderly individuals). Finally, considering the potential risks of various cyber frauds, it is essential to establish strict security regulations and conduct additional educational and promotional activities aimed at individuals and businesses to prevent fraud.

The analysis has some shortcomings. The analysed period is relatively short, while Croatian real GDP is not available on a monthly basis. Likewise, it would be interesting to see how individual cashless payment transaction items affect real GDP. But despite the shortcomings and considering the relatively scarce literature related to Croatia, the performed analysis represents a good starting point for future research on the impact of cashless payment transactions on economic growth in Croatia.

BIBLIOGRAPHY

1. Aldaas, A. 2021, A study on electronic payments and economic growth: Global evidences, *Accounting*, 7(2), pp. 409-414.
2. Balakrishnan, V. and Mohd Shuib, N.L., 2021. Drivers and inhibitors for digital payment adoption using the Cashless Society Readiness-Adoption model in Malaysia, *Technology in Society*, 65, pp. 1-11.
3. Broz, T., 2006. The Impact of Electronic Payments on Consumption and Economic Growth in Croatia, 2. Crans Montana Forum: "Hrvatska: vrata Europe prema jugoistoku", <https://www.bib.irb.hr:8443/718032>
4. Croatian National Bank, 2018. *Izvještaj o bezgotovinskim platnim transakcijama u Republici Hrvatskoj za 2017. godinu* [online]. Available at: https://www.hnb.hr/documents/20182/2108219/h-izvjestaj_bezgot_pt_2017.pdf/adcc3846-7ed1-4a41-b22f-d5f27c5654c8.
5. Croatian National Bank, 2021. *Utjecaj pandemije COVID-19 na navike plaćanja u RH* [online]. Available at: <https://www.hnb.hr/-/utjecaj-pandemije-covid-19-na-navike-placanja-u-rh>.
6. Croatian National Bank, 2024. *Payment services* [online]. Available at: <https://www.hnb.hr/en/statistics/statistical-data/payment-services>.
7. Croatian National Bank, 2025. *Statistical data* [online]. Available at: <https://www.hnb.hr/en/statistics/statistical-data>.
8. Cunha, R. and Pereira, P. L. V., 2015. Automatic Model Selection for Forecasting Brazilian Stock Returns. *CEQEF - Nº25 Working Paper Series*, 398, pp. 1-20.
9. Davis, F. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13, pp. 319-340.
10. Dickey, D. A. and Fuller, W. A., 1979. Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, 74, pp. 427-431.
11. Doornik, J. A. and Hendry, D. F., 2018. *Empirical Econometric Modelling – PcGive 15: Volume I*. Timberlake Consultants Ltd., Richmond.
12. Doornik, J. A. and Hendry, D. F., 2018a. *Empirical Econometric Modelling – PcGive 15: Volume II*. Timberlake Consultants Ltd., Richmond.
13. Doornik, J. A., 2008. Encompassing and automatic model selection. *Oxford Bulletin of Economics and Statistics*, 70, pp. 915-925.
14. Doornik, J. A., 2018. *An Introduction to OxMetrics 8: A Software System for Data Analysis and Forecasting*. Timberlake Consultants Ltd., Richmond.
15. Ferra, Y. and Ajija, S.R., 2023. The Influence of Non-Cash Payment Transactions on Economic growth in 5 Asean Countries, *JlET (Jurnal Ilmu Ekonomi Terapan)*, 8(2), pp. 276-286.
16. Grzelczak, M., and Pastusiak, R., 2020. Cashless Payments and Economic Growth in Selected European Countries. *Annales Universitatis Mariae Curie-Sklodowska, Sectio H—Oeconomia*, 54, pp. 33-46.

17. Givelyn, I., Rohima, S., Mardalena, M. and Widyanata, F., 2022. The Impact of Cashless Payment on Indonesian Economy: Before and During Covid-19 Pandemic. *Jurnal Ekonomi Pembangunan*, 20, pp. 89-104.
18. Hasan, I., De Renzis, T. and Schmiedel, H., 2012., Retail Payments and Economic Growth, Bank of Finland Research Discussion Paper No. 19/2012, Available at SSRN: <https://ssrn.com/abstract=2100651> or <http://dx.doi.org/10.2139/ssrn.2100651>.
19. International Financial Statistics, 2024. *IMF Data* [online]. Available at: <https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b&sid=1390030341854>.
20. Kim, C., Mirusmonov, M. and Lee, I., 2010. An Empirical Examination of Factors Influencing the Intention to Use Mobile Payment. *Computers in Human Behavior*, 26, pp. 310-322.
21. Kwiatkowski, D., Phillips, P. C. B., Schmidt, P. and Shin, Y., 1992. Testing the null hypothesis stationarity against the alternative of a unit root: How sure are we that economic time series have a unit root? *Journal of Econometrics*, 54, pp. 159-178.
22. Mišić, T., 2021. *Utjecaj pandemije COVID-19 na navike plaćanja u RH*, Hrvatska narodna banka. Available at: <https://www.hnb.hr/-/utjecaj-pandemije-covid-19-na-navike-placanja-u-rh> (01.05.2024.)
23. Matemba, E. D. and Li, G., 2018. Consumers' willingness to adopt and use WeChat wallet: An empirical study in South Africa, *Technology in Society*, 53, pp 55-68.
24. Marafa, A.A., 2022. Impact Of Digital Payment Systems on Economic Growth In Nigeria, *Nigerian Defence Academy Journal of Economics and Finance*, 6(1), pp. 47-58.
25. Noman, M., Maydybura, A., Channa, K.A., Wong, W-K., and Chang, B.H. 2023. «Impact of cashless bank payments on economic growth: Evidence from G7 countries, *Advances in Decision Sciences*, 27(1), pp. 1-22.
26. Österholm, P., 2005. The Taylor Rule: A Spurious Regression? *Bulletin of Economic Research*, 57(3), pp. 217-247.
27. Panday, A., 2011. Impact of monetary policy on exchange market pressure: The case of Nepal. *Journal of Asian Economics*, 37(C), pp. 59-71.
28. Phillips, P. C. B. and Perron, P., 2014. Testing for a Unit Root in Time Series Regression. *Biometrika*, 75, pp. 335-346.
29. Rahman, M., Ismail, I. and Bahri, S., 2020. Analysing consumer adoption of cashless payment in Malaysia, *Digital Business*, 1(1), pp. 1-11.
30. Rahman, M., Ismail, I., Bahri, S. and Khalilur Rahman, M., 2021. An Empirical Analysis of Cashless Payment Systems for Business Transactions, *Journal of Open Innovation: Technology, Market, and Complexity*, 8(4), pp. 1-20.
31. S&P Global Inc. (2022). *EViews 13 Users Guide II*. Seal Beach CA: S&P Global Inc.
32. Statista (2024) Asia Leading the Cashless Revolution, <https://www.statista.com/chart/20618/cashless-payments-across-the-world/> (accessed 8.5.2024.)
33. Statista (2021) Card Over Cash?, <https://www.statista.com/chart/23950/preference-cashless-payment-selected-countries/> (Accessed 8.5.2024.)

34. Srivastava, A. and Řežábek, P., 2022. Impact of Digital Payments on the Economic growth of a Country- A case of the Czech Republic, *International Journal of Economic Sciences*, Vol. XI(1), pp. 85-104.
35. Tee, H. H., and Ong, H. B., 2016. Cashless Payment and Economic Growth. *Financial Innovation*, 2, 1-9
36. Tran, L. and Wang, W., 2023. Cashless Payments Impact to Economic Growth: Evidence in G20 Countries and Vietnam—Vietnamese Government with a Policy to Support Cashless Payments. *American Journal of Industrial and Business Management*, 13, pp. 247-269.
37. Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D., 2003. User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), pp. 425-478.
38. Venkatesh, V., Thong, J. Y. L., & Xu, X., 2012. Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, 36(1), pp. 157-178.
39. Yusuf, I., 2016. Cash-less policy and economic growth: Evidence from Nigeria, *International Journal of Electronic Finance*, 9(1), pp. 63-71.
40. Zandi, M., Koropeckyj, S., Singh, V. and Matsiras, P., 2016. The impact of Electronic Financial Payments on Economic Growth., <https://usa.visa.com/content/dam/VCOM/download/visa-everywhere/global-impact/impact-of-electronic-payments-on-economic-growth.pdf> (accessed 8.5.2024.)

APPENDIX

Appendix 1. VAR diagnostic tests (single and vector)

	Variable	Test	Prob.
Serial correlation AR 1-6 test	DLRGDP	$F(6.65) = 1.6378$	0.1510
	DLTRAN_VAL	$F(6.65) = 1.0710$	0.3890
	Vector	$F(24.116) = 1.0347$	0.4297
ARCH 1-6 test	DLRGDP	$F(6.87) = 0.35835$	0.9032
	DLTRAN_VAL	$F(6.87) = 0.98009$	0.4437
Normality test	DLRGDP	$\chi^2(2) = 1.9630$	0.3748
	DLTRAN_VAL	$\chi^2(2) = 0.47610$	0.7882
	Vector	$\chi^2(4) = 2.5166$	0.6417
Hetero test	DLRGDP	$F(20.61) = 0.41779$	0.9836
	DLTRAN_VAL	$F(20.61) = 0.94169$	0.5403
	Vector	$F(60.176) = 0.52251$	0.9979
RESET 23 test	Vector	$F(8.132) = 0.76386$	0.6351

Notes: “D” indicates first difference, while “L” indicates logarithm of the variable
 Source: own calculations

Appendix 2. F-tests on the significance on all regressors (except unrestricted), retained regressors, of each variable, of each lag and all lags up to 10

	Variable	Test	Prob.
Test on all regressors except unrestricted	All	$F(54.140) = 34.3675$	0.0000
Tests on retained regressors	DLRGDP_1	$F(2.70) = 372.384$	0.000
	DLRGDP_3	$F(2.70) = 10.6827$	0.000
	DLRGDP_6	$F(2.70) = 16.8988$	0.000
	DLRGDP_8	$F(2.70) = 4.52316$	0.014
	DLRGDP_9	$F(2.70) = 13.8149$	0.000
	DLRGDP_10	$F(2.70) = 17.3280$	0.000
	DLTRAN_VAL_1	$F(2.70) = 40.8617$	0.000
	DLTRAN_VAL_2	$F(2.70) = 11.9102$	0.000
	DLTRAN_VAL_3	$F(2.70) = 3.64401$	0.031
	DLTRAN_VAL_6	$F(2.70) = 10.0097$	0.000
	I:2015(5)	$F(2.70) = 5.32003$	0.007
	I:2015(7)	$F(2.70) = 3.17791$	0.048
	I:2015(8)	$F(2.70) = 3.90899$	0.025
	I:2016(1)	$F(2.70) = 34.0709$	0.000
	I:2016(10)	$F(2.70) = 11.0712$	0.000
	I:2018(4)	$F(2.70) = 16.2615$	0.000
	I:2020(3)	$F(2.70) = 8.47015$	0.001
	I:2020(4)	$F(2.70) = 214.867$	0.000
	I:2020(6)	$F(2.70) = 5.49189$	0.006
	I:2020(7)	$F(2.70) = 164.472$	0.000
	I:2020(8)	$F(2.70) = 8.44517$	0.001
	I:2021(2)	$F(2.70) = 11.5326$	0.000
	I:2021(3)	$F(2.70) = 12.8441$	0.000
	I:2021(5)	$F(2.70) = 4.85026$	0.011
	I:2022(3)	$F(2.70) = 4.46383$	0.015
	I:2022(7)	$F(2.70) = 10.2199$	0.000
	I:2023(3)	$F(2.70) = 3.57302$	0.033
	Constant U	$F(2.70) = 1.71286$	0.188

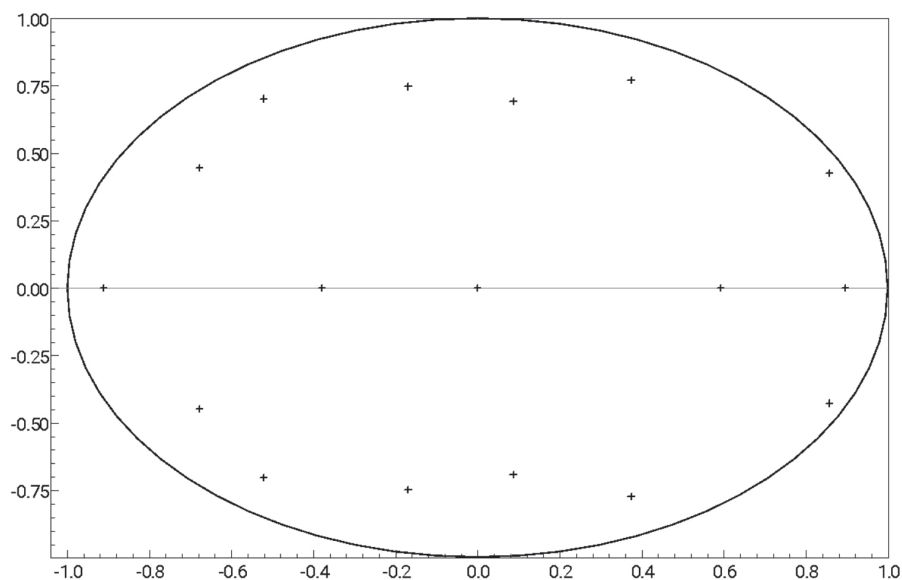
Tests on the significance of each variable	DLRGDP	$F(12.140) = 43.542$	0.000
	DLTRAN_VAL	$F(8.140) = 14.484$	0.000
	Constant	$F(2.70) = 1.7129$	0.1878
	I:2015(5)	$F(2.70) = 5.3200$	0.0071
	I:2015(7)	$F(2.70) = 3.1779$	0.0477
	I:2015(8)	$F(2.70) = 3.9090$	0.0246
	I:2016(1)	$F(2.70) = 34.071$	0.0000
	I:2016(10)	$F(2.70) = 11.071$	0.0001
	I:2018(4)	$F(2.70) = 16.262$	0.0000
	I:2020(3)	$F(2.70) = 8.4701$	0.0005
	I:2020(4)	$F(2.70) = 214.87$	0.0000
	I:2020(6)	$F(2.70) = 5.4919$	0.0061
	I:2020(7)	$F(2.70) = 164.47$	0.0000
	I:2020(8)	$F(2.70) = 8.4452$	0.0005
	I:2021(2)	$F(2.70) = 11.533$	0.0000
	I:2021(3)	$F(2.70) = 12.844$	0.0000
	I:2021(5)	$F(2.70) = 4.8503$	0.0106
	I:2022(3)	$F(2.70) = 4.4638$	0.0150
	I:2022(7)	$F(2.70) = 10.220$	0.0001
	I:2023(3)	$F(2.70) = 3.5730$	0.0333
	Lag(s)	Test	Prob.
Tests on the significance of each lag	Lag 10	$F(2.70) = 17.328$	0.0000
	Lag 9	$F(2.70) = 13.815$	0.0000
	Lag 8	$F(2.70) = 4.5232$	0.0142
	Lag 6	$F(4.140) = 13.093$	0.0000
	Lag 3	$F(4.140) = 6.1753$	0.0001
	Lag 2	$F(2.70) = 11.910$	0.0000
	Lag 1	$F(4.140) = 146.10$	0.0000

Tests on the significance of all lags up to 10	Lag 10 – 10	$F(2.70) = 17.328$	0.0000
	Lag 9 – 10	$F(4.140) = 13.801$	0.0000
	Lag 8 – 10	$F(6.140) = 9.4695$	0.0000
	Lag 7 – 10	$F(6.140) = 9.4695$	0.0000
	Lag 6 – 10	$F(10.140) = 11.498$	0.0000
	Lag 5 – 10	$F(10.140) = 11.498$	0.0000
	Lag 4 – 10	$F(10.140) = 11.498$	0.0000
	Lag 3 – 10	$F(14.140) = 9.7720$	0.0000
	Lag 2 – 10	$F(16.140) = 11.753$	0.0000
	Lag 1 – 10	$F(20.140) = 45.321$	0.0000

Notes: "D" indicates first difference, "L" indicates logarithm of the variable while "I" indicates impulse dummy variables

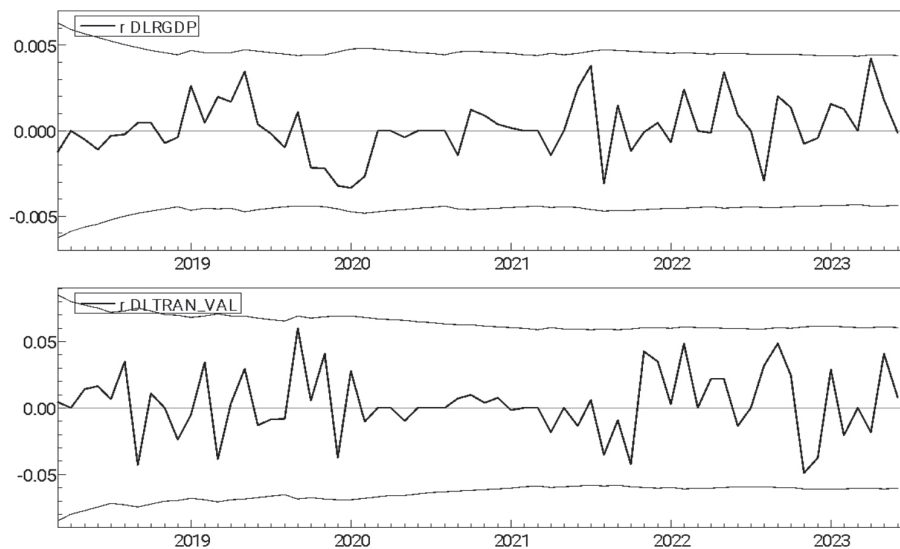
Source: own calculations

Appendix 3. Roots of companion matrix



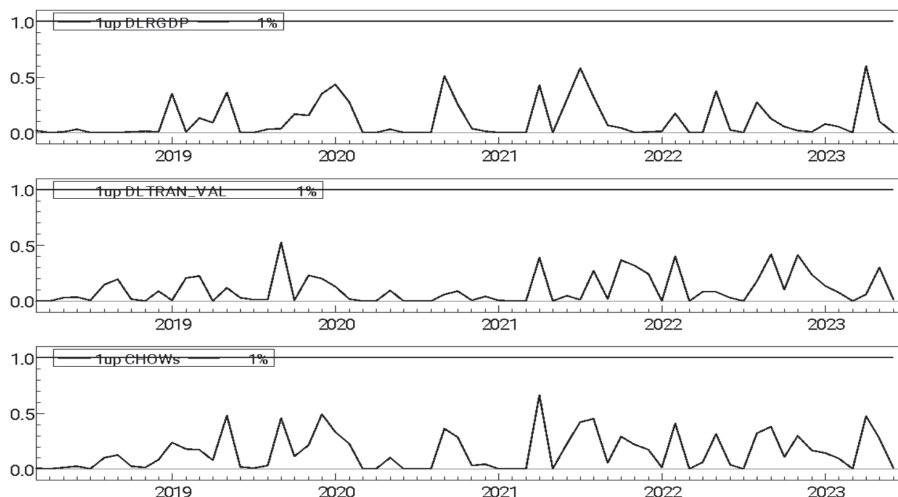
Source: own calculations

Appendix 4. 1- step residuals for each equation



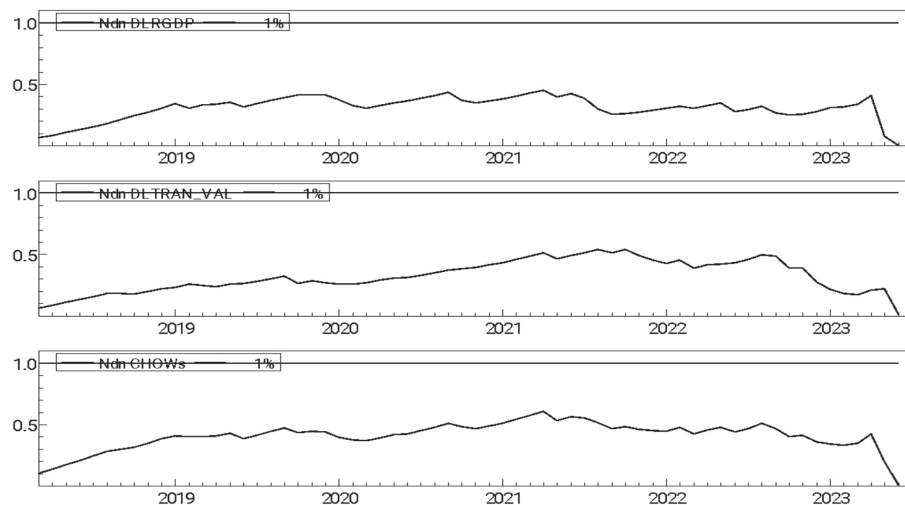
Source: own calculations

Appendix 5. 1-step Chow tests for each equation and the entire system



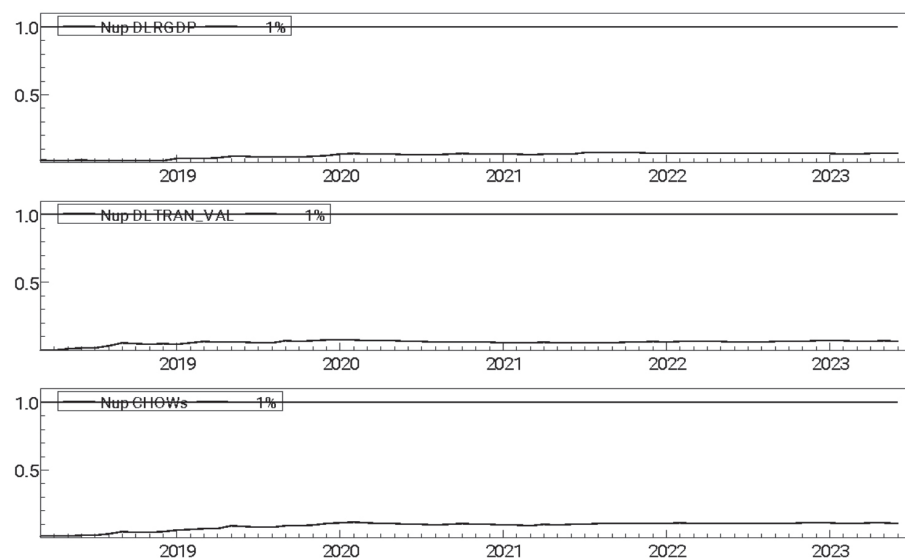
Source: own calculations

Appendix 6. Break-point Chow tests for each equation and the entire system



Source: own calculations

Appendix 7. Forecast Chow tests for each equation and the entire system



Source: own calculations



CENTRAL BANK DIGITAL CURRENCIES – BETWEEN PRIVACY REQUESTS AND SURVEILLANCE CONCERNS

MARTA BOŽINA BEROŠ

Juraj Dobrila University of Pula
Faculty of Economics and Tourism "Dr. Mijo Mirković"
Pula, Croatia
marta.bozina.beros@unipu.hr

MARIN BEROŠ

Institute of Social Sciences Ivo Pilar
Pula, Croatia
marin.beros@pilar.hr

Paper Category: Original scientific paper

ABSTRACT

Most central banks around the world are either considering issuing digital counterparts of fiat money or tapping into the initial phases of pilot implementation programmes. Arguably, as a type of state-owned and operated digital form of traditional currency, central bank digital currencies or “CBDCs” represent a (r)evolutionary shift in how money is conceptualised from a philosophical, legal and economic standpoint. They also usher in a historical reshaping of central banks’ positions with actors within the financial system, and re-define the central bank’s relationships with the public. CBDCs may bring important advantages; however, the technological design of a CBDC may allow central banks, and thus governments, to accrue personal information, raising privacy concerns as well as fears about unprecedented surveillance scenarios.

Against this backdrop, this paper examines CBDCs in the context of privacy requests, using an analytical lens that intersects political economy and political philosophy, and with a qualitative analysis of relevant scholarship, policy documents, legal texts, and various public records related to the digital euro project. We begin by discussing the emergence of CBDCs in the light of the potential deconstruction of the state-money nexus brought about by privately issued cryptocurrencies. The paper then examines how the digitalisation of fiat money affects citizens’ fundamental rights, specifically the right to privacy and the dangers of mass surveillance. It then proceeds to discuss the European Central Bank’s digital euro project – focusing on its policy arguments, legislative features and design solutions developed to prioritise privacy requests and legitimise the digital euro. This enables us to provide a comprehensive examination of the digital euro’s privacy-enhancing features, while also highlighting potential gaps and proposing solutions useful for alleviating surveillance concerns.

Keywords: central bank digital currencies, digital euro, fundamental rights, privacy, surveillance

1. INTRODUCTION

In an attempt to reap the many benefits of digitalisation in payments, while also mitigating the risks posed by cryptocurrencies, most central banks around the world are either considering issuing digital counterparts of *fiat* money or tapping into the initial phases of pilot implementation programmes. Overall, central bank digital currencies or “CBDCs” can be viewed as a digital evolution of traditional *fiat* currencies, delivering all the benefits of the digitalisation phenomenon in payments and the financial system, while maintaining stability and regulatory oversight due to their ties to central banks. In a digital economy in which payment solutions increasingly rely on privately owned digital platforms and less on the use of state-issued money, CBDCs provide an opportunity to consolidate the role and capabilities of public actors in the digital revolution (Dionysopoulos et al. 2024, p. 1). Competition from privately issued cryptocurrencies, such as the widely cited Bitcoin or Ethereum, has prompted central banks to take a more proactive approach to currency issuance and control (and, as a result, monetary policy), yet this is only one of several reasons why CBDCs are rising to the very top of the central bank policy agenda. Other well-known arguments focus on transactional efficiency – faster, more affordable payments that can be executed even across borders – or broader policy issues, such as increasing financial inclusion for citizens who do not have access to banks, creative use of monetary policy tools, particularly negative interest rates, and, finally, improved anti-money laundering risk mitigation because digital transactions are easier to track and may even deter illicit activity.

As we have already learned from monetary history, market developments have typically been the *spiritus movens* of evolutionary shifts within the monetary domain, but developmental leaps typically gain sustainability and soundness only through state involvement and, henceforth, in the monetary context, central bank intervention. The pace of central banks in exploring the CBDCs’ ecosystem varies greatly around jurisdictions, with 46 research studies, 33 development strategies, 21 pilot regimes, and 11 operational CBDCs to date (Atlantic Council-Geoeconomics Center 2023), it is still reasonable to conclude that central banks have embraced the market-initiated transformation of “money”. A cross-comparison of these global examinations of digital currencies provides a broad definition of CBDCs as state-owned and operated, digital and programmable forms of central bank-issued currency that are widely accessible to the public. Several important elements of CBDCs can be teased out from this definition:

- they are digital, electronic tokens backed by central monetary authorities and denominated in the issuing country national currency, which means that their issuance and distribution are monitored and regulated by that authority,
- CBDCs should be recognised as legal tender with the same status and acceptance as physical cash,
- CBDCs should be integrated into existing payment system infrastructures,
- they follow the same regulatory compliance as physical cash, ensuring that they adhere to the legislative and policy boundaries set by anti-money laundering frameworks.

The described core features of CBDCs suggest that they represent a turning point in monetary history, with far-reaching implications for both theory and practice. CBDCs usher a radical shift in how money is conceptualised from a philosophical, economic, and legal standpoint. Moreover, CBDCs represent an inflection point and a historical reshaping of central banks' positions with actors in the financial system, as well as their relationship with the public. Yet, the interaction of the public and the government through sovereign issued digital currencies brings to light some of the more significant conceptual issues that are essential to the functionality and legitimacy of any CBDC.

Because CBDCs provide access to a multitude of financial data about citizens, including personal data, the technological design of a particular CBDC may enable central banks and governments to examine and gather such information, raising questions about how the data will ultimately be used, as well as about potential surveillance scenarios. Arguably, at least some of the information gathered through CBDCs will inevitably be used by central banks for anti-money laundering purposes. In the light of this, privacy-preserving features and technological solutions which break the vicious cycle of innovation and control become essential for the conceptual design of CBDCs and their practical implementation. An excellent example is the European Central Bank (ECB) and its digital euro project, which strongly prioritises privacy, thus directly responding to public preferences for “a digital euro focused on privacy and the protection of personal data” (European Central Bank 2021, p. 14).¹

1 Aside from the ECB, many other central banks around the world have prioritised privacy and data protection in the policy and institutional design of their own CBDCs, including the Federal Reserve, People's Bank of China, and the Bank of Canada. For a comparison

With tensions between privacy requests, surveillance concerns and public authorities' policy enforcement placed at the core of discussions about CBDCs, there is a fast-evolving body of scholarship studying these fundamental issues from the perspectives of political economy and political philosophy (for example, Curran 2024, Chey 2023, Jian 2023, Stanger 2023 and S e 2021). Building on this wider scholarship framework, this paper contributes to the more specific work on the digital euro (for example Tronnier 2024, Westermeier 2024, Thomodakis et al. 2023). As a result, this paper examines CBDCs in the context of the public's growing privacy requests and concerns about mass surveillance, employing an analytical lens that intersects political economy and political philosophy, as well as a qualitative analysis of relevant scholarship, policy and legal documents, in addition to various public records, with the digital euro project serving as an informative case study.

The paper is organised as follows; after the introduction, section two presents a comprehensive literature review on the deconstruction of the state-money nexus caused by privately issued cryptocurrencies, how digital payment formats affect citizens' fundamental rights, specifically the right to privacy and consequently fuel apprehensions about mass surveillance scenarios. The section also sketches the contours of the paper's analytical framework, which will guide the ensuing case-study. The third section delves into the ECB's digital euro project, analysing political economy arguments in favour of euro's digitalisation, the current policy context, and regulatory proposals developed to strengthen the digital euro's legitimacy. Section four gives a comprehensive examination of the digital euro's privacy-enhancing features, while also highlighting potential gaps and solutions useful for alleviating surveillance concerns. Section five concludes on the state-of-play of the digital euro as well as on the implications of CBDCs to fundamental rights.

2. DIGITAL MONEY FORMATS, PRIVACY AND SURVEILLANCE: A LITERATURE REVIEW

As governments and central banks explore the potential implementation of CBDCs, concerns regarding surveillance and privacy have been paramount. While CBDCs hold the potential to revolutionise the financial landscape, they also pose significant challenges in terms of privacy and surveillance. Addressing these challenges requires a multi-faceted approach that balances

of central bank privacy approaches to CBDCs see: Jiang, J. (2023), Privacy Implications of Central Bank Digital Currencies, *Seton Hall Law Review*, 54, pp. 69-135

innovation with accountability, ensuring that CBDCs serve the interests of individuals and society as a whole. It is not surprising then that numerous policy and academic discussions on digital *fiat* money centre on the complex interplay between technological innovation, regulatory frameworks, citizens' rights and broader societal values (to cite a few examples, Anthony and Michel 2023, Jiyaing 2023, Ballaschk and Paulick 2021, Mora et al. 2019). Therefore, this section critically reflects on the multidirectional relationship between CBDCs and citizens' right to privacy, from the perspective of political philosophy and political economy, synthesising relevant literature in these fields. Researchers in both domains have written extensively about the potential misuse of personal financial data gathered through CBDCs' broader technological designs, as well as about power imbalances through potential surveillance, resulting from increased government control and decreasing individual liberty. Arguably, the vast majority of CBDCs' developmental studies, strategies, and pilot programmes allow public authorities, not least the central bank, to purposefully track, record, and save information, resulting in vast quantities of metadata that can be used for profiling and model predictions (Søe 2021, p. 16). Despite the numerous risks associated with digital currencies' distinct algorithmic characteristics, governments and public authorities around the world appear steadfast in their commitment to providing a digital alternative to their *fiat* currencies in the near future. Why is this so?

A compelling claim is that, through CBDCs, the state intends to maintain control over currency in the coming years, thereby halting the erosion of the state-money nexus caused by the rise of alternative forms of payment and “currency”.² Indeed, the introduction of digital payment formats based on a decentralised model supported by blockchain technology, also known as decentralised digital currencies or cryptocurrencies, represents a significant disruption to the state-money nexus that underpins the traditional financial ecosystem (Verma et al. 2023, p. 35). A few words on terminology are apposite at this point; namely, “digital currencies” are an umbrella term used to describe all electronic money formats, be it virtual currencies or cryptocurrencies. “Virtual currencies” are privately issued, electronically transferable digital representations of value, which are not issued by a central, public authority or “attached to a *fiat* currency” (Božina Beroš 2019, p. 334).

2 In this paper we do not refer to “cryptocurrencies” and “virtual currencies” as money because both categories lack fundamental economic and/or legal characteristics to be considered such. Instead, we sometimes use another umbrella term - that of “payments” to refer to cryptocurrencies and virtual currencies, thus emphasising the functionality these two categories share with money, namely, facilitating the exchange of value and transactions (albeit their utilisation remains marginal in relation to traditional currency).

If virtual currency transactions are based on cryptographic technology, particularly blockchain (Chey 2023, p. 1607), they can be referred to as cryptocurrencies (such as Bitcoin, Ethereum or Litecoin).

As noted above, the most significant disruptors in the evolution of digital money formats are undoubtedly cryptocurrencies. Driven by citizens' perception of reduced transactional costs, greater financial inclusion, and enhanced individual freedom because of individuals' direct control of their own digital assets without the involvement of third-party intermediaries (such as credit institutions or banks), with improved privacy protection, cryptocurrencies are striving for a competitive edge over traditional currencies. Furthermore, the growing use of digital currencies and payment systems provided by private companies (e.g., PayPal, Venmo) offers individuals with alternatives to traditional *fiat* currencies. Yet, Stanger (2024, p. 512) notes:

“The claim that decentralised finance will serve ordinary humans by cutting out the middleman, thereby bolstering democratic values, has not yet panned out in practice.”

Nonetheless, their design “for the purpose of serving as new money” (Chey 2023, p. 1606) and, moreover, their eschewing of governmental control and regulation, challenges the traditional concept of the state-money nexus, which refers to the state's monopoly on currency issuance and regulation. Because of their capacity to prevent central banks from regulating the money supply and its circulation (e.g., control the cross-border flow of money) or to stabilise payments, cryptocurrencies give rise to salient monetary policy concerns and to overall financial stability. Given the unrelenting pace and scope of digitalisation, the increasingly virtual landscape of money and finance will continue to shape the relationship between the state and its control over currency in the years ahead. Therefore, the issuance of CBDCs comes as a reasonable response to the broader challenges posed by the erosion of the state-money nexus, and as a monetary innovation whose purpose is to uphold central banks' supremacy in monetary policy (Masciandaro, 1995). They aim to provide the benefits of digital currencies while maintaining the state's control over monetary policy and regulation. However, the implementation of CBDCs raises its own set of challenges, such as cybersecurity risks, the potential impact on financial intermediation, and ultimately, privacy concerns.

From a political philosophy standpoint, the issue of privacy is an uncompromising element of CBDCs, because privacy is an essential

component of liberty (Shaman 2008, p. 121). Although there is no clear-cut definition of privacy, we define it broadly as an individual's need and right to have autonomous control over personal information or financial information, in the case of digital money formats, as well as to protect it. Another, more contextualised take to the definition of privacy is provided by Lessing (1999, p. 57) as:

“(...) that part of life that is left after one subtracts, as it were, the monitored and the searchable. A life where less is monitored is a life where more is private; and life where less can (legally or technologically) be searched is also a life where more is private.”

Privacy coincides with anonymity in monetary transactions (Borgonovo 2021, p. 3), although the two terms should not be used interchangeably. In fact (Thomadakis 2023, p. 27):

“privacy can be described as the ability of users to control the type and amount of data they share with others (...) anonymity means that the parties involved remain unknown, while privacy means that the content of the communication remains hidden to everyone but the actors involved in the payment transaction.”

However, CBDCs' design further enhances some core technical features of digital payment solutions, such as connectivity and interoperability, also redefining the relationship between citizens, financial institutions and the state (Westermeyer 2024, p. 36). Therefore, without strong privacy safeguards, CBDCs may allow governments and selected public authorities to monitor and control individuals' financial transactions, undermining their individual autonomy and liberty. Even though public authorities and governments emphasise the argument that CBDCs' data collection offers the potential for increased transparency and efficiency in financial transactions as well as anti-money laundering prevention, the loss of anonymity, which is critical for protecting individuals' privacy, is still urgent and calls for a carefully designed balance between transparency and anonymity to ensure that individuals' rights to privacy are respected while maintaining the necessary level of transparency to prevent illicit activities. This tension between privacy and control in CBDCs can be explained with Curran's (2023, p.2) assertion that the prospective business model of central banks may lead to an “unprecedented invasion and instrumental rationalisation”

of individuals' personal data, thereby disfiguring the existing relationship between central banks and the public simply by introducing the likelihood of control, which shifts the power balance in favour of the public authority (Søe 2021, p. 16) and not the determinate individual as, arguably, the ultimate sovereign.³

In fact CBDC's design will likely allow transactions to be recorded in a centralised database maintained by the central bank or government. This propensity to aggregate data may be expected from a central bank; after all, it would facilitate its task of safeguarding the monetary and financial system (Bilotta 2021, p. 9). While the majority of the data would be used to monitor and track transactions for regulatory compliance purposes, such as preventing money laundering, it could also be used to profile individuals based on various factors, such as income, spending habits and preferences. As Chaum (2021, p. 4) perceptively notes, the mere possibility of mass surveillance is problematic "even if people believe they have nothing to hide" because data collection relies on algorithms that are potentially prone to errors and thus to erroneous behavioural data, profiling and possibly sanctioning. Furthermore, due to the pervasive digitisation of public services, CBDC-acquired data could be then connected with information related to other aspects of an individual's life obtained through public service platforms and eventually translated into pure behavioural data. Therefore it is conceivable that CBDCs will act as "supply chains" for "surveillance data flows," where the citizens' direct interaction with the central bank would allow a production of knowledge that (Zuboff 2019):

"(...) extends far beyond the compilation of the information we gave them. It is the knowledge that they have produced from that information that constitutes their competitive advantage; these knowledge asymmetries introduce wholly new axes of social inequality and injustice."

From this perspective, CBDCs' elevated "monitoring" and "searchability" blatantly obstruct "the right to be forgotten" (Kahn 2018, p. 338) and open the door to unprecedented government overreach and abuse of institutional power, all at the expense of political freedom, dissent and ultimately, democracy. Addressing these concerns requires careful attention from

3 Although this claim is based more on a Bodinian or Hobbesian perspective to sovereignty. For a more exhaustive insight on the character of the holder of sovereignty within a jurisdiction see: Philipott, D. (2020), "Sovereignty" *Stanford Encyclopedia of Philosophy*, Fall 2020 edition, Edward N. Zalta (ed.), retrieved from: <https://plato.stanford.edu/archives/fall2020/entries/sovereignty/> (Accessed 9 May 2024)

policymakers when designing CBDCs which must have robust regulatory frameworks in place so as to prevent the misuse of power and ensure democratic oversight. In this regard, an important scholarly contribution has been made by Nissenbaum’s theory of “contextual integrity,” which (2004, p. 119):

“(…) ties the adequate privacy protection to norms of specific contexts, demanding that information gathering and dissemination be appropriate to that context and obey the governing norms of distribution within it.”

What Nissenbaum provides, essentially, is a prescriptive justification of privacy norms being grounded in contexts within which information is collected and shared. Or, as briefly put by Tronnier (2024, p. 5879): “privacy, and privacy perceived violations, are context-dependent”. Contextual integrity appears promising to address salient privacy and surveillance concerns because it allows CBDC systems to be designed with built-in privacy-enhancing features by applying the theory’s basic principles. For instance, privacy-preserving protocols (e.g., encryption) can be used to minimise the disclosure of sensitive transactional data. Even more importantly, contextual integrity provides a practical framework for policymakers and regulators to develop rules and regulations governing CBDCs, tailored to context-specific privacy norms.⁴

Considering all critical points identified by relevant literature, as well as contextual integrity’s operative, real-life framework, it is clear that the majority of CBDC’s worldwide have yet to explore or effectively address policy and regulatory implications of their disruptive potential on fundamental rights. A starting point could be to develop current CBDC policy proposals along the lines of several key analytical questions (Jiang 2023, p. 76); first, what is the broader policy context of CBDC usage and who are the involved actors? Second, what types of information are shared and how to protect privacy in CBDC transmission? With this in mind, the following sections look at the ECB’s proposal for a digital euro, attempting to assess and contextualise the balance between digital currency operationality and privacy regulation as envisaged and developed by one of the world’s most institutionally powerful central banks.

4 For example, regulators might impose stricter privacy requirements for retail transactions involving personal spending data.

3. CONTEXTUALISING THE ECB'S DIGITAL EURO PROPOSAL

The proposal of a digital euro emerged as central banks around the world began to investigate CBDCs in response to the increasing digitisation of financial transactions, particularly during the coronavirus crisis, and the possibility of cryptocurrencies entering the “traditional” financial sector via retail payment services. This development is becoming more likely as retail payments continue to demonstrate the greatest openness to embrace financial innovation in payment methods, driven by consumer appetite for digital, instant and contactless options (Thomodakis et al. 2023, p. ii). As a response, the ECB began seriously considering the feasibility of complementing cash payments with a CBDC in late 2018 (for example, see statement by Coeuré 2018), with discussions intensifying in 2020 (Croatian National Bank 2020) and the years immediately following, amid growing concerns about the potential impact of private cryptocurrencies on monetary policy and sovereignty in addition to overall financial system stability. As sharply observed by ECB's president Christine Lagarde: “payments are a public good that is simply too important to be left to the market” (Christie 2023). Between 2018 and 2020, top ECB executives and policymakers expressed similar sentiments in official statements and public speeches, which then gained greater political and policy traction thanks to two seminal ECB deliverables – the 2020 “Report on a digital euro” and the 2021 “Eurosystem report on the public consultation on a digital euro”. Both documents underscored the importance of providing citizens with reliable and stable digital money formats in an increasingly digital financial ecosystem (ECB 2020, p. 3; ECB 2021, p. 16). Indeed, following these exhaustive studies on the policy and public perception implications of the possible issuance of a digital counterpart to the “everyday euro”, the ECB concluded that the euro in its current form is not “fit for the digital age” and that, therefore, options and scenarios of implementing eurozone's CBDCs should be explored in order to support EU's autonomy in the payment ecosystem as well as preserve citizens' trust in public money (European Central Bank 2020).

From a political economy standpoint, the ECB's proposal to explore the digital euro is nothing short of an ideological revolution for the bank – indeed, the ECB has been determined in preserving “technological neutrality” in various domains of its policy choices throughout the decades.⁵ However,

5 For example, when assessing the digital transformation of bank business models as part of its supervisory exercise, or when considering the entry of fintech businesses in the EU financial market. See European Central Bank (2023a), Bank's digital transformation:

with the digital euro, the ECB intends to capitalise on the potential of technological advancements, particularly distributed-ledger technologies, which serve as the foundation for many cryptocurrencies, as well as to create synergies with private payment solutions, shifting from technological neutrality to what we might call technological entrepreneurship. The ECB's intriguing shift in beliefs should come as no surprise, given that one of the primary goals of central banks is to maintain trust in money and the monetary system (i.e., rules and institutions) that underpins it. To accomplish this task, central banks must be able to respond swiftly to economic, technological, and societal developments, analysing the most relevant developments and adapting accordingly. Considering the pervasive effects of digitalisation within the society, which fuels citizens' demand for payment immediacy, and keeping in mind that one of the components of maintaining confidence in money is being able to provide citizens with unfettered access to riskless, central bank money for their everyday payments, the ECB's decision to “enter the digital era” appears as a logical next step in its mission to ensure monetary stability (European Central Bank 2023b, p. 3). Furthermore, by acknowledging the increasingly digital reality of our socio-economic interactions, the ECB's decision to go digital will support “the sense of sharing the same currency” thus allowing the ECB to address concerns about the erosion of the state-money nexus and better protect the strength of the euro (Ibidem, p. 9)

So, how exactly does the ECB's digital euro proposal intend to achieve this? A valid response is to return to the key analytical questions raised in the preceding section – namely, what is the policy context of this proposal and who are the actors involved? Understanding the broader context and identifying key stakeholders will allow us to gauge whether the operational aspects of the digital euro's design provide context-tailored privacy norms in the following section.

It is important to keep in mind that the digital euro project aims to capitalise on two key facts: first, that the euro as a common currency is an essential catalyst of deeper financial and political integration, and second, that the EU economy is becoming increasingly immaterial and digitalised. Reflecting the larger socioeconomic reality in which the project is being developed, the digital euro also intends to leverage technological innovations

where do we stand? Available at: https://www.bankingsupervision.europa.eu/press/publications/newsletter/2023/html/ssm.nl230215_2.en.html (Accessed 13 May 2024); European Central Bank-Banking Supervision (2018), Guide to assessments of fintech credit institution licence applications, Frankfurt Am Main: European Central Bank, retrieved from: https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.201803_guide_assessment_fintech_credit_inst_licensing.en.pdf (Accessed 13 May 2024)

provided by specific cryptocurrency formats not only for resilience but also for increased transactional efficiency. Indeed, digital central bank money will support resilience by supporting trust in the banking and financial system thanks to its at par convertibility with bank deposits (European Commission 2023, p. 1). Furthermore, the digital euro aims to strengthen financial inclusion for all citizens in the eurozone (and beyond) regardless of their geographical location or financial profile. From a narrower, monetary policy perspective, there are no direct provisions that could sketch the policy and, thus, legislative contours of the digital euro proposal – the ECB's current investigative work on its own CBDC therefore is backed by and consistent with primary law principles, the broader internal market freedom to provide payment services, and finally, several EU policies in accessibility, financial inclusion and data protection, not least the Commission's priority of strategic autonomy in the light of potential external disruptions in finance and payments as well as that of green transition (European Commission 2023, pp. 3, 4, and 9). Under these broader contextual circumstances, the digital euro will provide (European Central Bank 2023b, p. 10):

“(...) for the first time in history, direct access for people to digital central bank money issued and backed by the ECB.”

Moreover, the digital euro will (European Commission 2023, p. 1):

“(...) be offered as a public digital means of payment, alongside the existing private digital means of payment, supporting a stronger and more competitive, efficient and innovative European retail payments market and digital finance sector.”

These descriptions highlight the ECB's leading role in the development and positioning of this evolutionary money format. The goal is to make the digital euro as similar to traditional euro banknotes and coins as possible, and to develop it as an alternative to cash, and not as a replacement. As such this CBDC should be a direct liability of the ECB or of the national central banks of eurozone towards digital euro users.

One notable feature of traditional euro banknotes and coins is their anonymity in the context of everyday payments, and it is worth mentioning that the ECB is very clear about the digital euro being “reliable money” in that sense (European Central Bank 2023b, p. 4). It is not surprising then that the ECB is in charge of designing and regulating the digital euro through a string of research, pilot studies, and consultations that help imbed wider

views and inputs into the digital euro's features and framework that will bring this novel money format closer to cash-like privacy. The European System of Central Banks, specifically the Eurosystem, also has influence over the project's development. In fact, national central banks from eurozone countries collaborate with the ECB to develop and implement the digital euro. They offer insights, facilitate pilot programmes, and ensure compliance with national financial systems.⁶ Together, the ECB and eurozone national central banks collaborate to develop the market's most affordable and convenient digital payment solution for the digital euro (Howell et al. 2024). In this context, the ECB is responsible for coordinating and collaborating with credit institutions, primarily banks and payment service providers (PSPs), which in turn are responsible for managing end users' digital euro accounts⁷ and for providing digital euro payment services (European Commission 2023, p. 18).

Indeed, banks are one of the more critical stakeholders of the project, as they act as the primary channel through which individuals, merchants and businesses will access the digital euro. This makes banks responsible for facilitating the seamless integration between the digital money format with traditional bank accounts, payment systems, and related financial services. All of this should ensure the smooth operation and wider acceptance of the digital euro. In this respect, banks can help create a robust and user-friendly ecosystem for the digital euro by leveraging their existing technological infrastructure and expertise, particularly in anti-money laundering. At the same time, and from a bank's perspective, a digital euro would extend the reach of intermediaries throughout the eurozone while also serving as a platform for further innovation and competition in the digital payment markets. An important role is given to PSPs in this context, whose role in the digital euro ecosystem is to intermediate between banks and end users, which means that they should proactively develop the technology and

6 For example, the Commission's Expert Group on Banking, Payment, and Insurance was established between September 2022 and February 2023 with the goal of discussing the digital euro proposal through targeted consultations with Member States. Furthermore, Member States could express their views on the digital euro during Euro Group meetings beginning in 2021. See European Commission (2023), Proposal for a regulation of the European Parliament and of the Council on the establishment of the digital euro, COM/2023/369 final, at p. 6.

7 According to Recital 23 of the Commission's proposal regulation, a digital payment account is: “a category of payment accounts denominated in euro through which digital euro users are able to carry out inter alia the following transactions: place funds, withdraw cash and execute and receive payment transactions to and from third parties, irrespective of the technology used and the structure of the ledger or of the data (e.g. whether digital euros are recorded as holding balances or units of value).”

platforms required for the digital euro distribution and operability across value-chains.⁸

Competent regulatory and supervisory authorities at the EU and national governance levels are also an integral component and stakeholder in terms of the project's implementation and sustainability, because they are responsible for building public trust in the digital euro.⁹ On the one hand, competent regulatory and supervisory authorities ensure that the digital euro conforms with, and adheres to, the general legal and regulatory framework that also apply to "traditional" money formats, for example, anti-money laundering provisions. They also assess regulatory and supervisory standards for the (potentially disruptive) technology underpinning the digital euro. On the other hand, and more importantly for the purposes of our discussion, regulatory and supervisory authorities are first called upon to prevent any "strategic collection" or misuse of consumers' personal data within the digital euro ecosystem, by developing and implementing strict data protection and privacy standards based on the needs and preferences of the end-user, the citizen. To this end, the ECB, in its regulatory and supervisory capacity, has conducted public consultations and surveys to ensure that the digital euro meets citizens' expectations and requirements.

The issue of personal data collection and management leads us to mention the citizens - the digital euro end-users - as one of the more essential stakeholders in this ecosystem. Indeed, the success of the project depends on the digital euro's wider adoption and usage by the public. This means that, from a transactional point of view, citizens must see added value in using this innovative financial asset over traditional payment methods. Citizens' spending and saving habits will have a significant impact on the overall economic impact of the digital euro, allowing central banks to develop more effective monetary policies in response. However, in order to reap such monetary and transactional benefits, central banks must gain access to specific personal transactional data, which in turn emphasises the importance of privacy considerations. At the same time, we must keep in mind that the rights to privacy and data protection are fundamental citizen rights in the EU, as stipulated by Arts. 7 and 8 of the Charter of Fundamental Rights of the EU (Recital 70 of the Commission's proposal regulation). Thus, it is only by openly addressing data protection that the ECB will "encourage

⁸ They are also responsible to develop outreach and educational measures aimed to raise awareness about the various aspects of the digital euro among the public.

⁹ At the national level, these may include, in addition to central banks, other public authorities (e.g., independent regulatory agencies), depending on a Member State's banking supervision model.

the widest possible adoption of the digital euro” (Thomadakis 2023, p. 30); however, with some expected degree of reporting and data collection given anti-money laundering requirements (Ibidem, p. 12).

This ambivalence of privacy requirements - strong enough to mitigate surveillance concerns and maintain citizens’ trust while not contradicting anti-money laundering and financial crime prevention requirements - complicates the “context” of a contextual integrity approach to privacy in the digital euro ecosystem. The success of providing tailored privacy norms is naturally dependent on the digital euro’s specific design features; thus, in the following section, we will delve into a more detailed description of the digital euro’s take on privacy or, in other words, how each of the mentioned core stakeholders are organised toward data collection and management due to a “less-than-cash-like” anonymity of this novel digital money format.

4. THE DIGITAL EURO’S TAILORED TAKE ON PRIVACY

In one of his public speeches, the then-member of the ECB’s Executive Board, Yves Mersch, stated that the pervasively virtual realities of our economic contexts were prompting the ECB to initiate analytical discussion about its own CBDC, with a focus not only on the gains for monetary policy and the payment system, but also on the overall financial safety and sustainability of central banks’ adoption of potentially disruptive technologies (Mersch 2017). And while ECB’s first considerations of CBDCs were centred on operational and cyber resilience concerns of new technologies (primarily because of central banks’ assessment of distributed-ledger technology or DLT appropriateness for digital money purposes), just in a couple of years, and as a direct result to the public consultation on the digital euro conducted during the project’s investigation phase (European Central Bank 2021), the focus shifted to privacy issues and concerns over mass surveillance. Aware of these concerns, in 2022 Fabio Panetta and Christine Lagarde claimed that: “people should be able to choose how much information they want to disclose – so long as they comply with prevailing laws” (Panetta and Lagarde 2022). As a result, the ECB readily acknowledged that the digital euro “would be designed to have the highest possible level of privacy” in its preparatory documents for the introduction of euro banknotes and coins in the digital era (European Central Bank 2023b, p. 8).

The principle guiding the ECB’s design of the digital euro is that it will function as a digital equivalent of euro banknotes and coins, readily available to citizens and non-bank firms (European Central Bank 2020, p. 6) supplementing conventional cash payments rather than replacing

them. Alongside the digital euro, other means of electronic payments should remain readily available throughout the eurozone. In fact, the investigation phase leads to the conclusion that, although the ECB will have exclusive authority to issue the digital euro, the sector of regulated financial intermediaries, namely credit institutions, will be responsible for providing ancillary services with the scope of distributing (i.e., intermediating) this digital money format to end users. PSPs will have the opportunity to offer related services in this chain of intermediation, such as managing digital euro accounts and using the infrastructure of the digital euro to create new payment options and services for their clients. Fintech businesses may also facilitate cooperation and interoperability between conventional and non-traditional PSPs, boosting the effectiveness of payments throughout the eurozone (European Central Bank 2023b, p. 9).

Compared to other digital payment methods, the digital euro would benefit from being a publicly accepted means of payment throughout the eurozone, which would help it overcome the operational and financial inefficiencies of the current fragmented payment landscape from the standpoint of both businesses and citizens. Economies of scale suggest that to achieve the intended monetary and payment benefits, the digital euro must be widely accepted by EU citizens. This acceptance must be equal to citizens' confidence in and reliance on euro cash, which in turn might be dependent on the digital euro's capacity to replicate the unique advantages of cash payments, namely anonymity and privacy. Judging by the stocktake on the digital euro's investigation phase, its preparation plan and the accompanying legislative proposal, the digital euro will enjoy the highest level of user privacy. However, we must bear in mind that digital forms of payment inherently imply less anonymity and privacy because transactional, personal, data is already accessible to third parties throughout the payment ecosystem (including fintech businesses). As a result, complete anonymity will not be achievable with digital euros, if only due to legal compliance obligations that prevent illicit activities. Still, as Urbinati et al. (2021, p. 14) rightly argue, if personal data were managed "under the responsibility and the control of public authorities" such as central banks:

"(...) this would already guarantee compliance with the privacy protection standards, especially compared with cases in which transaction data is managed by big private institutions."

At the same time, Cham et al. (2021, p. 4) remind us that – regardless of the anonymity costs – privacy of payments in CBDCs protects citizens

from potential mass surveillance, data abuse by PSPs, and from opportunistic behaviour by other contractual parties in a payment transaction. As a result, the ECB continues to examine how to strike a balance between the public interest in the safety and soundness of the financial system—which is also ensured by the enforcement of laws such as those prohibiting money laundering—and citizens’ fundamental right to privacy, or, in Kahn’s words, “the right to be forgotten”, as we’ve mentioned in previous sections. For the time being, the digital euro is leaning toward a so-called tiered privacy model which involves different degrees of privacy depending on the mode of payment, whether it is an online or offline functionality, as well as the value of the transaction.

More concretely, an “online” mode will cover the majority of payments in central bank money – even those done remotely and without the need of holding bearer instruments. The digital euro will require onboarding monitoring and procedures, similar to any other digital payment solution.¹⁰ Indeed, existing EU regulations do not allow for anonymous electronic payments and the same is therefore expected for the digital euro (European Central Bank 2020, p. 27). Furthermore, similar to the privacy-preserving features of other digital payments, the digital euro will ensure that data circulates only to supervised entities – in other words banks and PSPs, who will collect and share data in accordance with anti-fraud and anti-money laundering regulations (Art. 34 of the Commission’s proposal regulation). In terms of payment validation, online transactions will rely on PSPs, who will then have access to transactional data. The PSPs’ access to personal data will be limited to strictly necessary information and in line with existing EU data protection legislation. At the same time, the Eurosystem would have access only to data relevant for the performance of “critical digital euro tasks” (European Central Bank 2023b, p. 38). It would not have access to data that would enable identification of natural persons making or receiving payments in digital money format. To this end, the ECB is currently exploring various data-anonymisation options, such as data segregation, cryptographic techniques in settlement infrastructures and pseudonymisation – all in line with the Commission’s legislative proposal on the digital euro (see Art. 35 of the Commission’s proposal regulation).

On the other hand, an “offline” mode will use a bearer payment instrument not reliant on an internet connection and limited to proximity

10 Moreover, it is important to note that the digital euro will include options to protect personal user data from subsequent PSP-distribution for marketing or broader commercial purposes; user will have to “opt in” in order to give consent for their personal data to be used beyond onboarding reasons.

payments – it will mostly resemble cash-payments (Ibidem, p. 13) and it is therefore expected that the offline mode will provide a higher degree of user privacy. In fact, users would rely on some kind of digital euro wallets on their smartphones or other electronic devices for offline payments, which would be protected by cryptographic techniques to prevent unauthorised access. Offline digital euros would offer a level of privacy equal to citizens' withdrawal of cash at automatic teller machines (Commission's proposal regulation, p. 3). Since an offline payment would rely on peer-to-peer validation without the involvement of a third party, PSP intervention will not be required, nor would data flow to the Eurosystem or any third-party supporting service provider (Art. 36 of the Commission's proposal regulation). However, such offline transactions might be subject to prefunding requirements, which would require an earlier online connection, as well as the imposition of transaction value limits. Even then various degrees of privacy can be guaranteed, but this will ultimately depend on the final technical solution chosen by the ECB (European Central Bank 2020, p. 27). According to ECB's current investigation results and the legislator's proposal, it is obvious that the digital euro will not provide full anonymity even in offline payments (European Central Bank 2023b, p. 29); however, the fact that it will not match a cash-like privacy degree does not have to discourage mass use. In fact, the ECB arguably makes significant efforts to plan and design privacy safeguards that protect all stakeholders in the digital euro-ecosystem, treating citizens' right to privacy as a fundamental design feature. It is also encouraging that the ECB has been very clear throughout its analytical and policy work on the digital euro that it does not intend to collect user data for any type of exploitation (e.g., aggregation and translation to behavioural data, commercial purposes, etc.). It has repeatedly stated that its interest in user data is solely for the purpose of conducting monetary policy. Given that, as with any other digital means of payment, complete anonymity is not a viable option for the digital euro, the Commission's proposal regulation addresses the right to privacy with context-appropriate solutions, carefully balancing between the public interest in financial safety and a level of privacy at least equal to – if not a bit higher – than the one provided by private sector digital solutions (European Central Bank 2022, p. 7). Indeed, depending on the mode of use (online vs offline) the digital euro could provide almost (but not quite as) cash-like levels of privacy, particularly in offline payments and for lower-level transactions executed in close physical proximity of the payer and payee.¹¹

11 "While customers would be subject to customer checks during onboarding, real-time information about holdings, balances and transaction amounts would only be known by

Returning to Nissenbaum’s contextual integrity reasoning, we can argue that some degree of privacy infringement within the digital euro ecosystem may be acceptable to users, because it is based on actions and practices of key stakeholders taken in the interest of a public good – financial system safety (Nissenbaum 2009 as cited by Tronnier 2024, p. 5880). Moreover, as central banks are public entities their “trade-off approach” to balancing privacy concerns (i.e., right to user anonymity vs fraud detection and financial crime prevention) may provide a competitive edge in comparison to other digital payment solutions.

5. CONCLUSIONS

Our overwhelmingly digitalised lives propelled the “extent of the monitored, and the reach of the searchable” (Lessing 1999, p. 57) to unprecedented dimensions, dramatically compromising the “right to be forgotten”. Indeed, the increasing dematerialisation of economic relationships as well as the blending of technology and finance have significantly limited individuals’ control over their personal (financial) information. This is true for any digital payment solution, not least for CBDCs. With CBDCs central banks are planning to leverage the benefits of digital technology and maintain the trust associated with state-issued money in a digitalised society. However, apart from several additional benefits to that of preserving the state-money nexus, CBDCs also raise some concerns, with one of the most challenging to address being the balance between individual autonomy and state surveillance. This is because CBDCs may enhance the state’s monitoring capabilities by allowing governments to track citizens’ financial data and related behavioural patterns in real time. Such an erosion of citizens’ privacy and individual autonomy emphasises the importance of democratic oversight in designing CBDCs to ensure that digital money formats not only align with demands for greater monetary and financial sovereignty, but also with broader democratic values and principles. Therefore, this paper carefully assessed the digital euro project, which is currently one of the most advanced investigations in the practical implementation of digital representations of *fiat* money, in terms of its implications to fundamental individual rights.

them and not by third parties, such as financial intermediaries or banks. By limiting offline payments to low-value payments and to situations where the payer and payee are in close physical proximity, the risk of illicit use could be contained.” See: European Central Bank (2022), Progress on the investigation phase of a digital euro, Frankfurt am Main: European Central Bank, at p. 8.

In the light of the present scenario, it is clear that privacy is a major concern in all political and policy discussions about the digital euro, as highlighted by the EU legislator in the recent legislative proposal on the digital currency. As a result, there are several key privacy features that can be teased out from the policy and regulatory standpoint, such as pseudonymity, limiting the amount of personal data available to the Eurosystem, and tiered-privacy models. From a conceptual standpoint, it is an approach that is well backed by relevant political economy and political philosophy scholarship, particularly Nissenbaum's contextual integrity framework. This framework helps analyse and address privacy concerns related to the digital euro by emphasising the importance of context-specific norms, such as appropriate data flows, user control, and purpose limitation. From a practical point of view, the digital euro's policy and legislative proposals are consistent with these principles, aiming to respect financial context norms while striking a delicate balance between user privacy and *sine qua non* public policy goals, such as preventing illicit activities.

The ECB has yet to present a definitive design for the digital euro; therefore, a definitive critical appraisal of privacy-preserving measures and processes remains to be rendered (Thomadakis 2023, p. 28). For the time being it is safe to argue that the digital euro ushers in an important turn in the EU monetary history, one in which understanding the nuances and potential consequences of central banks' technological entrepreneurship to our fundamental rights, such as the right to privacy, is critical to our future trajectory.

BIBLIOGRAPHY

1. Anthony, N., Michel, N. (2023), “Central Bank Digital Currency-Assessing the Risks and Dispelling the Myths”, *CATO Policy Analysis* No. 491, CATO Institute, Available at: <https://www.cato.org/policy-analysis/central-bank-digital-currency#> (Accessed 10 May 2024)
2. Atlantic Council-GeoEconomics Center (2023), Central Bank Digital Currency Tracker, Available at: <https://www.atlanticcouncil.org/cbdctracker/> (Accessed 19 February 2024)
3. Ballaschk, D., Paulick, J. (2021), “The public, the private and the secret: Thoughts on privacy in central bank digital currencies, *Journal of Payment Strategy & Systems*, 15(3), pp. 277-286, DOI:
4. Boronovo, E., Caselli, S., Cillo, A., Masciandaro, D., Rabitti, G. (2021), “Money, Privacy, Anonymity: What Do Experiments Tell Us?”, *Journal of Financial Stability*, 56 DOI: <https://doi.org/10.1016/j.jfs.2021.100934>
5. Božina Beroš, M. (2019), “Sovereign Digital Currencies: Central Banking of the Future or Echoes from the Past?”, *IANUS Diritto e Finanza*, No. 19, pp. 333-342, Available at: https://www.rivistaianus.it/numero_19_2019/15_Beros_333-342.pdf (Accessed 6 May 2024)
6. Chaum, D., Grothoff, C., Moser, T. (2021), “How to Issue Central Bank Digital Currency”, Available at: <https://arxiv.org/pdf/2103.00254> (Accessed 21 May 2024)
7. Chey, H. (2023), “Cryptocurrencies and the IPE of money: an agenda for research”, *Review of International Political Economy*, 30(4), pp. 1605-1620, DOI: <https://doi.org/10.1080/09692290.2022.2109188>
8. Christie, R. (2023), “Digital Euro Blurs the Lines Between Money and Politics”, Brussels briefing-Internationale Politik Quarterly, Available at: <https://ip-quarterly.com/en/digital-euro-blurs-lines-between-money-and-politics> (Accessed 15 May 2024)
9. Coeuré, B. (2018), “The new frontier of payments and market infrastructure: on cryptos, cyber, and CCPs” (Power Point presentation), *Economics of Payments IX conference*, Basel 15 November 2018, Available at: <https://www.ecb.europa.eu/press/key/date/2018/html/ecb.sp181115.en.html> (Accessed 13 May 2024)
10. Croatian National Bank (2020), “ECB intensifies its work on a digital euro”, Available at: <https://www.hnb.hr/en/-/ecb-intensifies-its-work-on-a-digital-euro> (Accessed 13 May 2024)
11. Curran, D. (2023), “Surveillance capitalism and systemic digital risk: The imperative to collect and connect the risks of interconnectedness”, *Big Data & Society*, 10(1), pp. 1-12, DOI: <https://doi.org/10.1177/20539517231177621>
12. Dionysopoulos, L., Marra, M., Urquhart, A. (2024), “Central bank digital currencies: A critical review”, *International Review of Financial Analysis*, Vol. 91, DOI: <https://doi.org/10.1016/j.irfa.2023.103031>
13. European Central Bank (2023a), Bank’s digital transformation: where do we stand? Available at: https://www.bankingsupervision.europa.eu/press/publications/newsletter/2023/html/ssm.nl230215_2.en.html (Accessed 13 May 2024)
14. European Central Bank (2023b), A stocktake on the digital euro. Summary report on the investigation phase and outlook on the next phase, Frankfurt Am Main: European Central

- Bank, Available at: https://www.ecb.europa.eu/paym/digital_euro/investigation/profuse/shared/files/dedocs/ecb.dedocs231018.en.pdf (Accessed 15 May 2024)
15. European Central Bank (2022), Progress on the investigation phase of a digital euro, Frankfurt am Main: European Central Bank, Available at: https://www.ecb.europa.eu/euro/digital_euro/timeline/profuse/shared/pdf/ecb.degov220929.en.pdf (30 May 2024)
 16. European Central Bank (2021), Eurosystem report on the public consultation on a digital euro, Frankfurt Am Main: European Central Bank April 2021, Available at: https://www.ecb.europa.eu/euro/digital_euro/html/pubcon.en.html (Accessed 3 May 2024)
 17. European Central Bank (2020), Report on a digital euro, Frankfurt Am Main: European Central Bank, Available at: https://www.ecb.europa.eu/euro/digital_euro/timeline/html/index.en.html (Accessed 13 May 2024)
 18. European Central Bank-Banking Supervision (2018), Guide to assessments of fintech credit institution licence applications, Frankfurt Am Main: European Central Bank, Available at: https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.201803_guide_assessment_fintech_credit_inst_licensing.en.pdf (Accessed 13 May 2024)
 19. European Commission (2023), Proposal for a regulation of the European Parliament and of the Council on the establishment of the digital euro, COM/2023/369 final, Brussels 28.6.2023.
 20. Howell, E., Dubský, S., Mighetti, A. (2024), "Digital Euro: Digitalizing the Eurozone Payment Ecosystem", Flagship Advisory Partners, 18 January, Available at: <https://insights.flagshipadvisorypartners.com/digital-euro-digitalizing-the-eurozone-payment-ecosystem> (Accessed 20 May 2024)
 21. Jiang, J. (2023), "Privacy Implications of Central Bank Digital Currencies", *Seton Hall Law Review*, 54, pp. 69-135
 22. Kahn, C. M. (2018), "Payment Systems and Privacy", *Federal Reserve Bank of St. Louis Review*, Fourth Quarter 2018, 100(4), pp. 337-344, DOI: <https://doi.org/10.20955/r.100.337-44>
 23. Lagarde, C., Panetta, F. (2022), "Key objectives of the digital euro", *The ECB Blog*, 13 July, Available at: <https://www.google.com/search?client=firefox-b-d&q=citing+blogs+harvard> (Accessed 24 May 2024)
 24. Lessing, L. (1999), "The Architecture of Privacy: Remaking Privacy in Cyberspace", *Vanderbilt Journal of Entertainment & Technology Law*, 1(1), pp. 56-65
 25. Masciandaro, D. (1995), "Designing a central bank: Social player, monetary agent, or banking agent?", *Open Economies Review*, 6, pp. 399-410, DOI: <https://doi.org/10.1007/BF01000390>
 26. Mersch, Y. (2017), Digital Base Money: an assessment from the ECB's perspective, Speech at the Farewell ceremony for Pentti Hakkarainen, Deputy Governor of Suomen Pankki-Finlands Bank, Helsinki, 16 January, Available at: <https://www.ecb.europa.eu/press/key/date/2017/html/sp170116.en.html> (Accessed 23 May 2024)
 27. Mora, H., Pujol López, A., Mendoza Tello, J. C., Morales, M. R. (2019), "Virtual Currencies in Modern Societies: Challenges and Opportunities, In: Visvizi, A., Lytras, M. D. (eds.), *Politics and Technology in the Post-Truth Era*, Leeds: Emerald Publishing, pp. 171-185

28. Nissenbaum, H. (2004), “Privacy as Contextual Integrity”, *Washington Law Review*, 79(1), pp. 119-158
29. Philipott, D. (2020), “Sovereignty” *Stanford Encyclopedia of Philosophy*, Fall 2020 edition, Edward N. Zalta (ed.), Available at: <https://plato.stanford.edu/archives/fall2020/entries/sovereignty/> (Accessed 9 May 2024)
30. Shaman, J. M., *Equality and Liberty in the Golden Age of State Constitutional Law*, Oxford: Oxford University Press
31. Søre, S. O. (2021), “A Story of Surveillance? Past, Present, Prediction,” *SATS -Northern European Journal of Philosophy*, 22(1), pp. 11-25, DOI: <https://doi.org/10.1515/sats-2020-0021>
32. Stanger, A. (2024), “Are Cryptocurrencies and Decentralised Finance Democratic?”, In: Werthner, H., Ghezzi, C., Kramer, J., Nida-Rümelin, J., Nuseibeh, B., Prem, E., Stanger, A. (Eds.) *Introduction to Digital Humanism-A Textbook*, Cham: Springer, pp. 511-523
33. Thomadakis, A., Lannoo, K., Shamsfakhr, F. (2023), “A digital euro beyond impulse – Think twice, act once”, *Centre for European Policy Studies Round Table Report*, CEPS-ECMI-ECRI Study, Available at: <https://www.ceps.eu/ceps-news/a-digital-euro-beyond-impulse-think-twice-act-once/> (Accessed 13 May 2024)
34. Tronnier, F. (2024), “Using contextual Integrity to Uncover Acceptability of Information Flows in Central Bank Digital Currency Transactions”, *Proceedings of the 57th Hawaii International Conference on System Sciences*, pp. 5878-5887, Available at: <https://scholarspace.manoa.hawaii.edu/items/44d97b3d-bdd1-4f9f-9da3-ecc3612bc389> (Accessed 21 May 2024)
35. Urbinati, E., Belsito, A., Cani, D., Caporini, A., Capotosto, M., Folino, S., Galano, G., Goretti, G., Marcelli, G., Tiberi, P., Vita, A. (2021), “A digital euro: a contribution to the discussion on technical design choices”, *Banca d'Italia Mercati, infrastrutture, sistemi di pagamento-Questioni Istituzionali*, No. 10, Available at: <https://www.bancaditalia.it/media/notizia/a-digital-euro-a-contribution-to-the-discussion-on-technical-design-choices/?dotcache=refresh> (Accessed 26 May 2024)
36. Verma, P., Mukherjee, D., Moza, B. (2023), “Decentralised Money: A Comprehensive Review of Cryptocurrencies”, *International Journal on Advanced Trends in Computer Applications*, 9(2), pp. 35-41
37. Westermeier, C. (2024), “The digital euro as a Materialization of (in)security”, *Review of International Political Economy*, Available at: <https://doi.org/10.31235/osf.io/x45eg> (Accessed 9 May 2024)
38. Zuboff, S. (2019), “High tech is watching you”, Interview with S. Zuboff by Laidler, J., March 4 2019, *The Harvard Gazette*, Available at: <https://news.harvard.edu/gazette/story/2019/03/harvard-professor-says-surveillance-capitalism-is-undermining-democracy/> (Accessed 10 May 2024)

A BIBLIOMETRIC ANALYSIS OF MANAGEMENT ACCOUNTING AND INFORMATION SYSTEMS RESEARCH: SIX DECADES OF TRENDS

ANTONIJA PETRLIĆ

University of Rijeka

Faculty of Economics and Business

Rijeka, Croatia

antonija.petrlic@efri.uniri.hr

Paper Category: Original scientific paper

ABSTRACT

This paper provides a comprehensive overview of the status and trends in research on the concepts of management accounting and information systems. In other words, the study aims to outline the research field by examining the main characteristics of publications on these two concepts, including performance and citation, co-citation, bibliographic, co-word and co-authorship analysis. Therefore, a bibliometric analysis based on the Web of Science Core Collection database was conducted to analyse studies on these concepts from the last 57 years (1968-2024). The analysis was carried out for a total of 279 extracted publications using the VOSviewer software. The results show a fluctuating trend in the studies but also indicate an expected increase in importance in the future. Furthermore, a low level of collaboration between researchers in terms of country networking was demonstrated. However, the analysis shows four main research clusters that focus on external factors, research design and application of statistical methods, technology and digitalisation, and tools and innovations in management accounting. In this context, the results of the co-word analysis highlight data and information quality, big data, blockchain, artificial intelligence, innovation, business intelligence and digitalisation in general as concepts that should be further explored in the context of management accounting. The results of this paper primarily contribute to the management accounting literature by providing a detailed insight into how the application of information systems and their importance to management accounting has changed over time and where the focus should be placed in the future to increase effectiveness. The paper also contributes to practitioners by confirming the increasing importance of management accounting and the significance of data and information quality and the use of tools that enable it (e.g., business intelligence, big data, etc).

Keywords: bibliometric analysis, controlling, digitalisation, information systems, management accounting

1. INTRODUCTION

Proper and successful corporate management is hardly possible today without the introduction of new technologies and customised functions that are jointly responsible for the management of the company. Management accounting, i.e. the German concept of controlling (Becker and Messner, 2005; Messner et al., 2008; Schäffer, 2013; Bajnai, 2021; Petrlić and Srok, 2024), sometimes considered synonymous, is an informative-analytical and advisory function that combines analysis, control, planning and reporting and provides management with the best possible solutions to challenges that arise inside and outside the organisational environment (Vitezić, 2008). While decision-making represents the process of creating value for business, through planning, control and performance evaluation (Mihăilă, 2014), management accounting as a professional function has the task of providing information that helps managers make correct and timely decisions (Gärtner and Hiebl, 2018) and create added value. Although management accounting experienced its development through several stages and the resulting different theoretical starting points as a concept, process, and function, today it is interpreted as a function that not only performs statistical processing and data analysis, but also provides solutions and suggestions for decision-making. It is therefore interpreted as management support that works in a proactive and forward-looking manner, while management accountants, as task owners, are vividly described as “business partners” of managers (Vitezić and Petrlić, 2017; Weber and Schäffer, 2014).

In today's business and environmental conditions, management accounting is an indispensable management function in which the management accountant, i.e. controller, as an internal economic expert, business analyst, consultant and partner, has the task of analytically processing collected data and advising and supporting management in achieving the set strategic and operational goals (Vitezić, Lebefromm and Petrlić, 2019). In doing so, management accountants use numerous internal and external, structured and unstructured, data and information as input for their analyses and reports. Although the quality of reports, i.e. outputs, depends on the skills of management accountants, given the volume, velocity, variety and veracity of today's data, the use of appropriate information systems (IS) that enable data collection and analysis, represent a key contributor to high-quality decision-making outputs. That includes different enterprise resource planning (ERP) systems and management accounting systems (MAS), business intelligence (BI), business analytics (BA) and artificial intelligence (AI) tools. IS facilitates, connects and, today more than ever, automates and unifies different process

and business systems, enabling a better and faster process of data analysis. By using different systems, management accountants can fulfil their role as business partners more easily, as IS allows them to spend their time on in-depth analysis and interpretation of real-time data (Vitezić and Lebefromm, 2019; Vitezić, Petrić and Žuger, 2023), instead of collecting and cleaning data. The relationship between and the importance of IS for management accounting has been demonstrated in various studies (Yigitbasioglu, 2017; Pervan and Dropulić, 2019). However, empirically speaking (survey, interview, etc.) most of them investigate the importance of MAS characteristics (Weißenberger and Angelkort, 2011; Weißenberger, Angelkort and Holthoff, 2012; Ghasemi et al., 2015; 2016; Ismail, Isa and Mía, 2018; Pedroso and Gomes, 2024), followed by ERP (Chou, Tripuramallu and Chou, 2005; Goretzki, Strauss and Weber, 2013; Gullkvist, 2013; Abbasi, Zamani and Valmohammadi, 2014; Gürtner and Krichbaum, 2014; Vitezić, Petrić and Žuger, 2023) and BI and BA (Gullkvist, 2013; Petrić, 2023; Vitezić, Petrić and Žuger, 2023). It can be emphasised that most research on management accounting and IS is based on a literature review (Appelbaum et al., 2017; Rikhardsson and Yigitbasioglu, 2018). However, considering the increasing role of management accounting in recent years and the digital transformation of organisations, as well as the resulting demands on front-line functions, the following question arises: “What are the main characteristics and further trends of the publications on management accounting and information systems?” The answer can be given by bibliometric analysis, which, according to Öztürk, Kocaman and Kanbach (2024), has recently been widely used in the fields of business and management due to the benefits and conveniences it offers. Although a bibliometric analysis of the general concept of management accounting and its synonyms has been carried out (Zyznarska-Dworczak, 2018; Balstad and Berg, 2020; İyibildiren, 2022; Nain, Lajuni and Mail, 2022; Pedroso and Gomes, 2023), as well as the connection with other concepts such as sustainability (Petrić and Srok, 2024), or bibliometric analyses on concepts like “accounting information system” (İyibildiren, Eren and Ceran, 2023) and “management accounting system” (Nurhayadi, Abu Hanifah and Muchlish, 2023), a bibliometric analysis that examines the main characteristics of the concepts of “management accounting” and “information systems” is not known.

Therefore, the purpose of this paper is to provide a comprehensive overview of the evaluation of research regarding management accounting and information systems. For this purpose, a bibliometric analysis was conducted based on bibliographic data extracted from the Web of Science Core Collection for the last 57 years, including 279 publications. The

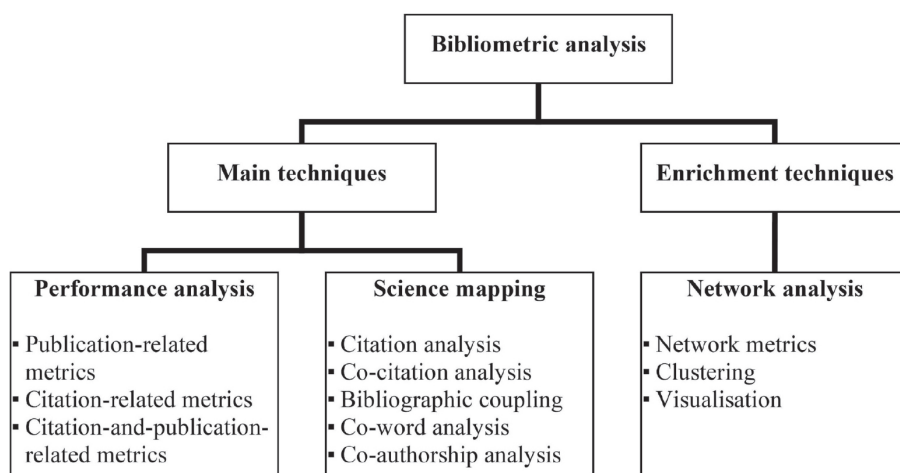
VOSviewer software was used for the analysis, construction and visualisation of bibliometric analysis results.

The paper is structured in five chapters. The first chapter represented the introduction, including the outlined importance of management accounting and information systems. The second describes the methodology and data, while chapter three shows the results of the performance and science mapping analysis of the conducted bibliometric analysis. Chapter four is the conclusion with included limitations. The last chapter presents the reference list used in this paper.

2. METHODOLOGY AND DATA

In order to determine the current status and to analyse further research directions on the concepts, i.e. the relationship between management accounting and information systems, a bibliometric analysis was conducted. The bibliometric analysis was chosen over the traditional qualitative literature review as it is generally recognised as a more objective approach (Zupic and Čater, 2015; Zdrilić, Došenović Bonča and Aleksić, 2023). Although there are several methodological guidelines for how to conduct bibliometric research (Koskinen et al., 2008; Andrés, 2009; Romanelli et al., 2021; Öztürk, Kocaman and Kanbach, 2024), in this paper the bibliometric analysis is based on the technique toolbox by Donthu et al. (2021) that considers two main technique categories, and the enrichment techniques (Figure 1).

Figure 1. The bibliometric analysis toolbox



Source: Author, based on Donthu et al. (2021)

The main techniques include performance analysis and science mapping. Performance analysis examines the contribution of research constituents to a given field using metrics such as number of publications and citations, average citation, sole-authored publications, h-index, etc., while science mapping examines the relationships between analysed constituents (Donthu et al., 2021). On the other hand, enrichment techniques can be interpreted as add-ons or tools that enrich the assessment and presentation of the results of bibliometric studies (Donthu et al., 2021). For the purpose of this paper, both performance analysis and science mapping techniques were used, enriched with a visualisation tool.

The data for the bibliometric analysis was collected in the Web of Science Core Collection database. Thereby, the following topic search query was used: “manag* account*” and “inf* syst*”. The query includes the search for titles, abstracts, keywords plus and author keywords as well as synonyms for the analysed terms. The search yielded 279 publications, i.e. papers in the period of 57 years (1968-2024), or exactly up to the time of the search (until May 2024). Although additional restrictions (such as language, document type, time span, etc.) are often used for specific research topics (Romanelli et al., 2021), none were used in this work due to the narrowness of the yielded search and the aim of providing a comprehensive insight into the state of the two search concepts. So, the final sample includes mostly articles (200) and proceeding papers (64) as document types, but publications were also classified as review articles, book chapters, editorial materials, early accesses publications, and notes. Most of them are written in the English language (257 i.e. 90.11%), followed by Russian (7), Spanish (5), Portuguese (4), German (3), Czech (1), and Ukrainian (1). One publications’ language is unspecified. The VOSviewer software was used for the analysis, construction and visualisation of bibliometric analysis results (van Eck and Waltman, 2010). Thereby, for higher quality analysis and visualisation of the results of applied science mapping techniques different units of analysis (authors, sources, countries, organisations, authors’ keywords), as well as threshold parameters, were applied.

3. RESULTS

3.1. PERFORMANCE ANALYSIS

Performance analysis represents the descriptive analysis of the research field, which, according to Donthu et al. (2021) (Figure 1), can be divided into three categories: publication-related, citation-related and citation- and

publication-related metrics. Table 1 shows these results for the research in question.

Table 1. Performance analysis metrics

Metric name	Result
Publication-related metrics	
Total publications	279
Number of contributing authors	591
Sole-authored publications	84
Co-authored publications	195
Number of active years of publication	33
Productivity per year of publication	8.46
Citation-related metrics	
Total citations	3,940
Average citations per publication	14.12
Average citations per total years	69.12
Average citations per active years	119.39
Citation-and-publication-related metrics	
Collaboration index	0.008
Collaboration coefficient	0.53
Number of cited publications	187
Proportion of cited publications	0.67
Citations per cited publication	21.07
<i>h</i> -index	36
<i>i</i> 10-index	89
<i>i</i> 100-index	7
<i>i</i> 200-index	1

*Notes: Productivity per year of publication = Total publications/Number of active years of publication, Collaboration index = (Number of contributing authors/Total publications)/Total publications, Collaboration coefficient = 1 - (Total publications/Number of contributing authors), Proportion of cited publications = Number of cited publications/Total publications, Citations per cited publication = Total citations/Number of cited publications, *h*-index = *h* number of publications cited at least *h* times, *i*10, *i*100, *i*200-index = *i* number of publications cited at least *i* times (e.g., *i* = 10, 100, 200, etc.)*

Source: Author based on Web of Science Core Collection (WoSCC)

A total of 591 authors contribute to the 279 publications. That is, 30.2% of the publications where sole-authored publications, while the rest of the publications are co-authored by the following number of authors: 1 publication with 9 authors, 1 publication with 8 authors, 1 publication with 6 authors, 10 publications with 5 authors, 33 publications with 4 authors, 57 publications with 3 authors, 92 publications with 2 authors, and 84 publications with 1 author. In total, all the contributing authors come from 62 countries and have 387 affiliations. Most of the publications are authored by researchers that come from the USA (37), followed by the People's Republic of China (20), Australia (19), Indonesia (18), Germany (17), Russia (16), England (15), Portugal (10), Ukraine (10), etc. The rest account for less than 10 publications, including Croatia that accounts for 5 publications, 4 from the University of Split and 1 from the University of Zagreb. On the other, the top 3 affiliations regarding the number of occurrences are the Ministry of Education and Science of Ukraine (6), Kyungpook National University (5), and Prague University of Economics and Business (5), while the rest account for 4 or less occurrences. Considering the total number of publication and the number of contributing authors, it can be emphasised that a middle level (0.53) of collaboration of the research constituent is present.

Further, most of the publications were from the area of business and economics (73.12%), followed by computer science (13.26%) and engineering (10.39%), etc. Regarding the Web of Science Index, most publications are indexed in the Emerging Sources Citation Index (41.22%) and Social Sciences Citation Index (26.88%). All the 279 publications were published in 204 different journals and publication titles belonging to 93 different publishers. Among them, most of the papers were published by Emerald Group Publishing (46) followed by Elsevier (36), Taylor & Francis (21), Springer Nature (18) and American Accounting Association (17). The rest account for 10 or fewer publications. The journals with the greatest number of publications are the Journal of Accounting and Organizational Change (7), published by Emerald Group Publishing, and the International Journal of Accounting Information Systems (7), published by Elsevier. Following are the journals Qualitative Research in Accounting and Management (5) and the Asian Review of Accounting (5), both published by Emerald. All other journals account for 4 or less publications, that is, 164 journals and publication titles have published only one paper. One of them is also the Journal of Accounting Literature in which the most cited paper (with 279 citations) was published, named “The use of partial least squares structural equation modelling (PLS-SEM) in management accounting research: Directions for future theory development” by Nitzl (2016). That is also the case with the second most cited

publication (169 citations) “Digitisation, ‘Big Data’ and the transformation of accounting information” by Bhimani and Willcocks (2014). The third most cited publication (163 citations) is published in one of the two most occurring journals i.e. International Journal of Accounting Information Systems; that is the paper by Appelbaum et al. (2017) “Impact of business analytics and enterprise systems on managerial accounting”. However, if we look at the content of the top 3 cited articles, we could say that the second is actually the first most relevant paper regarding management accounting and information system relationship research. This is because the paper by Nitzl (2016) presents the contention and importance of information systems for management accounting, but in terms of application of PLS-SEM as a statistical method in accounting research, and not the application of information system tools like ERP or BI directed towards management accountants’ activities and their efficiency improvement. Table 2 represents the ten most cited publications and their citation information.

Table 2. Top 10 cited publications

Publication title	Authors	Journal name	PY	TC	FCY (NoC)	BCY (NoC)
The use of partial least squares structural equation modelling (PLS-SEM) in management accounting research: Directions for future theory development	Nitzl, C.	Journal of Accounting Literature	2016	279	2016 (2)	2023 (60)
Digitisation, ‘Big Data’ and the transformation of accounting information	Bhimani, A.; Willcocks, L.	Accounting and Business Research	2014	169	2014 (1)	2022 (39)
Impact of business analytics and enterprise systems on managerial accounting	Appelbaum, D.; Kogan, A.; Vasarhelyi, M.; Yan, Z.	International Journal of Accounting Information Systems	2017	163	2018 (6)	2021 (35)
The use of Environmental Management Accounting (EMA) for identifying environmental costs	Jasch, C.	Journal of Cleaner Production	2003	135	2004 (1)	2020, 2019 (16)
A Review of IT Governance: A Taxonomy to Inform Accounting Information Systems	Wilkin, C.L.; Chenhall, R.H.	Journal of Information Systems	2010	124	2011 (5)	2014 (19)
Business intelligence and analytics in management accounting research: Status and future focus	Rikhardsson, P.; Yigitbasioglu, O.	International Journal of Accounting Information Systems	2018	113	2018 (1)	2022 (28)
How CFOs Determine Management Accounting Innovation: An Examination of Direct and Indirect Effects	Naranjo-Gil, D.; Maas, V.S.; Hartmann, F.G.H.	European Accounting Review	2009	113	2010 (1)	2020 (15)
Determinants and consequences of firm information technology budgets	Kobelsky, K.W.; Richardson, V.J.; Smith, R.E.; Zmud, R.W.	Accounting Review	2008	106	2010 (4)	2018 (13)

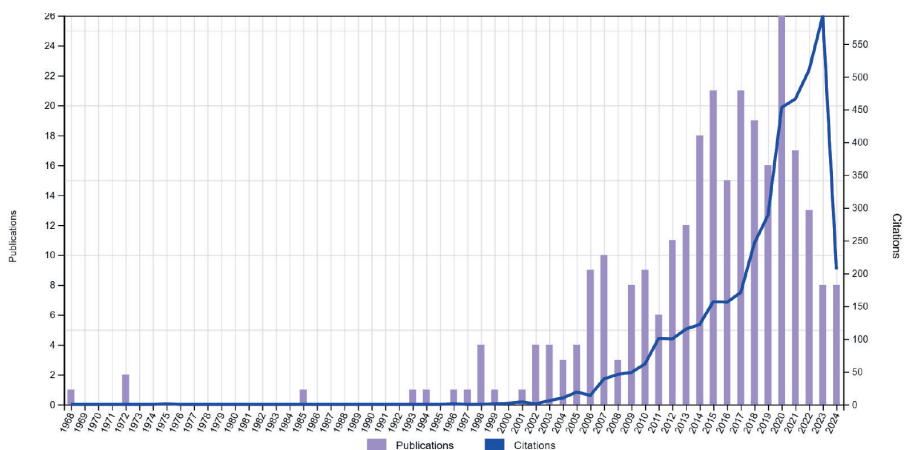
Using budgets for performance evaluation: Effects of resource allocation and horizontal information asymmetry on budget proposals, budget slack, and performance	Fisher, J.G.; Maines, L.A.; Peffer, S.A.; Sprinkle, G.B.	Accounting Review	2002	99	2003 (1)	2018 (9)
The case of partial least squares (PLS) path modelling in managerial accounting research	Nitzl, C.; Chin, W.W.	Journal of Management Control	2017	84	2017 (2)	2023 (18)

Notes: PY = Publication year, TC = Total citations, FCY (NoC) = First citation year (number of citations), BCY (NoC) = Best citation year (number of citations)

Source: Author, based on Web of Science Core Collection (WoSCC)

The ten most frequently cited publications account for 35.2% of the total citations (3,940) of all 279 publications in the 57-year period analysed. According to the citation-related metrics (Table 1), each publication has an average of 14.12 citations per publication and 69.12 per year. That is, if we considered only the active publication year (33), each publication is cited an average of 119.39 times. If, on the other hand, only the publications that were cited at least once are considered (187), the total citations account for only 67% of the total publications, resulting in an average citation per cited publication of 21.07.

Figure 2. Number of publications and citations



Source: Web of Science Core Collection (WoSCC)

Figure 2 presents the total number of publications and citations in the analysed period. Although the analysed period covers 57 years, starting with the first article published in 1968 “Information Systems and Managerial Accounting” by Firmin and Linn, (1968), the continuous publication on management accounting and information systems in WoSCC started in 2001 with the article “A generic accounting model to support operations management decisions” by Verdaasdonk and Wouters (2001). Between 1968 and 2001, including the first published article from 1968, there were a total of 12 publications with a total of 3 citations. From 2001 to 2023, an increasing trend in citations is present, with a peak in 2023 with 594 citations. In the same period, the number of publications fluctuates with a peak in 2020 with 26 publications and a decline thereafter, which can be attributed to COVID-19. Therefore, an upward trend can be expected in the future, as the number of publications in the first five months of 2024 corresponds to the total number in 2023. Regarding citation indexed (Table 1), only one publication was cited 200 times or more, 7 publications more than 100 and less than 200 times and 89 publications more than 10 and less than 100 times. This means that 36 of the total of 279 publications were cited at least 36 times.

Although the performance analysis shows the importance of research regarding management accounting and information systems, especially in the last two decades, a deeper insight of the relationships between the analysed constituents is possible throughout the science mapping techniques.

3.2. SCIENCE MAPPING

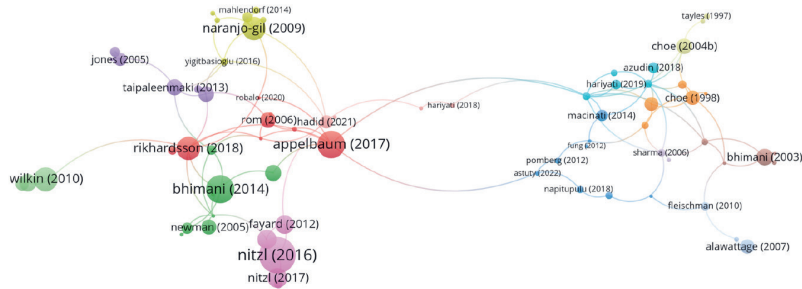
Science mapping includes citation, co-citation, bibliographic, co-word and co-authorship techniques, i.e. metrics that, in combination with various enrichment techniques, are instrumental in presenting bibliometric results regarding structural connections and intellectual interaction between analysed concepts (Tunger and Eulerich, 2018; Donthu et al., 2021). In this paper, we applied visualisation enrichment techniques (VOSviewer) to present the results of all five science mapping techniques using different units of analysis: documents, references, source, countries, keywords.

The importance of a publication can be determined using different methods, but the most objective measure of influence is considered citations of a publication (Stremersch, Verniers and Verhoef, 2007; Donthu et al., 2021). Citation analysis as a basic science mapping technique shows the relationships between publications and indicates which one is most

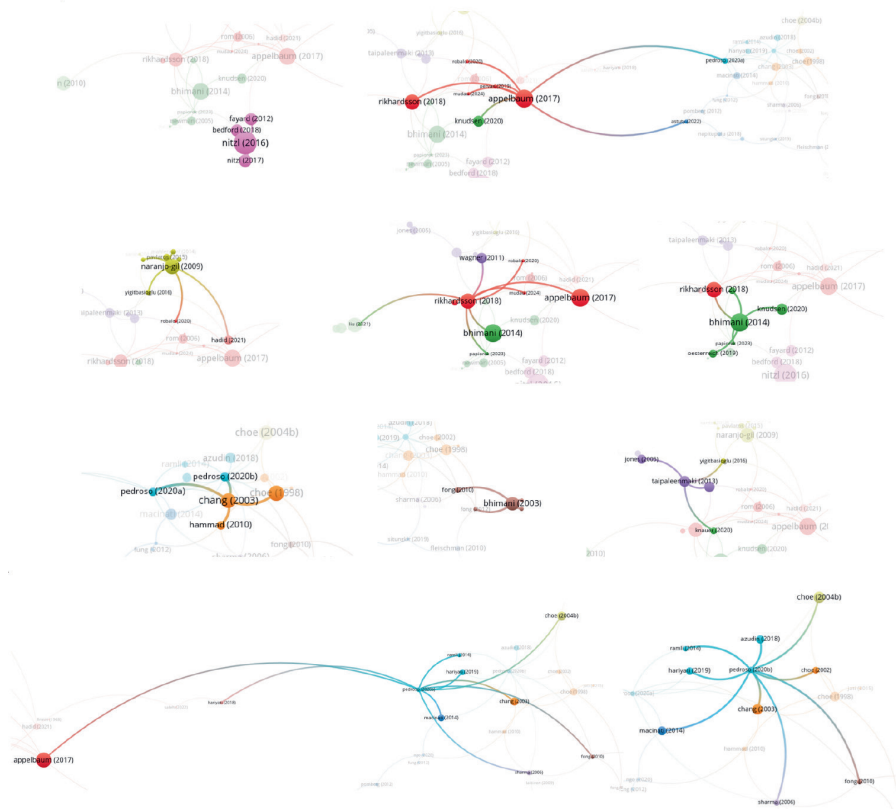
influential in a research field. More specifically, influence is determined by the number of citations it receives (Donthu et al., 2021).

Figure 3. Citation analysis network

Whole network



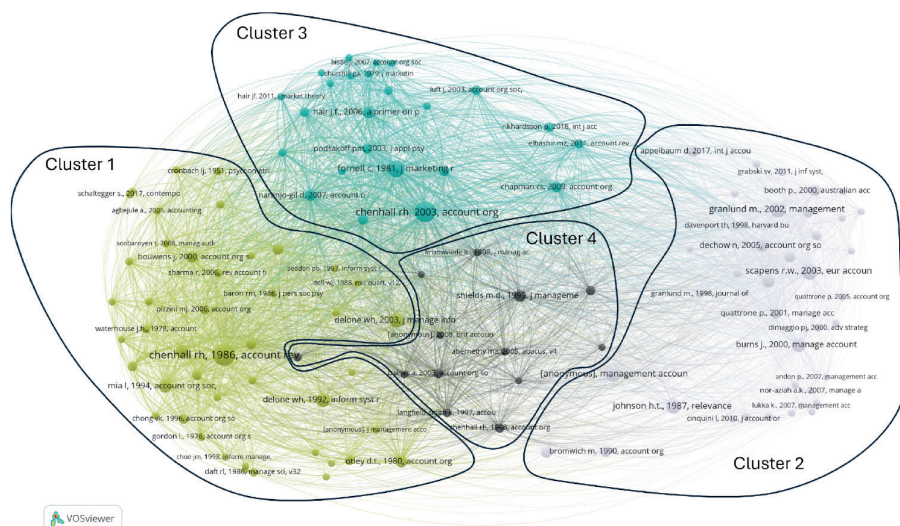
Parts of the (above) network



Source: Author, based on analysis in VOSviewer

The citation analysis made, based on the minimum of 1 citation of a document, i.e. a publication (n=187) (Figure 3), confirms the results of the top 10 publications (Table 2). The larger the node in the visualisation, the more citations a publication has in total. In this case, it is visible that Nitzl (2016), followed by Bhimani and Willcocks (2014) and Appelbaum et al. (2017) have the largest nodes and are therefore the most influential publications. In addition, the links, i.e. lines, represent the number of citations that occur between the analysed (187) publications. For example, Appelbaum et al. (2017) has 7 links, meaning that the 7 publications (out of 187) linked to it have cited them and vice versa in their publication. Thus, looking at the number of links, one could conclude that the most influential publications in the analysed sample with at least 1 citation are actually Pedroso, Gomes and Yasin (2020) (in the figure the name appears as “Pedroso 2020a”) with 9 links and only 13 citations in total and Pedroso and Gomes (2020) (in the figure the name appears as “Pedroso 2020b”) with 9 links and only 14 citations in total. However, through additional analyses of the results of the citation analysis conducted on the basis of the entire bibliometric sample regardless of the number of minimum citations of a document (n=279), the following influential ranking can be established according to the number of links: 1) Pedroso and Gomes (2024) with 15 links, 2) Rikhardsson and Yigitbasioglu (2018) with 12 links, 3) Appelbaum et al. (2017) with 12 links, 4) Pedroso and Gomes (2020) with 11 links, etc. It could be said that currently these publications are the most recognised between the authors in the analysed field.

Unlike citation analysis, co-citation analysis considers that “two publications are connected when they occur in the reference list of another publication” (Donthu et al., 2021, p. 288). In general, it is the most commonly used mapping technique in bibliometric analysis (Zupic and Čater, 2015), but it has one disadvantage: it focuses on the highly-cited publications (Donthu et al., 2021). However, on the other it assumes that publications that are cited together are often thematically similar (Hjørland, 2013).

Figure 4. Co-citation analysis network by cited references

Source: Author, based on analysis in VOSviewer

The co-citation analysis can be conducted by using cited references, sources or authors as the unit of analysis. In this paper, the co-citation analysis was performed based on the cited references with the minimum of 6 citations of cited reference, resulting in 121 cited references that met this threshold (Figure 4). Of course, a different parameter of the minimum citations of cited references could be set resulting in different clustering results, but in this case the set parameter was used in order to gain insight into the 1% of the most highly-cited publications and to narrow the number of clusters i.e. most prominent thematic directions for future research. So, the analysis revealed 4 main clusters. The first cluster (cluster 1) comprises 45 references, the second (cluster 2) 39, the third (cluster 3) 25 and the fourth (cluster 4) 13 of the 121 cited references. The number of citations is visually determined by the size of the node, i.e. the larger the node, the higher the number of citations (Zdrilić et al., 2023). Based on the number of references in each cluster it can be emphasised that cluster 4 is the least influential. This is also supported by the fact that none of the 5 most influential publications based on the co-citation analysis come from this cluster (Table 3). That is, the most influential publication (Chenhall and Morris, 1986) belongs to cluster 1, the second and third most cited publications (Fornell and Larcker, 1981; Chenhall, 2003) to cluster 3 and the fourth and fifth (Granlund and Malmi, 2002; Scapens and Jazayeri, 2003) to cluster 2. The most influential

publication in cluster 4, with a total of 13 citations, is the paper by Shields (1995) “An Empirical Analysis of Firms’ Implementation Experiences with Activity-Based Costing” published in the Journal of Management Accounting Research. Considering these publications, the following thematic directions of clusters can be set: cluster 1 – importance of external factor, cluster 2 - importance and role of technology and digitalisation, cluster 3 - importance and role of research design and statistical methodology application, and cluster 4 - importance and role of management accounting tools and innovations. According to the size of the clusters and the given results in Table 3, it could be emphasised that cluster 1 and cluster 2 represent the most important, while cluster 4 the least important thematic direction of the analysed constituents. Namely, if we take into account the results of the co-word analysis (Figure 7) and the fact that the two publications from 2002 and 2023, belonging to cluster 2 of the top 5 publications (Table 3) have nearly the same total citations as the publication from cluster 1 published 1986, it can be concluded that the importance and role of technology and digitalisation represent the most significant research direction. Although cluster 4 is the smallest, if we take into account the argument regarding the paper by Nitzl (2016) (Table 2), it could be emphasised that cluster 4 has more significance than cluster 3.

Table 3. Top 5 influential publications based on co-citation analysis

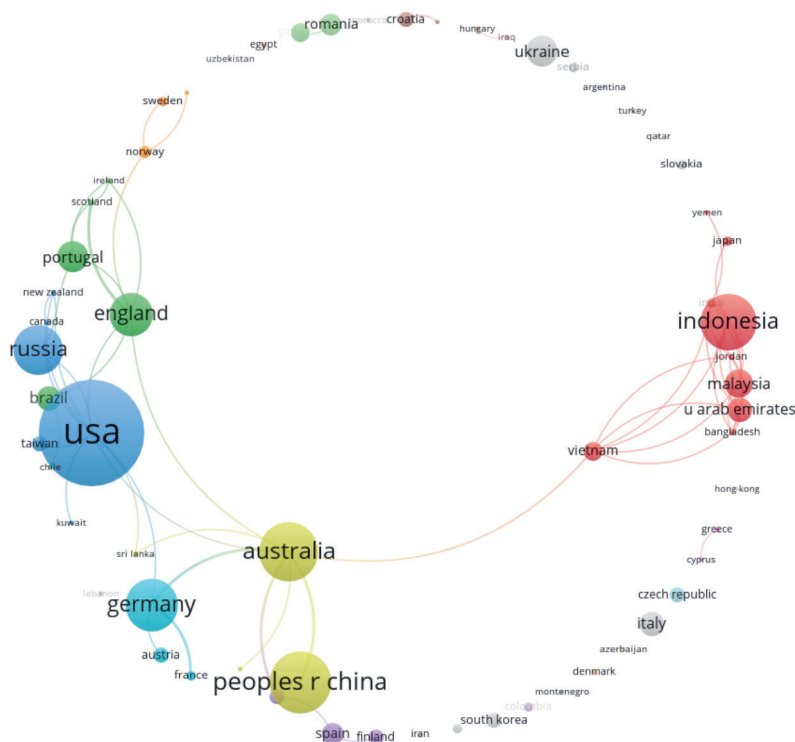
Publication title	Authors	Journal name	PY	TC	TLS	CLNo
The Impact of Structure, Environment, and Interdependence on the Perceived Usefulness of Management Accounting Systems	Chenhall, R.H.; Morris, D.	The Accounting Review	1986	30	323	1
Management control systems design within its organizational context: findings from contingency-based research and directions for the future	Chenhall, R.H.	Accounting, Organizations and Society	2003	28	333	3
Evaluating structural equation models with unobservable variables and measurement error	Fornell, C.; Larcker, D.F.	Journal of Marketing Research	1981	20	280	3
ERP Systems and Management Accounting Change: Opportunities or Impacts? A Research Note	Scapens, R.W.; Jazayeri, M.	European Accounting Review	2003	20	280	2
Moderate impact of ERPS on management accounting: a lag or permanent outcome?	Granlund, M.; Malmi, T.	Management Accounting Research	2002	19	226	2

Notes: PY = Publication year, TC = Total citations, TLS = Total link strength, CLNo = Cluster number

Source: Author, based on analysis in VOSviewer

The co-citation analysis showed the connection of publications by the occurrences in the reference list of another publication. Co-authorship analysis, on the other hand, examines the interactions between researchers in the field (Donthu et al., 2021). It can be conducted using authors, organisations and countries as the unit of analysis. In this paper, countries were used as the unit of analysis. All 62 countries were used for the analysis, i.e. the analysis was conducted with at least 1 publication and 0 citations from a country.

Figure 5. Co-authorship analysis network by countries



Source: Author, based on analysis in VOSviewer

Figure 5 shows the relatively low level of cooperation between the countries. Of the total of 62 countries, 20 (32.26%) have not published any research with other countries. The size of the node indicates the number of publications (i.e. the larger the node, the higher the number of publications), while the thickness of the line connecting two countries indicates the number of realised collaborations. In this case, there are only four collaborations with two realised publications, while all others have only one. These are: 1) Australia and Germany, 2) Australia and the People's Republic of China, and 3) Australia and the Netherlands. Overall, the countries with the largest number of collaborations are Australia (11) and the USA (10). These results are consistent with the performance analysis metrics, i.e. collaboration index and collaboration coefficient (Table 1), but also indicate the urgent need for future collaborations.

The next science mapping technique that was performed is bibliographic coupling. When analysing bibliographic coupling, it is assumed that two

Figure 6. Bibliographic coupling analysis network by source (journal)



(77-104) | 95

a total of 393 citations and a total link strength of 926. Secondly, it covers current trending topics, which is evident from the journal nodes and the pale colour of the lines that harmonise with the timeline (2020 and later) (Figure 6). In the same journal, 2 of the 10 most cited publications of this research sample are published, namely Appelbaum et al. (2017) and Rikhardsson and Yigitbasioglu (2018), which examine the influence and importance of business analytics and business intelligence and enterprise systems in management accounting.

While citation, co-citation and bibliographic coupling are techniques that use cited or citing references as proxies, co-word analysis focuses on the content of the publications considered in the analysis (Donthu et al., 2021). That is, the keywords of the publications are used as the unit of analysis (Zdrilić et al., 2023), and in some cases also the publication titles, abstracts and full texts (Donthu et al., 2021). In this paper, the authors’ keywords were used as the unit of analysis.

In this research sample (n=279) there are a total of 803 keywords. Among them, 82.32%, i.e. 661 keywords, occur only once, while the rest of 142 keywords occurs two or more times (min=2; max=67). More precisely, 73 keywords occur 2 times, 32 keywords 3 times, 15 keywords 4 times and the rest 5 to 67 times (Table 4).

Table 4. Most occurring author’s keywords

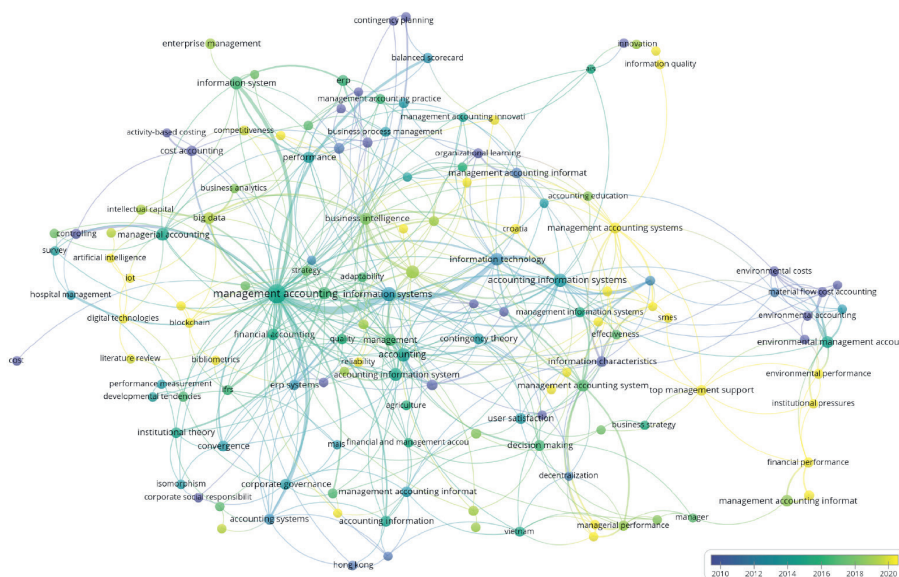
Keyword	No Occ	Keyword	No Occ
management accounting	67	management accounting change	8
information systems	19	big data	7
accounting information systems	15	environmental management accounting	7
accounting	13	management accounting system	7
accounting information system	11	financial accounting	6
information system	11	management accounting information system	6
information technology	10	performance	6
managerial accounting	10	accounting information	5
strategic management accounting	10	cost accounting	5
business intelligence	8	decision making	5
management	8	management accounting systems	5

Notes: NoOcc = Number of occurrences

Source: Author, based on analysis in VOSviewer

If considering the main keywords query of this research (i.e. management accounting and information systems) their synonyms, and the result in Table 4, including the equality of meaning of singular and plural keywords (e.g., accounting information systems and accounting information system), it can be concluded that the most frequently occurring keywords actually are: accounting, information technology, business intelligence, management, and big data. Additionally, although the keyword decision making occurs 5 times, a thorough analysis of all 803 keywords shows that it is also one of the “actual” most frequently occurring keywords, due to a different word formation that includes: decision-making (3 occurrences) and make decisions (1 occurrence). For the purpose of keyword connection analysis and the defining of current topic trends, a bibliometric co-word i.e. co-occurrence network of author keywords coloured by the timeline is presented in Figure 7, with a threshold of at least 2 occurrences of a keyword.

Figure 7. Co-word analysis network by authors keywords



Source: Author, based on analysis in VOSviewer

The size of the nodes represents the frequency of occurrence of a keyword, while the thickness of the lines connecting two nodes indicates how often the keywords occur together in a publication (Zdrilić et al., 2023). The timeline indicates new trending topics. The node sizes (Figure

7) confirm the previously mentioned and emphasised keyword occurrences (Table 4). The thickest line, i.e. the strongest connection, occurs between the keywords accounting and information systems and information system (9 and 4 co-occurrences), information systems and information technology (5 co-occurrences), management accounting and financial accounting (4 co-occurrences), and information technology and accounting information systems (4 co-occurrences). The keyword management accounting occurs 3 times with 4 other keywords, including the keyword business intelligence as well as business intelligence and strategic management accounting. All other keywords have 2 or 1 co-occurrence. More interesting, however, are the most recently used keywords (bluer nodes), which can be seen as research directions for future research on management accounting and information systems. Therefore, new research should first focus on investigating the importance and relationship of the following concepts to management accounting and information systems: data quality, information quality, big data, blockchain, artificial intelligence, innovations, business intelligence and digitalisation in general.

4. CONCLUSION

This study analysed 279 publications regarding the current characteristics of research on the concepts of management accounting and information systems over the last 57 years. The paper contributes to the literature by identifying trends and gaps in management accounting and information systems research. From the results of the analysis study, it can be concluded that research on these two concepts will increase and gain in significance in the future. The analysis of publications, network connections and citations show trends in various studies and guidelines. Namely, further research should focus on the specifics of different information systems and their utilisation, as well as the impact of innovation and the importance and possibilities of ensuring data and information quality. The study reveals four main clusters that highlight the importance of external factors, research design and the application of statistical methods, technology and digitalisation, and management accounting tools and innovations. In addition, the results suggest that researchers in this area should work on increasing their collaboration. Although this can be explained by the size of the academic community involved with this field and the different implementations of management accounting in practise, the future development of its practise, especially the increasing impact of technological and digital transformation, will depend to a large extent on new studies through collaboration between

different academic communities and practitioners. Therefore, researchers in the field of management accounting should collaborate with researchers in information sciences to gain the best insight into today's most dependent concepts of efficient controlling i.e., data and information quality, big data, blockchain, artificial intelligence, innovation, business intelligence, etc.

This paper also provides guidance to practitioners. It confirms the increasing importance of management accounting in general, as well as the importance of data and information quality and the use of tools that enable it. In the end, it can be emphasised that the relationship between the analysed constituents is gaining in importance in science and practice, but that its future development will significantly depend on the level of new and strong collaborators.

The main limitation is the fact that the study is based only on bibliometric methods and is therefore too descriptive. In addition, only one database (WoSCC) was used, which may have affected the breadth of the conclusions given. Therefore, future research should consider using other or even multiple databases, especially Scopus, as a relatively large proportion of the journals containing the analysed constituents are indexed there. In addition, further enrichment techniques should be applied to gain a better insight into the results.

Acknowledgement

"This work has been fully supported by the University of Rijeka project uniri-mladi-drustv-23-17".

BIBLIOGRAPHY

1. Abbasi, S., Zamani, M. and Valmohammadi, C., 2014. The effects of ERP systems implementation on management accounting in Iranian organizations. *Education, Business and Society: Contemporary Middle Eastern Issues*, 7(4), pp.245–256. <https://doi.org/10.1108/EBS-03-2014-0020>.
2. Andrés, A., 2009. *Measuring Academic Research: How to Undertake a Bibliometric Study*. Elsevier Ltd. <https://doi.org/10.1533/9781780630182>.
3. Appelbaum, D., Kogan, A., Vasarhelyi, M. and Yan, Z., 2017. Impact of business analytics and enterprise systems on managerial accounting. *International Journal of Accounting Information Systems*, 25(March), pp.29–44. <https://doi.org/10.1016/j.accinf.2017.03.003>.
4. Bajnai, P., 2021. The English management accounting and the German controlling: are they synonyms or different concepts? *Cross-Cultural Management Journal*, 23(1), pp.7–14.
5. Balstad, M.T. and Berg, T., 2020. A long-term bibliometric analysis of journals influencing management accounting and control research. *Journal of Management Control*, 30(4), pp.357–380. <https://doi.org/10.1007/S00187-019-00287-8/TABLES/6>.
6. İyibildiren, M., 2022. Bibliometric Analysis of Academic Studies Published Under the Title of Management Accounting. *The Journal of Selcuk University Social Sciences Institute*, (49), pp.26–47. <https://doi.org/10.52642/SUSBED.1110587>.
7. Becker, A. and Messner, M., 2005. After the scandals: A German-speaking perspective on management accounting research and education. *European Accounting Review*, 14(2), pp.417–427. <https://doi.org/10.1080/09638180500126926>.
8. Bhimani, A. and Willcocks, L., 2014. Digitisation, ‘Big Data’ and the transformation of accounting information. *Accounting and Business Research*, 44(4), pp.469–490. <https://doi.org/10.1080/00014788.2014.910051>.
9. Chenhall, R.H., 2003. Management control systems design within its organizational context: findings from contingency-based research and directions for the future. *Accounting, Organizations and Society*, 28(2–3), pp.127–168. [https://doi.org/10.1016/S0361-3682\(01\)00027-7](https://doi.org/10.1016/S0361-3682(01)00027-7).
10. Chenhall, R.H. and Morris, D., 1986. The Impact of Structure, Environment, and Interdependence on the Perceived Usefulness of Management Accounting Systems. *The Accounting Review*, 61(1), pp.16–35.
11. Chou, D.C., Tripuramallu, H.B. and Chou, A.Y., 2005. BI and ERP integration. *Information Management & Computer Security*, 13(5), pp.340–349. <https://doi.org/10.1108/09685220510627241>.
12. Donthu, N., Kumar, S., Mukherjee, D., Pandey, N. and Lim, W.M., 2021. How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, pp.285–296. <https://doi.org/10.1016/j.jbusres.2021.04.070>.
13. van Eck, N.J. and Waltman, L., 2010. Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84, pp.523–538. <https://doi.org/10.1007/s11192-009-0146-3>.

14. Firmin, P.A. and Linn, J.J., 1968. Information Systems and Managerial Accounting. *The Accounting Review*, 43(1), pp.75–82.
15. Fisher, J.G., Maines, L.A., Pfeffer, S.A. and Sprinkle, G.B., 2002. Using Budgets for Performance Evaluation: Effects of Resource Allocation and Horizontal Information Asymmetry on Budget Proposals, Budget Slack, and Performance. *The Accounting Review*, 77(4), pp.847–865. <https://doi.org/10.2308/ACCR.2002.77.4.847>.
16. Fornell, C. and Larcker, D.F., 1981. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), p.39. <https://doi.org/10.2307/3151312>.
17. Gärtner, B. and Hiebl, M.R.W., 2018. Issues with Big Data. In: M. Quinn and E. Strauß, eds. *The Routledge Companion to Accounting Information Systems*, Routledge. pp.161–172.
18. Ghasemi, R., Azmi Mohamad, N., Karami, M., Hafiz Bajuri, N. and Asgharizade, E., 2015. The Relationship among Strategy, Competition and Management Accounting Systems on Organizational Performance. *European Online Journal of Natural and Social Sciences*, 4(3), pp.565–581.
19. Ghasemi, R., Azmi Mohamad, N., Karami, M., Hafiz Bajuri, N. and Asgharizade, E., 2016. The Mediating Effect of Management Accounting System on the Relationship between Competition and Managerial Performance. *International Journal of Accounting & Information Management*, 24(3), pp.272–295. <https://doi.org/10.1108/IJAIM-05-2015-0030>.
20. Goretzki, L., Strauss, E. and Weber, J., 2013. An institutional perspective on the changes in management accountants' professional role. *Management Accounting Research*, 24(1), pp.41–63. <https://doi.org/10.1016/j.mar.2012.11.002>.
21. Granlund, M. and Malmi, T., 2002. Moderate impact of ERPS on management accounting: a lag or permanent outcome? *Management Accounting Research*, 13(3), pp.299–321. <https://doi.org/10.1006/MARE.2002.0189>.
22. Gullkvist, B.M., 2013. Drivers of change in management accounting practices in an ERP environment. *International Journal of Economic Sciences and Applied Research*, 6(2), pp.149–174.
23. Gürtner, B. and Krichbaum, A., 2014. the Role of Management Accountants in the Use of Erp Systems in Large Companies. *European Journal of Management*, 14(2), pp.91–108. <https://doi.org/10.18374/EJM-14-2.9>.
24. Hjørland, B., 2013. Facet analysis: The logical approach to knowledge organization. *Information Processing & Management*, 49(2), pp.545–557. <https://doi.org/10.1016/J.IPM.2012.10.001>.
25. Ismail, K., Isa, C.R. and Mia, L., 2018. Market Competition, Lean Manufacturing Practices and The Role of Management Accounting Systems (MAS) Information. *Jurnal Pengurusan*, 52(2018), pp.47–61. <https://doi.org/10.17576/pengurusan-2018-52-04>.
26. İyibildiren, M., Eren, T. and Ceran, M.B., 2023. Bibliometric analysis of publications on web of science database related to accounting information system with mapping technique. *Cogent Business & Management*, 10(1). <https://doi.org/10.1080/23311975.2022.2160584>.

27. Jasch, C., 2003. The use of Environmental Management Accounting (EMA) for identifying environmental costs. *Journal of Cleaner Production*, 11(6), pp.667–676. [https://doi.org/10.1016/S0959-6526\(02\)00107-5](https://doi.org/10.1016/S0959-6526(02)00107-5).
28. Kobelsky, K.W., Richardson, V.J., Smith, R.E. and Zmud, R.W., 2008. Determinants and Consequences of Firm Information Technology Budgets. *The Accounting Review*, 83(4), pp.957–995. <https://doi.org/10.2308/ACCR.2008.83.4.957>.
29. Koskinen, J., Isohanni, M., Paajala, H., Jaaskelainen, E., Nieminen, P., Koponen, H., Tienari, P. and Miettunen, J., 2008. How to use bibliometric methods in evaluation of scientific research? An example from Finnish schizophrenia research. *Nordic journal of psychiatry*, 62(2), pp.136–143. <https://doi.org/10.1080/08039480801961667>.
30. Messner, M., Becker, A., Schäffer, U. and Binder, C., 2008. Legitimacy and Identity in Germanic Management Accounting Research. *European Accounting Review*, 17(1), pp.129–159. <https://doi.org/10.1080/09638180701819808>.
31. Mihăilă, M., 2014. Managerial accounting and decision making, in energy industry. In: *Procedia - Social and Behavioral Sciences*. 2nd World Conference On Business, Economics And Management - WCBEM 2013. pp.1199–1202. <https://doi.org/10.1016/j.sbspro.2013.12.612>.
32. Nain, S., Lajuni, N. and Mail, R., 2022. Management Accounting Practices: A Bibliometric Analysis. *Management and Accounting Review*, 21.
33. Naranjo-Gil, D., Maas, V.S. and Hartmann, F.G.H., 2009. How CFOs determine management accounting innovation: an examination of direct and indirect effects. *European Accounting Review*, 18(4), pp.667–695. <https://doi.org/10.1080/09638180802627795>.
34. Nitzl, C., 2016. The use of partial least squares structural equation modelling (PLS-SEM) in management accounting research: Directions for future theory development. *Journal of Accounting Literature*, 37, pp.19–35. <https://doi.org/10.1016/j.acclit.2016.09.003>.
35. Nitzl, C. and Chin, W.W., 2017. The case of partial least squares (PLS) path modeling in managerial accounting research. *Journal of Management Control*, 28, pp.137–156. <https://doi.org/10.1007/s00187-017-0249-6>.
36. Nurhayadi, W., Abu Hanifah, I. and Muchlish, M., 2023. Scopus Indexed and VOSviewer-Based Environmental Management Accounting System Mapping: Bibliometrics and Visualization. <https://doi.org/10.4108/eai.4-11-2022.2328756>.
37. Öztürk, O., Kocaman, R. and Kanbach, D.K., 2024. How to design bibliometric research: an overview and a framework proposal. *Review of Managerial Science*, pp.1–29. <https://doi.org/10.1007/S11846-024-00738-0/TABLES/7>.
38. Pedroso, E. and Gomes, C.F., 2020. The effectiveness of management accounting systems in SMEs: a multidimensional measurement approach. *Journal of Applied Accounting Research*, 21(3), pp.497–515. <https://doi.org/10.1108/JAAR-05-2018-0059/FULL/XML>.
39. Pedroso, E. and Gomes, C.F., 2023. *The current role of management accounting: paradigm shift and future challenges*. *Journal of Accounting and Organizational Change*, <https://doi.org/10.1108/JAOC-05-2022-0086>.
40. Pedroso, E. and Gomes, C.F., 2024. Disentangling the effects of top management on management accounting systems utilization. *International Journal of Accounting Information Systems*, 53, p.100678. <https://doi.org/10.1016/J.ACCINF.2024.100678>.

41. Pedroso, E., Gomes, C.F. and Yasin, M.M., 2020. Management accounting systems: an organizational competitive performance perspective. *Benchmarking: An International Journal*, 27(6), pp.1843–1874. <https://doi.org/10.1108/BIJ-12-2019-0547>.
42. Pervan, I. and Dropulić, I., 2019. The impact of integrated information systems on management accounting: Case of Croatia. *Journal of Contemporary Management Issues*, 24(1), pp.21–38. <https://doi.org/10.30924/mjcmi.24.1.2>.
43. Petrić, A., 2023. The effect of business intelligence on controllers' output quality and decision-making. In: A. Erceg, ed. *Interdisciplinary management research XIX*. Osijek: Josip Juraj Strossmayer University of Osijek, Faculty of Economics and Business in Osijek. pp.1315–1330.
44. Petrić, A. and Srok, A., 2024. Management accounting and sustainability: insights from bibliometric analysis. In: Z. Wittine and S. Franc, eds. *Empowering Change: Fostering Social Entrepreneurship for a Sustainable Future*. Zagreb: Faculty of Economics and Business, University of Zagreb. pp.57–75.
45. Rikhardsson, P. and Yigitbasioglu, O., 2018. Business intelligence & analytics in management accounting research: Status and future focus. *International Journal of Accounting Information Systems*, 29(February), pp.37–58. <https://doi.org/10.1016/j.accinf.2018.03.001>.
46. Romanelli, J.P., Carolina, M., Gonçalves, P., Fernando De Abreu Pestana, L., Akemi, J., Soares, H., Boschi, R.S. and Fernandes Andrade, D., 2021. Four challenges when conducting bibliometric reviews and how to deal with them. *Environ Sci Pollut Res Int.*, 60448(60458), pp.28–43. <https://doi.org/10.1007/s11356-021-16420-x>/Published.
47. Scapens, R.W. and Jazayeri, M., 2003. ERP systems and management accounting change: opportunities or impacts? A research note. *European Accounting Review*, 12(1), pp.201–233. <https://doi.org/10.1080/0963818031000087907>.
48. Schäffer, U., 2013. Management accounting research in Germany: From splendid isolation to being part of the international community. *Journal of Management Control*, 23, pp.291–309. <https://doi.org/10.1007/S00187-013-0170-6>/METRICS.
49. Shields, M.D., 1995. An Empirical Analysis of Firms' Implementation Experiences with Activity-Based Costing. *Journal of Management Accounting Research*, 7(1), pp.148–166.
50. Stremersch, S., Verniers, I. and Verhoef, P.C., 2007. The Quest for Citations: Drivers of Article Impact. *Journal of Marketing*, 71(3), pp.171–193. <https://doi.org/10.1509/JMKG.71.3.171>.
51. Tunger, D. and Eulerich, M., 2018. Bibliometric analysis of corporate governance research in German-speaking countries: applying bibliometrics to business research using a custom-made database. *Scientometrics*, 117, pp.2041–2059. <https://doi.org/10.1007/s11192-018-2919-z>.
52. Verdaasdonk, P. and Wouters, M., 2001. A generic accounting model to support operations management decisions. *Production Planning & Control*, 12(6), pp.605–620. <https://doi.org/10.1080/09537280010014703>.
53. Vitezić, N., 2008. Interaktivni odnos računovodstva, kontrolinga i internog nadzora. In: *Računovodstvo i porezi u sadašnjim uvjetima poslovanja, IX. Savjetovanje*. Zagreb-Šibenik: Hrvatski računovođa. pp.29–46.

54. Vitezić, N. and Lebefromm, U., 2019. *Production Controlling in the Digital Age*. Rijeka: University of Rijeka, Faculty of Economics and Business.
55. Vitezić, N., Lebefromm, U. and Petrić, A., 2019. From analytic to predictive digital performance measurement - A new challenge for controlling. In: S. Drezgić, S. Žiković and M. Tomljanović, eds. *Economics of Digital Transformation*. Rijeka: University of Rijeka, Faculty of Economics and Business. pp.239–251.
56. Vitezić, N., Petrić, A. and Žuger, I., 2023. More efficient controlling through erp and bi systems education. *Journal of Accounting and Management*, XIII(1), pp.37–48.
57. Weinberg, B.H., 1974. Bibliographic coupling: A review. *Information Storage and Retrieval*, 10(5–6), pp.189–196. [https://doi.org/10.1016/0020-0271\(74\)90058-8](https://doi.org/10.1016/0020-0271(74)90058-8).
58. Weißenberger, B.E. and Angelkort, H., 2011. Integration of financial and management accounting systems: The mediating influence of a consistent financial language on controllership effectiveness. *Management Accounting Research*, 22(3), pp.160–180. <https://doi.org/10.1016/j.mar.2011.03.003>.
59. Weißenberger, B.E., Angelkort, H. and Holthoff, G., 2012. MAS Integration and Controllership Effectiveness: Evidence of a Preparer-User Perception Gap. *German Academic Association for Business Research (VHB)*, 5(2), pp.134–153.
60. Wilkin, C.L. and Chenhall, R.H., 2010. A Review of IT Governance: A Taxonomy to Inform Accounting Information Systems. *Journal of Information Systems*, 24(2), pp.107–146. <https://doi.org/10.2308/JIS.2010.24.2.107>.
61. Yigitbasioglu, O.M., 2017. Drivers of management accounting adaptability: the agility lens. *Journal of Accounting & Organizational Change*, 13(2), pp.262–281. <https://doi.org/10.1108/JAOC-12-2015-0092>.
62. Zdrilić, I., Došenović Bonča, P. and Aleksić, D., 2023. Interorganizational employee mobility: A bibliometric analysis. *Management*, 28 (Special Issue), pp.55–78. <https://doi.org/10.30924/mjcmi.28.si.5>.
63. Zupic, I. and Čater, T., 2015. Bibliometric Methods in Management and Organization. *Organizational Research Methods*, 18(3), pp.429–472. <https://doi.org/10.1177/1094428114562629>.
64. Zyznarska-Dworczak, B., 2018. The development perspectives of sustainable management accounting in central and Eastern European countries. *Sustainability*, 10(5), p.1445. <https://doi.org/10.3390/su10051445>.

DO CORPORATE SOCIAL RESPONSIBILITY ACTIVITIES TOWARDS EMPLOYEES AFFECT ECONOMIC VALUE ADDED?

ROBERT ZENZEROVIĆ

Juraj Dobrila University of Pula
Faculty of Economics and Tourism »Dr. Mijo Mirković«
Pula, Croatia
robert.zenzerovic@unipu.hr

ADRIANA GALANT

Juraj Dobrila University of Pula
Faculty of Economics and Tourism »Dr. Mijo Mirković«
Pula, Croatia
adriana.galant@unipu.hr

KSENIJA ČERNE

Juraj Dobrila University of Pula
Faculty of Economics and Tourism »Dr. Mijo Mirković«
Pula, Croatia
ksenija.cerne@unipu.hr

Paper Category: Original scientific paper

ABSTRACT

Employees represent a group of primary stakeholders essential for a company's performance. Their knowledge, skills, experience, attitudes, and motivations represent critical success factors, and companies should strive for improvement. Taking care of employees is a part of modern corporate social responsibility (CSR) activities. Such activities could also significantly impact the economic value added (EVA). EVA is a measure of financial performance that shows the economic profit available to owners. It provides information on the residual profit above the costs of the sources of financing representing the extension of classic financial performance measures such as net operating profit after tax, earnings before interest, tax, amortisation, depreciation, and the accounting result.

Considering the importance of employees for a company's success, the main hypothesis of this paper is that corporate social responsibility activities toward employees contribute to EVA creation. The research has been conducted on a sample of Croatian medium-sized and large companies and data has been analysed using the PLS-Structural Equational Model. CSR activities toward employees have been measured using several statements rated on a 5-point Likert scale collected using the online questionnaire. EVA has been calculated using the companies' financial data. The results indicate that CSR activities toward employees are positively and statistically significant, and affect a company's EVA.

The research contributes to the discussion about the importance of CSR by focusing on one of the most important stakeholders of a company, employees. By taking care of employees via CSR activities, companies exhibit improved EVA, which is in the interest of a company and its stakeholders.

Keywords: corporate social responsibility, employees, economic value added

1. INTRODUCTION

Employees are an important group of a company's stakeholders whose role is critical in value creation. Their value is not represented in financial statements, but the companies use the human capital concept to estimate their employees' value. Human capital is the "overall range of individual and collective knowledge and education, skills and competency, as well as other individual characteristics such as employees' responsibility, motivation, creativity, innovation, loyalty, experience, and others" (Zenzerović, Černe and Galant, 2023).

The development and retention of human capital are essential for sustaining an organization's activities over time. The strength of human capital can significantly impact an organization's innovation capacity, operational efficiency, and long-term success. This is why an important portion of modern CSR activities focuses on employees' welfare.

This research determines whether CSR activities toward employees contribute to companies' economic value-added creation. Most of the existing research focuses on information from publicly disclosed sustainability reports, while the authors performed direct research among companies' employees and related the data to EVA calculated for those companies.

The paper is organized as follows: The hypothesis has been defined based on the literature review. The methodology is described. The analysis results are the following. Finally, conclusions are drawn based on the results.

2. LITERATURE REVIEW

Considering that interests of employees are an integral part of the overall corporate responsibility of a company, there are numerous studies on whether CSR activities contribute to financial performance, but without one common conclusion. However, according to the literature, it can be concluded that the positive effect dominates (Van Beurden and Gössling, 2008, Lu et al., 2014, Wang et al., 2016, Bartolacci et al., 2020; Velte, 2021).

This research tries to expand the existing ones by focusing on more contemporary and sophisticated financial performance measures. Traditional measures such as net operating profit after tax (NOPAT), earnings before interest, tax, amortisation, and depreciation (EBITDA), and the accounting result i.e. net income or loss do not provide information on whether the company generates extra profit above the cost of capital. Economic value added is a contemporary measure of financial performance that shows the economic profit available to owners. It is a category that provides

information on the residual profit above the costs of the sources of financing and represents the extension of classic financial performance measures (Zengerović, 2023, p. 83).

The research performed on a sample of Indian companies by Mittla et al. (2008, p. 1437) found “little evidence that companies with a code of ethics would generate significantly more EVA”. However, the results reported by Schiessl et al. (2022, p. 396) showed that “companies with high CSR indexes decreased EVA”. Based on a sample comprised of Chinese companies, a study by Wu et al. (2023) found that corporate financial performance, measured with relative EVA, positively impacts the corporate social responsibility (CSR) participation level.

Edmans (2012) found that employees’ satisfaction is beneficial for a company’s value and corporate social responsibility can improve stock returns. “Behavioural science research supports the notion that good human resource results have a positive influence on business performance” (Koys, 2003, p.18). Although, in literature, mixed results on the relationship between employee satisfaction and profits can be found (Bernhardt et al., 2000), a positive relationship dominates (e.g. Shahzad Latif et al. (2013), Yee et al. (2008), Edmans (2011), Koys, (2001).

Using a sample of Korean companies, Yoo et al. (2019) have shown that CSR activities enhanced the commitment of employees and subsequently company’s profitability. Motivated by irresponsible business behaviour regarding employees of certain global giants, Lee et al. (2013) explored the relationship between the adoption of employee rights protection and the financial performance of the buyer and its supplier. They showed the strategic importance of employee rights protection, i.e. its positive effect on the financial performance and corporate reputation of the buyer and its supplier.

According to Gursoy and Swanger (2007), human resources are one of the critical internal strategic success factors that positively impact the financial performance of service companies. From a service company point of view, “if employees feel the company takes good care of them, they are, in return, likely to take time to provide a better service” (Gursoy and Swanger, 2007, p. 216). Deb et al. (2023) have shown that organisational infrastructure, leadership and management, salary, and other benefits, directly and positively affect the company’s performance. They have also reported the indirect effect of working hours, infrastructure, leadership and management, working environment, salary, and benefits on a company’s performance via emotional intelligence. Using a sample of Slovenian companies, Auer Antoncic and Antoncic (2011) reported a positive

relationship between employee satisfaction (general satisfaction with work, employee relationships, remuneration, benefits and organisational culture, and employee loyalty) and firm growth. Employee satisfaction has been proven to be important in crises as well. Shan and Tang (2023) have shown that companies with higher employee satisfaction had better stock market performance during the COVID-19 crisis.

Chi and Gursoy (2009) investigated the relationship between employee satisfaction, customer satisfaction, and financial performance in the hospitality industry and they found no direct effect of employee satisfaction on financial performance. However, they found an indirect relationship between employee satisfaction on financial performance, via customer satisfaction.

Kessler et al. (2020) concluded that it takes some time for job satisfaction to affect a company's performance, i.e. the effect exists but is not immediate. On the other hand, Bilan et al. (2020, p. 780) found that there is no relationship between "factors of hiring effectiveness and retention of skilled workers with the economic success of the company".

A meta-analysis conducted by Unger et al. (2011) showed that there is a significant small relationship between human capital attributes and entrepreneurial success (profitability, growth, and size). The importance of employees' satisfaction and engagement for business outcomes has also been confirmed in a meta-analysis by Harter et al. (2002).

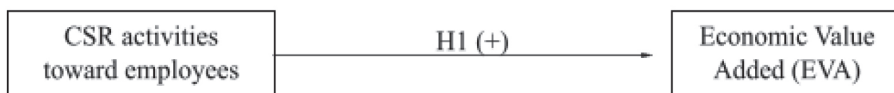
Based on the previously mentioned, and in line with the research aim, the following hypothesis is defined:

H1: Corporate social responsibility activities toward employees contribute to the company's economic value-added creation.

3. METHODOLOGY

The model developed for this analysis is presented in Figure 1.

Figure 1: Research model



Source: Authors

To test the defined hypothesis, two sets of data were needed: data on CSR activities toward employees and financial data for EVA calculation. Data on CSR activities toward employees was obtained in an online survey using part of a questionnaire developed by Turker (2009). For the purposes of this research, eight (8) statements regarding employees have been included. Table 1 contains the list of used statements. Respondents, mostly higher-level managers, indicated their agreement with each statement on a scale from 1 (strongly disagree) to 5 (strongly agree). The survey was translated into Croatian for data collection. Data were gathered in the second half of 2016 and the first half of 2017 as part of a doctoral thesis research project.

Table 1. Statements regarding the CSR activities toward employees

1.	The employees in our company receive a reasonable salary to maintain an acceptable quality of life. (EMP1)
2.	Our company policies provide a safe and healthy working environment for all its employees. (EMP2)
3.	Our company supports employees who want to acquire additional education. (EMP3)
4.	Our company policies encourage the employees to develop their skills and careers. (EMP4)
5.	Our company implements flexible policies to provide good work and life balance for its employees. (EMP5)
6.	The management of our company is primarily concerned with employees' needs and wants. (EMP6)
7.	The managerial decisions related to the employees are usually fair. (EMP7)
8.	I believe that our company provides equal opportunities to all its employees. (EMP8)

Source: Turker, 2009

Financial data was extracted from the financial reports of companies, obtained from a Financial Agency (FINA) that collects financial data for all companies in Croatia. The financial data was collected for the year 2017. The total sample included 102 large and medium-sized companies. For model testing the variable EVA has been divided by the value of capital and reserve (variable EVA/CR). The EVA was calculated using the following formula:

$$EVA = NOPAT - (WACC \times CI) \quad (1)$$

Where:

EVA = Economic value added

NOPAT = Net operating profit after taxes

WACC = Weighted average cost of capital

CI = Capital invested represented by a sum of capital and reserves and financial liabilities

The model was tested using the Smart-PLS approach and SmartPLS software (Ringle et al., 2015). This involved evaluating both the measurement model and the structural model. The measurement model assessment included the evaluation of internal consistency, convergent validity, and discriminant validity for multi-item variables (CSR activities toward employees).

4. RESULTS

The descriptive statistics of variables used in the analysis are shown in Table 2. The companies, on average, did not have positive EVA, which resulted in a negative mean value of EVA/CR. The EVA/CR 2017 variable ranges from -0.93 to 0.86, with a kurtosis of 12.24 and a standard deviation of 0.18. The variables used to measure CSR activities toward employees range from 1 to 5, and for all of them, the mean value is higher than 3.5, indicating that values are negatively skewed.

Table 2. Descriptive statistics

	N	Mean	Min	Max	Kurtosis	Standard deviation
EVA/CR 2017	98	-0.01	-0.93	0.86	12.24	0.18
EVA 2017	102	-119,565,486	-2,601,102,689	138,246,264	29,48	343,593,939
CR	102	1,095,824,196	-895,202,708	25,149,872,953	32,01	3,235,234,984
EMP1	102	4.09	1.00	5.00	1.59	0.86
EMP2	102	4.28	1.00	5.00	4.34	0.80
EMP3	102	4.03	1.00	5.00	1.73	0.90
EMP4	102	4.05	1.00	5.00	2.06	0.87
EMP5	102	3.83	1.00	5.00	1.17	0.88
EMP6	102	3.58	1.00	5.00	-0.14	0.87
EMP7	102	3.95	1.00	5.00	1.35	0.87
EMP8	102	3.73	1.00	5.00	0.38	0.91

Source: Authors' calculation

Table 3 contains the correlation matrix of the variables used for model testing purposes. There is a statistically significant correlation between almost all CSR activities toward employees' indicators and the EVA measure.

The only exception is for the EMP2 indicator where correlations are not statistically significant. The correlation coefficient ranges between 0.14 (EMP2) and 0.28 (EMP1 and EMP3), i.e. they range from small correlation to moderate correlation. From the matrix, it can also be observed that there is a statistically significant correlation between CSR toward employees' indicators, and these correlations are moderate to high.

Table 3. Correlation matrix

	EVA/ CR	EMP1	EMP2	EMP3	EMP4	EMP5	EMP6	EMP7	EMP8
EVA/ CR	1,00								
EMP1	0.28***	1.00							
EMP2	0.14	0.53***	1.00						
EMP3	0.28***	0.65***	0.65***	1.00					
EMP4	0.23**	0.51***	0.65***	0.85***	1.00				
EMP5	0.20**	0.35***	0.59***	0.64***	0.60***	1.00			
EMP6	0.18*	0.30***	0.41***	0.46***	0.46***	0.46***	1.00		
EMP7	0.22**	0.42***	0.69***	0.57***	0.62***	0.49***	0.53***	1.00	
EMP8	0.20**	0.25**	0.57***	0.49***	0.50***	0.52***	0.51***	0.70***	1.00

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

Source: Authors' calculation

After evaluating the descriptive statistics of variables, the measurement model was analysed for variable CSR activities toward employees since this is only a multi-item variable. The results are presented in Table 4. Internal consistency was assessed using composite reliability and Cronbach's alpha, both of which are above 0.7. Indicator reliability was evaluated by examining the outer loadings of indicators, which should be above 0.7. Two (2) loadings are lower than 0.7; however, they were not excluded since composite reliability and AVE values are above suggested values (Hair et al., 2017). Convergent validity was assessed through AVE values, which exceed 0.5. Discriminant validity was evaluated using the HTMT criterion, cross-loadings, and the Fornell-Larcker criterion. There were no cross-loadings, the Fornell-Larcker Criterion was met and HTMT is lower than the threshold value of 0.85 (Hair et al., 2017). Additionally, the HTMT confidence interval does not include 1. Based on this analysis it can be concluded that internal consistency reliability, indicator's reliability, convergent validity, and

discriminant validity have been established, and the structural model can be evaluated.

Table 4: Summary results of measurement model evaluation

Latent variable	Indicator	Convergent Validity		Internal consistency reliability		Discriminant validity
		Loading	AVE	Composite reliability	Cronbach's Alpha	HTMT
CSR toward employees	EMP1	0.69	0.60	0.91	0.902	0.29
	EMP2	0.81				
	EMP3	0.89				
	EMP4	0.85				
	EMP5	0.74				
	EMP6	0.65				
	EMP7	0.80				
	EMP8	0.72				

Source: Authors' calculation

The structural model evaluation included collinearity evaluation (VIF values between 0.2 and 5), path coefficient significance (using bootstrapping), and f^2 values for the effect size. Additionally, the predictive relevance (Q^2 value) of the model was assessed using blindfolding, and SRMR values were calculated to evaluate the model fit (Hair et al., 2017). For each predictor construct's tolerance (VIF) values are higher than 0.2 and lower than 5, and therefore collinearity is not an issue. The path coefficient between CSR activities toward employees and variable EVA/CR is positive (0.29), indicating that there is a positive effect of considered CSR activities on EVA. Using the bootstrapping procedure, the significance of this path coefficient has been assessed and resulted in a p-value of 0.02 (<0.05). Therefore, the positive effect is significant at the level of 5%. The effect size f^2 was analysed to assess how much CSR activities toward employees contribute to EVA. The result is 0.09, which indicates a small to medium effect. The SRMR is 0.08, which can be considered a good fit. The Q^2 value is higher than 0 ($Q^2 = 0.024$) indicating that the exogenous constructs have predictive relevance for EVA (Hair et al., 2017). The results are presented in Figure 2.

Figure 2. Structural model evaluation results



Where:

** p value < 0.05

SRMR = 0,08

EVA/CR = Economic value added/Capital and reserves

Source: Authors

5. CONCLUSION

Employees represent one of the most important stakeholders, which are crucial for a company's success. Therefore, it is important to keep employees satisfied and motivated to perform their job obligations. Keeping employees satisfied and motivated, through activities above legal requirements, falls within the CSR activities of the company, and in such a way companies also contribute to sustainable development.

Considering the importance of different stakeholders, CSR activities can also affect a company's financial performance. Previous empirical research has shown that the positive effect of CSR activities on financial performance dominates (e.g. Van Beurden and Gössling, 2008, Lu et al., 2014, Wang et al., 2016, Bartolacci et al., 2020, Velte, 2021). Considering only CSR activities toward employees, the same could be expected. If employees are satisfied and motivated, it is reasonable to expect that they will fulfil their obligations better, which is in the interest of the company. Previous research has also documented the positive effects of different CSR activities toward employees' outcomes and financial performance (e.g. Gursoy and Swanger, 2007, Auer Antoncic and Antoncic, 2011, Deb et al., 2023, Shan and Tang, 2023).

This research goes a step further than analysing the effects of CSR activities toward employees on traditional financial performance measures. It considered the EVA measure which shows the economic profit available to owners. EVA represents a “measure of value creation, superior to accounting indicators because it considers the cost of capital and the risk level of a company” (Sichigea and Vasilescu, 2015, p. 489). Therefore, it was assumed

that CSR activities toward employees contribute to the company's EVA creation which has been set as the hypothesis of this paper.

The defined hypothesis was tested on a sample of large and medium-sized companies operating in Croatia. Data was collected using the online questionnaire and from the company's financial statements. Analysis of the data included descriptive statistics and PLS-SEM modelling. The obtained results confirmed the defined hypothesis, i.e. it has been proven that CSR activities toward employees contribute to EVA creation. Therefore, if companies take care of their employees and keep them satisfied, they also exhibit financial benefits.

This research contributed to the ongoing discussion about the importance of CSR activities in creating value for shareholders, by focusing on employees' issues. The results of this analysis have practical implications as well. In the situation of chronic lack of a quality workforce, which Croatian companies are currently facing, CSR activities could be a very important tool for retention of current employees, but also for attraction of new employees, and at the same time increasing the value for company's owners.

The research should also be extended to other countries to get a wider perspective. Additionally, the research should be re-taken for more recent years. Having results for recent years would also allow a comparison to be made between two time periods which were characterised by significant changes in the market (COVID-19 pandemic, energy crisis, employees' migrations, etc.). Regardless of these limitations, the research provided significant conclusions and contributions, and opened new questions to be analysed in future research.

BIBLIOGRAPHY

1. Auer Antoncic, J., and Antoncic, B. (2011). ‘Employee satisfaction, intrapreneurship, and firm growth: a model.’ *Industrial Management & Data Systems*, 111(4), pp. 589-607.
2. Deb, S. K., Nafi, S. M., Mallik, N., and Valeri, M. (2023). ‘The mediating effect of emotional intelligence on the relationship between employee job satisfaction and firm performance of small business.’ *European Business Review*, 35(5), pp. 624-651.
3. Edmans, A. (2012). ‘The link between job satisfaction and firm value, with implications for corporate social responsibility.’ *Academy of Management Perspectives*, 26(4), 1-19.
4. Kessler, S. R., Lucianetti, L., Pindek, S., Zhu, Z., and Spector, P. E. (2020). ‘Job satisfaction and firm performance: Can employees’ job satisfaction change the trajectory of a firm’s performance?’ *Journal of Applied Social Psychology*, 50(10), pp. 563-572.
5. Hair, J. F., Hult, G.T., Ringle, C. M. and Sarstedt, M. (2017). *A primer on partial least squares structural equation modelling (PLS-SEM)*, Second edition, SAGE Publications, Inc., Los Angeles, USA
6. Harter, J. K., Schmidt, F. L., and Hayes, T. L. (2002). ‘Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: a meta-analysis.’ *Journal of Applied Psychology*, 87(2), pp. 268.
7. Unger, J. M., Rauch, A., Frese, M., and Rosenbusch, N. (2011). ‘Human capital and entrepreneurial success: A meta-analytical review.’ *Journal of Business Venturing*, 26(3), pp. 341-358.
8. Bilan, Y., Mishchuk, H., Roshchyk, I., and Joshi, O. (2020). ‘Hiring and retaining skilled employees in SMEs: problems in human resource practices and links with organizational success.’ *Business: Theory and Practice*, 21(2), pp. 780-791.
9. Koys, D. J. (2001). ‘The effects of employee satisfaction, organizational citizenship behavior, and turnover on organizational effectiveness: A unit-level, longitudinal study.’ *Personnel Psychology*, 54(1), pp. 101-114.
10. Edmans, A. (2011). ‘Does the stock market fully value intangibles? Employee satisfaction and equity prices.’ *Journal of Financial Economics*, 101(3), pp. 621-640.
11. Yee, R. W., Yeung, A. C., and Cheng, T. E. (2008). ‘The impact of employee satisfaction on quality and profitability in high-contact service industries.’ *Journal of Operations Management*, 26(5), pp. 651-668.
12. Latif, M. S., Ahmad, M., Qasim, M., Mushtaq, M., Ferdoos, A., and Naeem, H. (2013). ‘Impact of employee’s job satisfaction on organizational performance.’ *European journal of business and management*, 5(5), pp. 166-171.
13. Koys, D. J. (2003). ‘How the achievement of human-resources goals drives restaurant performance.’ *Cornell Hotel and Restaurant Administration Quarterly*, 44(1), pp.17-24.
14. Yoo, J. M., Choi, W., and Chon, M. L. (2019). ‘Do employees matter in the relationship between corporate social responsibility and financial performance?’ *Sustainability*, 11(22), 6251.

15. Lee, P. K., Lau, A. K., and Cheng, T. C. E. (2013). 'Employee rights protection and financial performance.' *Journal of Business Research*, 66(10), pp. 1861-1869.
16. Ringle, C. M., Wende, S. and Becker, J.-M. (2015). »SmartPLS 3.« Boenningstedt: SmartPLS GmbH, <http://www.smartpls.com>.
17. Shan, C., and Tang, D. Y. (2023). 'The value of employee satisfaction in disastrous times: Evidence from COVID-19'. *Review of Finance*, 27(3), pp. 1027-1076.
18. Van Beurden, P., and Gössling, T. (2008). 'The worth of values—a literature review on the relation between corporate social and financial performance.' *Journal of Business Ethics*, 82(2), pp. 407-424.
19. Velte, P. (2021). 'Meta-analyses on corporate social responsibility (CSR): a literature review.' *Management Review Quarterly*, pp. 1-49.
20. Wang, Q., Dou, J., and Jia, S. (2016). 'A meta-analytic review of corporate social responsibility and corporate financial performance: The moderating effect of contextual factors.' *Business & Society*, 55(8), pp. 1083-1121.
21. Bartolacci, F., Caputo, A., and Soverchia, M. (2020). 'Sustainability and financial performance of small and medium-sized enterprises: A bibliometric and systematic literature review.' *Business Strategy and the Environment*, 29(3), pp. 1297-1309.
22. Lu, W., Chau, K. W., Wang, H., and Pan, W. (2014). 'A decade's debate on the nexus between corporate social and corporate financial performance: a critical review of empirical studies 2002–2011'. *Journal of cleaner production*, 79, pp. 195-206.
23. Mittal, R.K., Sinha, N. and Singh, A. (2008), 'An analysis of linkage between economic value added and corporate social responsibility', *Management Decision*, Vol. 46 No. 9, pp. 1437-1443. <https://doi.org/10.1108/00251740810912037>
24. Turker, D. (2009). 'Measuring corporate social responsibility: A scale development study.' *Journal of business ethics*, 85, 411-427. Doi: 10.1007/s10551-008-9780-6
25. Schiessl, D., Korelo, J.C. and Mussi Szabo Cherobim, A.P. (2022), 'Corporate social responsibility and the impact on economic value added: the role of environmental innovation', *European Business Review*, Vol. 34 No. 3, pp. 396-410. <https://doi.org/10.1108/EBR-03-2021-0071>
26. Sichigea, N., and Vasilescu, L. (2015). 'Economic value added and market value added - modern indicators for assessment of the firm's value.' *Annals of the Constantin Brancusi University of Targu Jiu, Economic Series, Eco-Trend*, pp. 488-493.
27. Wu, X., Dluhošová, D., and Zmeškal, Z. (2023). 'The moderating role of a corporate life cycle with the impact of economic value-added on corporate social responsibility: Evidence from China's listed companies.' *Emerging Markets Review*, 55, 101021.
28. Zenzerović, R., Černe, K., Galant, A. (2023). 'Comparison of Economic Value Added and Modified Value-Added Intellectual Coefficient as a Measures of Intellectual Capital Valuation.' *Conference Proceedings of the 10th International Scientific Conference "Finance, Economics and Tourism – FET2022"*, pp. 465 – 479. <https://fet.unipu.hr/images/50033862/FETconf%20Conference%20Proceedings%202022%20online.pdf>
29. Zenzerović, R., (2023). 'Do companies that generate profits make EVA?' *E-mentor*, 99 (2), pp. 83 – 89., DOI: <https://doi.org/10.15219/em99.1611>

INVESTIGATING THE EFFECTS OF INTELLECTUAL CAPITAL EFFICIENCY ON NON-PERFORMING ASSETS OF INDIAN BANKS: A STUDY OF PRE-COVID AND DURING-COVID TIMES

SHRUTI BANSAL

Punjabi University
Department of Commerce
Punjab, India
shrutibansal1147@gmail.com

NARINDER KAUR

Punjabi University - Guru Kashi Campus
Department of Business Studies
Punjab, India
kaurnarinder@pbi.ac.in

MOHIT TANEJA

Chitkara University
Chitkara Business School
Punjab, India
mohit.taneja@chitkara.edu.in

Paper Category: Preliminary scientific paper

ABSTRACT

Purpose - The paper aims to measure the effect of Intellectual Capital Efficiency (ICE) on Non-Performing Assets (NPAs) of the top 10 Indian banks. The components of ICE employed are Human Capital Efficiency (HCE) and Capital Employed Efficiency (CEE), and the study is undertaken in Pre- COVID (2016-17 to 2018-19) and during- COVID-19 (2019-20 to 2021-22) periods.

Design/Methodology/Approach - The study applies the Auto-Regressive Distributed Lag (ARDL) model, which shows that the dependent variable, explained by the independent variable, is also explained by its own lag.

Findings - The results of this study reveal that ICE influences NPAs of the banks in both the periods differently, while Human Capital (HC) does not affect the NPA position of the banks whereas, in contrast to this, investment in physical assets lowers NPAs.

Practical Implications – The strength of the present study lies in the fact that investment made in HC does not offer productivity to the Indian banking sector. Therefore, banks need to reconsider their investment strategies with regard to HC and reframe their investment structure.

Originality/Value - The study is perhaps the first one to have undertaken ICE to measure its effect on the asset quality of Indian banks using the ARDL model. Also, to the best of our knowledge, such an analysis on the subject within the context of COVID, with structural break, has not been previously conducted.

Keywords: Intellectual Capital, VAIC, Non-Performing Assets, Human Capital, Capital Employed

1. INTRODUCTION

For a goldilocks economy like India, the well-being of the financial sector is important. The financial industry is a modern economy's lifeblood, as it offers funding for general prosperity, innovation, and infrastructure (Tiwari and Vidyarthi, 2018). As a major aspect of the financial sector, the banking system is the barometer of economic health of a nation and statesmen take pride in projecting a banking system which symbolises strength and stability (Uppal and Rani, 2010). For a developing country like India, which has the second largest number of banks among all countries in the world after the US (Sarkar and Sarkar, 2018), it needs to be even more attentive regarding the well-being of its banking system.

In today's competitive globalised environment, organisations tend to increase productivity by shifting from tangible to intangible assets. As human capital development is still purely a public good, it gives businesses an advantage over their competitors. Similarly, banks are knowledge-intensive organisations, and hence are required to manage their intellectual resources efficiently. IC plays a vital role in the knowledge-based economy and drives firms' sustained competitive advantage. It is well argued that banks have accumulated higher levels of IC than other industries (Firer and Williams, 2003). Companies that manage their intellectual resources are able to produce value and build a competitive edge by performing innovation through R&D, and further, it leads to a rise in the company's financial performance (Lestari, 2016). Given the growing significance of IC in banking operations, it is imperative to quantify the dynamics and impact of IC on the organisation's performance (Tran and Vo, 2022).

Pulic (1998, 2000a, b, 2004a, b, 2008) introduced the concept of ICE, regarding this concept as being consistent with a knowledge-based economy as compared to other traditional measures like earnings before interest, taxes, depreciation and amortisation (EBITDA) (Marzo, 2022). The field of IC attracted prominence in the 1990s, when academics, practitioners, and accountants recognised the importance of managing, measuring, and reporting on IC in businesses. IC is something to which a price tag cannot be allotted and which includes expertise and a firm's learning ability. ICE highlights that part of an organisation which is usually left ignored or is not brought into the books of accounts i.e. intangible assets. In the words of Pulic (2008), knowledge, when it creates value, or value creation through knowledge in the market or economy becomes Intellectual Capital. IC has been considered a way to gain competitive advantage by Steward (1994), Ho (2005), Li *et al.* (2019), Ferreira (2020), Quiutero (2021) for companies

in the economy mainly driven by knowledge (Edvinsson and Malone, 1997, Steward, 1997, Pulic 1998, Bontis, 1999) and banks belong to such a knowledge-intensive sector.

Intellectual Capital is a tool for the sustainable success of the banking sector. Variables selected for the present study are competent enough for contributing towards the sustainable development and performance of the banking industry. It is also exciting to see how a structural break of pre- and during-COVID-19 periods respond to the ICE.

For the Indian banking sector to sail in the victory boat of Sustainable Development Goals (SDGs), it needs to immediately address the issue of mounting Non-Performing Assets (NPAs). Improvement in the asset quality of banks is not only required for capital adequacy but also for the achievement of SDG 8 (productivity) and SDG 9 (profitability). To tackle the problem of NPAs, banks need to follow the principles of intellectual ability.

ICE can be measured using a balanced scorecard approach, the market capitalisation method, Skandia Navigator and the intangible asset monitor by Yao *et al.* (2019) but the widely used, objective, verifiable and accepted measure is VAIC methodology, because it is easy, standardised and uses a more reliable and accurate data set which is based on audited financial statements. VAIC indicates how much new value has been created per invested monetary unit in each resource as stated by Pulic (2008).

2. NEED OF THE STUDY

It is important to measure the ICE of the service industry, which includes the banking sector. ICE draws attention to the areas of a business that are typically overlooked, or not included in the books of accounts, i.e. intangible assets. Enterprises across the globe perceive opportunities to enhance efficiency in the domain of knowledge management, or intellectual property management (Pulic, 2008). Exploring the relationship between ICE and NPAs is an exciting task, because the results can help various stakeholders in policy formulation belonging to the field of banking. The problem of NPA in the Indian banking sector has many reasons. Lack of accountability and transparency is one such reason which has led to the colossal amount of NPAs (Kaur and Viz, 2018). The study is a pioneer from a number of perspectives. First, it considers the two most important, yet under-researched, factors influencing NPAs concerning the Indian banking sector. Second, the present study has used modern techniques to analyse the data i.e. the ARDL model. Moreover, the present research is divided into the structural break of pre-

COVID (2016-17 to 2018-19) and during-COVID era (2019-20 to 2021-22) to draw some relevant conclusions.

3. MOTIVATION OF THE STUDY

Despite the rising level of uncertainty and the constantly shifting environment in which banks operate, they nevertheless need to establish and preserve their IC (Branco et al., 2011). Any service industry, including banking, depends more on intangible assets than tangible ones, so the calibre of the company's IC will probably have an impact on how well it performs. According to Kamath (2007), one of the service industries that heavily depends on its HC is banking. The dynamic business environment in which banking institutions operate is typified by the necessity of maintaining alignment with the business cycle of other industries (Shih et al., 2010). In addition, as more specialised banks enter the market, regulations are becoming stiffer; there is a bad loan issue, and competition is becoming fiercer. Thus, to operate sustainably, the banks are required to work in the area of managing IC more efficiently. While major studies are addressing the impact of IC and its components on banks' performance (Mavridis, 2004, Kamath, 2007, Joshi et al., 2010, Ulum et al., 2014, Tiwari and Vidyarthi, 2018, Gupta and Raman, 2020, Rehman et al., 2021, Majumder, 2023, Ul, Rehman et al., 2024, Uslu, H. 2024, Rong et al., 2025), little focus appears to be put on the relationship between banks' IC and NPA. To address this gap, the present study examines the extent to which Indian banks use their HC and CE and how these two elements impact their asset quality. Thus, this study provides another aspect of the significance of IC in risk management of banks.

4. THEORETICAL LINKAGES AND LITERATURE REVIEW

According to the International Federation of Accounts (1998), IC can be considered as a foundational knowledge base for organisations. There has never been agreement on a single definition of IC, despite the fact that academicians and researchers have offered a number of definitions. Most of the time researchers use IC as a synonym for 'intangible assets' and 'knowledge assets' (Gaur and Gupta, 2023). Generally, IC is perceived as "*possession of knowledge used to create value for an organisation in some way* (Roos et al., 1997)" or "*experience applied to get a competitive edge over the existing firms*" (Bontis, 2001, Majumder, 2023). The substantial research on IC grew in the late 1990's, particularly in Northern Europe. To date, the majority of research

articles pertaining to IC have regarded it as a non-monetary asset, devoid of any tangible form, yet significantly impactful in terms of firm profits. Along with focusing on IC, it is important to give equal attention to its components. Researchers like Kim *et al.* (2011), considered three components of IC, i.e. human capital (HC), structural capital (SC) and relational capital (RC). However, to get a comprehensive comparative view, this study has examined two exhaustive components, namely the capital employed (CE) and human capital (HC). HC is the collection of attributes that a person possesses to contribute to a company, such as knowledge, experience, and skills. HC has been recognised as the most important factor of IC; it helps individuals to be innovative and creative in a way that benefits businesses. Sveiby, 1997, Mohapatra *et al.* 2019, and Rong, *et al.*, 2025 claimed that firms would be stagnant if there were no contribution of HC. Goh, (2005), examined the IC performance of 16 Malaysian commercial banks and the outcome showed that banks have greater HC as compared to any other variable of IC. Similarly, Joshi *et al.* (2010) undertook the study of Australian banks and showed that HC has a considerable association with the efficiency of banks in creating value. The study of Poh *et al.*, (2018) and Uslu, H., (2023), conducted in Malaysia and Türkiye respectively, pointed out that a bank's performance is influenced by IC and HC and these appear to be the most contributing components in enhancing a bank's performance. Additionally, the absence of intangible assets (i.e. HC) will prevent any firm from being competitive. Since the present study is more specifically inclined towards examining efficiency i.e. human capital efficiency (HCE) and capital employed efficiency (CEE), where Capital Employed (CE) is the sum of financial and physical capital (Majumder, 2023), considered as an important aspect of an organisation's wealth. Yao *et al.*, (2019) reported no significant relationship between capital employed efficiency and performance of Pakistani financial institutions. Studies by Kumar, 2016, Singh *et al.*, 2016, Mohapatra *et al.*, 2019 used the VAIC model to study the IC efficiency in the Indian banking sector and found that the performance of Indian banks gets affected by HCE and CEE. Research conducted on the Ethiopian banking sector by Ejigu, 2020 also supports the hypothesis that IC has a positive effect on banking performance. Another study on Vietnamese Financial institutions by Tran and Vo, 2022 found the results in favour of IC. Weqar *et al.* (2020) and Barak and Sharma (2023) applied Modified Value Added Intellectual Coefficient (MVAIC) methodology and stood by the statement that HCE and CEE affect Indian banking. A study by Pratama *et al.* (2022) concluded that IC (using VAIC) has a favourable impact on the social performance of Islamic banks. The research work conducted by Marpaung and Muharam in 2024 found

CEE to be having no effect on ROA, but another novel element introduced in the study i.e. Innovation Capital Efficiency had negative and significant influence on ROA. In India there is still a gap to study IC with regard to NPAs, but Asare in 2020 studied the association between IC and asset quality. The study found that IC has no meaningful impact on asset quality; however, a negative relationship was demonstrated between IC and NPA. Gaur and Gupta (2023) claimed that IC and its components are crucial for managing banks' NPAs. The comprehensive literature review conducted for the study also noticed that the majority of studies have taken ROA, ROE, EPS, Tobin's Q ratio and ROI as their dependent variables and missed out on a crucial variable of banking i.e. NPA.

Hypotheses

A set of empirical alternative hypotheses has been developed and is mentioned below:

Ha1 Human Capital Efficiency (HCE) affects the Non-Performing Assets (NPA) position of selected banks.

Ha2 Capital Employed Efficiency (CEE) affects the Non-Performing Assets (NPA) position of selected banks.

5. RESEARCH DESIGN AND METHODOLOGY

5.1. ECONOMETRIC MODEL: AUTOREGRESSIVE DISTRIBUTED LAG (ARDL) MODEL

The present research aims to test the relationship between the independent variables i.e. Intellectual Capital Efficiency and Dependent Variable i.e. Asset Quality. Past literature supports the ARDL model on the grounds of portraying positive and productive outcomes. Data should be normalised before processing. Julia (2015) explained the standard form of two simple ARDL model variables (p,q), that may be written as-

$$y_t = \beta_0 + \beta_1 y_{t-1} + \beta_2 y_{t-2} + \dots + \beta_p y_{t-p} + \alpha_0 x_t + \alpha_1 x_{t-1} + \dots + \alpha_q x_{t-q} + e_t.$$

In the above-mentioned model, the value of variable y_t is explained partly by the other variables and partly by the lagged value of the variable itself and other variables (x_t) in the model.

5.2. SAMPLE DESCRIPTION AND PERIOD OF THE STUDY

- The present study takes into account the top 10 banks as per their market capitalisation. Banks are listed on the NSE and are publicly traded

(Annexe 1). The study is undertaken from the period of 2016-17 to 2021-22. The period selected has been further divided into the structural break of pre- (2016-17 to 2018-19) and during- (2019-20 to 2021-22) COVID-19 times. The data regarding ICE using the VAIC model has been extracted from the Prowess database and data for NPA is obtained from the financial statements of respective banks.

5.3. COMPONENT FOR MEASURING INTELLECTUAL CAPITAL EFFICIENCY USING THE VAIC MODEL

VAIC reflects the intellectual ability of the firm and is also known as Business Performance Indicator (BPI).

$$\text{Value added} = *Output - **Input$$

**Output = Gross income of the bank (including interest income, insurance income and other revenues)*

***Input = Interest expense + insurance cost + other operating expenses (excluding employee costs)*

Human Capital Efficiency (HCE) - Employees are considered to be the key resource of the 21st century, so it becomes reasonable to give this resource the status of investment and not of cost (Pulic, Ante. 2008).

$$\text{HCE} = \text{The ratio of value added divided by HC (VA/HC)}$$

$$\text{HC} = \text{Total employee expenditure (Payments + Provisions for employee)}$$

Capital Employed Efficiency (CEE) - Is the book value of the net assets of the firm or sum total of the physical and material assets of the organisation

$$\text{CEE} = \text{The ratio of value added divided by CE (VA/CE)}$$

$$\text{CE} = \text{Shareholder's fund} + \text{long-term borrowings}$$

Structural Capital Efficiency (SCE) exclusion criteria

- a. Not in Pulic's model originally - Marzo, G. 2022 implied a few of the lead remarks in his research and stated that SC does not exist in VAIC and researchers should not rely on SCE for analysing the role of SC. Further he mentioned that SCE is nothing but a counterbalance of HCE and it has never been considered in empirical analysis so far. Lastly, he concluded that it is a concept that is difficult to grasp because it lacks theoretical consistency.
- b. Insignificant performance in banks - In the studies of Dalwai and Mohammadi, 2020, Nsour, E., 2021, Smriti and Das 2018, Barak and Sharma 2023 structural Capital Efficiency (SCE) was recognised as an insignificant variable.

Dependent Variable - Asset Quality

Non-Performing Assets (NPA) – Asset quality of the banks can be measured through NPA. The position of NPAs depicts a lot about the banks. Many research studies have excluded the NPA factor of banking while evaluating its performance, but the efficiency of a bank cannot be accurately determined without taking into account its NPLs (Drake, Hall and Simper 2006, Pasiouras 2008). So the present study takes NPA ratio as its dependent variable.

$NNPA = \text{Gross NPA} - (\text{Interest in suspense} + \text{Provisions})$

$NNPA \text{ Ratio} = \frac{\text{Net Non-Performing Assets}}{\text{Total Assets}}$

Total Assets

Table 1. Descriptive Statistics

	2016-17 to 2018-19 (Pre-COVID-19)			2019-20 to 2021-22 (During-COVID-19)		
	NPA	CEE	HCE	NPA	CEE	HCE
Mean	0.459102	-0.824676	0.577766	0.164650	-0.749296	0.574919
Median	0.568200	-0.801221	0.562198	0.093295	-0.740529	0.542472
Maximum	1.222456	-0.616364	0.786837	0.761928	-0.497027	0.801109
Minimum	-0.481486	-1.123205	0.326889	-0.494850	-0.967784	0.338277
Std. Dev.	0.482510	0.130393	0.129597	0.357258	0.109147	0.154400
Obs.	30	30	30	30	30	30

Table 4.5 exhibits the descriptive statistics of all variables

Table 2. Augmented Dickey-Fuller (ADF) Test of Unit Root

Variables	ADF			
	2016-17 to 2018-19		2019-20 to 2021-22	
At Level	t-stat	Critical value	t-stat	Critical value
NPA*	-3.0176	-3.5742	-3.1310	-3.5742
CEE**	-3.7615	-3.5742	-3.1461	-3.5742
HCE	-5.4306	-3.5742	-3.6088	-3.5742

*Value of NPA in both the periods was found to be stationary at first difference.

**Value of CEE in the period 2019-20 to 2021-22 was found to be stationary at first difference.

6. RESULTS AND DISCUSSION

Table 3. ARDL Model

Pre-COVID-19			During-COVID-19	
Variable	t-Statistic	Prob*	t-Statistic	Prob*
D(LOG_NPA_(-1))	-2.29813	0.0353	-0.789315	0.4384
D(LOG_CEE_)	-2.044070	0.0426	-1.061076	0.3002
LOG_CEE_(-1)	2.353776	0.0275	-2.692613	0.0463
LOG_HCE_	1.128096	0.2709	-1.016446	0.3205
C	-0.352839	0.7274	-0.629007	0.5358
R-squared	0.318602		0.268405	
Adjusted R-squared	0.163739		0.141171	
Durbin-Watson stat	1.980862		2.184384	

$$D(\text{LOGNPA}_t) = -1.626449432021 * (D(\text{LOGNPA}_{t-1})) - (0.25464808 * \text{LOGCEE}_{t-1}) + 0.63203877 * \text{LOGHCE}_t - 2.59286542 *$$

$$D(\text{LOGNPA}_t) = -1.698697540600 * (D(\text{LOGNPA}_{t-1})) + 0.52595225 * D(\text{LOGCEE}_t) + 0.32095423 * \text{LOGHCE}_{t-1} - 0.11928432$$

Table 5.1 presents the findings of the ARDL model run on E views for the period i.e. Pre-COVID and During-COVID of 3 years each. NPA is the dependent variable and CEE and HCE are the independent variables. The number of lags selected through AIC is 1. NPA and CEE are found to be significant variables during pre-COVID times, whereas only CEE is found to be a significant variable while COVID was prevalent. From the table it is understandable that the Pre-COVID period explains more change in NPA due

to CEE and HCE in comparison to the period of During- COVID as R squared is 31.8% during 2016-17 to 2019-20 and 26.8% during 2019-20 to 21-22. The value of Durbin-Watson is 1.980 (2016-17 to 2018-20) and 2.184 (2019-20 to 2021-22) which signifies that there is positive auto correlation among the residuals.

The F-stat value in the test applied is higher than the upper boundary of the F statistics i.e. I(1) values at 1% level. This confirms the existence of a long run relationship among the variables of the model in both the periods.

Table 4. F-Bounds Test (2016-17 to 2019-20)

Null Hypothesis :No levels relationship				
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic :n=1000		
		10%	2.37	3.2
F-statistic	5.728578	5%	2.79	3.67
K	3	2.50%	3.15	4.08
		1%	3.65	4.66
Actual Sample Size	27	Finite Sample :n=27		
		10%	2.618	3.532
		5%	3.164	4.194
		1%	4.428	5.816

Table 5.2 shows the results of ARDL Bounds Co-integration test. The F-stat value in the test applied is 5.728, which is higher than the upper boundary of the F statistics i.e. I(1) values at 1% level. This confirms the existence of a long run relationship among the variables of the 1st model.

Table 5. F-Bounds Test (2019-20 to 2021-22)

Null Hypothesis: No levels relationship				
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
		10%	2.37	3.2
F-statistic	8.502652	5%	2.79	3.67
K	3	2.50%	3.15	4.08
		1%	3.65	4.66
Actual Sample Size	27	FiniteSample:n=27		
		10%	2.618	3.532
		5%	3.164	4.194
		1%	4.428	5.816

Table 5.3 shows the results of ARDL Bounds Co-integration test. The F-stat value in the test applied is 8.5026, which is higher than the upper boundary of the F statistics i.e. I(1) values at 1% level. This confirms the existence of a long run relationship among the variables of the 2nd model.

Table 6. Heteroskedasticity tests (Breusch-Pagan-Godfrey test)

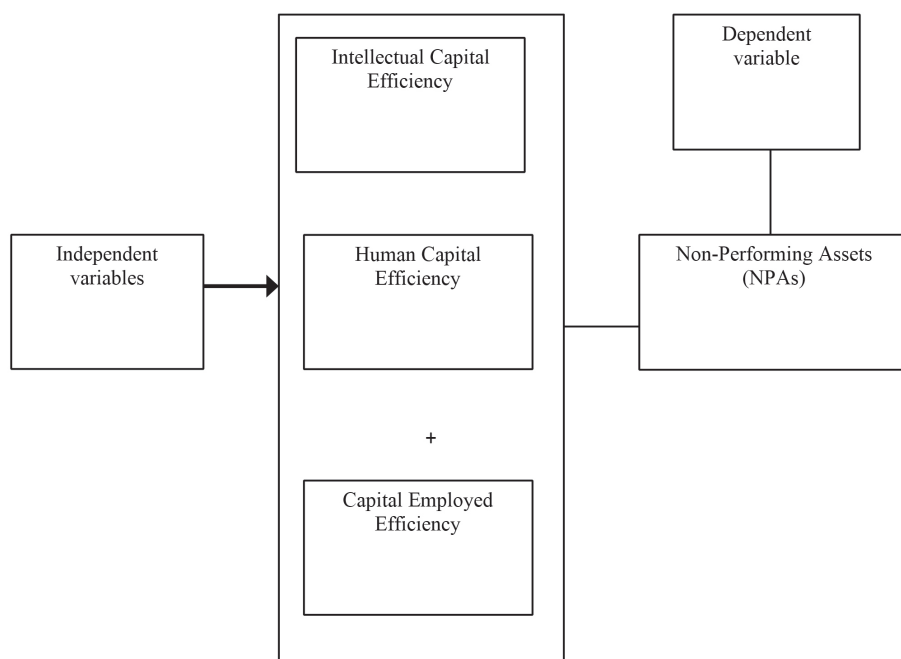
Null Hypothesis: Homoscedasticity (Pre-COVID)				Null Hypothesis: Homoscedasticity (during-COVID)		
F-statistic	0.515992	Prob.F(9,17)	0.8433	1.732556	Prob.F(7,19)	0.1610
Obs*R-squared	5.793126	Prob.Chi-Square (9)	0.7604	10.51960	Prob.Chi-Square (9)	0.1610
Scaled explainedSS	3.907276	Prob.Chi-Square (9)	0.9174	2.438608	Prob.Chi-Square (9)	0.9316

To check the assumption of homoscedasticity among the residuals the ‘Breusch-Pagan-Godfrey’ test was used. The table shows the F-statistic and obs*R-squared having a probability or p-value of more than 0.05, suggesting the failure to reject the null hypothesis and confirming the assumption of homoscedasticity among the residuals of the model in both the periods of study.

Table 7. Correlation analysis of dependent and independent variables

	CEE	HCE	NPA
CEE	1.000000		
HCE	-0.339271	1.000000	
NPA	-0.041044	-0.553964	1.000000

Figure 1. Conceptual model showing the relationship among the variables



Source: Author's compilation

The conceptual diagram stating the constructs measured through variables is partly supported by the results produced by the model of the study. As HCE does not significantly affect the NPA position of the banks, it is insignificant, because the $P \text{ value} > 0.05$. So, the study fails to accept the first alternate hypothesis of the study and fails to reject the second hypothesis.

Correlation analysis depicted a negative relationship of HCE (-0.553964) and CEE (-0.041044) with that of NPA, stating the importance of IC in the domain of banking.

7. CONCLUSION

The prominent function of investment in IC has been enhancing the performance of banks (Kumar, 2016, Singh *et al.*, 2016, Mohapatra, *et al.*, 2019, Nsour, 2021). ICE has been less explored from the NPA perspective, especially in the Indian context and from the structural break point of view. The analysis of the current article makes useful recommendations for formulating policies relating to Indian banking and its ecosystem. Giving due consideration to the confined time period undertaken, the study interprets that the investment in Human Capital (HC) did not show any significant relationship with NPA with both the periods of pre- and during-COVID. It can be practically implied that now is a better time for investment in physical assets or technological aspects than HC in Indian banks. It is also pertinent to mention here that investment in HR should be done to upgrade the skill set so that employees can contribute in a contemporary manner. During the COVID period, neither HCE nor CEE were significant, which further concludes that NPAs during COVID got explained by other variables which may be macro in nature. The model of the study explained that variation in NPA, as explained by ICE, is different in the periods of pre- and during-COVID-19. Change in Asset Quality as explained by independent variables is more in 2016-17 to 2018-19 (Pre-COVID) than 2019-20 to 2021-22 (During-COVID). The long term relationship among the variables of the study shows the way to conclude that investment in intellectual capital will not be in vain, but will contribute towards the formation of an efficient and reliable Indian banking system. The findings of this study align with the studies of Majumder, 2023, Ul, Rehman *et al.*, 2024 and Rong *et al.*, 2025, where HCE is insignificant and states that, during financial crises in an economy, HC is less effective than financial capital (CE) in contributing towards banks' value added (VA). On the other hand, the research work of Rehman *et al.*, 2021, Majumder, 2023 and Marpaung, A., and Muharam, H. 2024 emphasise increasing profits and obtaining better performance through efficient use of physical capital. In his paper, Uslu, H. 2020 strongly emphasised the influential role played by HC for enhancing financial profitability of banks in Türkiye. This paper also focuses on making more investment in physical and financial resources i.e. CE, as a valuable strategic source to guarantee optimal performance returns. Although there are various studies which have investigated the role of ICE on the banking sector of different economies, a lack of theoretical backing remains. The present study highlighted the endogenous growth theory and the findings of the study contradict the endogenous growth theory, because investment in HC proves to be of no use

from the NPA's point of view and, on the other hand, investment in physical capital provides a competitive advantage to the banks in India in the period of a global pandemic like COVID or an economic crisis. However, trusting in the insights given by IC, it is the most valuable strategic resource that positively affects the stability of a company's financial performance (Putri et al., 2024). The present paper concludes that sustainable development of the banking system requires some flexible policies concentrating on the ever-changing economic and financial ecosystem along with effective implementation of such policies.

8. LIMITATIONS AND SCOPE FOR FUTURE RESEARCH

The study has undertaken only one accounting performance indicator i.e. Non-Performing Assets (NPAs), whereas further research can be undertaken considering market- and value-based performance indicators. Interestingly, the study found that, during COVID, the variation in NPA explained by ICE was less than Pre-COVID. So, subsequent research should examine the influence of macroeconomic variables (including GDP growth, inflation, unemployment, and governmental policies) on NPAs, particularly during periods of economic turmoil such as the COVID-19 epidemic. The study failed to include other possible control variables, including managerial practices, regulatory frameworks, and technology improvements that may affect NPAs. These factors may have influenced the observed variations in NPA levels and might hinder the study's capacity to separate the effect of intellectual capital efficiency on bank performance. To isolate the influence of intellectual capital efficiency on NPAs, future studies should add control variables like managerial quality, digital transformation, or technological innovation. Furthermore, incorporating a broader and more varied sample of banks, encompassing multiple locations, sizes, and financial frameworks, would augment the generalisability of the results. This may facilitate the recognition of patterns unique to various categories of banks (e.g., public versus private, large versus small).

Lastly, upcoming research may build upon this study by using market-oriented and value-oriented performance metrics, like Return on Assets (ROA), Return on Equity (ROE) and Market-to-Book Ratio. These measures may offer a comprehensive perspective on the impact of ICE on bank performance.

REFERENCES

1. Asare, N., Laryea, M.M., Onumah, J.M. and Asamoah, M.E., 2020. “Intellectual capital and asset quality in an emerging banking market,” *Asian Journal of Accounting Research*, Vol.6 No.1, doi:10.1108/AJAR-05-2020-0034.
2. Barak, M. and Sharma, R.K., 2023. Investigating the impact of intellectual capital on the sustainable financial performance of private sector banks in India. *Sustainability*, 15(2), p.1451.
3. Bontis, N., 1998. Intellectual capital: an exploratory study that develops measures and models. *Management decision*, 36(2), pp.63-76.
4. Castelo Branco, M., Delgado, C., Sousa, C. and Sá, M., 2011. Intellectual capital disclosure media in Portugal. *Corporate Communications: An International Journal*, 16(1), pp.38-52.
5. Edvinsson, L. and Malone, M.S., 1997. “Intellectual capital: the proven way to establish your company’s real value by finding its hidden brainpower,” *Piatkus*.
6. Ejigu, T., 2020, “Intellectual capital and Organisation performance: A study of Ethiopian Banking Sector”, Ph.D. thesis. Department of Economics, Punjabi University, Patiala.
7. Faruq, M.O., Akter, T. and Rahman, M.M., 2023. Does intellectual capital drive bank’s performance in Bangladesh? Evidence from static and dynamic approach. *Heliyon*, 9(7).
8. Ferreira, J., Coelho, A. and Moutinho, L., 2020. Dynamic capabilities, creativity and innovation capability and their impact on competitive advantage and firm performance: The moderating role of entrepreneurial orientation. *Technovation*, 92, p.102061.
9. Firer, S. and Mitchell Williams, S., 2003. Intellectual capital and traditional measures of corporate performance. *Journal of intellectual capital*, 4(3), pp.348-360.
10. Gaur, D. and Gupta, K., 2023. Intellectual capital and non-performing assets: the role of knowledge assets in improving credit quality of Indian banking sector. *Journal of Indian Business Research*, 15(3), pp.379-402.
11. Chen Goh, P., 2005. Intellectual capital performance of commercial banks in Malaysia. *Journal of intellectual capital*, 6(3), pp.385-396.
12. Gupta, K. and Raman, T.V., 2021. The nexus of intellectual capital and operational efficiency: the case of Indian financial system. *Journal of Business Economics*, 91(3), pp.283-302.
13. Ho, C.K., 2005. Corporate governance and corporate competitiveness: an international analysis. *Corporate Governance: An International Review*, 13(2), pp.211-253.
14. Joshi, M., Cahill, D. and Sidhu, J., 2010. Intellectual capital performance in the banking sector: An assessment of Australian owned banks. *Journal of Human Resource Costing and Accounting*, 14(2), pp.151-170.
15. Jula, N.M., 2015. Software solutions for ARDL models. *Challenges of the Knowledge Society*, p.1001.
16. Barathi Kamath, G., 2007. The intellectual capital performance of the Indian banking sector. *Journal of intellectual capital*, 8(1), pp.96-123.

- (119 - 138) | 135

33. Pulic, A., 2012. Value creation efficiency at national and regional levels: Case study—Croatia and the European Union. In *Intellectual capital for communities* (pp. 197-211). Routledge.
34. Pulic, A., 2008. The principles of intellectual capital efficiency-A brief description. *Croatian Intellectual Capital Centre, Zagreb*, 76, pp.1-24.
35. Quintero-Quintero, W., Blanco-Ariza, A.B. and Garzón-Castrillón, M.A., 2021. Intellectual capital: A review and bibliometric analysis. *Publications*, 9(4), p.46.
36. Rehman, W.U., Sheikh, L. and Jalil, F., 2021. Revisiting the nexus between intellectual capital and performance of BRICS financial sector. *Pakistan Social Sciences Review*, 5(1), pp.516-534.
37. Rong, C., Sial, M.S., Álvarez-Otero, S. and Jo, H., 2025. Assessing the Intellectual Capital of Value Creation Process of Commercial Banks in the European Union. *Journal of the Knowledge Economy*, pp.1-30.
38. Sarkar, J. and Sarkar, S., 2018. Bank ownership, board characteristics and performance: Evidence from commercial banks in India. *International Journal of Financial Studies*, 6(1), p.17.
39. Shih, K.H., Chang, C.J. and Lin, B., 2010. Assessing knowledge creation and intellectual capital in banking industry. *Journal of intellectual capital*, 11(1), pp.74-89.
40. Stewart, T.A., 2010. *Intellectual Capital: The new wealth of organization*. Crown Currency.
41. Sveiby, K.E., 1997. The new organizational wealth: managing and measuring knowledge-based assets. *Barrett-Kohler Publishers*.
42. Tiwari, R. and Vidyarthi, H., 2018. Intellectual capital and corporate performance: a case of Indian banks. *Journal of Accounting in Emerging Economies*, 8(1), pp.84-105.
43. Tran, N.P. and Vo, D.H., 2022. Do banks accumulate a higher level of intellectual capital? Evidence from an emerging market. *Journal of Intellectual Capital*, 23(2), pp.439-457.
44. Ul Rehman, W., Saltik, O., Degirmen, S., Ocak, M. and Shabbir, H., 2024. Dynamics of intellectual capital and financial performance in ASEAN banks. *Arab Gulf Journal of Scientific Research*, 42(4), pp.1426-1443.
45. Ulum, I., Ghozali, I. and Purwanto, A., 2014. Intellectual capital performance of Indonesian banking sector: a modified VAIC (M-VAIC) perspective. *Asian Journal of Finance and Accounting*, 6(2), pp.103-123.
46. Uppal, R.K. and Rani, P., 2010. Transformation in Indian Banks Through Corporate Governance-Emerging Challenges and Strategies for a New Gateway. *Prabandhan: Indian Journal of Management*, 3(8), pp.3-11.
47. Uslu, H., 2022. The role of intellectual capital in financial development: evidence from the banking sector of Türkiye. *Competitiveness Review: An International Business Journal*, 32(2), pp.230-249.
48. Weqar, F., Khan, A.M. and Haque, S.M.I., 2020. Exploring the effect of intellectual capital on financial performance: a study of Indian banks. *Measuring Business Excellence*, 24(4), pp.511-529.

49. Yao, H., Haris, M., Tariq, G., Javaid, H.M. and Khan, M.A.S., 2019. Intellectual capital, profitability, and productivity: evidence from Pakistani financial institutions. *Sustainability*, 11(14), p.3842.

APPENDIX (1)

LIST OF BANKS UNDERTAKEN

S.No.	Name of the bank
1.	HDFC
2.	ICICI
3.	SBI
4.	Kotak Mahindra
5.	Axis
6.	Bank of Baroda
7.	IndusInd
8.	Punjab National Bank
9.	Canara
10.	IDBI bank

HOW FAMILY PENSION INVESTMENT SHAPES YOUNG ADULTS' ATTITUDES TOWARD PENSION DISTRIBUTIVE JUSTICE

MARCIN BRYCZ

University of Gdańsk
Faculty of Economics
Gdańsk, Poland
marcin.brycz@staffms.ug.edu.pl

MARK BIERNAT

University of Gdańsk
Faculty of Economics
Gdańsk, Poland

Paper Category: Preliminary scientific paper

ABSTRACT

The aim of the study is to determine how the type of pension investment within a family influences young adults' attitudes toward pension distributive justice. Understanding how family financial behaviours influence young adults' perceptions of pension fairness is essential for evaluating future perspectives on pension systems. Despite increasing concerns about the sustainability of pensions, young adults often demonstrate low financial literacy and limited involvement in retirement planning. This study investigates how different family pension investment types, such as bank savings, investment funds, real estate, and expected inheritance, affect young adults' views on distributive justice within pension systems.

A survey of 297 respondents aged 18–30 from the United States (N = 186) and the United Kingdom (N = 111) was conducted to assess these relationships. Using ANOVA models, the analysis reveals that family pension investment type significantly influences attitudes toward pension fairness. Respondents from families relying on expected inheritance exhibit the highest support for pension fairness, while those with bank savings show the lowest. Additionally, gender differences emerge, with males favouring earnings-based fairness more strongly than females.

These findings highlight the role of financial socialisation in shaping intergenerational attitudes toward pension justice. The study underscores the need for targeted financial literacy programmes addressing pension awareness among young adults. Policy implications suggest that pension reforms should consider generational fairness concerns to enhance long-term public trust in retirement systems.

Keywords: justice, pension, Theory of Value

1. INTRODUCTION

Pension systems worldwide are undergoing significant changes due to demographic shifts, economic pressures, and evolving labour market structures. As life expectancy rises and birth rates decline, ensuring the sustainability and fairness of pension systems has become a key policy challenge (Barr, 2013). While much of the research on pensions focuses on macroeconomic and institutional factors, less attention has been given to how individual perceptions of pension distributive justice are shaped, particularly among young adults. Understanding these perceptions is critical, as younger generations will ultimately bear the long-term consequences of current pension policies. However, many young adults exhibit low pension literacy and limited engagement in retirement planning (Lusardi & Mitchell, 2014), raising concerns about their preparedness for future financial security.

A growing body of research highlights the role of intergenerational financial socialisation in shaping economic attitudes (Bowen, 2002; Blinder, 1973). Family financial behaviours—particularly parental investment strategies and savings habits—significantly influence young adults' views on wealth distribution and fairness (Alesina & La Ferrara, 2001). While previous studies have explored how early exposure to inequality affects redistributive preferences, little attention has been given to how different family pension investment strategies influence young adults' perceptions of pension fairness.

This study examines whether the type of pension investment within a family, such as bank savings, investment funds, real estate, or expected inheritance, affects young adults' attitudes toward pension distributive justice. Additionally, it explores whether gender differences influence these attitudes, given previous findings that women often face disadvantages in many pension systems (Ginn & Arber, 2001). Finally, the study investigates whether perceptions of working year sufficiency impact beliefs about pension fairness. By analysing these factors, this research aims to contribute to a deeper understanding of how family financial behaviour shapes intergenerational perceptions of pension justice and inform policy discussions on pension education and financial literacy programmes.

2. LITERATURE REVIEW

Distributive justice is a complex concept involving three key actors: the allocator, who assigns fair rewards to the rewardee; the observer, whose assessments shape perceptions of justice; and the rewardee, who receives

the allocations. An individual may assume one, two, or all three of these roles simultaneously. The allocator determines what constitutes a just outcome, while the observer compares the actual reward to the expected fair reward, leading to an evaluation of justice (Jasso et al., 2016). Within pension systems, distributive justice is particularly relevant, as these systems rely on principles of fairness in balancing contributions and benefits.

Pension systems inherently rely on intergenerational financial distribution, as there is no universally stable method to preserve financial value over extended periods. The challenge of securing adequate resources for old age is further compounded by shifting demographic structures, including rising life expectancy and changing workforce compositions (Barr & Diamond, 2006). Given these dynamics, pension systems are intrinsically redistributive, balancing individual contributions with broader societal needs. Chybalski (2016) identifies multiple dimensions of pension systems, including distributional fairness, measured through indicators such as pension expenditure relative to GDP and the old-age dependency ratio, as well as adequacy, assessed using replacement rates and sustainability metrics. Public perceptions of pension fairness play a crucial role in shaping attitudes toward pension reforms, particularly during periods of economic uncertainty. When pension systems undergo structural changes, public reactions are influenced not only by economic self-interest but also by subjective perceptions of fairness (Heijkant et al., 2024).

Despite their future dependence on pension systems, young adults (18–30 years old) exhibit a significant knowledge gap regarding pensions, commonly referred to as pension illiteracy. Mata (2021) found that financially knowledgeable young individuals are less likely to adopt passive retirement strategies, emphasising the role of education in shaping pension attitudes. Similarly, Dundre and Sloka (2021) assessed private pension investment behaviours among young people and concluded that financial literacy, gender, and age significantly influence pension investment decisions. However, despite these factors, only a small proportion of young adults actively save for retirement, raising concerns about their preparedness for long-term financial security.

The level of trust in public pension institutions also plays a critical role in shaping retirement behaviours. Xie et al. (2023) found that higher trust in public institutions does not necessarily increase pension investments among young people, whereas lower trust correlates with a greater likelihood of private retirement savings. These findings suggest that young adults may develop their views on pension fairness primarily through observed financial behaviours within their family environments. Hastings and Mitchell (2020)

further emphasised that income level significantly affects pension attitudes, noting that individuals in higher wage quartiles are more likely to engage in voluntary savings, with financial literacy serving as a key determinant of total savings accumulation. Additionally, perceptions of pension justice are strongly influenced by pension reforms that extend the retirement age, as individuals often adjust their attitudes toward fairness in response to such policy changes (Riekhoff, 2021).

The liquidity and maturity of pension investments provide further insights into individuals' financial strategies and overall wealth management. Those who rely primarily on bank savings for retirement tend to be more risk-averse, less financially literate, and have lower income levels than those who invest in financial markets (Bateman, 2010). In contrast, real estate investments for retirement are typically chosen with long-term wealth preservation in mind, spanning multiple economic cycles and providing inflation protection and capital security (Drew, 2015). Some individuals also rely on expected inheritance as a future financial resource, prioritising family wealth transmission over active personal savings. However, as birth rates decline and family sizes shrink, inheritance is becoming an increasingly predictable form of future financial security. The role of inherited wealth in shaping economic attitudes is complex, as individuals may form their pension expectations based on the anticipated transfer of assets rather than engaging in active savings behaviour. Early studies by Blinder (1973) examined the unequal distribution of inherited wealth, while more recent analyses highlight its growing importance due to economic expansion and reductions in wealth taxation (Piketty and Zucman, 2015). However, inheritance remains a socially ambivalent resource, often leading to psychological effects on self-perception, as individuals who inherit wealth may experience lower self-respect due to a lack of personal financial achievement (Schoenberg, 2006).

Despite these well-documented financial and psychological influences, limited research explores how family pension investment behaviours shape young adults' perceptions of pension fairness. While studies have examined general financial socialisation and intergenerational wealth transmission, there remains a gap in understanding how different forms of pension investment—such as bank savings, investment funds, real estate, or inheritance—systematically influence pension justice perceptions among young adults. Additionally, although gender disparities in pension security are widely recognised, fewer studies investigate how financial socialisation differs between men and women in shaping their views on pension fairness. Finally, while research has explored public opinion on increasing the

retirement age, there is limited focus on how young adults' perceptions of the sufficiency of working years influence their attitudes toward pension fairness.

This study addresses these gaps by analysing the relationship between family pension investment type and young adults' distributive justice perceptions. Specifically, it examines whether exposure to different pension investment strategies influences merit-based versus needs-based perceptions of fairness. Additionally, given that some young adults hold liberal economic views, the study considers whether support for extending the retirement age moderates pension fairness attitudes. Finally, gender differences are analysed to determine whether financial socialisation influences men and women differently in their evaluations of pension justice.

By exploring these factors, this research contributes to a broader understanding of financial socialisation, intergenerational economic attitudes, and public trust in pension systems. The findings have important implications for pension literacy programmes, financial education initiatives, and long-term pension reform strategies, particularly as younger generations will ultimately shape the future trajectory of pension policy and public discussion.

3. PROCEDURE, METHODS, AND PARTICIPANTS

This study aims to determine how young adults perceive pension distributive justice, specifically whether pension benefits should be tied to earnings from at least the last ten years before retirement. The analysis focuses on how the type of pension investment within a family influences young adults' perceptions of pension fairness. The underlying assumption is that family financial behaviour, particularly pension investment decisions, significantly shapes young people's attitudes toward pension justice.

Additionally, the study examines whether support for extending or reducing the pensionable working period influences attitudes toward pension fairness, treating this variable as a random factor. Given previous research highlighting gender disparities in pension systems, this study also investigates the role of gender in shaping perceptions of pension fairness. Based on these objectives, the following hypotheses were formulated:

1. The type of pension investment within a family influences young adults' perceptions of pension distributive justice.
2. Individuals who perceive the retirement age as too high will exhibit lower pension justice scores than those who believe the retirement age is too low.

3. Gender differences exist in perceptions of pension distributive justice, with women expected to perceive pension systems as less just compared to men.

To test these hypotheses, a 34-item questionnaire was administered in English-speaking countries (the United States and the United Kingdom) using the CircleSurvey and CircleSwap platforms. To incentivise participation, \$1 was donated to Nova Ukraina for each completed survey, which helped attract a socially engaged sample. Respondents were informed that their participation was voluntary and anonymous, and they had the option to withdraw at any time.

Out of the 34 survey items, five key questions were selected for inclusion in the ANOVA model:

1. Dependent Variable – Pension justice was measured as the mean score of three items, each rated on a Likert scale from 1 (unjust) to 5 (just):
 - a. Considering a retirement benefits system (pension or social security) where a lifetime of low contributions (based on lower earnings) results in a lower defined benefit at retirement, how would you evaluate the fairness of this arrangement?
 - b. How would you evaluate the fairness of a retirement benefits system (pension or social security) where benefits are determined based on earnings accrued over the last 10 years, with a minimum requisite duration for social security tax contributions?
 - c. Retirement benefits (pension or social security) are calculated based on lifetime earnings. In your opinion, is this system fair or unfair?

These three questions were distinguished through Principal Component Analysis (PCA) and assessed for internal consistency using Cronbach's alpha ($\alpha = 0.71$).

2. Fixed Factor – 'Pension Investment Type in the Family' – Respondents could select at least one of the following options: 'Bank Savings,' 'Funds,' 'Real Estate,' 'Expected Inheritance,' or provide their own response. If multiple investment types were selected, the response was coded according to the least liquid asset. For example, a selection of 'Real Estate' and 'Expected Inheritance' was coded as 'Expected Inheritance' to reflect its lower liquidity.
3. Random Factor – Working Period Definition. This variable reflected whether respondents held a »liberal« or »adequatist« stance on the pension system. It was measured using the following item: Do you think the current length of required working years to receive

retirement benefits (pension or social security) is well-defined? Responses were recorded on a Likert scale from 1 (too low) to 5 (too high) and then recoded into two categories: »Too Low« (responses 1–2) or »Too High« (responses 4–5).

A total of 373 participants initially completed the survey. However, after removing outliers and excluding respondents outside the target age range (18–30 years old), the final sample size was $N = 297$. Sample Characteristics: The final sample had a mean age of 22 years ($SD \leq 2.32$), with gender distribution as follows: 189 female respondents and 108 male respondents.

A detailed breakdown of the sample composition is provided in Table 1.

Table 1. Descriptive statistics of the sample

	Female			Male		
	Count	Age		Count	Age	
		mean	std. dev.		Mean	std. dev.
USA	117	21.1	1.99	69	22.1	2.23
UK	72	23.0	2.32	39	22.9	2.14

4. MODEL ESTIMATION

To assess our hypotheses, we estimated two ANOVA models with Pension Distributive Justice as the dependent variable and the grouping variable as follows:

1. Type of Pension Investment in the Family (Bank Savings vs. Funds vs. Real Estate vs. Enhanced Assets with Inheritance) and a random factor—attitude toward the length of work years required to receive a pension (too low vs. too high). Therefore, the model consists of eight groups (4×2).
2. Gender (Female vs. Male) and a random factor—attitude toward the length of work years required to receive a pension (too low vs. too high). Therefore, the model consists of four groups (2×2)¹.

¹ Dummy created, similar to in Allesina and Ferrera (2001), Tab. 3

² The decision to estimate separate models rather than a single model was due to an insufficient number of observations for the 16-group model. Although all main effects were significant at the 0.05 level, the observed power was substantially lower than 0.8.

Table 2. Distributive Pension Justice by Family Pension Investment Type and Pensionable Working Period Definition.

			Count	Mean	Standard Deviation
Model 1	Pension Investment in the Family	Bank Savings	69	2.82	.83
		Funds	82	2.96	.82
		Real Estate	78	3.15	.93
		Expected Inheritance	68	3.24	.82
	Working period definition	Too low	48	2.83	.88
		Too high	249	3.08	.85
Model 2	Gender	Male	110	3.21	.88
		Female	197	2.91	.86
	Working period definition	Too low	50	2.77	.91
		Too high	257	3.02	.86

According to the Pension investment in the Family, individuals from households with more illiquid investments exhibit a stronger pension justice attitude. Those who perceive the pensionable age as too low demonstrate lower support for distributive justice (Model 1). In Model 2, where gender is the grouping variable and working period definition for retirement age is considered, females score lower on the pension justice scale.

4.1. PENSION INVESTMENT IN THE FAMILY MODEL

First, Levene's Test of Equality of Error Variances was conducted. The results, $F(7,289) = 0.731$, $p = 0.646$, indicate that the error variance of the dependent variable is equal across groups. Additionally, the Breusch-Pagan Test for Heteroskedasticity suggests that the variance of the errors does not depend on the value of the independent variable, $\chi^2(1) = 0.065$, $p = 0.799$. Having confirmed that the key assumptions are met, we proceeded with the ANOVA estimation.

The main effect of Pension Investment Type in the Family is statistically significant, $F(3, 2.703) = 3.759$, $p = 0.011$, $\eta^2 = 0.037$, observed power = 0.809. The main effect of pensionable working period definition is also significant, though the observed power is relatively low, $F(1, 3.027) = 4.208$, $p = 0.041$, $\eta^2 = 0.014$, observed power = 0.534. Figure 1 presents the marginal means for Distributive Pension Justice. Regardless of attitude toward the pensionable age, individuals from families with more illiquid pension investments exhibit

a stronger attitude toward distributive pension justice. To further confirm these findings, we conducted a series of post hoc tests, including Bonferroni and LSD.

Figure 1. Estimated Marginal Means of Distributional Pension Justice

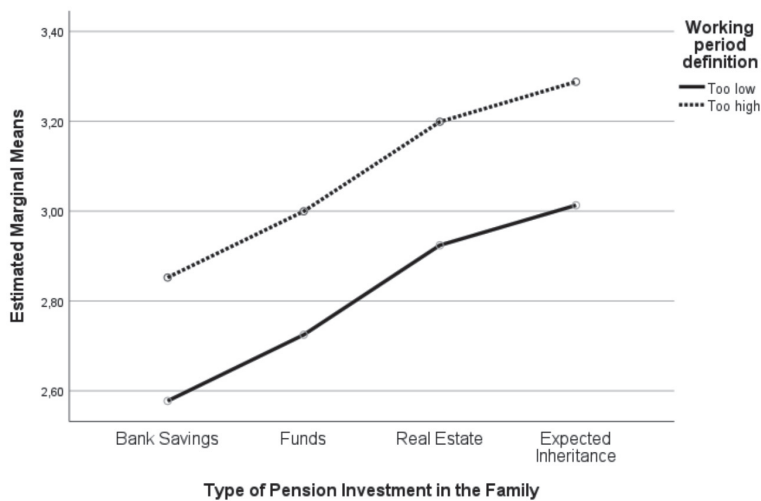


Table 3 presents the results of post hoc tests, indicating that the most significant difference in pension distributive justice occurs between Bank Savings and Enhanced Assets with Expected Inheritance, as confirmed by both LSD and Bonferroni tests. The less conservative LSD test also identified significant differences between: (1) Funds and Expected Inheritance and (2) Bank Savings and Real Estate.

Table 3. Post hoc tests for Investment type in the Family.

Type of Pension Investment in the Family		Mean Difference (I-J)	Std. Error	Sig. LSD	Sig. Bonferroni
(I)	(J)				
Bank Savings	Funds	-0.1429	0.1385	0.303	1.000
Bank Savings	Real Estate	-0.3331	0.1401	0.018*	0.109
Bank Savings	Expected Inheritance	-0.4189	0.1449	0.004*	0.025*
Funds	Real Estate	-0.1902	0.1341	0.157	0.943
Funds	Expected Inheritance	-0.2759	0.1391	0.048*	0.289
Real Estate	Expected Inheritance	-0.0857	0.1407	0.543	1.000

*denotes significance at level >0.05

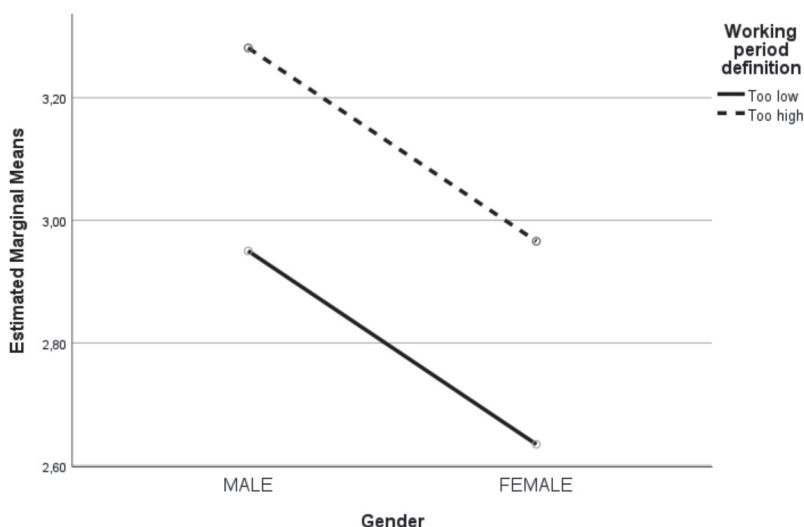
The data presented in Table 3 and Figure 1 indicate that the random factor—attitude toward changes in the pensionable working age—differentiates perceptions of pension distributive justice. Individuals who support extending the required working period to obtain a pension tend to exhibit lower pension distributive justice scores. This attitude is commonly associated with liberal economic views.

4.2. MODEL WITH GENDER

The model examining the fixed factor of gender and the random factor of working period definition consisted of four groups. Levene's test, $F(3, 303) = 0.347$, $p = 0.792$, indicated that the null hypothesis—stating that the error variance of the dependent variable is equal across groups—was not rejected. Similarly, the Breusch-Pagan test, $\chi^2(1) = 0.048$, $p = 0.827$, confirmed that the variance of the errors does not depend on the values of the independent variable. Having verified the main assumptions, we proceeded with interpreting the model results.

The main effect of gender was statistically significant, $F(1, 6.989) = 9.521$, $p = 0.02$, $\eta^2 = 0.03$, with an observed power of 0.868. The main effect of working period definition was also significant, $F(1, 4.571) = 6.227$, $p = 0.013$, with an observed power of 0.701. Both effects reached statistical significance, with high power for gender and moderate power for working period definition.

Figure 2. Estimated Marginal Means of Distributional Pension Justice



The model presented in Figure 2 (Model 2) shows no interaction between the fixed and random factors. On average, females exhibit lower support for distributive pension justice than males. Similarly, as observed in Model 1, individuals who perceive the pensionable age as too low also show lower support for distributive pension justice.

5. CONCLUSION

This study focused on the determinants of pension distributive justice, with particular emphasis on the type of pension investment within the family. Additionally, the influence of gender differences was examined, along with perceptions of the pensionable age as a potential confounding factor. The analysis considered whether respondents viewed the pensionable age as too low or too high and how this perception influenced attitudes toward pension fairness.

The findings indicate that the less liquid and longer-term a family's pension investment, the stronger the respondents' support for pension distributive justice. In other words, individuals from households that invest in real estate or expected inheritance are more likely to believe that pensions should be closely tied to lifetime earnings. The results from the Least Significant Difference (LSD) test reveal a significant difference in pension distributive justice between families that invest in bank savings versus real

estate. A more conservative Bonferroni test further confirms that the only statistically significant difference occurs between bank savings and expected inheritance.

Additionally, gender plays a significant role in perceptions of pension distributive justice. Regardless of respondents' views on raising or maintaining the pensionable age, females consistently reported lower pension distributive justice scores than males. The main effect of gender was statistically significant, indicating that gender differences systematically influence perceptions of pension fairness.

6. DISCUSSION

The results confirm that both gender and the type of pension investment within a family have a significant impact on young adults' perceptions of pension distributive justice. When contextualised within the literature review, these findings align with established theories on financial socialisation and pension fairness perceptions.

First, individuals who believe that the current retirement age is too low exhibit lower support for pension distributive justice. Specifically, they are less inclined to agree that pension benefits should be determined based on at least ten years of pre-retirement earnings. This suggests that those dissatisfied with the current retirement age tend to hold more liberal views on pension structuring.

The most significant differences in pension justice perceptions emerged between respondents from families that rely on expected inheritance versus those that invest in bank savings. Individuals from families with higher expected inheritance perceive greater pension fairness, which may be explained by their higher wealth levels and a weaker connection between pension benefits and personal earnings. Additionally, LSD tests indicate significant differences between respondents from households investing in funds versus those relying on inheritance, as well as between those with bank savings versus real estate investments.

Both real estate and expected inheritance represent long-term assets that maintain value across multiple economic cycles. The higher perception of pension fairness among these groups may stem from the fact that such assets provide more reliable and predictable financial security compared to the public pension system. Moreover, real estate and wealth accumulation through inheritance tend to hold greater overall value than bank savings or funds, potentially shaping attitudes toward pension fairness.

A significant gender difference was also observed in pension justice perceptions, with women reporting lower levels of perceived pension distributive justice compared to men. This finding aligns with previous research emphasising that women face greater disadvantages in pension systems, particularly in Notional Defined Contribution (NDC) or Defined Contribution (DC) models. Several factors contribute to this pension gender gap, including career interruptions due to childbearing, lower salaries for equivalent jobs compared to men, and reduced long-term earnings accumulation. These structural disparities result in women receiving lower pension benefits, reinforcing perceptions of pension system injustice.

BIBLIOGRAPHY

1. Alesina, A. and La Ferrara, E., 2001. Preferences for Redistribution in the Land of Opportunities. NBER wp 8267 [online]. Available at: https://www.nber.org/system/files/working_papers/w8267/w8267.pdf
2. Barr, N., and Diamond, P., 2006. The economics of pensions. *Oxford Review of Economic Policy*, 22 (1). pp. 15-39 DOI: 10.1093/oxrep/grj002
3. Bateman, H., Louviere, J., Thorp, S., Islam, T., & Satchell, S. (2010). Investment decisions for retirement savings. *Journal of Consumer Affairs*, 44(3), 463-482.
4. Blinder, A. S. (1973). A model of inherited wealth. *The Quarterly Journal of Economics*, 87(4), 608-626.
5. Chybalski, F. The Multidimensional Efficiency of Pension System: Definition and Measurement in Cross-Country Studies. *Soc Indic Res* 128, 15–34 (2016). <https://doi.org/10.1007/s11205-015-1017-3>
6. Drew, M. E., Walk, A. N., & West, J. (2015). Conditional allocations to real estate: An antidote to sequencing risk in defined contribution retirement plans. *Journal of Portfolio Management*, 41(6), 82.
7. Dundure, E., & Sloka, B. 2021. Financial literacy self-evaluation of young people in Latvia. *European Integration Studies*, (15), 160-169.
8. García Mata, O. 2021. The effect of financial literacy and gender on retirement planning among young adults. *International Journal of Bank Marketing*, 39(7), 1068-1090.
9. Hastings, J., & Mitchell, O. S. (2020). How financial literacy and impatience shape retirement wealth and investment behaviors. *Journal of Pension Economics & Finance*, 19(1), 1-20.
10. Heijkant, L., Selm, M., Hellsten, I., Vliegenthart, R., 2024. Justice Matters. News Framing Effects on Opinions about Pension Reform, Work, Aging and Retirement, Volume 10, Issue 3, July 2024, Pages 285–299, <https://doi.org/10.1093/workar/waad011>
11. Jasso, G., Törnblom, K. Y., & Sabbagh, C., 2016. Distributive justice. *Handbook of social justice theory and research*, 201-218.
12. Riekhoff, A. J. (2021). Pension reforms, the generational welfare contract and preferences for pro-old welfare policies in Europe. *Social Policy & Administration*, 55(3), 501-518.
13. Schoenberg, E. J. (2006). When too much is not enough: Inherited wealth and the psychological meaning of money. Unpublished manuscript, Department of Psychology, Columbia University, New York, NY.
14. Thomas Piketty, Gabriel Zucman, Chapter 15 - Wealth and Inheritance in the Long Run, Editor(s): Anthony B. Atkinson, François Bourguignon, *Handbook of Income Distribution*, Elsevier, Volume 2, 2015, Pages 1303-1368, <https://doi.org/10.1016/B978-0-444-59429-7.00016-9>.
15. Xie, X., Osńska, M., & Szczepaniak, M. (2023). Do young generations save for retirement? Ensuring financial security of Gen Z and Gen Y. *Journal of Policy Modeling*, 45(3), 644-668.

16. Foster, L. (2017). Young People and Attitudes towards Pension Planning. *Social Policy and Society*, 16(1), 65–80. doi:10.1017/S1474746415000627
17. Schokkaert, E., & Van Parijs, P. (2003). Debate on social justice and pension reform: social justice and the reform of Europe's pension systems. *Journal of European Social Policy*, 13(3), 245-263.

TRANSFORMING COMPANY CASH FLOW MANAGEMENT THROUGH BLOCKCHAIN TECHNOLOGY

NINA HÄCK

Doctorate Paneuropean Studies - International Joint Cross-Border PhD
Programme in International Economic Relations and Management
Eisenstadt, Austria
nina.haack@outlook.at

BOJANA VUKOVLJAK

Doctorate Paneuropean Studies - International Joint Cross-Border PhD
Programme in International Economic Relations and Management
Eisenstadt, Austria
b.stojmenovic@outlook.com

Paper category: Preliminary scientific paper

ABSTRACT

The presence of sufficient liquidity is a critical determinant for the enduring viability of a company. The pandemic has already demonstrated the criticality of efficient liquidity management for a company's existence, particularly during periods of crisis. Consequently, several firms have been forced to reconsider their conventional processes and existing methods, while actively seeking innovative alternatives for the future. Furthermore, this has resulted in the acceleration of digitalisation within the business sector, and, among the recent advancements, blockchain technology has attracted significant interest. As a technical solution which enables data management in a distributed infrastructure without a central authority in a traceable and compliant consensus, blockchain provides greater transparency for economic operators, especially potential investors. Furthermore, it facilitates more streamlined payment settlement, which is crucial for maintaining liquidity. The European Union actively encourages and supports the digital integration of innovative practices within businesses. Thus, cash flow management is expected to become simpler. The purpose of this article is to analyse the potential application of blockchain technology in the corporate sector to increase the efficiency and sustainability of liquidity management. Research published in financial journals provides the foundation of this paper and shows that many companies have already recognised the relevance of innovative liquidity management for the future. Besides the systematic literature review, a quantitative content analysis is employed. Furthermore, a case study was undertaken and meticulously evaluated. The investigation indicates the existence of a few start-ups and new companies that actively support entrepreneurs in innovative liquidity management and the reorganisation of processes. Awareness of the future relevance of modern cash flow management is evident. Nevertheless, companies do not have complete confidence in the new technologies and there are uncertainties regarding privacy and security of data. Thus, this research can highlight the proven benefits and drawbacks associated with innovative cash flow management.

Keywords: Liquidity, Cash management, Blockchain, innovation, privacy, security of data

1. INTRODUCTION

Small and medium sized enterprises (SMEs) are the cornerstone of the Austrian economy (Bundesministerium für Arbeit und Wirtschaft, 2023). Representing 99.8% of all domestic companies, SMEs constitute a central component of the market-orientated economy. In particular, these are characterised by their strong performance, flexibility and especially their ability to innovate. However, SMEs' business operations face numerous challenges (Bundesministerium für Arbeit und Wirtschaft, 2023). Besides key challenges relating to the shortage of qualified professionals, the rapidly progressing digitalisation and the constant emergence of new legal and regulatory requirements, SMEs require effective management of their operating cash flow. Crisis-related increases in commodity and energy prices coupled with limited access to capital highlight the importance of a constantly positive cash flow.

Successful organisations possess sufficient liquidity during their fiscal year to complete all payment obligations on time. Thus, a clear and transparent knowledge of the company's cash flow is required and crucial for a company's existence (Marsh, 2014). Furthermore, liquidity and financial planning are crucial components of effective business management and serve as vital assets for a company. Research in this field has shown that, since the onset of the coronavirus pandemic, this subject has emerged as a fundamental concern for the majority of corporations. At that time (09.2020), half of the companies surveyed reported that they utilised Excel spreadsheets for financial planning. Another 30% of respondents allocated 10-20 hours per month to manual processes in this domain. Moreover, the crisis induced occurrences, such as reduced working hours or decreasing demand and sales, prompted a reconsideration of procedures (Breinich-Schilly, 2021). Additionally, the European Commission's annual DESI (Digital Economy and Society Index) report indicates advancements in the digital domain. In the most recent results (DESI 2022), Austria is ranked 10th out of the 27 member states. Austria has a score that exceeds the EU average, notably in the area of digital density among SMEs (Europäische

Kommission, 2022). Nevertheless, there is potential for development in this area (Ernst & Young, 2022). Therefore, digital solutions for financial planning should be a particular focus of these new approaches (Breinich-Schilly, 2021).

Moreover, the small and medium-sized enterprise sector is particularly susceptible to numerous opportunities and prospects that digitalisation presents, ranging from the introduction of new products and services to

the simplification of daily operations and the modification of processes (Bundesministerium für Arbeit und Wirtschaft, n.d.). In terms of a company's future competitiveness, innovation is considered one of the relevant factors. A key aspect of this is that it is imperative for small and medium-sized enterprises (SMEs) to promptly become acquainted with pertinent advancements in order to capitalise on them (Bundesministerium Digitalisierung und Wirtschaftsstandort, n.d.).

The cash flow statement provides the management board with the appropriate information to derive the required decisions to secure future liquidity. Consequently, it is a priority to ensure the integrity and accuracy of the cash flow statement (Többens, 2023). This is exactly the subject addressed in this article. Recently published research of auditing experts indicates that the main challenge facing companies is to compile accurate historical data which can be applied to generate a cash flow forecast. Combined with the constantly growing relevance of digitalisation of business processes, numerous corporations are rethinking conventional methods in cash flow management and looking for innovative alternatives as a result. Specifically, blockchain technology is of high interest for economic experts (Hani & Michaelis, 2019).

In this regard, blockchain technology stands out as a potentially game-changing innovation for SMEs. The foundational technology behind cryptocurrencies, formerly obscure, is now recognised as a promising technology with potential applications across several sectors of the economy, including the small and medium-sized enterprise (SME) area (Aumüller et al., 2022; Purwaningsih et al., 2023). Furthermore, apart from the many benefits such as transparency, security, fraud prevention, trade facilitation and a few others (Ji & Tia, 2022; Wilkie & Smith, 2021), it may also provide significant assistance to enterprises, namely in the realm of cash management (Herskind et al., 2020). This technology has the potential to positively influence the field and provide companies with a competitive advantage. Therefore, smart contracts should not be overlooked as these might be important in this case. The notable aspect here relates to the discussion of autonomous contracts, which may significantly impact the efficiency of processing and payments (Martino, 2021; Purwaningsih et al., 2023). Moreover, blockchain technology may have a beneficial impact on other aspects such as ensuring future liquidity, enhancing data accuracy and integrity, providing error-free and real-time visibility into financial flows, and strengthening partnerships with suppliers (Aumüller et al., 2022; Breinich-Schilly, 2021; Javaid et al., 2022). Lastly, it is noteworthy that this technology allows small and medium-sized enterprises (SMEs) to establish

their own business network within the corporate environment, where cash flow management is also a crucial element (IBM, n.d.-c; Märkel et al., 2021).

Thus, the current state of information leads to the basic hypothesis of this study, which is: “Blockchain technology can simplify the data preparation for cash flow forecast”. Furthermore, through transparent and more streamlined payment settlements, positive effects on the operating cash flow of companies are expected. The primary research question with “Is there an increased interest in cash flow management through blockchain technology in the economy?” will be addressed. The advantages of blockchain in connection with a digital cash flow management chain are analysed.

The paper is divided into three major sections. The first part focuses on a literature review and the basic description of cash flow management and blockchain technology itself. Subsequently, the methodology of the applied quantitative research is explained. The third part contains a comprehensive case study to support the insights gained.

2. LITERATURE REVIEW

2.1. TRADITIONAL CASH FLOW MANAGEMENT

Cash flow is the lifeblood of any business (Bittleston, 2018). This a statement which weighs very heavily, but emphasises the high importance of this topic for any economic entity. A healthy cash flow demonstrates that money is coming in from revenue, investments, or loans to complete all payment obligations on time. Bad management and lack of knowledge in cash flow management entails the risk of bankruptcy, even if the business is profitable (Bittleston, 2018). Even for internal financing and external funding from banks or investors, a clear understanding of liquidity is vital (Li-Kai & Wang, 2024). Managing the cash flow well could be the difference between the success and failure of a company (Harte, 2014).

Financial experts define cash flow as net variation in cash and equivalents. Business operations differentiate three types of cash flow, the operating cash flow, the investment cash flow, and the finance cash flow (Lissner, 2023). The cash flow from investment activities aggregates the incoming and outgoing money in connection with investments. In contrast, the cash flow from finance activities contains the money received and paid in connection with capital increases. However, this paper is focused on the operating cash flow of a company. Operating cash flow is short- and medium-term and represents the cash flows associated with a company’s main business. Specifically, cash inflows represent the income that the company generates from selling its

products or services. Cash outflows are expenses incurred from operating activities, e.g. personnel or material costs (Asokan, 2023).

The foundation of successful liquidity management is the cash flow forecast (Alarcon & Kugel, 2023). The cash flow statement provides the management board with the appropriate information to derive the requisite decisions to secure the future liquidity of the company (Marsh, 2014). The ability to determine at any time whether the company is liquid enough to withstand crisis scenarios is essential. Thus, interdependencies and possible upcoming risks should be recognisable immediately (Többens, 2023). The pandemic has already demonstrated the criticality of efficient liquidity management for a company's existence. Despite this, an accurate and transparent database that includes all operating revenues and expenditures of a company is a key prerequisite for preparing a solid cash flow forecast. Usually, in small and medium-sized companies, the controlling department provides the database for the operating cash flow. Often data records from various sources are combined (Asokan, 2023). This leads to the assumption that the current abilities and possibilities in providing accurate and integrated data for SMEs in Austria are limited.

Frequently, SMEs exert significant pressure on their available cash resources. Often a solid liquidity cash flow forecast is introduced into the business process after the company has already encountered payment challenges. Anticipated incoming sales tend to be overestimated or estimated prematurely. The process of harmonising payment terms among incoming and outgoing invoices appears new to the controlling department of various SMEs (Controller Institut, 2020). Approximately 300,000 enterprises, which is nearly half of all Austrian SMEs, solely use the Excel spreadsheet programme by Microsoft for the purposes of accounting and financial planning. There are numerous factors contributing to this phenomenon. Integrated Enterprise Resource Planning (ERP) software is either cost-prohibitive or limited through a scarcity of specialised expertise and staff to manage it (Bundesministerium für Arbeit und Wirtschaft, 2023). By applying the Excel tool, it can be simple and easy for the data to turn unmanageable. Accidentally replacing a formula, inputting a transposed value, or making an inaccurate reference might undermine the validity of the entire planning process.

In brief, traditional cash flow management is presently a manual process that relies on human involvement. However, especially in times of crisis, incorrect data leads to internal issues within an economic entity but also results in legal ramifications for the company's management. According to Section 25 of the Austrian Limited Liability Companies Act (GmbHG) and

Section 84 of the Austrian Stock Corporation Act (AktG), the managing directors and the Management Board of SMEs are required to act with the same level of care and prudence as a responsible businessperson when operating the company. The duty of care encompasses the need to carefully consider and plan for financial stability. Section 28a of the GmbHG and Section 81 of the AktG require the managing directors or the Management Board to provide the Supervisory Board with a forecast of the company's future financial situation, as well as promptly report any circumstances that significantly affect the company's liquidity. These standards are not possible without proper planning tools (Controller Institut, 2020). Consequently, several firms have been forced to reconsider their conventional processes and existing methods, while actively seeking innovative alternatives for the future. Digitalisation and associated developments have a significant impact on a company's cash flow management (Alter, 2015). The pandemic caused increased awareness of these responsibilities. Organisations, in addition to national and international regulatory agencies, continue to investigate innovations and their potential to enhance internal operations. The European Union actively encourages and supports the digital integration of innovative practices within businesses (Ehlers, 2023). Especially, blockchain technology has attracted significant interest.

2.2. COMPONENTS OF BLOCKCHAIN TECHNOLOGY

The awareness of blockchain technology significantly increased with the emergence of the cryptocurrency Bitcoin in 2008 (Aumüller et al., 2022; Cong & He, 2018; Zheng et al., 2017). It became evident very rapidly that this technological advancement was applicable to a much broader range of applications than merely transactional cryptocurrency. Therefore, the blockchain sector has undergone a variety of developments, and it has become evident that the primary objective was not only to facilitate currency transfers but also to facilitate transactions of various types (Cong & He, 2018; EY - Österreich, 2020). Consequently, it was promptly recognised that this technology is perceived by many as a significant advancement in economic development, particularly in the light of the advantages that this renewal can provide, including automation, simplification, increased integrity, reliability, and numerous other potential outcomes for a company's operations. All of this is achievable via a distributed design that eliminates the need for middlemen in business operations (Deloitte Deutschland, n.d.).

Primarily, blockchain technology can be conceptualised as a distributed ledger, or also known as a peer-to-peer system, in which all events that

transpire within the network are documented. What sets it apart is that this ledger is accessible to all users and the data stored on it is immutable (IBM, n.d.-a; Wilkie & Smith, 2021). This shared network facilitates interaction among network participants in the absence of an underlying authority - a decentralised network. It is feasible to envision that this decentralised network is overseen by computers, which are frequently referred to as “nodes,” and are accountable for accuracy and security (Bitpanda, n.d.; Martino, 2021; Meinel & Gayvoronskaya, 2020).

Instead of only transferring information, as was previously the case while utilising the Internet, values may now be provided (Meinel & Gayvoronskaya, 2020; Sedlmeir et al., 2020; Tapscott & Tapscott, 2016). This implies that each modification is traceable and that all network participants share a common understanding of the real situation. This enhances the foundation of trust, as no data can be altered or manipulated (EY Reporting, 2016; Märkel et al., 2021; Tapscott & Tapscott, 2018). Within this blockchain system, these transactions are represented as blocks, which subsequently establish a chain. Each block is not an island; it is always preceded and followed by other blocks (Bossauer et al., 2020; Märkel et al., 2021). Data is gathered inside this block, including both tangible and intangible information as needed (Martino, 2021). Moreover, the data stored in these values serve also the purpose of linking the blocks together and ensuring their validity. Changes that are required, such as those that are necessary for fixing errors, are recorded in accordance with another transaction. This implies that both data records are visible and traceable (IBM, n.d.-b; Thi Do et al., 2019).

Moreover, every block is distinguished by a hash. This is a kind of cryptographic encryption used to secure a block of data. This hash is a combination of alphanumeric characters with a fixed length, which undergoes encryption. This implies that the transaction information is always accompanied by a hash value in each block. These values serve also the purpose of linking the blocks together and ensuring their validity. Furthermore, a digital signature is accessible. It includes time and transaction data. This will ensure that all transactions are traceable, verifiable, and unmistakable (Martino, 2021; Nakamoto, 2008; Zheng et al., 2017).

Given that this network is designed to operate without specific middlemen, such as a central authority like banks, they are verified for accuracy in the following manner (Macrinici et al., 2018; Zheng et al., 2017). Typically, a decision is made between a public or private blockchain, which then defines the subsequent steps regarding authorisations.

A key characteristic of a public system in the blockchain environment is its near-complete anonymity, which precludes any possibility of access

or confirmation of identity. This network is also open and available to all individuals. Moreover, when a public blockchain is used, there is a distinct method of mining for validation. This method is executed by using a whole computer infrastructure. The network endeavours to solve cryptographic challenges, reach a consensus, and so verify the authenticity of a transaction (Aumüller et al., 2022; Fries & Paal, 2019).

In contrast to the public system, the private network operates slightly differently. Everything is initially defined in the private blockchain. Participants in the network are recognised and identified, and access privileges are established. An appropriate designation for this would be an exclusive “enterprise network”. The procedure involves a kind of selective confirmation. This confirmation is sent by authorised users who are accountable for verifying transactions (Fries & Paal, 2019; IBM, n.d.)

a). A comparison of the two variants shows that the second alternative is at present clearly more suited to an SME’s business purpose in terms of cash flow management. In the corporate environment, trust is a critical factor, and companies are not as accustomed to this technology. Consequently, beginning with private blockchain may be more straightforward, as demonstrated by Aumüller et al. (2022). Nevertheless, it would be reasonable to select the variety that is most appropriate for the company (Fill & Meier, 2020).

2.3. BLOCKCHAIN BENEFITS FOR BUSINESS CASH FLOW MANAGEMENT

As previously stated by Ernst and Young and reiterated in other sections of this paper, understanding and effectively managing one’s own financial resources is a crucial element in ensuring the survival of a firm (Schmidt, 2020). Global change, advancing digitalisation and the associated rapid pace of the market show that it will no longer be easy for companies to keep up without making their own changes. The pandemic has clearly demonstrated that digitalisation is an essential characteristic of firms’ ability to withstand and recover from challenges (Bundesministerium für Arbeit und Wirtschaft, n.d.). Hence, it is essential for SMEs to possess knowledge about the advantages and potential uses of cutting-edge advancements like blockchain technology. What are the reasons blockchain is particularly noteworthy? As evidenced by the literature, this technology is perceived as having a significant influence on both society and businesses. In addition, it may be relevant to corporate management and highly beneficial for investment decisions (Du et al., 2023). Consequently, this section will offer a brief

overview of the benefits of blockchain technology and potential applications in the administration of cash flow for small and medium-sized enterprises.

Real-time visualisation is one of blockchain's most significant attributes. This enhances the transparency of the processes. This is feasible due to the fact that blockchain functions on a distributed network, which ensures that all participants possess and receive identical information. Moreover, this technology has the capability to facilitate tracking and traceability of previous transactions. This, naturally, can streamline the process of auditing (Gan et al., 2021; Ji & Tia, 2022). A real-time visualisation would positively affect reporting and planning in terms of operational cash flow management as it is possible to provide the current liquidity status at any given moment. Consequently, this would benefit future investment choices and decrease the likelihood of seeking external funding. Payments would be executed more rapidly, and there would be a more robust foundation of trust between the corporations and their contractual partners. Subsequently, payment terms would be simplified.

The trust basis would also be enhanced by the robust security measures and the unchangeability of the data in this system. The security of blockchain is ensured by the use of encryption, consensus, and decentralisation principles. Thanks to its decentralised architecture, the system is immune to system failures caused by a single critical component. Furthermore, the data is immutable, which means that fraud attempts cannot be readily realised. Further, the data's integrity can be improved. These factors have the potential to decrease the company's cash cycle costs and time. Manual entries and Excel applications can be implemented to mitigate typing errors, as well as reducing the manual effort required for maintenance and control functions. Additionally, the ability to select between private and public blockchains would enable users to independently determine the authorisation and access rights. This, in turn, would increase the confidence of small and medium-sized enterprises when interacting with this new technology (IBM, n.d.-a).

Reduced effort and increased efficiency, as well as speed, are further advantages of this innovation. The removal of middlemen in transactions leads to a decrease in transaction costs when different fees, such as bank fees, are eliminated. In addition, the speed of transactions is enhanced due to the predefined if-then conditions set by smart contracts. This enhances operational efficiency within the organisation by streamlining and automating multiple tasks. By applying this approach to the financial flow process, transactions will not necessitate the involvement of a bank; rather, they will be executed through blockchain. This is especially beneficial, because the transaction time is significantly longer with banks (a few

In conclusion, this technology enhances banks' ability to evaluate financing requests and aids in their own business management for future strategic decisions and planning.

In addition to the kind of blockchain technology, there is another essential type of use for this innovation. In this context, the expression “smart contract” needs to be mentioned. Smart contracts are contracts that have been encoded in a digital format inside a blockchain. In a nutshell, they are legitimate contracts in a paperless structure, but these must also be legally enforceable, as is the case with traditional contracts (Macrinici et al., 2018). Smart contracts are, first of all, programmed if-then conditions rather than contracts in the legal sense (Jakob et al., 2018). However, the two types of contracts differ in one respect: the elimination of intermediaries who previously acted as a bridge between the contracting parties (Macrinici et al., 2018). With the functionality of the if-then relationship, these contracts are based on a conditional logic. Specifically, this implies that a subsequent action is initiated without human intervention when specific conditions of the contract are satisfied (Aumüller et al., 2022). For that purpose, it is essential that the precise responsibilities be clearly stated in the contracts so that the contracting parties intend to adhere to them (Macrinici et al., 2018). Finally, this type of technology has the potential to assist businesses in reducing costs, improving legal clarity and verifiability, and expediting the signing of contracts (Fries & Paal, 2019). More specifically, in terms of cash flow management, this might indicate a preference for payment flows. It has the potential to positively impact the partial issues associated with payment transactions and, as a result, other company obligations, particularly the payment flows that are automatically triggered when the defined criteria are met (Cheng et al., 2023; Eha, 2017; Jakob et al., 2018).

3.1. OBJECTIVE AND RESEARCH QUESTION

(155 - 188) | 165

company. Even after the health crisis, SMEs are facing various challenges (Bundesministerium für Arbeit und Wirtschaft, 2023), particularly in view of the distinct scarcity of specialised staff, and adjustments to organisational procedures are required. Manual steps and time-consuming coordination loops could be significantly accelerated and simplified by digital processes (Mayr, 2024). This paper assumes that blockchain technology stands out as a potentially game-changing innovation for SMEs. Cash flow management is considered a key sector of corporate governance, where the implementation of a domestic blockchain results in crucial, positive impacts on the data preparation for the cash flow forecast (Faster Capital, 2024). Hence, this entire research is focused on the primary research questions “Is there a recognisable, increased interest by academics in cash flow management through blockchain technology in economy?” and “What concrete advantages or positive impacts may be expected from blockchain related to digital cash flow management chains?”

Based on a traditional literature assessment, cash flow management for SMEs is outlined and the blockchain technology explained. Consequently, emerging challenges and issues, particularly through times of crisis, are noticeable.

The technique section of this paper focuses on a quantitative literature review. During the literature review, numerous publications stated that blockchain technology is still in a formative phase within the SME sector, since the initial enterprises primarily solely participate in actively implementing blockchain technology through trial projects. Thus, it appears appropriate to analyse the statistical increase in publications that discuss the integration of cash flow management and blockchain. The objective is not to engage in a detailed discussion of the topic, but rather to present the current state of progress in this field.

3.2. CLARIFICATION OF THE EVALUATION METHOD

This paper used a quantitative research approach. Upon the completion of the traditional literature research, the literature acquired for this purpose was organised, labelled, and analysed. The reference books used were categorised based on their original source of information. Physicist Wilhelm Fucks states that this strategy is based on the principles and techniques of quantitative content analysis (Aichele, 2005).

For the analysis, the Google Scholar, Pro Quest and Scopus databases were employed. The key justification for using Google Scholar was the possibility to research in a comprehensive, worldwide database. In contrast,

Pro Quest and Scopus were intended to enhance this by highlighting specifics as well-founded and highly respected databases. Satoshi Nakamoto published the first paper about blockchain technology in 2008 (Nakamoto, 2008). Therefore, the quantitative part concentrates on the previous sixteen years. In detail, the following periods were included in the evaluation:

- 2008-2012
- 2013-2017
- 2018-2024

Initially, categories were established to facilitate searching the databases for the frequency of citations in scientific literature. The selected categories encompass the primary terms and topic clusters that are most concise and commonly found in the literature upon which this study is grounded. The frequent association between cash flow management and blockchain has contributed to the conclusion that these specific keywords effectively encapsulate the literature. The following keywords have been outlined to evaluate the corresponding hit rate according to the literature available for this purpose:

Table 1. Identified keywords

Cash Management
Liquidity
Internal Financing (Intercompany Financing)
Digitalised Cash Flow Management
Innovations and Liquidity
Innovations and Cash Management
Distributed Ledger Technology
Blockchain
Blockchain and liquidity process
Cash Management through Blockchain

Source: own investigation

Subsequently, a codebook was generated using these categories. To address our study topic, the relevant categories were arranged in a table by relevance.

Table 2. Code Book

0	Cash Management
1	Liquidity
2	Internal Financing (Intercompany Financing)
3	Digitalised Cash Flow Management
4	Innovations and Liquidity
5	Innovations and Cash Management
6	Distributed Ledger Technology
7	Blockchain
8	Blockchain and liquidity process
9	Cash Management through Blockchain

Source: own investigation

Each article was categorised according to the appropriate category if it contained general information related to the selected category.

Table 3. Examples of classification assignment

	Record	Justification
0	<u>Modernising Cash Management:</u> “The note highlights that cash management is necessary because there are mismatches between the timing of payments and the availability of cash.”	This paper ought to be classified as “Cash Management” simply because it provides a comprehensive description of Cash Management to get a clear understanding and emphasises the significance for companies.
1	<u>Importance of financial liquidity in hospital management:</u> “It is one of the management’s biggest challenges, which the possibility to conduct health care activity depends on.”	This article should be categorised as “Liquidity” because it gives information on the importance of sustainable liquidity in the public sector. The results can be reflected on SMEs.
2	“The effects of information environment on internal and external financing choices.”	This paper ought to be classified as “Internal Financing (Intercompany Financing)” because it defines the difference between internal and external financing.

3	<u>Strategy creation behaviour and “last gasp” digitalisation as predictors of sales performance and cash flow:</u> “Although recent literature has examined diverse measures adopted by SMEs to navigate the COVID-19 turbulence, there is a shortage of evidence on how crisis-time strategy creation behaviour and digitalisation activities increase sales and cash flow.”	This article should be categorised as “Digitalised Cash Flow Management” because it brings on point how digitalisation activities can increase sales and cash flow.
4	“Stock liquidity, financial constraints, and innovation in Chinese SMEs. “	This paper should be categorised as “Innovations and Liquidity” for the reason that it gives information on how innovations can affect liquidity and stock liquidity of Chinese SMEs.
5	<u>“Value innovation management and discounted cash flow.”</u>	This article should be categorised as “Innovations and Cash Management” because it
		analyses the impact of innovative management on the cash flow.
6	<u>“Distributed Ledger Technology and the Future of Money and Banking is Necessary, Banks</u>	This work should be categorised as “Distributed Ledger Technology” because its title shows that the article is based on distributed ledger technology. <u>Are Not.” Bill Gates 1994.</u>
7	<u>Business models for the Blockchain: An empirical analysis:</u> “The blockchain technology promises to disrupt the business models.”	This paper should be categorised as “Blockchain” because it gives information on Blockchain relevant impacts.
8	<u>“Toward the application of blockchain technology to enhance traceability and information sharing in the supply chain of textile supply chain: Application to the order-to-cash process.”</u>	This paper should be categorised as “Blockchain and liquidity process” as it gives background information on how Blockchain can affect the order-to-cash-process.
9	Cash Management, Technology – Bridges into the Blockchain world.	This work should be categorised as “Cash Management through Blockchain” because the article is based on testing payment triggers through Blockchain. This is directly referring to Cash Management.

Source: own investigation

Using the codebook, the respective keywords were entered into the search engines of Google Scholar, Pro Quest and Scopus and the resulting number of matches was recorded. For more comprehensive information regarding the outcomes, please refer to the results and discussion section.

The second research enquiry of the paper relates to the benefits that blockchain technology offers in connection with the cash management

chain. It was decided to use qualitative research methodology to answer this question. An Austrian industrial company, which wishes to remain anonymous in the study, disclosed its current internal cash flow management process to us and declared its willingness to innovate in this area. Specifically, a private blockchain should support cash management as part of a pilot project. For this reason, the second part of this paper focuses on a qualitative case study that follows the case-problem method. Different possible solutions are discussed, and their advantages are highlighted. The goal is not to conduct a thorough investigation of the Cash Management Process. The aim is to reflect the current state of the application of blockchain within an SME company regarding liquidity. The objective is to establish whether blockchain can contribute to more transparent Cash Management in the future.

After completing the classic literature analysis as well as the quantitative approach, the collected literature was meticulously analysed again. The focus was on practical approaches and reports of pilot projects in all companies. Articles from traditional print media as well as publications from online periodicals were consulted. There were no constraints imposed on the source of the newspaper stories, such as focusing on specific databases. The key justification for using all sources was to capture the greatest possible range of background information on current projects related to blockchain and cash management. Each author has a different focus in their publications, so the newspaper articles should also be categorised as a first step. The underlying ambition was to compile a well-rounded and clear case description from individual sources. The previously selected key words from the quantitative analysis could be used in a reduced form as literature categories for the qualitative part:

Table 4. Literature Categories

General data of the company (anonymous)
Conventional Cash Management (process)
(current) liquidity (of the company)
Innovations and Cash Management of the pilot project
Cash Management through Blockchain

Source: own investigation

The results clearly show that the number of published papers related to all selected keywords is steadily increasing. If there were only a few hits in 2008, there is already a five-digit number of hits in 2024. Furthermore, there has been a significant surge in articles specifically related to blockchain and internal financing between the years 2018 and 2024. The utilisation of blockchain technology for cash management has shown a significant rise during this era. This demonstrates a consistent and focused interest in the chosen subjects.

Subsequently, a ProQuest database search was carried out. The objective was to juxtapose the findings of Google Scholar with those of a more limited database that selectively releases papers. In this case, the search was conducted without any limitations, and the analysis encompassed all findings, including material written in both English and German.

The following results were outlined:

Table 5. Pro Quest

Keyword	2008-2012	2013-2017	2018-2024
Cash Management	3,142	4,994	6,232
Liquidity	3,858	7,988	14,233
Internal Financing (Intercompany Financing)	1,061	1,678	3,401
Digitalised Cash Flow Management	349	674	1,101
Innovations and Liquidity	741	1,063	2,258
Innovations and Cash Management	346	501	888
Distributed Ledger Technology	3,632	4,822	10,922
Blockchain	0	4,995	75,663
Blockchain and liquidity process	4	33	458
Cash Management through Blockchain	2	132	488

Source: own investigation

The results indicate a noticeable rise in publications pertaining to advancements in cash management, blockchain, and internal financing. An analogy can be made to the outcomes discussed in the preceding section. In the third phase, an extensive search was conducted on the Scopus database. Similar to Proquest, Scopus is a prestigious publication platform. It was necessary to discover a comparison to the hits of Proquest in order to support the findings with another reliable source. The stated objectives were successfully accomplished:

Table 6. Scopus

Keyword	2008-2012	2013-2017	2018-2024
Cash Management	2,148	2,699	5,260
Liquidity	4,263	7,292	12,533
Internal Financing (Intercompany Financing)	491	765	1,759
Digitalised Cash Flow Management	0	0	85
Innovations and Liquidity	145	207	430
Innovations and Cash Management	97	104	256
Distributed Ledger Technology	72	563	25,199
Blockchain	5	1,710	171,605
Blockchain and liquidity process	0	1	200
Cash Management through Blockchain	0	4	243

Source: own investigation

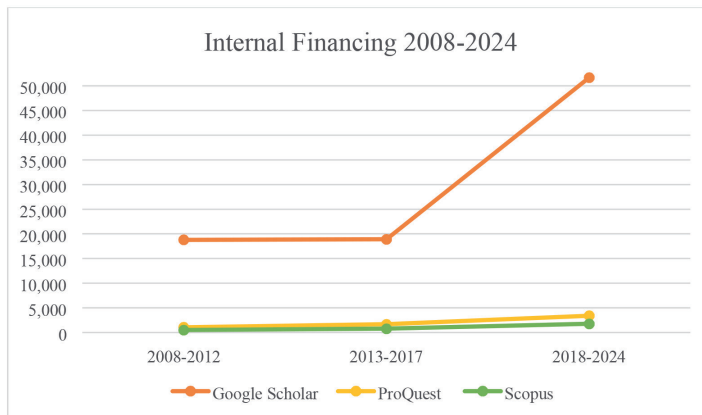
The comparison of ProQuest and Scopus validates the underlying premise that cash management is gaining significant attention as a result of the emergence of blockchain technology. The data analysis unequivocally demonstrates a significant surge in publications focused on blockchain, distributed ledger technology, and liquidity. An examination of the results verifies the picture presented by the literature analysis. The academic community is rapidly linking the cash flow management process to blockchain, which is clearly a highly relevant and current topic.

An examination of the Google Scholar findings reveals the evident confirmation of what the existing literature has already demonstrated: Companies, particularly SMEs, are receptive to innovation in the realm of cash flow management. Traditional approaches are being re-evaluated, and the demand for real-time accessible data is becoming more evident, particularly considering the conclusion of the COVID-19 pandemic. The same outcome was also apparent in the areas of "Internal Financing," "Digitalised Cash Flow Management," and "Cash Management through Blockchain." Prior to Nakamoto's publication on blockchain in 2008, there was already a substantial body of specialised literature on these topics in the analysed databases. Google Scholar is a comprehensive database, whereas Pro Quest and Scopus offer limited access to certain papers. This is also evident in the quantity of matches discovered. However, the pattern is evident and may be observed in all systems. The scholarly literature on liquidity concerning blockchain is consistently expanding over time. The scientific

community anticipates that the new technology will revolutionise cash flow management.

The following image emerges when the Internal financing category is examined in detail across all time periods:

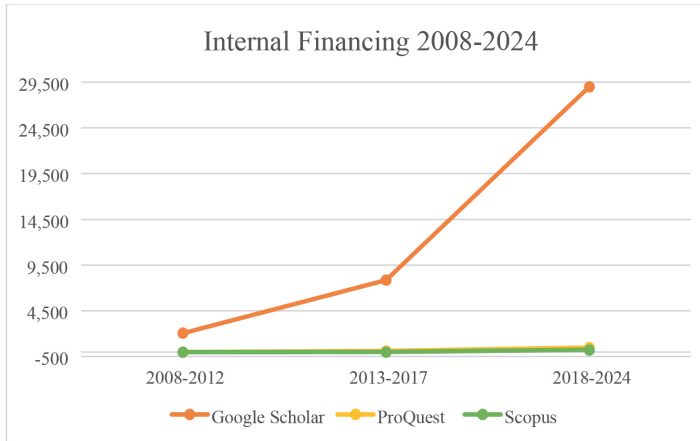
Figure 1. Internal Financing



Source: own investigation

The graph illustrates the increasing prominence of the subject of Internal Financing in the literature, as well as the growing attention it is receiving. Consequently, the use of blockchain technology is likely to have a substantial effect on the internal finance process and liquidity. Upon analysis, it is evident that the category “Cash Management through blockchain” exhibits the same pattern.

Figure 2. Cash Management through Blockchain



Source: own investigation

The amount of literature available increases every year. Scopus deviates from the norm throughout the period from 2013 to 2017, especially for the topic ‘Distributed Ledger Technology’. However, this deviation could be attributed to a scarcity of articles of superior quality in the database. Overall, the performed research suggests that the topic is highly relevant to the public, although the level of understanding about it is quite shallow. Scopus and ProQuest, which are high-quality databases, also indicate a rising trend in the number of relevant references. However, the total number of results is much lower compared to Google Scholar. The quantitative content analysis on which this article is based confirms the hypothesis that, over the past decade, the academic literature has increasingly focused on innovative cash flow management in the context of blockchain. The research question “Is there an increased interest in cash flow management through blockchain in the economy?” can be answered in the affirmative, according to the data. However, in a further phase of the present research, a case study on the research question was done to complement the results of the quantitative study with qualitative statements. Specifically, the focus was on the question of where blockchain can have a positive impact on the process steps of cash flow management. An evident sign of this is that the European Union is currently offering financial support for the execution of advancements in cash management. The benefits outlined in the case study might emphasise this and, consequently, address the second research question of the article.

4.2. CASE STUDY

4.2.1. CURRENT APPROACH TO CASH FLOW FORECASTING IN AN AUSTRIAN SME

The company is an Austrian medium-sized enterprise operating in the metal industry and has a workforce of approximately 120 employees. Approximately 50% of these individuals are employed in production roles, while the remaining individuals serve in administrative positions. To comply with the General Data Protection Regulation (GDPR) and safeguard trade secrets, the company concerned herein prefers to maintain anonymity. Therefore, in this case study, we will use the acronym “SMI” to refer to the company under discussion, which stands for small-medium sized-innovative. The company’s primary business generates approximately EUR 100 million in annual sales. This is a production process that is specifically tailored to customer projects and executed by unique project teams. SMI offers a fundamental selection of products that can be tailored to suit individual projects. Regularly, initiatives involving the research and development of a new type of product are undertaken, based on the specified criteria from the customer. The particular transaction with each unique customer sometimes has a duration of eight to twelve months, and these large pre-order quantities necessitate temporary financing. From a process standpoint, the liquidity constraint arises when pre-financing supplier transactions is necessary in order to fulfil the corresponding customer transactions after a period of eight to twelve months. Thus, a correct, coherent, and complete cash flow forecast is essential for SMI.

The organisation presently generates its cash flow prediction via the Microsoft Excel application. The fundamental data for the computations is extracted from an Enterprise Resource Planning (ERP) system.

The data quality provided by ERP systems relies on the calibre of the information entered into the system by human effort. An illustrative instance of this would be the process of recording an invoice. SMI receives all incoming invoices by email or postal mail. The accounting department is responsible for accurately recording all received invoices in the ERP system, ensuring that the dates are right. An invoice that is lost and not documented in the system is excluded from the calculation of cash flow. There is a potential risk that the outstanding payment amount may only be discovered during the continuing dunning procedure, leading to inaccurate planning and estimation of liquidity until that point. This is precisely the area where the organisation is encountering difficulties and desires to strategies with more

accuracy than in the past. Besides, SMI encounters specific challenges when predicting future payments for orders. The company's ordering procedure with its suppliers can be conducted through many channels, depending on the provider. Orders can be submitted through email, telephone, and post, as well as directly and automatically through the ERP system. Depending on the workload, there can be a long period of time between the actual order and the employee entering it into the ERP system. SMI therefore recognises that the basic data captured on day X will not always be 100% accurate. For SMI, a firm that receives orders in the millions, having such a limited quality of data to start with is extremely detrimental and poses a significant risk. The managing directors and the management of SMI desire a weekly report on the present state of cash flow. The cash flow prediction serves as the foundation for the management team to determine which additional projects can be approved by SMI and then funded in advance. The success of the company hinges on this matter. In addition, the company's owners frequently make impromptu enquiries regarding the existing cash flow strategy to determine any essential investments with little warning. There must be a continuous and immediate availability of cash flow daily.

Customised modifications are occasionally applied to the product portfolio in the company's project-related activity. Hence, the price of the product may fluctuate throughout the duration of a project. This results in a potential risk in relation to the sales projection. SMI is largely aware of the aforementioned risks. However, their traditional process does not include the research and development department or the sales department for reconciling sales figures. The finance department compiles the database from the ERP system in an appropriate format, with the expectation that the data is accurate. The named process does not involve any other departments. Customers occasionally miss payment terms in their day-to-day business activities, resulting in delayed receipt of payment. SMI is a corporation that proactively engages with customers and together seeks alternative solutions. There is still uncertainty over the inclusion of the alternative solution in the cash flow forecast. The individuals who serve as primary points of contact for the customer and are crucial for coordinating cash management may differ depending on the project team. Several of the difficulties in predicting cash flow that were discussed in the literature study are relevant to SMI. The company is aware of many risks; others are suspected. However, the company wants to take an innovative approach and map its cash flow planning via a private blockchain of its business partner network as part of a pilot project for the fourth quarter of 2024. Preparations for this are now in progress. The

research question of where the blockchain can have a positive impact on the cash flow forecast of the company is coming to the fore.

4.2.2. APPROACHES USED BY THE PROJECT TEAM AND POTENTIAL OUTCOMES

Blockchain was an obvious technology for the project team to investigate, particularly given SMI's involvement in the production sector. This was particularly evident due to the fact that this technological advancement has garnered attention in the field of supply chain management and potential applications, and it has already demonstrated a number of use cases, as suggested by a study conducted by the World Economic Forum and, as noted by Hinckeldeyn, a senior engineer at the Institute of Technical Logistics, in his publication (Hinckeldeyn, 2019; Building Block(Chain)s for a Better Planet, 2018). SMI may profit from certain well-known benefits in its ambitions to rethink cash flow management. The following advantages of implementing blockchain in connection with cash flow management should be highlighted: data integrity, payment processing, customer and supplier relationship management, and contract completion (Adams, 2023; PwC Österreich, n.d.-b).

Moreover, the actual presentation of the company's current cash flow would also be positively impacted. It was determined that a private blockchain would be the most favourable option at present. The primary reason for this choice was the significant value that the company's clients place on confidentiality and trust, particularly due to the highly private nature of some business projects. As already mentioned in Chapter 1.2 the private blockchain provides the ability to map a company's own closed corporate network. Another advantage of this application is the ability to handle authorisation and access rights separately in this environment. The choice was also made considering that a private blockchain is more capable of meeting legal standards and that concerns about data privacy, for instance, are not an issue owing to the closed nature of this system (Martino, 2021). The literature in Chapter 1.2 has already shown that for several firms the private blockchain offers a more accessible means of acquainting themselves with this blockchain technology compared to other types. This is particularly true because of the intricate and yet somewhat unfamiliar character of this innovation (Märkel et al., 2021; PwC Österreich, n.d.-a).

Another objective of the project is to eliminate the use of Excel and minimise manual operations and other error-prone procedures, in order to enhance the accuracy of cash flow management. One way in which the

blockchain might be beneficial in this context is its ability to function as a shared, decentralised network that is continuously updated in real time. These technological developments would make it easier to provide information to all network members in an equal manner based on their approved access credentials. For example, both SMI and one of its customers would have the same level of insight into their collaboration. This common understanding would benefit their business partnership by increasing transparency. Furthermore, the system's security measures, and the supplementary feature of data immutability enable the rapid establishment of new business relationships with previously unknown partners. Additionally, this could increase the organisation's market competitiveness.

In the context of business relationships, the implementation of smart contracts would be logical, particularly due to the potential for automating processes using the "If-when" function. In more detail, this cash administration procedure entails the inclusion of the contract in the blockchain, with payment occurring automatically upon the fulfilment of the contract's terms. Manual invoicing, Excel entry, or the eradication of late incoming payments would not be required as subsequent actions. Since there are existing blockchain initiatives that potentially allow B2B payments without middlemen such as banks, there would be enhanced efficiency and cost savings in this case (Adams, 2023; Aumüller et al., 2022).

Furthermore, the company's current cash flow statement would see a general enhancement in quality. Initially, the potential for real-time visualisation would result in a shared database truth of the cash flow. This is especially pertinent to SMI because the organisation employs numerous teams that are not always concurrently engaged in the same project steps, such as in the context of pricing negotiations or other contractual obligations. Blockchain would have a positive impact on the advancement of the contract process and the responsibilities related to paperwork. Moreover, blockchain implementation would substantially diminish the risk of input or output non-documentation. The automated procurement process is essential for the purpose of eliminating the current use of multiple channels and thereby increasing efficiency, as this can only be achieved through a single system. Additionally, this would facilitate the decision-making process for future business initiatives by providing the complete and current financial situation and simplifying forecasting and planning. Also ad hoc business decisions by the management would be facilitated. This is not always straightforward with the present system, as seen in the case study above. In conclusion, it is possible to state that many possibilities would emerge through the programmability of blockchain, which has been further

developed. Additionally, the elimination of numerous process steps would result in cost reductions, and the more efficient design of these steps would facilitate quicker processing, which would subsequently create a competitive advantage.

5. DISCUSSION

The analysis conducted in this paper demonstrates an increasing correlation between Cash Management and blockchain. The entire research of this article was accompanied by the basic hypothesis that blockchain technology and especially its effects (Big Data, Artificial Intelligence) simplify the data preparation for forecast cash flow. Furthermore, positive effects on the operating cash flow of companies, especially SME's, were expected through transparent and more streamlined payment settlements. The increasing number of publications in reputable, peer-reviewed journals published in databases such as Scopus confirms that the academic community is progressively associating Cash Management and Liquidity with blockchain technology. The literature research conducted at the outset verified the same argument. The publications of the Austrian Federal Economic Chamber highlight that the advancement of blockchain technology will have a substantial impact on a company's liquidity (Federal Ministry of Labour and Economy, 2023). In accordance with this theory, it became evident that organisations consistently face significant difficulties in cash flow forecasting, and this aspect of business is subject to continual evolution.

The European Union actively encourages and supports the digital integration of innovative practices within businesses, including the area of cash flow management. For SMEs, the capacity to obtain and utilise technology expertise will grow in significance to sustain operations and avoid financial hardships. The significance of internal financing is growing steadily. The coronavirus crisis has substantially boosted key interest rates throughout Europe, rendering external funding options such as credit investments nearly unattainable for SMEs (Schnabl, 2020). Additionally, the Federal Ministry of Labour and Economic Affairs has verified that enterprises with a greater degree of digitalisation have shown superior control of the difficulties and evolving conditions within the coronavirus epidemic. Hence, it is generally agreed that in order to increase their resilience and adaptability to potential future events, it is imperative that small and medium-sized enterprises receive assistance with respect to newly developed technologies (Bundesministerium für Arbeit und Wirtschaft, n.d.).

The case study conducted at an Austrian SME validates this assertion. Companies are open to innovation, especially in the area of cash management, and are constantly looking for solutions to organise their income and expenditure more clearly. The conducted case study highlights the significant challenges associated with preparing accurate and transparent data. The concern of many managers arises not only from the cooperation across multiple departments but also from the vulnerability to errors resulting from human data input. This research validates that blockchain provides specific benefits. The data stored in a blockchain is immutable, consistently accessible, and any new entries can always be traced. The wide accessibility allows for the resolution of coordination issues across different departments. Moreover, the findings of this case study are reinforced by the existing blockchain solutions available in the market, which serve as exemplary applications. For instance, using a private blockchain for the cash flow management of the American service company Genpact or an Ethereum platform solution like BitFlow, for the real-time evaluation of cash flow. They have acknowledged the previously identified deficiencies in the existing cash flow procedure and have effectively dealt with them via their proposed alternative. Genpact's approach ensures enhanced transparency in the exchange between the contractual parties, eliminates defaults or losses on liabilities, eliminates delayed payments, and provides benefits through the use of smart contracts (Eha, 2017). Furthermore, BitFlow enables enhanced visualisation of capital flow, budgeting, and liquidity (Herskind et al., 2020). Moreover, Shantanu Ghosh, the Senior Vice President of Genpact, affirms that the organisations that will emerge as market leaders are those who proactively embrace digitalisation in their operations (Eha, 2017).

Finally, it is obvious that the transformation in Cash Management will definitely have a positive impact on the liquidity of SMEs, but it remains to be seen when the blockchain trend will start to break through for SMEs. Similarly, experience with blockchain technology is currently quite limited and has substantial growth potential in many companies. Currently, pilot initiatives, like the one on which this study is founded, are more prevalent in large stock businesses.

These results might suggest that Cash Management will become much more digitalised, and the finance department's work may become less important. The opposite is the case as the planning activities and daily challenges will change. In particular, blockchain technology promises the availability of a correct database which offers the potential for different interpretations of recommendations for decision-making approaches to the management board. Overall, blockchain technology may provide a

substantial competitive edge by transferring trust to the system. This enables the more efficient establishment of new business partnerships without relying heavily on external trust.

6. CONCLUSION

In conclusion, it is evident that blockchain is gaining more and more importance in the field of Cash Management. SMEs in particular inform themselves about and engage with various blockchain opportunities in a variety of business areas. It is important to emphasise that they are aware that the Cash Management Process will be affected by innovations in the future. The quantitative content analysis reveals a consistent increase in the number of publications and scholarly interest in the development of cash flow management in relation to this innovation. This confirms the basic hypothesis of this paper. The precise effects of emerging technologies like blockchain on the process of cash flow management and the subsequent liquidity of a company have not been thoroughly investigated. This is primarily attributable to the technology's complexity, the absence of regulatory requirements, and the industry's lack of adoption in this context. However, it is possible that the attention may also turn to this field in the future, considering the significant investments made in supply chain initiatives including blockchain technology in recent years. Continuing this study with a focus on cash flow management would be a logical and relevant conclusion.

Moreover, the first pilot projects have demonstrated that the utilisation of blockchain technology enables the gathering of vast quantities of data in real-time, which would allow better financial planning and forecasting, as well as having a beneficial impact on liquidity. Additionally, it would be intriguing to observe the impact of tangible blockchain technology in the cash flow management process on the available financing alternatives for businesses. Increased data volumes offer the benefit of acquiring more information but also come with the drawback of other parties gaining greater knowledge about one's own organisation. This is exactly where the further research of this article will continue. In addition, this investigation did not specifically examine the negative aspects and risks associated with blockchain technology. It also did not delve into explicit business-to-business payment processes, internal and external funding options, procedures for onboarding business partners, and the implementation of this distinctive business network. These areas could be explored in future research endeavours.

BIBLIOGRAPHY

1. Adams, J. (2023, November 10). How JPMorgan is using blockchain to make B2B payments 'programmable' | Payments Source. American Banker. <https://www.americanbanker.com/payments/news/how-jpmorgan-is-using-blockchain-to-make-b2b-payments-programmable>
2. Aichele D. (2005). Das Werk von W. Fucks, an international handbook, Berlin/New York, pp. 158-180
3. Alarcon, J. Kugel R. (2023). Digital Cash Flow Management Advances in a Post-Pandemic World. Pennsylvania CPA Journal. Philadelphia. Vol. 94. Iss. 3. <https://www.proquest.com/docview/2920255944/B7ED83A221EC41E6PQ/29?accountid=14682&sousousour=Tade%20Journals>
4. Alter, R. (2015). Cash-Flow Management. Verbesserungshebel – Cockpit-Kennzahlen – Umsetzungsworkshop. Schäffer-Pöschel Verlag. Stuttgart.
5. Asokan, N. (2023). Cash Flow-Arten: Diese müssen Sie kennen. <https://agicap.com/de/artikel/cash-flow-arten/>
6. Aumüller, D., Eiber, M., & Matthesius, M. (2022). Blockchain – Eine wertvolle Technologie für KMU? Eine Erörterung am Beispiel der Eingliederung von additiver Fertigung in ein kooperatives Wertschöpfungsnetzwerk.
7. In L. Heim (Ed.), Entrepreneurship der Zukunft (pp. 145–163). Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-37926-1_7
8. Bittleston, J. (2018). Keeping an eye on cash flow: Improving cash flow management is vital for the health of any enterprise. The Business Times. Singapore. <https://www.proquest.com/docview/2097984746/79D09F14D9864C24PQ/3?accountid=14682&source=News>
9. Bitpanda. (n.d.). Was ist eine Bitcoin Node? Bitcoin Nodes: Definition & Rolle Auf Der Blockchain — Bitpanda Academy. Retrieved 11 July 2024, from <https://www.bitpanda.com/academy/de/lektionen/was-ist-eine-bitcoinnode/>
10. Bossauer, P., Schreiber, D., Neifer, T., Pakusch, C., & Stevens, G. (2020). Dezentralisierung der Sharing Economy – Potentiale Blockchain-basierter Sharing-Plattformen. WI2020 Zentrale Tracks, 158–173. https://doi.org/10.30844/wi_2020_b3-bossauer
11. Breinich-Schilly, A. (2021, January 22). Digitale Technologien verbessern Liquiditätsplanung. springerprofessional.de. <https://www.springerprofessional.de/finanzcontrolling/big-data/digitale-technologien-verbessern-liquiditaetsplanung/18767272>
12. Bundesministerium Digitalisierung und Wirtschaftsstandort. (n.d.). Digitalisierung in Gewerbe und Handwerk.
13. Bundesministerium für Arbeit und Wirtschaft. (n.d.). KMU und Digitalisierung. Retrieved 10 July 2024, from <https://www.bmaw.gv.at/Services/Publikationen/KMU-und-Digitalisierung.html>
14. Bundesministerium für Arbeit und Wirtschaft. (2023). KMU im Fokus 2023. Bericht über die Situation und Entwicklung kleiner und mittlerer Unternehmen der österreichischen

- Wirtschaft. [file://nhfilhdeo01/ctx_profile\\$/Ordnerumleitung/HAECKn/Downloads/FINAL%20KMU-FOKUS_2023_barrierefrei_final_21_02.pdf](file://nhfilhdeo01/ctx_profile$/Ordnerumleitung/HAECKn/Downloads/FINAL%20KMU-FOKUS_2023_barrierefrei_final_21_02.pdf)
15. Carter, T. Ejara, D. (2008). Value innovation management and discounted cash flow. *Management Decision*. Volume 46. p. 48-76. <https://www.scopus.com/record/display.uri?eid=2-s2.0-38749103095&origin=resultslist&sort=plf-f&src=s&sid=b9921540f67e8bcfodoca34d912096ef&sot=b&sdt=b&s=TITLE%28innovations+AND+cash+Management%29&sl=24&sessionSearchId=b9921540f67e8bcfodoca34d912096ef&relpos=1>
 16. Cheng, M., Chong, H.-Y., & Xu, Y. (2023). Blockchain-smart contracts for sustainable project performance:
 17. Bibliometric and content analyses. *Environment, Development and Sustainability*, 26(4), 8159–8182. <https://doi.org/10.1007/s10668-023-03063-w>
 18. Cong, L. W., & He, Z. (2018). Blockchain Disruption and Smart Contracts (w24399). National Bureau of Economic Research. <https://doi.org/10.3386/w24399>
 19. Controller Institut. (2020). Liquiditätsplanung in der Krise: Herausforderungen und Lösungen. <https://insights.controller-institut.at/liquiditaetsplanung-in-der-krise-herausforderungen-und-loesungen/>
 20. Deloitte Deutschland. (n.d.). Was sind die Chancen und Risiken der Blockchain? | Deloitte Deutschland. Blockchain Game Changer. Retrieved 11 July 2024, from <https://www2.deloitte.com/de/de/pages/innovation/contents/Blockchain-Game-Changer.html>
 21. Du, J., Shi, Y., Li, W., & Chen, Y. (2023). Can blockchain technology be effectively integrated into the real economy? Evidence from corporate investment efficiency. *China Journal of Accounting Research*, 16(2), 100292. <https://doi.org/10.1016/j.cjar.2023.100292>
 22. Eha, B. P. (2017). A blockchain for cash flow management.
 23. Ehlers, J. (2023). Der überarbeitete Unionsrahmen für Forschung, Entwicklung und Innovation von 2022. KPMG Law Insights. KPMG. <https://kpmg-law.de/der-ueberarbeitete-unionsrahmen-fuer-forschungsentwicklung-und-innovation-von-2022/>
 24. Ernst & Young. (2022, March 29). Cloud Computing, Data Analytics und KI als digitale Zukunftstreiber des österreichischen Mittelstands. EY-Studie Digitaler Wandel im österreichischen Mittelstand 2022. https://www.ey.com/de_at/news/2022/03/ey-studie-digitaler-wandel-im-oesterreichischen-mittelstand-2022
 25. Europäische Kommission. (2022). Index für die digitale Wirtschaft und Gesellschaft (DESI) 2022 Österreich.
 26. Europäische Kommission. <https://ec.europa.eu/newsroom/dae/redirection/document/88737>
 27. EY - Österreich. (2020, January 22). Was ist Blockchain? Kryptowährungen | EY - Österreich. Blockchain?
 28. Blockchain! https://www.ey.com/de_at/tax/blockchain-blockchain
 29. EY Reporting. (2016, September 27). Wie Unternehmen dank Blockchain bald in Echtzeit geprüft werden können
 30. |EY - Österreich. https://www.ey.com/de_at/assurance/how-blockchain-could-introduce-real-time-auditing

31. FasterCapital. (2024). Die Auswirkungen der Technologie auf das Liquiditätsmanagement. <https://fastercapital.com/de/thema/die-auswirkungen-der-technologie-auf-dasliquidit%C3%A4tsmanagement.html>
32. Fill, H.-G., & Meier, A. (2020). Grundlagen, Anwendungsszenarien und Nutzungspotenziale (Springer Vieweg Wiesbaden, Ed.).
33. Fries, M., & Paal, B. P. (Eds.). (2019). Smart Contracts - Schlaue Verträge?, Tübingen. Mohr
34. Siebeck. <https://doi.org/10.1628/978-3-16-156911-1>
35. Gan, Q., Lau, R. Y. K., & Hong, J. (2021). A critical review of blockchain applications to banking and finance: A qualitative thematic analysis approach. *Technology Analysis & Strategic Management*, 1-17. <https://doi.org/DOI: 10.1080/09537325.2021.1979509>
36. Hader, M. Mhamedi, A. Tchoffa, D. Abouabdellah, A. (2022). Toward the application of blockchain technology to enhance traceability and information sharing in the supply chain of textile supply chain: Application to the order-to-cash process. *Blockchain driven Supply Chains and Enterprise Information Systems*. p. 97-111. <https://www.scopus.com/record/display.uri?eid=2-s2.0-85159054176&origin=resultslist&sort=plff&src=s&sid=b9921540f67e8bcfodoca34d912096ef&sot=b&sdt=b&s=TITLE%28Blockchain+and+Cash+process%29&sl=24&sessionSearchId=b9921540f67e8bcfodoca34d912096ef&relpos=0>
37. Hanl, A. Michaelis, J. (2019). Digitales Zentralbankgeld als neues Instrument der Geldpolitik. Springer.
38. Heidelberg. Digitales Zentralbankgeld als neues Instrument der Geldpolitik (econstor.eu)
39. Harte, Johnny. (2014). Why maintaining good cash-flow management is vital for start-ups: These five steps could help your business to manage any cash-flow problems that can easily arise. *The Irish Times* (1921-). Dublin. Ireland. <https://www.proquest.com/docview/1736307512/79D09F14D9864C24PQ/7?accountid=14682&sourcsourc=Historical%20Newspapers>
40. Herskind, L., Giaretta, A., De Donno, M., & Dragoni, N. (2020). BitFlow: Enabling real-time cash-flow evaluations through blockchain. *Concurrency and Computation: Practice and Experience*, 32(12), e5333. <https://doi.org/10.1002/cpe.5333>
41. Hinckeldeyn, J. (2019). Blockchain-Technologie in der Supply Chain: Einführung und Anwendungsbeispiele (Springer Vieweg Wiesbaden, Ed.).
42. Hoffmann, C. (2022). Cash Management, Technology – Bridges into the Blockchain world. Deutsche Bank. <https://flow.db.com/cash-management/bridges-into-the-blockchain-world>
43. Huibers, F. (2024). Distributed Ledger Technology and the Future of Money and Banking is Necessary,
44. Banks Are Not. Bill Gates 1994. *Accounting, Economics and Law: A Convivium*. Volume 14. Issue 2. p. 213249. <https://www.scopus.com/record/display.uri?eid=2-s2.0-85099391300&origin=resultslist&sort=plff&src=s&sid=b9921540f67e8bcfodoca34d912096ef&sot=b&sdt=b&s=TITLE%28Distributed+ledger+technology%29&sl=24&sessionSearchId=b9921540f67e8bcfodoca34d912096ef&relpos=4>

45. IBM. (n.d.-a). Grundlegende Blockchain-Sicherheit. Was ist Blockchain-Sicherheit? | IBM. Retrieved 11 July 2024, from <https://www.ibm.com/de-de/topics/blockchain-security>
46. IBM. (n.d.-b). Was ist Blockchain? | IBM. Retrieved 11 July 2024, from <https://www.ibm.com/de-de/topics/blockchain>
47. IBM. (n.d.-c). Wie sich die Sicherheit bei den einzelnen Blockchain-Typen unterscheidet. Was ist Blockchain-
48. Sicherheit? | IBM. Retrieved 10 July 2024, from <https://www.ibm.com/de-de/topics/blockchain-security>
49. Jakob, S., Schulte, A. T., Sparer, D., Koller, R., & Henke, M. (2018). BLOCKCHAIN UND SMART
50. CONTRACTS: EFFIZIENTE UND SICHERE WERTSCHÖPFUNGS-NETZWERKE (White Paper No. 10; Future Challenges in Logistics and Supply Chain Management, pp. 1–20). Fraunhofer-Institut für Materialfluss und Logistik IML.
51. Javaid, M., Haleem, A., Singh, R. P., Suman, R., & Khan, S. (2022). A review of Blockchain Technology applications for financial services. *Bench Council Transactions on Benchmarks, Standards and Evaluations*, 2(3), 100073. <https://doi.org/10.1016/j.tbench.2022.100073>
52. Ji, F., & Tia, A. (2022). The effect of blockchain on business intelligence efficiency of banks. *Kybernetes*, 51(8), 2652–2668. <https://doi.org/10.1108/K-10-2020-0668>
53. Li-Kai, L. Wang, V. (2024). The effects of information environment on internal and external financing choices. *International Journal of Business Excellence*. Volume 33. Issue 1. p. 142 – 167. <https://www.scopus.com/record/display.uri?eid=2-s2.0-85196160225&origin=resultslist&sort=plff&src=s&sid=b9921540f67e8bcfodoca34d912096ef&sot=b&sdt=b&s=TITLE%28internal+financing%29&sl=24&sessionSearchId=b9921540f67e8bcfodoca34d912096ef&relpos=2>
54. Lienert, I. (2009). Modernizing Cash Management. IMF Technical Notes and Manuals 2009/003. International Monetary Fund. <https://ideas.repec.org/p/imf/imftnm/2009-003.html>
55. Lissner, B. (2023). Cash Flow Management: So sichern Sie Ihre Liquidität. <https://qonto.com/de/blog/business/cashflow/cashflow-management>
56. Liu, W. Suzuki, Y. (2024). Stock liquidity, financial constraints, and innovation in Chinese SMEs. *Financial Innovation*. Volume 10. <https://www.scopus.com/record/display.uri?eid=2-s2.0-85186252064&origin=resultslist&sort=plf-f&src=s&sid=b9921540f67e8bcfodoca34d912096ef&sot=b&sdt=b&s=TITLE%28Innovations+and+liquidity%29&sl=24&sessionSearchId=b9921540f67e8bcfodoca34d912096ef&relpos=0>
57. Macrinici, D., Cartoceanu, C., & Gao, S. (2018). Smart contract applications within blockchain technology: A systematic mapping study. *Teleinformatics and Informatics*, 35(8), 2337–2354. <https://doi.org/10.1016/j.tele.2018.10.004>
58. Märkel, C., Stronzik, M., Simons, M., Wissner, M., & Lundborg, M. (2021). Einsatz von Blockchain in KMU: Chancen & Hemmnisse (Working Paper 477). WIK Diskussionsbeitrag. <https://www.econstor.eu/handle/10419/248433>
59. Marsh, A. (2014). Cash Flow Management Potent Tool: Cash Flow Management. *Financial Planning*. <https://www.proquest.com/docview/1912096253/908ED4AB46BC42FBPQ/1>

60. Martino, P. (2021). *Blockchain and Banking: How Technological Innovations Are Shaping the Banking Industry*. Springer International Publishing. <https://doi.org/10.1007/978-3-030-70970-9>
61. Maslach, D. Markiewicz, J. Warelis, A. Kryzak, M. (2019). Importance of financial liquidity in hospital management. *Przegląd epidemiologiczny*. Volume 73. Issue 3. p.369-381. <https://www.scopus.com/record/display.uri?eid=2-s2.0-85075549307&origin=resultslist&sort=plff&src=s&sid=b9921540f67e8bcfodoca34d912096ef&sot=b&sdt=b&s=TITLE%28importance+of+liquidity%29&sl=24&sessionSearchId=b9921540f67e8bcfodoca34d912096ef&relpos=5>
62. Mayr, R. (2024). Digitalisierung als Erfolgsfaktor für die Bewältigung wirtschaftlicher Herausforderungen. *Welmarktführer*. Innovation Day. <https://live.handelsblatt.com/digitalisierung-als-erfolgsfaktor-fuer-diebewaeltigung-wirtschaftlicher-herausforderungen/>
63. Meinel, C., & Gayvoronskaya, T. (2020). *Blockchain: Hype over Innovation*. Springer Berlin Heidelberg. <https://doi.org/10.1007/978-3-662-61916-2>
64. Nakamoto, S. (2008.). *Bitcoin: A Peer-to-Peer Electronic Cash System*. s.I.: bitcoin.org
65. Onjewu, A. Nyuur, R., Salima, P., Wang, Y. (2024). Strategy creation behaviour and “last gasp” digitalization as predictors of sales performance and cash flow. *International Journal of Entrepreneurial Behavior and Research*. Volume 30. p. 800-827. <https://www.scopus.com/record/display.uri?eid=2-s2.0-85174233061&origin=resultslist&sort=plf-f&src=s&sid=b9921540f67e8bcfodoca34d912096ef&sot=b&sdt=b&s=TITLE%28Digitalisation+and+Cash+Flow%29&sl=24&sessionSearchId=b9921540f67e8bcfodoca34d912096ef&relpos=0>
66. Purwaningsih, E., Muslikh, M., Suhaeri, S., & Basrowi, B. (2023). Utilizing blockchain technology in enhancing supply chain efficiency and export performance, and its implications on the financial performance of SMEs. *Uncertain Supply Chain Management*, 449–460. <https://doi.org/doi:10.5267/j.uscm.2023.9.007>
67. PwC Österreich. (n.d.-a). *Blockchain in der Immobilienbranche*. Retrieved 11 July 2024, from <https://www.pwc.at/de/branchen/digital-real-estate/blockchain-in-der-immobilienbranche.html>
68. PwC Österreich. (n.d.-b). *Digitalisierung des Rechnungswesens*. Retrieved 11 July 2024, from <https://www.pwc.at/de/dienstleistungen/wirtschaftspruefung/pruefungsnaheberatung/digitalisierungrechnungswesens.html>
69. Schmidt, T. (2020, June 16). *Wie ein integriertes Liquiditätsmanagement in Krisenzeiten schützt. Integriertes Cash Management Hilft in Krisen | EY - Deutschland*. https://www.ey.com/de_de/covid-19/integriertes-cashmanagement-hilft-in-krisen
70. Schnabl, G. (2020). *Die Inflationsmessung erzeugt die Illusion der stabilen Kaufkraft*. *Wirtschaftsdienst*. 100. Jahrgang. Heft 11. p. 838-841. <https://www.wirtschaftsdienst.eu/inhalt/jahr/2020/heft/11/beitrag/dieinflationsmessung-erzeugt-die-illusion-der-stabilen-kaufkraft.html>
71. Sedlmeir, J., Buhl, H. U., Fridgen, G., & Keller, R. (2020). Ein Blick auf aktuelle Entwicklungen bei Blockchains und deren Auswirkungen auf den Energieverbrauch. *Informatik Spektrum*, 43(6), 391–404. <https://doi.org/10.1007/s00287-020-01321-z>

72. Tapscott, D., & Tapscott, A. (2016). *Blockchain revolution: How the technology behind bitcoin is changing money, business, and the world*. Portfolio / Penguin.
73. Tapscott, D., & Tapscott, A. (2018). *How Blockchain Will Change Organizations*. In *Mit Sloan Management Review, What the Digital Future Holds* (pp. 43–56). The MIT Press. <https://doi.org/10.7551/mitpress/11645.003.0010>
74. Thi Do, H., Hoiczky, C., & Uckelmann, D. (2019). Blockchain – Anwendungen in Logistik und Supply Chain: Funktionsweise, Use Cases und Leitfaden für Unternehmen. *ZWF Zeitschrift für wirtschaftlichen Fabrikbetrieb*, 114(10), 617–620. <https://doi.org/10.3139/104.112163>
75. Többens, B. (2023). Cash Forecasting mit Unterstützung von künstlicher Intelligenz (KI). KPMG. <https://kpmg.com/de/de/home/themen/2023/04/cash-forecasting-ki.html>
76. Upadhyay, N. (2024). Business models for the Blockchain: An empirical analysis. *Digital Business*. Volume 4. Issue 2. <https://www.scopus.com/record/display.uri?eid=2-s2.0-85195824807&origin=resultslist&sort=plff&src=s&sid=b9921540f67e8bcfodoca34d912096ef&sot=b&sdt=b&s=TITLE%28Blockchain%29&sl=24&sessionSearchId=b9921540f67e8bcfodoca34d912096ef&relpos=8>
77. Wilkie, A., & Smith, S. S. (2021). Blockchain: Speed, Efficiency, Decreased Costs, and Technical Challenges. In H. K. Baker, E. Nikbakht, & S. S. Smith (Eds.), *The Emerald Handbook of Blockchain for Business* (pp. 157–170). Emerald Publishing Limited. <https://doi.org/10.1108/978-1-83982-198-120211014>
78. World Economic Forum (Ed.). (2018). *Building Block(chain)s for a Better Planet (The Fourth Industrial Revolution for the Earth)*. <https://www.weforum.org/publications/building-block-chain-for-a-better-planet/>
79. Zheng, Z., Xie, S., Dai, H., Chen, X., & Wang, H. (2017). An Overview of Blockchain Technology: Architecture, Consensus, and Future Trends. 2017 IEEE International Congress on Big Data (BigData Congress), 557–564. <https://doi.org/10.1109/BigDataCongress.2017.85>

EFFICIENCY OF THE LEASING INDUSTRY IN CROATIA BY DEA AND PROFITABILITY APPROACHES¹

TICIJAN PERUŠKO

Juraj Dobrila University of Pula

Faculty of Economics and Tourism "Dr. Mijo Mirković"

Pula, Croatia

tperusko@unipu.hr

Paper category: Preliminary scientific paper

¹ *This paper is a result of scientific project "Accounting as a support to sustainable business" supported by the Faculty of Economics and Tourism "Dr. Mijo Mirković", Juraj Dobrila University of Pula. Any opinions, findings, and conclusions or recommendations expressed in this paper are those of the author(s) and do not necessarily reflect the views of the Faculty of Economics and Tourism "Dr. Mijo Mirković" Pula.

ABSTRACT

The main goal of the research is to analyse the efficiency of leasing companies in Croatia, as well as to assess the capability of using the resources in the best way. Data Envelopment Analysis (DEA) methodology was used to conduct the analysis, which facilitates quantitative evaluation of leasing company efficiency in relation to the resources they use and the results they achieve. When it comes to the choice of model orientation to input or output, the reviewed literature recommends the input orientation due to the assumption that leasing companies have a greater influence on inputs than on outputs. Inputs in the model are business expenses which consist of depreciation costs, employee expenses and other costs, leasing company assets and interest expenses. Revenues realised from operational and financial leasing are basic revenues in the leasing industry and this is the reason why they have been taken as the model output. The analysis encompassed active leasing companies which operated in the Republic of Croatia in the period between the years 2016 and 2022. The Croatian leasing sector shows an average efficiency of 96.86%, with annual variations between 95.32% and 97.91%. Company size did not show a significant impact on business efficiency, suggesting that quality management strategies and adaptability are more important success factors. Financial indicators further confirm the strength of the sector, with an average return on assets of 1.73% and a return on equity of 16.18%. The analysis of the obtained research results enables identification of the leasing companies which distinguish themselves as efficient leaders, and those which are lagging behind in exploitation of their resources. The research results facilitate understanding of the leasing company and leasing industry business in Croatia, identifying the areas for improvement of business performances.

Key words: DEA, business expenses, interest expenses, assets, leasing industry, efficiency

1. INTRODUCTION

In the modern business environment, efficiency is the key indicator of company performance. In this context, leasing companies play an important role as mediators in financing, facilitating access to capital-intensive means with minimum initial stakes to companies and individuals alike. As a financial service, leasing includes acquisition of equipment, machinery, vehicles and other assets to users, without the need for full ownership. This business model enables users to achieve the advantage of using the assets, while leasing companies obtain revenue through charges and interest. However, in this dynamic environment the question is asked of how to, quantitatively and qualitatively, estimate the leasing company efficiency, as well as how to properly adjust expenses and revenues in order to achieve optimal business performance. For this reason, the efficiency analysis for leasing companies becomes an essential tool in the assessment of their performances and in creation of strategies directed towards business operations improvement.

Efficiency in the leasing industry relates to achievement of the highest business results with minimum resources. This concept is crucial for a long-term leasing company success as it facilitates maximisation of profits, optimisation of operational processes and maintenance of a competitive position in the market. Company efficiency can be measured through different aspects, including financial performances, operational processes, service quality, management of risk and relationships with interested parties.

Through the efficiency analysis, a contribution is made to a better understanding of how leasing companies use their resources for the achievement of optimal results. Implementation of innovative technologies, improvement of operational processes, strategies of management of risks and improvement of relationships with clients are all the key components which contribute to efficiency. Here, the analysis of cost and profitability is the key component in the understanding of efficiency. Separation of operational, administrative and financial costs and their comparison with the revenue enables identification of the areas where savings can be achieved and profitability increased.

Besides, analysis of leasing companies' efficiency helps in understanding how economic and regulative environments affect their business dynamics. With the changes in the market, regulations and technological progress, leasing companies have to adjust their strategies in order to stay competitive and efficient. The research in this area, therefore, contributes to new scientific knowledge and provides practical guidelines for business decisions.

In the light of the aforesaid facts, the purpose of this research is to deepen the understanding of the key aspects which affect the leasing companies' efficiency. Through the analysis of business expenses, assets, expenses from interests and revenues realised from operational and financial leasing, the aim was to explore how different factors interlink and shape the total efficiency. On the basis of the research results it is possible to identify the best practices, draw conclusions and recommend strategies for improvement of efficiency of leasing companies in Croatia.

The paper is structured in five main sections. After the introduction, the literature review presents the application of the DEA method in analysing the efficiency of financial institutions, including leasing companies. The research methodology describes the application of DEA analysis, ROA and ROE indicators. The research results are presenting an analysis of the efficiency of leasing companies by size, as well as an analysis of the return on assets and return on equity indicators for different groups of leasing companies. The conclusion summarises the key findings, research limitations, and recommendations for future research.

2. LITERATURE REVIEW

The analysis of the companies' efficiency has become the key topic of the research, which has as a goal to understand how companies optimally use resources, manage risks and generate value for their clients and owners. In their work, Cooper et al. (2011) show growing of the Data Envelopment Analysis (DEA) into a powerful quantitative, analytical tool for measuring and assessment of efficiency. DEA is particularly useful for organisations with several inputs and outputs, as Molinero (1996) stresses, as it can generate results about efficiency without making assumptions about the functional relationships between these variables. Zhu (2014) supplemented the application of the DEA method with procedures for estimation of efficiency and parallel company analysis. Researches applying the DEA method have focused on a wide range of areas in order to obtain a comprehensive insight into the factors which contribute to company efficiency and success.

A considerable number of papers are channelled towards the application of the DEA method for exploration of efficiency in financial institutions. In their paper, Berger and Humphrey (1997) give a review of research on financial institutions' efficiency in 21 countries. Furthermore, Kaffash and Marra (2017) directed their research towards the DEA models and their application; they studied 620 relevant papers which apply the DEA method and grouped them into different financial areas. They directed the goal of

the paper towards reconsideration of the empirical evaluation of financial institutions' efficiency and recommendation of the methods for achievement of more accurate research results. P. Harker and S. Zenios (2000) explored the influence of diversification and the role of technological changes, innovations and regulation on efficiency and success of financial institutions. What is more, Athanassopoulos (2000) and Sherman (1995) have proven that DEA, apart from the fact that it can be a valuable tool for evaluation and improvement of business efficiency, also serves for identification of different possibilities of saving in business expenses. Kočišová (2014) widened these researches by examining expenses, revenues and efficiency of business operations in the Slovak and Czech financial institutions. In his research, Ebrahimnejad (2014) elaborated the three-stage DEA model for the financial industry, showing the areas for improvement of efficiency.

Dalfard (2012) and Rahman (2020) also used DEA models for estimation of leasing companies' efficiency. Baten (2014) additionally explored leasing companies' cost-effectiveness, discovering that leasing companies, generally speaking, have room for improvement in resource use. Dmitrieva (2019) and Kirillov (2020) focused on the relationship lessor – lessee, where Dmitrieva proposes methodology for the analysis of efficiency of leasing based on international standards of financial reporting, and Kirillov analysed the terms of cost-effectiveness of leasing companies' operations.

The influence of leasing on acquisition of long-term assets and promotion of innovations in companies are illustrated in the paper by Nechaev (2020) and Zhulyn (2021). Nechaev (2021) widens the research by proposing the methodology for calculation of lease payment, considering asset and financial risks in the development of innovations. Further, in his research, Tilov (2020) focused on the improvement in leasing companies' competitiveness, suggesting measures such as optimisation of financing, improvement of price policy and widening of the offer of services. The stated researches highlight the advantages of the DEA method for estimation of efficiency, application in financial institutions and the leasing industry; they propose solutions and new directions for further research of this area.

This research provides a scientific contribution to the field of efficiency analysis of the leasing industry in Croatia. The research builds on the existing academic literature on the efficiency of financial institutions, extending the analysis to the specifics of the leasing industry. The identification of key inputs and outputs provides a conceptual framework for understanding the factors that shape the efficiency of leasing companies. Furthermore, the comparison of efficiency with indicators of return on assets and return on

equity allows for a comprehensive overview of financial performance and business sustainability.

3. RESEARCH METHODOLOGY

Data envelopment analysis (DEA) is a nonparametric method, presented by Charnes et al. (1978) and Banker et al. (1984) which, by application of linear programming, calculates the efficiency of the decision-making unit (DMU). The output data of this method is expressed in percentage value up to 100%, where DMU, which achieves values of 100%, is considered as fully efficient and represents an example of good practice in combining inputs and outputs. Efficient DMUs make an efficient limit for the calculation of efficiency measures in comparison with other DMUs in the analysed sample.

There are two models of the DEA analysis, namely the CCR model, founded on constant returns, and the BCC model, founded on changeable returns. By comparison of assumptions on which the models rest, it can be perceived that the CCR model applies constant returns, and, in the real economic world, it is not expected that all inputs and outputs will change proportionally. From this point of view, the BCC model is more flexible as it assumes variable returns (Pervan et al., 2021). Thus, the CCR model estimates the total technical efficiency, while the BCC model estimates pure technical efficiency. Moreover, the model orientation can be on inputs, where inputs with unchanged outputs are minimised, on outputs, where outputs are maximised with unchanged inputs and a non-oriented model, where inputs and outputs are improved simultaneously (Kramarić et al., 2022).

Implementation of the DEA analysis in the research has been chosen as it can be used on a small sample; it can measure relative efficiency with several inputs and outputs and, as a non-parametric method, does not require specific functional form defined in advance (Pervan et al., 2021). Due to its specific, more general, assumptions, the BCC model is closer to business in the real world, which is why it is applied in the research. In choosing the BCC model orientation on inputs or outputs, the reviewed literature emphasises the input orientation due to the assumption that leasing companies have greater influence on inputs than on outputs. The choice of inputs and outputs has been made in accordance with the literature which researches the area of efficiency. According to some authors (Golany and Roll, 1989), recommendations concerning the number of input and output units should be two times lower than the analysed DMUs, while other authors propose a stricter criterium according to which the number of input and output units should be at least three times lower than the number of DMUs (Bowlin,

1989). Financial reports are the main source of accounting information which is used in measuring of business efficiency of financial institutions through the analysis of the relationships between certain values, generally accepted as efficiency indicators. (Jurčević and Mihelja Žaja, 2013).

Revenues generated from operational and financial leasing, assets, business expenses and interest expenses most considerably affect the leasing company performance, and this is why they have been used in the efficiency analysis. The first input in the model are business expenses and they consist of depreciation expenses, employee expenses, administrative costs and other expenses. The second input in the model are assets which includes leasing companies' total assets, and the third input are generated expenses based on interest. The outputs of the model are annual revenue realised from financial and operational leasing. From the leasing companies' publicly available annual financial reports, information was gathered about inputs and outputs.

This research also applied a quantitative methodology for analysing financial profitability indicators, with a focus on return on assets (ROA) and return on equity (ROE) indicators in the leasing sector. ROA indicator is used as a key measure of resource management efficiency, calculated through the ratio of gross profit to total assets of the company. This indicator allows for the evaluation of the success of asset use in generating profit, which is especially important in the leasing industry where assets are the basis of the business. The ROE indicator is used to measure return on invested capital, calculated as the ratio of realised profit to capital. In the context of the leasing industry, this indicator serves to assess the efficiency of capital management and the stability of the company's financial structure. The methodological approach involves a comparative analysis of these indicators across different categories of leasing companies, enabling the identification of trends and patterns in the profitability of the sector. This analysis covers 13 active leasing companies in the Republic of Croatia in the period between the years 2016 and 2022.

4. RESEARCH RESULTS

Table 1 shows the correlation analysis between the examined variables. Correlation coefficients in leasing companies have high values, which points to a strong relationship between inputs and outputs. The strongest correlation coefficient is between revenue from financial and operational leasing and business expenses. All the coefficients are positive, which means that it is possible to continue the DEA analysis.

Descriptive statistics for selected inputs and outputs is shown in Table 2, from which it is visible that the leasing companies are of different sizes. The amount of revenue from financial and operational leasing ranges between €673 thousand to €56.2 million. The differences are noticeable also in business expenses, ranging between €353 thousand and €42.1 million, expenses from interests between €110 thousand to €5.6 million and the size of assets, between €8.2 million and €607 million². Independently from this, each leasing company represents one unit for decision making which is homogenous by its nature, provides leasing services and operates in the same environment.

Table 1. Correlation analysis of inputs and outputs in leasing companies

	Expenses from interest	Business expenses	Assets	Revenue from financial and operational leasing
<i>Expenses from interest</i>	1			
<i>Business expenses</i>	0.800285	1		
<i>Assets</i>	0.837457	0.853769	1	
<i>Revenue from financial and operational leasing</i>	0.836211	0.986242	0.882678	1

Source: Author's calculation

Table 2. Descriptive statistics for leasing companies

Description	Count	Minimum	Maximum	Mean	Standard Deviation
<i>Expenses from interest</i>	91	110,498	5,646,906	1,962,951	1,502,046
<i>Business expenses</i>	91	353,097	42,169,779	12,935,910	11,609,948
<i>Assets</i>	91	8,245,786	607,059,101	192,461,083	157,485,409
<i>Revenue from financial and operational leasing</i>	91	673,302	56,272,811	16,895,866	14,430,650

Source: Author's calculation

The DEA analysis facilitates a comparison of efficiency between leasing companies and analysis of the leasing industry efficiency. The DEA analysis results give an insight into the leasing companies' performances. Companies

2 * Converted at a fixed rate of HRK 7.53450 for €1.00

which achieve full efficiency are examples of good combination of resources and serve as examples to the companies with lower efficiency indexes in identification of the areas for improvement and achievement of optimal performances. Also, by application of the DEA method, an insight is enabled into the annual leasing industry efficiency in Croatia, as well as a comparison with annual profitability indicators of capital and assets.

4.1.LEASING COMPANY EFFICIENCY ANALYSIS

Seeing it by the share in the average value of market assets of the analysed period, we can divide the leasing industry in the Republic of Croatia into three groups. The group of large leasing companies whose values of average assets have market shares higher than 10%. Four leasing companies belong to this group, together encompassing 63.55% of the average assets of the Croatian leasing market. The group of medium-sized leasing companies, with shares in the market assets of between 5 and 10%, consisting of three leasing companies with the average market share of 20.36%. and the third group of small leasing companies with average shares in the market assets up to 5%. To sum up, seven leasing companies take up the share of 83.91% in the average market assets in the Republic of Croatia in the observed period, while the remaining six companies had the share of 16.09%. For this reason, the need imposes for efficiency analysis according to the company size.

Table 3. Efficiency of Croatian large leasing companies by shares in total average market assets from 2016 to 2022 (in %)

Leasing	2016	2017	2018	2019	2020	2021	2022	Effic. aver.	St. dev.	Share in assets
<i>UniCredit Leasing Croatia</i>	75.31	89.33	99.26	100	79.77	95.95	87.26	89.55	9.56	21.32
<i>Porsche Leasing</i>	100	100	100	100	100	100	100	100	0	15.29
<i>Erste S-Leasing</i>	100	100	100	100	100	100	99.36	99.90	0.24	14.28
<i>OTP Leasing</i>	95.29	96.04	100	100	100	100	100	98.76	2.13	12.66

Source: Author's calculation

In the group of large companies, UniCredit Leasing Croatia has the highest average share in the market assets, with considerable fluctuations in efficiency in the analysed period. The share in assets of 21.32% indicates the leading position of this company in the market, although its average efficiency is lower in relation to other analysed companies. On the other hand, Porsche Leasing stands out with its full efficiency during all the analysed years. Erste S-Leasing realised high average efficiency during the analysed period, with a slight fall in 2022. OTP Leasing was increasing its efficiency during the years 2016 and 2017 and, from the year 2018, achieves full efficiency, which was reflected in the average efficiency of 98.76%. The share in assets of 12.66% points to a substantial presence in the market, although somewhat lower in comparison with Erste S-Leasing.

The analysis of total trends shows that all the four leasing companies have a high degree of efficiency, each one with their own specificities. All considered, it can be concluded that Erste S-Leasing, OTP Leasing, Porsche Leasing and UniCredit Leasing Croatia represent the key players in the leasing industry in Croatia. While Porsche Leasing distinguishes itself with full efficiency, UniCredit Leasing Croatia dominates with a high share in the average market assets.

Table 4. Efficiency of Croatian medium-sized leasing companies by shares in total average market assets from 2016 to 2022 (in %)

Leasing	2016	2017	2018	2019	2020	2021	2022	Effic. aver.	St. dev.	Share in assets
<i>Impuls-Leasing</i>	97.84	98.14	96.40	95.46	100	100	100	98.26	1.85	7.57
<i>Raiffeisen Leasing</i>	96.94	92.36	77.58	77.42	73.79	72.84	81.33	81.75	9.33	7.02
<i>PBZ-Leasing</i>	100	100	100	100	100	100	100	100	0	5.77

Source: Author's calculation

In the group of medium-sized companies, PBZ-Leasing realises full efficiency throughout the whole period, while Raiffeisen Leasing records a significant fall in efficiency during the analysed period, with the lowest value in 2021. Despite this, the company demonstrates resistance with an increase in efficiency in the year 2022. The level of efficiency of Impuls-Leasing oscillates during the period between the years 2016 and 2019, and it achieves full efficiency in the period between 2020 and 2022.

Table 5. Efficiency of Croatian small leasing companies by shares in total average market assets from 2016 to 2022 (in %)

Leasing	2016	2017	2018	2019	2020	2021	2022	Effic. aver.	St. dev.	Share in assets
Mobil Leasing	97.34	100	100	100	100	100	100	99.62	1.01	4.55
ALD Automotive	100	100	100	100	100	100	100	100	0	3.78
BKS - leasing Croatia	100	100	100	100	85.66	90.68	96.51	96.12	5.76	3.16
Agram leasing	77.26	89.53	99.18	100	100	100	100	95.13	8.77	2.48
Scania Credit Hrvatska	100	100	100	100	100	100	100	100	0	1.66
i4next leasing Croatia	100	100	100	100	100	100	100	100	0	0.46

Source: Author's calculation

In the group of small leasing companies, ALD Automotive, i4next leasing Croatia and Scania Credit Hrvatska realised full efficiency throughout all seven observed years, which is the result of clear management strategies and adaptation to market conditions. Mobil Leasing achieved a high average efficiency of 99.62%, which makes it an almost fully efficient company. It is a result of a lower efficiency realised in 2016 where, afterwards, in the following six years, it achieved full efficiency. With the highest share of 4.55% in assets of the observed group, this company has a considerable influence in the group of small leasing companies.

BKS - leasing Croatia showed oscillations in efficiency, with a fall in the last three years. Despite this, following the fall in efficiency in 2020, it achieves a trend of efficiency growth and average efficiency of 96.12%. Efficiency of the company Agram Leasing grows in the first three observed years, thus showing improvement in efficiency which resulted in full efficiency in the last four analysed years. Although it has a lower share in the average assets in comparison with some competition, the increase in efficiency of 77.26% in 2016, to the full efficiency in 2019, shows a positive business trend in business improvement.

The efficiency analysis of small leasing companies in Croatia illustrates that, although all the companies showed high levels of efficiency, different shares in assets point to different strategies and positions in the market. ALD Automotive, i4next leasing Croatia, Scania Credit Hrvatska and Mobil Leasing distinguish themselves as the leaders in efficiency, while Agram leasing shows constant growth of efficiency, and BKS - leasing Croatia, a recovery after the fall in efficiency realised in 2020.

4.2. ANALYSIS OF LEASING COMPANIES USING INDICATORS OF RETURN ON ASSETS AND RETURN ON EQUITY

Analysis of leasing companies through the indicators of return on assets (ROA) and return on equity (ROE) provides an understanding of financial performances and efficiency in capital and asset management, as well as the capability of generating value for owners. Leasing companies are specific for their business which includes financing and lease of assets such as vehicles and equipment and are often faced with challenges of resource optimisation.

The indicator of return on assets (ROA) shows profitability of leasing companies' assets through the gross revenue and assets ratio. This indicator, which measures the use of assets for generation of gross revenue, becomes the key indicator of efficiency in resource management (Žager et al., 2023). In the leasing industry, where assets are of high values such as vehicles, machinery and vessels, this analysis facilitates estimation of how those assets are used for the generation of gross revenue through leasing activities.

On the other hand, the indicator of return on equity (ROE) has the key role in the measurement of company capability to realise return on invested capital, and points to how many profit units are realised per unit of capital (Žager et al., 2023). In the context of leasing, where financing is the fundamental aspect of the business model, ROE becomes the indicator of efficiency in capital management and financial structure stability. The ROE analysis enables understanding of how own capital is used in leasing for the purposes of increasing value for the owners.

The ROA and ROE analyses are used to identify areas of optimisation and implementation of strategies for improvement of financial performances. The efficiency in asset use becomes crucial for leasing companies, given that assets often form a base for their business. Through the ROA analysis, management of vehicles, equipment or property they possess can be evaluated, taking into account maintenance costs and generation of revenue by means of a leasing contract.

With regard to the fact that leasing companies frequently spend on financial instruments and borrowing in order to finance their assets, ROE becomes the key indicator of the financial structure stability. A high ROE can point to efficient management of the capital, while a low ROE can signal the need for re-evaluation of the financing strategies or for debt restructuring.

Table 6. Indicators of return on assets for large leasing companies in the period between the years 2016 and 2022 (in %)

Leasing	2016	2017	2018	2019	2020	2021	2022	ROA aver.	St. dev.	Share in assets
UniCredit Leasing Croatia	1.76	2.05	1.96	1.24	0.12	1.62	1.10	1.41	0.67	21.32
Porsche Leasing	2.62	0.52	2.21	0.93	0.89	1.99	1.63	1.54	0.78	15.29
Erste S-Leasing	2.61	1.68	2.15	1.67	0.99	1.63	0.30	1.58	0.75	14.28
OTP Leasing	1.55	1.37	1.41	0.93	1.40	1.52	2.12	1.47	0.35	12.66

Source: Author's calculation

Table 7. Indicators of return on equity for large leasing companies in the period between the years 2016 and 2022 (in %)

Leasing	2016	2017	2018	2019	2020	2021	2022	ROE aver.	St. dev.	Share in assets
UniCredit Leasing Croatia	10.43	14.18	13.90	11.51	0.73	9.54	7.18	9.64	4.62	21.32
Porsche Leasing	17.21	3.32	16.18	6.77	6.09	12.72	9.56	10.26	5.29	15.29
Erste S-Leasing	13.16	10.62	13.33	10.70	5.84	8.90	-1.99	8.65	5.35	14.28
OTP Leasing	24.20	23.45	27.20	18.29	20.41	19.31	21.31	22.02	3.11	12.66

Source: Author's calculation

Analysing the data on return on assets and return on equity for four large leasing companies in the period between the years 2016 to 2022, several key trends and characteristics have been noted. UniCredit Leasing Croatia, with its average ROA rate of 1.41% and ROE rate of 9.64%, shows relatively stable, but not exceptionally high, performances, with a substantial fall in profitability of both indicators in 2020. Porsche Leasing, with average ROA rates of 1.54% and ROE of 10.26%, had fluctuations in the business, especially in the year 2017, when the ROA rate went down to 0.52%, and ROE rate to 3.32%. Regardless of these fluctuations, Porsche Leasing maintains good average performances.

Erste S-Leasing realised the highest rate of average ROA of 1.58% and the lowest average ROE rate of 8.65%. The fall in profitability of own capital in 2022 points to possible structural problems or challenges, specific for that period. On the other hand, OTP Leasing excels with the highest ROE rate of 22.02%, in the group of large leasing companies, with average ROA rate of 1.47%. OTP Leasing shows constant growth and stability in its financial results, which points to a strong business strategy and efficient management.

Overall, OTP Leasing is the most efficient in the use of its assets and realisation of profitability on invested capital. Erste S-Leasing, although having the highest average ROA rate, faces challenges as regards capital profitability. UniCredit Leasing Croatia and Porsche Leasing have annual fluctuations in their performances which can be related to business decisions on appearance in the market. This data points to different strategies and degrees of success in the leasing sector, with OTP Leasing as a notable example of successful management in the observed period.

Table 8. Indicators of return on assets for medium-sized leasing companies in the period between the years 2016 and 2022 (in %)

Leasing	2016	2017	2018	2019	2020	2021	2022	ROA aver.	St. dev.	Share in assets
<i>Impuls-Leasing</i>	2.80	2.05	2.16	2.49	1.90	2.52	1.93	2.26	0.34	7.57
<i>Raiffeisen Leasing</i>	0.98	0.35	2.30	0.26	-0.90	2.24	1.53	0.97	1.16	7.02
<i>PBZ-Leasing.</i>	2.18	2.50	2.58	2.82	1.94	2.50	3.20	2.53	0.41	5.77

Source: Author's calculation

Table 9. Indicators of return on equity for medium-sized leasing companies in the period between the years 2016 and 2022 (in %)

Leasing	2016	2017	2018	2019	2020	2021	2022	ROE aver.	St. dev.	Share in assets
Impuls-Leasing	61.79	44.14	47.96	51.83	32.25	38.68	43.32	45.71	9.49	7.57
Raiffeisen Leasing	7.38	2.29	12.59	1.64	-5.41	10.80	8.61	5.41	6.27	7.02
PBZ-leasing.	12.21	11.61	14.91	16.54	10.34	11.86	15.97	13.35	2.42	5.77

Source: Author's calculation

By data analysis of return on assets and return on equity of medium-sized leasing companies, different trends and performances of Impuls-Leasing, Raiffeisen Leasing and PBZ-Leasing were perceived. Thus Impuls-Leasing shows constantly good performances with the average ROA rate of 2.26% and a considerably higher average ROE rate than other companies of 45.71%. As concerns ROA, PBZ-Leasing has the best performance among all the three companies, with the average of 2.53%, and ROE average rate of 13.35%. Raiffeisen Leasing realised the lowest average ROA rate of 0.97%, with average ROE rate of 5.41%.

By comparing this data, it can be concluded that Impuls-Leasing had a high capital productivity, which can be the result of a highly efficient management or specific business strategy. PBZ-Leasing shows the best results in respect of ROA, which points to efficient use of assets. On the other hand, Raiffeisen Leasing was facing bigger challenges as regards profitability, especially in 2020. These indicators reflect different degrees of success in management and different business strategies within the group of medium-sized leasing companies.

Table 10. Indicators of return on assets for small leasing companies in the period between the years 2016 and 2022 (in %)

Leasing	2016	2017	2018	2019	2020	2021	2022	ROA aver.	St. dev.	Share in assets
<i>Mobil Leasing</i>	0.47	2.31	0.58	2.61	0.16	1.57	1.18	1.27	0.94	4.55
<i>ALD Automotive</i>	4.71	4.19	4.63	3.25	3.03	6.45	6.35	4.66	1.35	3.78
<i>BKS - leasing Croatia</i>	1.42	0.49	1.62	1.07	0.39	0.95	1.31	1.04	0.46	3.16
<i>Agram leasing</i>	1.15	0.32	1.08	1.32	2.72	1.77	3.45	1.69	1.07	2.48
<i>Scania Credit Hrvatska</i>	1.88	0.06	0.77	0.97	1.32	3.53	0.67	1.31	1.13	1.66
<i>i4next leasing Croatia</i>	0.58	0.91	0.93	0.80	0.42	0.76	0.72	0.73	0.18	0.46

Source: Author's calculation

Table 11. Indicators of return on equity for small leasing companies in the period between the years 2016 and 2022 (in %)

Leasing	2016	2017	2018	2019	2020	2021	2022	ROE aver.	St. dev.	Share in assets
<i>Mobil Leasing</i>	2.33	13.48	3.66	13.50	0.63	4.95	4.00	6.08	5.24	4.55
<i>ALD Automotive</i>	24.33	24.72	31.74	21.56	19.82	36.25	39.25	28.24	7.54	3.78
<i>BKS - leasing Croatia</i>	19.05	13.49	16.80	11.45	6.62	15.54	18.77	14.53	4.43	3.16
<i>Agram leasing</i>	12.92	5.73	18.46	17.55	14.94	13.84	26.77	15.74	6.39	2.48
<i>Scania Credit Hrvatska</i>	27.16	-1.65	19.87	23.40	19.46	33.73	5.02	18.14	12.39	1.66
<i>i4next leasing Croatia</i>	13.03	14.00	13.52	14.29	6.32	13.67	12.93	12.54	2.78	0.46

Source: Author's calculation

By data analysis of return on assets and return on equity of small leasing companies, significant differences are evident in indicators among the companies, where ALD Automotive stands out with high average ROA rates of 4.66% and ROE of 28.4%. The realised indicators are the highest among small leasing companies. On the other hand, i4next leasing Croatia has the

lowest average return rate on assets of 0.73%, with the average ROE rate of 12.54%.

Mobil Leasing had the highest share in average market assets among small companies of 4.55%, with average ROA rates of 1.27% and ROE of 6.08%. BKS - leasing Croatia and Agram leasing had similar trends, with average ROA rates of 1.04% and 1.69%, and ROE of 14.53% and 15.74%. The company Scania Credit Hrvatska realised a high average ROE rate of 18.14%, and the average ROA rate of 1.31%. Annual ROE rates of this company considerably vary, which points to changeable annual productivity.

Overall, small leasing companies show a wide range in asset productivity and own capital. ALD Automotive dominates in the segment of small leasing companies with realised high rates in both indicators, while i4next leasing Croatia shows room for business improvement. Mobil Leasing, BKS - leasing Croatia, Agram leasing and Scania Credit Hrvatska show performances with certain room for growth.

4.3. EFFICIENCY ANALYSIS OF THE LEASING INDUSTRY IN CROATIA

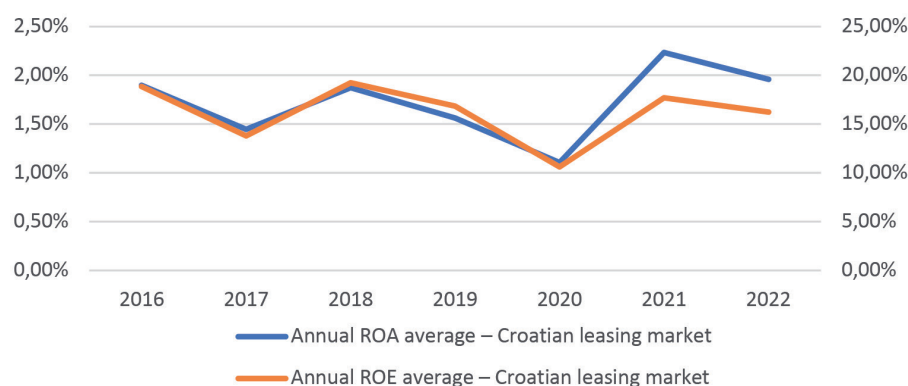
Analysis of the leasing market facilitates monitoring of performances through a period of time, with the aim to understand the adjustment of strategies and business models in order to respond to the market dynamics. With application of DEA analysis, ROA and ROE, efficiency trend analysis helps in recognition of long-term market patterns, enabling insight into potential challenges and opportunities for growth. The analysed indicators provide a comprehensive insight into the total efficiency, the efficiency in assets and capital management, business sustainability and the capability to generate profits. Analyses of these indicators are becoming crucial for the understanding of the market and optimisation of operations, as well as for the creation of long-term sustainability in the competitive environment of the leasing industry.

Table 12. Illustration of average annual values efficiency, return on assets and return on equity of the leasing industry in the Republic of Croatia in the period between the years 2016 and 2022 (in %)

DESCRIPTION	2016	2017	2018	2019	2020	2021	2022	Average rate	St. dev.
DEA BCC_I average Croatia	95.38	97.34	97.88	97.91	95.32	96.88	97.27	96.86	1.09
ROA annual average Croatia	1.90	1.45	1.87	1.57	1.11	2.23	1.96	1.73	0.37
ROE annual average Croatia	18.86	13.80	19.24	16.85	10.62	17.68	16.21	16.18	3.05

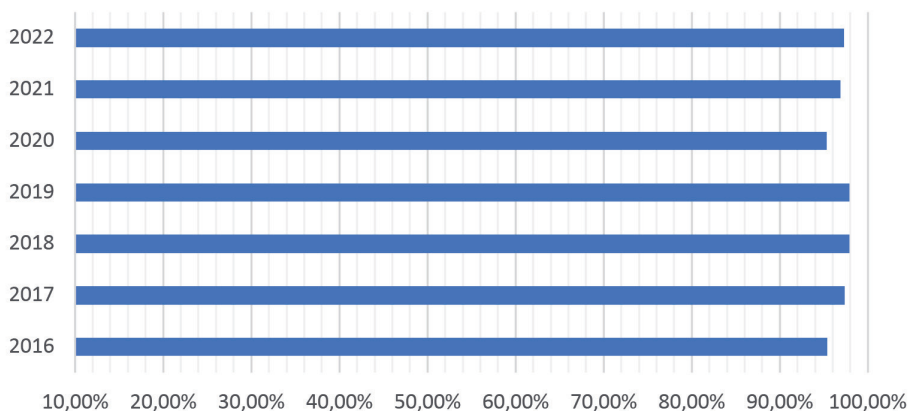
Source: Author's calculation

Graph 1. Comparative illustration of average annual indicators of return on assets and return on equity of the leasing industry in the Republic of Croatia in the period between the years 2016 and 2022



Source: Author's calculation

Graph 2. Average annual efficiency of the leasing industry in the Republic of Croatia in the period between the years 2016 and 2022



Source: Author's calculation

The market analysis in the period between the years 2016 and 2022 facilitates a broader insight into the key financial indicators and the dynamics of the leasing industry in Croatia. The efficiency indicators are high during the analysed period, oscillating between 95.32% and 97.91%, with the average efficiency rate of 96.86%. This suggests that leasing companies had maintained stable efficiency levels, which points to the business flexibility and adjustment to market requirements.

The annual average ROA shows certain fluctuations during the analysed period. After the initial fall in 2017, the ROA indicator recorded a gradual growth in 2018, following a new fall in the next two years due to the global pandemic. The following year, 2021, the rate of return on assets reached 2.23%, only to slightly fall in 2022, to 1.96%. The average annual rate of return on assets in Croatia stands at 1.73%.

The annual average ROE also shows a changeable trend during the analysed period which follows the ROA movement trend, which is visible from the illustrated graph. After the fall in 2017 and growth in 2018, the ROE rate plummeted in the pandemic years of 2019 and 2020, with a growth to 17.68% in 2021. In 2022, however, a new decline to 16.21% was recorded. This points to the challenges of efficiency and profitability which companies went through during specific periods. The average annual rate of return on equity in Croatia is 16.18%. Overall, the leasing market in Croatia has high total annual efficiency averages, high rates of returns on assets and capital, thus also showing a financial picture of companies which operate in this market

and pointing to their capability of efficient business and management of assets and capital.

5. CONCLUSION

The main goal of the paper is the efficiency analysis of the leasing companies and leasing industry in the Republic of Croatia. In the observed period between the years 2016 and 2022, a process of consolidation of the Croatian leasing industry was in progress, which reduced the number of leasing companies, so this research was focused on 13 active leasing companies. The data for the analysis was collected from the leasing companies' publicly available financial reports. The analysis was, according to the examined literature, conducted using the DEA method, with the application of input-oriented BCC model. The inputs used in the research are business expenses, assets and expenses of leasing companies' interests, while the output is revenue from financial and operational leasing.

The research findings show that, in the market of 13 leasing companies, four companies together encompassed the total market share of 63.55%, three leasing companies 20.36%, while the remaining six companies together had the average market share of 16.09%. Considering efficiency according to the size of the leasing companies, considerable differences in efficiency were not perceived, so it can be concluded that the company size does not affect its efficiency.

From the analysis of the leasing industry in the Republic of Croatia it can be concluded that the total realised average efficiency is very high and equals 96.86%, with annual oscillations of between 95.32% and 97.91%. The total realised average rate of return on assets is 1.73%, with oscillations of between 1.11% and 2.23%, and the total average rate of return on equity is 16.18%, with oscillations of between 10.62% and 18.86%. Based on the results of the conducted research it is concluded that the leasing industry in the Republic of Croatia realises high efficiency, with high returns on assets and capital, and that the company size is not a significant factor in determination of business efficiency and performance.

The research limitation is reflected in the fact that, in their financial reports, leasing companies do not present assets, business expenses and expenses from interests separately, according to operational and financial leasing. Separated illustrations would facilitate a more detailed analysis of the efficiency of the Croatian leasing company's and leasing industry's according to the types of leasing.

In future research, analyses and comparisons of efficiency of the leasing industry of Croatia and of other countries can be conducted. Furthermore, comparative analyses of efficiency can be made according to the size of the leasing companies of Croatia and of other countries and compare the efficiency levels between companies of similar asset sizes.

6. LITERATURE

1. Athanassopoulos, A. D. and Giokas, D., 2000., The Use of Data Envelopment Analysis in Banking Institutions: Evidence from the Commercial Bank of Greece, *Interfaces*, 29(3), pp. 1-13.
2. Banker, R. D., Charnes, A. and Cooper, W. W., 1984., Some models for estimating technical and scale inefficiencies in data envelopment analysis, *Management science*, 30 (9), pp. 1078-1092.
3. Baten, A and Hasan, M. Z, 2014., Cost Efficiency Measurement of Leasing Companies with SFA and DEA Approach, *Advances in Natural & Applied Sciences*, 8 (3). pp. 146-154
4. Behr, A., 2015., *Data Envelopment Analysis*, Production and Efficiency Analysis with R, Springer, pp. 135-159.
5. Berger, A. N. and Humphrey, D. B., 1997. Efficiency of financial institutions: International survey and directions for future research. *European journal of operational research*, 98(2), 175-212.
6. Bowlin, W. F., 1998. Measuring performance: An introduction to data envelopment analysis (DEA), *The Journal of Cost Analysis*, 15(2), pp. 3-27.
7. Charnes, A., Cooper, W. W. and Rhodes, E., 1978., Measuring the efficiency of decision making units, *European journal of operational research*, 2(6), pp. 429-444,
8. Cooper, W. W., Seiford, L. M., and Zhu, J., 2011., Data Envelopment Analysis: History, Models, and Interpretations, *Handbook on Data Envelopment Analysis*, Springer, pp. 1-39.
9. Dalfard, M. V., Sohrabian, A., Najfabadi, A. M., and Alvani, J., 2012. Performance Evaluation and Prioritization of Leasing Companies Using the Super Efficiency Data Envelopment Analysis Model, *Acta Polytechnica Hungarica*, 9(3), pp. 183-194.
10. Dmitrieva, I. N., Myznikova, T. N., Chernenko, A. L. and Shishkina A. V., 2019., Analysis of Efficiency of Financial Leasing, *Journal of Accounting and Auditing: Research & Practice*, 2019, pp. 1-11.
11. Ebrahimnejad, A., Tavana, M., Latfi, F. H., Shahverdi, R. and Yousefpour, M., 2014., A three-stage Data Envelopment Analysis model with application to banking industry, *Measurement*, 49, pp. 308-319
12. Golany, B., & Roll, Y., 1989. An application procedure for DEA. *Omega*, 17(3), p. 237-250.
13. Harker, P.Z. and Zenios, S. A., 2000., *Performance of financial institutions: efficiency, innovation, regulation*, Cambridge University Press, Cambridge
14. Jurčević, B. and Žaja, M. M., 2013. Banks and insurance companies' efficiency indicators in the period of financial crisis: The case of the Republic of Croatia. *Economic research-Ekonomska istraživanja*, 26(1), pp. 203-224.
15. Kaffash, S. and Marra, M., 2017. Data envelopment analysis in financial services: a citations network analysis of banks, insurance companies and money market funds, *Annals of Operations Research*, 253(1), pp. 307-344.
16. Kirillov, Yu. V., 2020, Analysis of leasing efficiency for the lessor, *IOP Conference Series: Materials Science and Engineering*, 919(4), pp. 1-6.

17. Kočišová, K. 2014., Application of Data Envelopment Analysis to Measure Cost, Revenue and Profit Efficiency, *Statistika: Statistics & Economy Journal*, 94(3), pp. 47-57.
18. Molinero, C. and Woracker, D., 1995., Data Envelopment Analysis a Non-Mathematical Introduction, *OR Insight*, 9(4), pp. 22-28.
19. Nechaev, A. S, Zakharov, S. V., Barykina Y. N., Vel'm M. V. and Kuznetsova O. N., 2022., Forming methodologies to improving the efficiency of innovative companies based on leasing tools, *Journal of Sustainable Finance & Investment*, 12(2), pp. 536-553
20. Nechaev, A. S., Antipina, O. V., Rasputina, A. V., Tyapkina, M. F. and Ilyina, E. A., 2021., Methods of Lease Payments Calculating in Terms of Innovations Financing, *Montenegrin Journal of Economics*, 17(1), pp. 133-149.
21. Pavić Kramarić, T., Pervan, M. and Ćurak, M., 2022., Determinants of Croatian Non-Life Insurance Companies' Efficiency, *Croatian Operational Research Review*, 13(2), pp. 149-160.
22. Pervan, M., Ćurak, M. and Pavić Kramarić, T., 2021., Has Accession to the European Union Affected the Efficiency of Croatian Insurance Companies? *International Review of Economics & Business*, 24(1), pp. 67-98.
23. Rahman, S. K., 2020., An Evaluation of Leasing Companies' Efficiency Through Data Envelopment Analysis, *International Journal of Project Management and Productivity Assessment*, 8(2), pp. 1-22.
24. Sherman, H.D. and Ladino, G., 1995., Managing Bank Productivity Using Data Envelopment Analysis (DEA), *Interfaces*, 25(2), pp. 60-73.
25. Tilov, A. A., 2020., Ways to improve the forms and methods of increasing the competitiveness of leasing companies in Russia, *Upravljenje / Management*, 8(1), pp. 27-34
26. Zhu, J., 2014., *Quantitative Models for Performance Evaluation and Benchmarking: Data Envelopment Analysis with Spreadsheets*, Springer.
27. Zhulyyn O. V., Nazarenko I. I., Tesliuk N. P. and Shturko V. V. 2021., Leasing as a Tool for Innovative Development of Enterprises, *Business Inform*, 7, pp. 195-201.
28. Žager, K., Sačer Mamić I., Sever, S. & Žger, L., 2023. *Analiza financijskih izvještaja*, VI izdanje, Zagreb: Rif.

PENSION SYSTEM SUSTAINABILITY IN CROATIA: TRENDS IN THE EU CONTEXT

SABINA HODŽIĆ

University of Rijeka

Faculty of Tourism and Hospitality Management

Ika, Croatia

sabinah@fthm.hr

TANJA FATUR ŠIKIĆ

University of Rijeka

Faculty of Tourism and Hospitality Management

Ika, Croatia

tanjafs@fthm.hr

NENSI BOŠNJAK

University of Rijeka

Faculty of Tourism and Hospitality Management

Ika, Croatia

nensi.bosnjak@gmail.com

Paper Category: Scientific review

ABSTRACT

Due to the economic, demographic and financial challenges in the European Union, the sustainability of pension systems is an urgent issue. Since gaining independence, Croatia has undertaken significant pension system reforms to improve functionality, funding methods, pension conditions and pension levels. However, ensuring sustainability and resilience in a dynamic market remains a challenge. The aim of this paper is therefore to analyse the opinion of Croatian citizens on the sustainability of the pension system and to make recommendations for reforms based on the survey results. The sample consisted of 157 respondents collected via the Google Forms platform and social media. The empirical results indicate that the current Croatian pension system is unsustainable due to the ageing population and the increasing number of pensioners. Based on the results, the recommendations to improve the current situation are to ensure the stability of the pension system through positive demographic development and to increase the level of financial literacy in the pension system. Consequently, continuous reforms of the pension system are recommended to achieve financial stability.

Keywords: Croatia, European Union, pension system, sustainability

1. INTRODUCTION

The country's social policy is heavily reliant on its pension system. Every country prioritises social care for its residents since it improves their quality of life and adds to their satisfaction. Due to the development of cities and strong industrialisation, the needs of citizens have changed a lot. Therefore, each country's pension system has its own characteristics, but most of them have the same goal - to secure pension entitlements. Looking only at European pension systems, they face a double challenge - to maintain the financial sustainability of adequate incomes and to provide insurance for Europeans in retirement. The main purpose of pension systems is to protect older people from poverty and provide them with a decent standard of living and economic independence in old age. It is therefore necessary to achieve the financial sustainability of pension systems. Pensions have a significant impact on government budgets and labour supply, and this impact must be taken into account in pension policy.

The European Union (EU) does not have a uniform pension system that would be applied by all Member States. Some issues are partly resolved by decisions, regulations or legal acts of the EU, while most decisions on the pension system are left to the Member States. This means that Member States are still largely independently responsible for the adequacy and sustainability of pension systems, which is a great responsibility and duty considering the importance of pensions and the different options within the pension system. The structure and composition of the pension environment in the EU varies considerably from country to country and is often determined by national social and labour law. In practice, all commonly known forms are represented, comprising the first, second and third pillars or a combination thereof, as well as specific forms that exist within individual pillars.

The Croatian pension system has three pillars. Each of these pillars provides insured persons with certain rights to which they are entitled as a result of their pension insurance contributions. The first pillar, known as the pillar of intergenerational solidarity, requires the working people to pay 15% of their gross salaries to current pensioners in the hope that future generations will give them pensions. This method, sometimes known as "pay-as-you-go", was designed when there were more young people than senior people, making it unsustainable to rely solely on it now. The second pillar of old-age provision is similarly mandatory, and it is based on individual capitalised savings. In this scenario, insured individuals set away 5% of their gross monthly earnings. The monies are subsequently transferred to a personal account with the pension fund. The third pension pillar is voluntary

pension savings, in which the insured control the quantity and timing of their investments. The Croatian pension system is capitalised and based on individual accounts of the working population.

Furthermore, the pension system is influenced by a variety of factors, including demographics. Several variables affect population ageing, including negative natural growth and increased life expectancy. The ageing of the population is also caused by the emigration of the younger population. Such trends are problematic for the pension system since the number of people paying into it is decreasing. This means that the number of persons contributing to the first pillar, and consequently funding current pensioners' pensions, is declining. The current issues and revisions to the pension system raise concerns about the system's future sustainability in Croatia. Therefore, the paper aims to provide an answer to the central research question, which is: What is the level of familiarity and sustainability of the Croatian pension system? The main objective of this paper is therefore to examine trends and analyse the opinion of Croatian citizens on the level of familiarity and sustainability of the pension system and to formulate recommendations for reforms based on the survey results. The paper will not only provide scientific results but will also have practical implications for understanding the development of pension systems in the EU, with a particular focus on the familiarity and sustainability of the Croatian pension system. Based on the research findings, the novelty of the paper lies in the citizens' perspective on the sustainability of the Croatian pension system as well as the implications for improving the current system as identified by the survey. The paper consists of six parts. After a brief introduction, the literature review presents the most important studies on the pension system. The following section describes the indicators for monitoring the pension system and the current trends in pension expenditure. The fourth section describes the methodology, while the fifth section presents the results of the survey. The final section contains a conclusion and recommendations for further research as well as limitations.

2. LITERATURE REVIEW

In the literature, there is a rich knowledge and research on the pension system sustainability, but still with no clear conclusion. Therefore, many researchers have examined the pension systems reforms (Barro, 1974; Schmäl, 2000; Alonso and Conde-Ruiz, 2007, Martin and Whitehouse, 2008; Natali, 2008; Grech, 2010; Kowalewski, 2012; Earles, 2013; Péter et al. 2020; Lee, 2024; Sanchez-Romero et al. 2024) as well as sustainability (Pallares-

Miralles et al. 2012; Chybalski, 2014; Rotschedl, 2015; Sika and Martišková, 2016; Matic and Vretenar Cobović, 2017; Hodžić et al. 2019; Tomassetti 2023; Nomura, 2023; Sowiński, 2024). In terms of sustainability, the most interesting studies are by Rotschedl (2015), Sika and Martišková (2016), Grech (2010), Pallares-Miralles et al. (2012), Hodžić et al. (2019), Péter et al. (2020), Tomassetti (2023). Hence, Rotschedl's (2015) research identified two viewpoints on sustainability. The first is a quantitative perspective, which reflects a demographic picture, whereas the second is a monetary perspective that considers the population's income structure. Using the data of the Czech Republic, the author found that the pay-as-you-go pension system may be considered as unsustainable. In a similar way, but on the case of the Slovak Republic, Sika and Martišková (2016) found that the Slovak Republic will have to incorporate automatic stabilisers in the calculation of pension entitlements, to strengthen the financial sustainability of the pension system.

Grech (2010) considered that a successful pension system is a system which achieves its goals with the least pressure on constraints. Pallares-Miralles et al. (2012) defined the sustainability of pension systems as an ability from the government side to fulfil all obligations in current and future pension systems. They also proposed a set of pension sustainability indicators - pension spending to GDP ratio, pension spending to general tax revenue ratio, unfunded pension liability as a share of GDP and tax revenues and net pension liability as a share of GDP and tax revenues.

Hodžić et al. (2019) found that EU countries with a higher old-age dependency ratio, life expectancy at age 65, replacement rate and poverty rate and public debt will also create higher pension expenditure, on average, while factors related to the labour market negatively affect pension spending. To achieve stability within the pension system, two perspectives (demographic and monetary view) play an important role.

Péter et al. (2020) examined recent statistics on demography, the economy, employment, and other issues, with a focus on the pension fund's prospects. They determined that a declining population of childbearing women will result in a steady decline in birth rates, despite any slight rise in fertility rates. Family policies alone are insufficient to manage economic and pension threats. However, increasing elderly people's labour-market involvement can effectively reduce rising pension expenses. This can be accomplished by encouraging elderly participation, raising retirement ages, protecting physical and mental health and employability, and cultivating a culture of self-reliance.

From the perspective of the sustainability of the Croatian pension system, the most interesting study is by Matić and Vretener Cobović (2017). In their study, they analysed the efficiency and sustainability of the Croatian pension system based on a survey. They found that the sustainability of the pension system is more strongly influenced by non-economic factors such as the attitude of those affected, awareness and trust in the system, willingness to participate in the pension scheme, expectations and satisfaction than by economic factors. Based on the empirical results from 2016, the general conclusion is that respondents expressed dissatisfaction with the inefficiency of the pension system and its long-term unsustainability. Subsequently, this study served as a basis for further research on the sustainability of the Croatian pension system.

3. THE INDICATORS AND CURRENT TRENDS OF PENSION EXPENDITURES IN THE EU

Since the end of the twentieth century, the EU has adopted significant pension reforms. Their scope varies by country. During and immediately following the 2007-2008 financial crisis, measures were primarily aimed at improving the financial viability of pension systems. Recently, as the economy has recovered and fiscal pressures have eased, the focus of reforms has switched to growing worry about pension adequacy.

Pension systems in EU countries range in terms of the length of statutory social insurance, payment levels, financing sources, beneficiary scope, benefit levels, and degree of redistribution. The EU has been striving to make sure that minimum pensions are adequate, that long-term income security is maintained, and that social protection systems are strengthened to promote a dignified living for all, while safeguarding the sustainability of pension systems (EPRS, 2023). The OECD recently recommended that policymakers enact legislation to ensure that people continue to save for retirement and avoid selling assets when markets change, and that pension providers behave in accordance with their investment objectives (OECD, 2022).

The EU's objectives for social protection with regard to the EU 2030 poverty target, which includes the pension system, are to reduce the number of people at risk of poverty or social exclusion by at least 15 million by 2030. Based on the European Commission's document (2022, p. 6) on monitoring social protection, the targets for sustainable pensions are as follows:

- a. “adequate retirement incomes for all and access to pensions which allow people to maintain, to a reasonable degree, their living standard

- after retirement, in the spirit of solidarity and fairness between and within generations;
- b. the financial sustainability of public and private pension schemes, bearing in mind pressures on public finances and the ageing of populations, notably by: supporting longer working lives and active ageing; by balancing contributions and benefits in an appropriate and socially fair manner; and by promoting the affordability and the security of funded and private schemes;
 - c. transparency of pension system, well adapted to the needs and aspirations of women and men and the requirements of modern societies, demographic ageing and structural change; that people receive the information they need to plan their retirement and that reforms are conducted on the basis of the broadest possible consensus”.

Based on the individual objectives, there are groups of primary and secondary indicators. The list of indicators based on the above objectives can be found in Table 1.

Table 1. The list of primary and secondary indicators

ADEQUATE PENSIONS		
PRIMARY INDICATORS		
INDICATOR	DEFINITION	DATA SOURCE
At-risk-of-poverty rate of older people	Risk of poverty for people aged 65+	Eurostat - EU SILC
Median relative income of elderly people	Median equivalised disposable income of people aged 65+ as a ratio of income of people aged 0-64	Eurostat - EU SILC
Aggregate replacement ratio	Ratio of the median individual pensions of the 65-74 age group relative to median individual earnings of the 55-64 age group, excluding other social benefits	Eurostat - EU SILC
Change in projected theoretical replacement ratio for base case accompanied with information on type of pension scheme and change in projected public pension expenditure	Change in the theoretical level of income from pensions at the moment of take-up related to the income from work in the last year before retirement for a hypothetical worker, percentage points, with information on the type of pension scheme and changes in the public pension expenditure as a share of GDP	ISG and EPG-AWG

SECONDARY INDICATORS		
At-risk-of poverty rate of older people	Risk of poverty for people aged 0-64, 0-74, 65+, 75+	Eurostat - EU SILC
Median relative income of elderly people (65+)	Median equivalised disposable income of people aged 65+ as a ratio of equivalised disposable income of people aged 0-64	Eurostat - EU SILC
Aggregate replacement ratio (incl. other social benefits)	Ratio of median individual pensions of the 65-74 age group relative to median individual earnings of the 55-64 age group, including other social benefits.	Eurostat - EU SILC
Income inequality among population aged 65+	Income quintile ratio (S80/S20) among population aged 65+	Eurostat - EU SILC
At-risk-of-poverty gap of elderly people	Poverty gap by age brackets (for 65+ and 75+) at the 60% threshold	Eurostat - EU SILC
At-risk-of-poverty rate of pensioners	At-risk-of-poverty rate restricted to the field of people whose main activity status is 'retired'	Eurostat - EU SILC
Incidence of risk of elderly poverty by housing tenure status	Incidence of risk of poverty for people belonging to the 65+ and 75+ age groups by the housing tenure status of their households: full ownership, owner still paying mortgage; tenants at market price; tenants at subsidised price or rent free	Eurostat - EU SILC
Risk of poverty calculated at 50% and 70% of median national equivalised income for the elderly	Risk of poverty calculated at 50% and 70% of median national equivalised income for people aged 65+ and 75+.	Eurostat - EU SILC
SUSTAINABLE PENSIONS		
PRIMARY INDICATORS		
Total current pension expenditure (% of GDP)	Pension expenditure is the sum of seven different categories of benefits: disability pension, early retirement benefit due to reduced capacity to work, old-age pension, anticipated old-age pension, partial pension, survivors' pension and early retirement benefit for labour market reasons.	Eurostat - ESSPROS
Employment rate	% of persons employed in relation to the total number of people in a given age group.	Eurostat - LFS
Duration of working life	The duration of working life indicator measures the number of years a person at a given age is expected to be active in the labour market.	Eurostat - LFS

Projections of pension expenditure, public and total (% of GDP)	Projections of pension expenditures reflect assumptions made on economic trends (notably evolution of employment rates, in particular for older workers).	EPC AWG
SECONDARY INDICATORS		
Total social protection expenditures (% of GDP)	Total expenditure on social protection (as % of GDP)	Eurostat - ESSPROS
Decomposition of the projected increase in public pension expenditure	Decomposition with the old age dependency ratio, the employment effect, the take-up ratio and the benefit ratio.	EPC AWG
MODERNISED PENSIONS		
PRIMARY INDICATORS		
Gender differences in the risk of poverty	The absolute difference between males and females in the at-risk-of-poverty rate for single-person households (see at-risk-of-poverty rate)	Eurostat - EU SILC
Gender differences in the relative income of older people	The absolute difference between males and females in the relative income of elderly people (65 and more) for single-person households.	Eurostat - EU SILC
Gender differences in aggregate replacement ratio	The absolute difference between males and females in the aggregate replacement ratio.	Eurostat - EU SILC
SECONDARY INDICATORS		
Gender differences in the relative income of older people	The absolute difference between males and females in the relative median income ratio, which is the ratio between the median equivalised disposable income of persons aged 65 or over and the median equivalised disposable income of persons aged between 0 and 64.	Eurostat - EU SILC

Source: Author's compilation based on European Commission (2022) document for monitoring social protection.

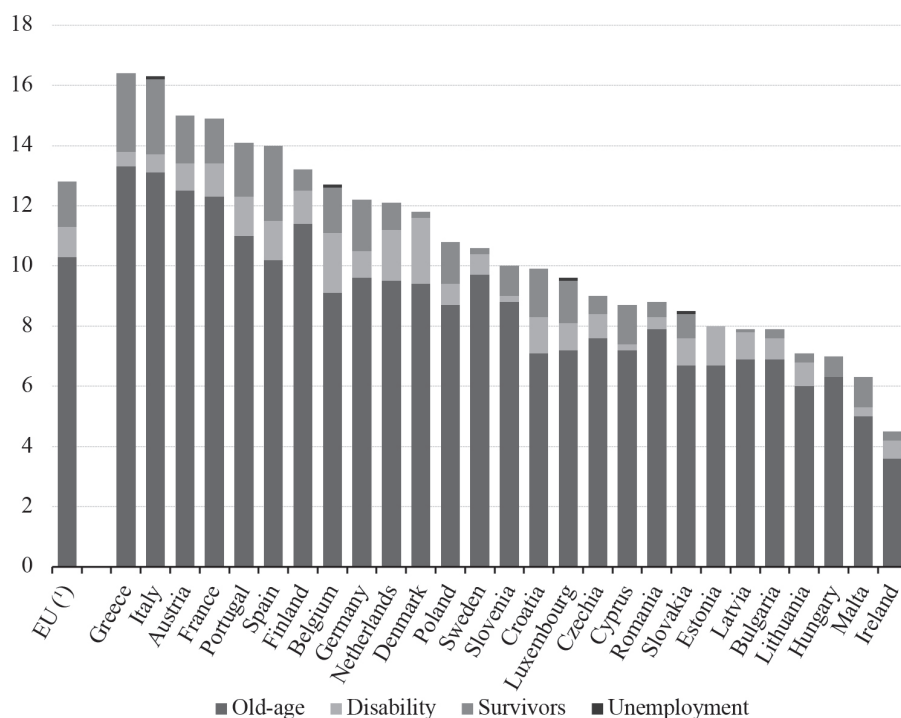
In addition to the most important indicators, the paper also presents trends in pension expenditure. Trends in expenditures for the pension system in EU countries are characterised by several key challenges: ageing population, significant variations in pension expenditures between countries and sustainability of pension system concerns in the long term.

The EU population is rapidly ageing, with the proportion of individuals aged 65 and up predicted to increase from 21.1% in 2022 to about 30% by

2050 (European Commission, 2024). This demographic transition will result in higher age-related public spending on pensions, healthcare, and long-term care. The Ageing Working Group (AWG) estimates that the entire cost of ageing amounts to 24.4% of GDP in 2022, rising to 25.6% of GDP in 2070. The majority of this increase is predicted to be by 2045 (European Commission, 2024).

In 2021, 27% of the EU population got a pension. Slovakia had the greatest share of the population receiving a pension (33.2%), followed by Luxembourg and Lithuania at just under 33.0%. In contrast, the proportion of the population receiving at least one pension was less than 20.0% in Cyprus (19.0%) and Malta (19.2%) (Eurostat, 2024). Furthermore, pension expenditure varies greatly between EU members. In 2021, EU pension expenditure accounted for 12.9% of GDP (Figure 1).

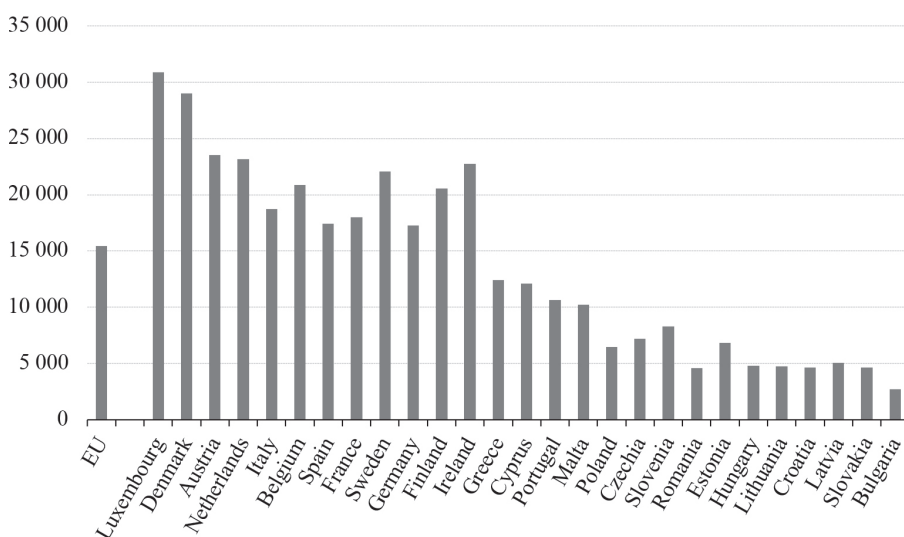
Figure 1. Expenditure on pensions in 2021, by type of pension (% of GDP)



Source: Eurostat 2024. Social protection statistics - pension expenditure and pension beneficiaries

In 2021, Greece's ratio peaked at 16.4% of GDP, followed by Italy (16.3%). The lowest ratios were found in Ireland (4.5% of GDP), Malta (6.4%), Hungary (7.0%), and Lithuania (7.1%). In 2021, pension expenditure per beneficiary for people receiving an old-age pension differed significantly between EU Member States, ranging from €30,898 in Luxembourg to €2,715 in Bulgaria (Figure 2.).

Figure 2. Average pension expenditure per beneficiary for old-age pensions in 2021, in €



Source: Eurostat 2024. *Social protection statistics - pension expenditure and pension beneficiaries*

As a result, an old-age pensioner in Luxembourg earned a (gross) pension that was 2.0 times higher than the EU average (€15,428). In comparison, the average EU expenditure on old-age pensions was 5.7 times higher than that recorded in Bulgaria. A portion of these disparities might be attributable to varying pricing levels between EU Member States; for example, the overall cost of living in Luxembourg is higher than in Bulgaria.

Between 2008 and 2021, the total number of pension recipients in the EU Member States grew by 5.8%, while pension spending increased by 25.1%. The number of pension beneficiaries increased gradually and remained quite stable. On the other hand, spending increased rapidly in 2009 (up 5.0%), followed by modest growth after 2013, with annual growth rates reaching 2.7% in 2020. According to the Ageing Report (2024), Luxembourg, Slovenia, and Belgium are predicted to have the largest pension expenditures in 2070,

accounting for over 18% of GDP. In contrast, pension expenditures in Greece, Croatia, France, and Latvia are predicted to fall during the next fifty years (European Commission, 2024).

Many European pension systems are unsustainable in the long term. Previous reforms have been insufficient to restore sustainability, and pension spending is anticipated to remain at historically high levels. As of 2021, the lifetime benefit-to-contribution ratio for younger generations is 1.7, showing that pension systems are unsustainable in the long term (Martinez and Soto, 2021). These trends underline the importance for EU countries to address the difficulties of pension sustainability and adequacy in the face of an ageing population and uncertain economic conditions.

Croatia has followed the main reform trends in the EU, but the financial system remains excessively reliant on budget transfers, and pension adequacy has worsened further. Croatia's working life remains short, ranking second in the EU, and the second pillar has produced respectable returns in the accumulation phase but essentially none in the pension payout phase. The third pillar of the pension programme remains constant, but its coverage ratio is low. Over the previous ten years, Croatia's proportion of public pension expenditure has stabilised at just over 10% of GDP, with fluctuations depending on the economic circumstances (from 9.5% in 2007 to 11.6% in 2015).

Despite gradual expansion, Croatia's working life span remains the second shortest in the EU. According to the World Bank report (2025), Croatia has lost around 400,000 inhabitants, and forecasts indicate a further decline of 19 per cent over the next three decades. This will consequently have an impact on the challenges of the labour market. This is one of the most significant difficulties confronting the Croatian pension system. Early retirement alternatives are often exploited, which leads to inadequate pension adequacy. In 2017, over 45% of Croatia's new old-age pension beneficiaries made use of an early retirement option. Furthermore, pensions governed by specific legislation frequently allow for early retirement under more favourable terms than ordinary legislation. These pensions make for a sizable proportion of pensions, both in terms of the number of recipients and the overall pension cost paid.

According to a report from the World Bank Group (2019), Croatia implemented extensive pension reform in 2018, requiring multiple modifications to six statutes governing the pension system. The reform increased the pension supplement and implemented an opt-out option at retirement for all second pillar participants. It hastened the growth in the legal retirement age, altered the decrement scheme for early retirement,

raised the increment for later retirement, and expanded alternatives for working in retirement while preserving pension benefits. The change raised the minimum pension point and extended the service duration for parents. Lower fees, more relaxed but explicit investment policy prescriptions, and extended supervision are among the changes made to second pillar pension fund legislation. A similar attitude was taken regarding the regulation of third-pillar funds. Despite accelerating the legal retirement age to 67 by 2033, the change has left many opportunities for early retirement. The reform did not significantly increase incentives for a longer work life. It is so difficult to anticipate a rise in future pension adequacy on that basis. There were no significant changes to the accelerated service time plan.

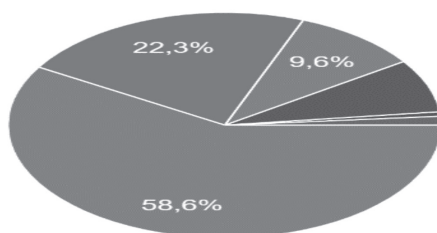
Given Croatia's demographic and fiscal limits, the only way to offer more generous pension benefits is to extend working life. If Croatia maintains one of the shortest working times, it will need to lower pension payments in order to be fiscally sustainable. It would be impossible to increase pension benefits without addressing the short working duration. Early retirement requirements must be strengthened, as must the pension decrement rate in that instance. An acceptable rise in the retirement age for early retirement must be considered, which means that the disparity in comparison to the statutory retirement age must be reduced while the service term required must be increased.

To summarise, the Croatian and EU pension systems confront serious sustainability and adequacy difficulties. Policymakers have attempted to address these issues through different reforms and recommendations, but more must be done to safeguard the pension system's sustainability over the years while preserving adequate payments for retirees.

4. METHODOLOGY

A survey on the opinion of the sustainability of the pension system in the Republic of Croatia was conducted among various groups of Croatian citizens. The survey was conducted via the Google Forms platform and then shared on the social networks Facebook and Instagram, where respondents could fill in the survey via a link. The first part of the survey refers to the profile of the respondents, while the second part refers to the sustainability of the pension system of the Republic of Croatia. The survey was conducted in March-April 2023. A total of 157 completed surveys were returned and analysed. Regarding the structure of the sample by gender, the majority, i.e. 65% of respondents, were women, while a smaller proportion, namely 35%, were men. The age groups of the respondents are shown in Figure 3.

Figure 3. Age groups of respondents

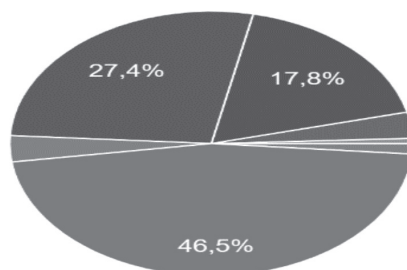


Source: Author's calculation

After analysing the age group, 58.6% of respondents were between 18 and 25 years old, 22.3% of respondents were between 26 and 35 years old, 9.6% were between 36 and 45 years old, 7.6% were between 46 and 55 years old, while 1.3% of respondents belonged to the 56-65 age group and finally one respondent, or 0.6%, belonged to the over 66 age group.

According to the information on the level of education completed, the majority of respondents had completed secondary school (46.5%), while 1.3% had only completed elementary school and 3.2% of respondents had completed higher education. 27.4% of respondents had a university degree (Bachelor's degree) and 17.8% had a university degree (Master's degree). It is also worth noting that 3.2% of respondents had completed a postgraduate degree and 0.6% or one respondent had completed a doctorate. The next question in the survey related to current employment status, with the largest percentage being employees at 54.8%, followed by 36.3% active students, 3.8% pupils and with the same percentage of 3.8% being unemployed and, at the very end, were 1.3%, or two pensioners. The results are shown in Figure 4.

Figure 4. The level of education

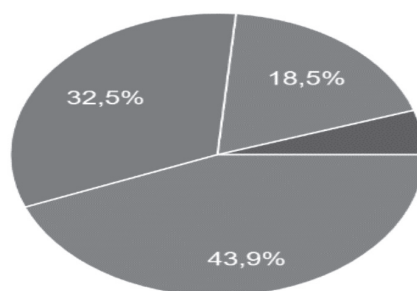


Source: Author's calculation

5. RESEARCH RESULTS

The second part of the survey begins with the question of the extent to which the respondents are actually familiar with the functioning of the Croatian pension system. The majority of respondents answered “yes”, namely 43.9%, while 32.5% answered “no”. 18.5% of respondents answered this question with “I am interested, but I do not know where to find information about it” and 5.1% answered “I am not interested”. The results are shown in Figure 5.

Figure 5. Familiarity with the operation of the Croatian pension system



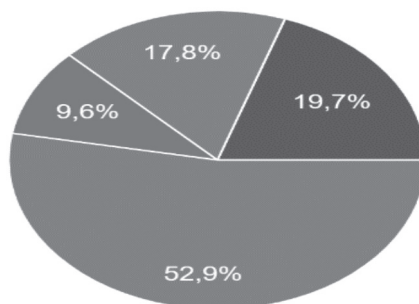
Source: Author's calculation

The results of this study are consistent with a study by Matic and Vretenar Cobović (2017), which showed that 44.93% of respondents (n=183) were familiar with the structure of the pension system. This result is in line with our result. Therefore, this is an indicator of additional education in the field of the pension system, as well as a more advanced campaign about the main features and importance of the pension system. The following question refers to the fact whether the respondents are familiar with the payment of the first and second pillars of pension in the Republic of Croatia. Slightly more than half of the respondents, namely 50.3%, answered “Yes”, while the other large part of the respondents, more precisely 46.5%, answered “No”, while 3.2% of the respondents stated “I am not interested”. The next question, seemingly similar to the previous one, is aimed at whether respondents are familiar with the third pillar of pension provision. Worryingly, 58.6% of respondents answered “no”, while 37.6% answered “yes” and a minority of 3.8% said they were “not interested”.

The majority of respondents, namely 52.9%, believed that the second pillar of pension insurance should be increased, while 19.7% of respondents considered the current situation to be satisfactory. 17.8% of respondents

believed that the second pillar of pension insurance should be completely abolished, while on the other hand only 9.6% of respondents believed that the second pillar of pension insurance should be reduced. The next question examines the extent to which respondents believed that investing in the third pillar would increase their income and their financial and general security in retirement. The most common answer was “I do not know” with 36.9%, while 5.1% of them believed that it would help them to a great extent and answered “yes, a lot”, and 14% of them answered “yes, a lot” and 17.2% “yes, a little”. In addition, 10.8% of them answered “yes, very little”, while 14.6% answered “no”. “Very little” was given by 0.6% of respondents, and “medium” had the same proportion of answers. When asked how respondents rate the level of Croatian pensions, there was almost only one answer, namely 99.4% of respondents who answered that Croatian pensions were low, while there was also one answer that disagreed and thought that Croatian pensions were sufficient, and that was 0.6% of respondents. The results are shown in Figure 6.

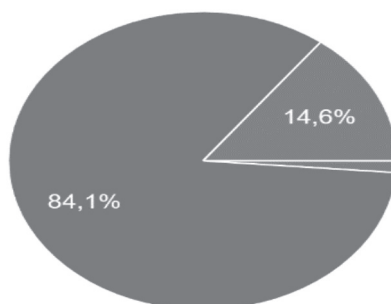
Figure 6. Familiarity with the first and second pillars of the pension system



Source: Author's calculation

The third part of the survey concerned the factors that influence the pension system. This part of the questionnaire begins with the question of what the respondents considered to have the greatest influence on the Croatian pension system. The answers offered were: number of births (5.1%), number of deaths (1.9%), population migration (10.8%), accelerated aging trend of the population (17.2%), life expectancy (8.9%), and most frequently the answer “all of the above” with a share of 56%. Based on this question, the following question concerned how the respondents saw the current relationship between the active population and the number of pensioners. The results are shown in Figure 7.

Figure 7. The ratio of the active population and the number of retirees

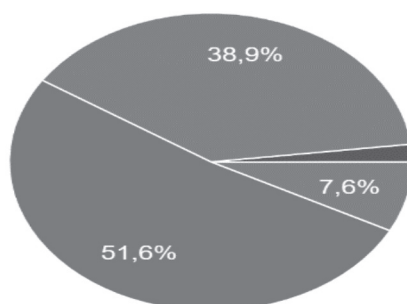


Source: Author's calculation

According to the research results, the vast majority of respondents believed that the existing ratio between working people and pensioners was unfavourable, namely 84.1% of them, while on the other hand 14.6% of them answered "I do not know" and 1.3% of them believed that this ratio is favourable. Following on from the previous question, respondents were asked whether they believed that the state will not be able to pay sufficient pensions in the future for pensioners to reach a dignified old age. 78.3% of respondents agreed and answered that the state will not be able to do so, while 12.1% of respondents did not know the answer to this question and, in contrast to the vast majority, 9.6% of respondents believed that the state would be able to pay sufficient pensions. The next question related to the Pension Insurance Act. 60.5% of respondents believed that it was unclear, 5.7% believed that the law was clear enough, while 33.8% of respondents stated that they did not know the answer to this question.

The last part of the survey refers to the sustainability of the pension system and begins with the question of who the respondents hold responsible for the sustainability of the Croatian pension system. The most common answer was "equally pension insurance and state" with 38.9%, then only "the state" with 36.9, then 16.6% of respondents answered "I don't know", while the remaining answers were "pension insurance" (3.2%), citizens (3.8%) and one respondent or 0.6% of answers "pension insurance, state and citizens". The results are shown in Figure 8.

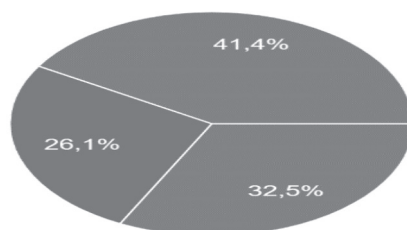
Figure 8. The sustainability of the pension system



Source: Author's calculation

According to the research results, just over half, 51.6%, believe that the future of the pension system was unsustainable, while only 7.6% of respondents took the opposite view, stating that they believed the future of the pension system was sustainable. 38.9% of respondents answered “I do not know” and 1.9% said they were not interested at all. Similar to a study by Matić and Vretenar Cobović (2017), the results showed that 57.97% of respondents were partially satisfied with the functioning of the current pension structures, while 37.68% were extremely dissatisfied. This led to their opinion on the inefficiency of the pension system and its long-term unsustainability.

The next question asked respondents who they thought was mainly to blame for the difficult situation pensioners find themselves in. The most common answer was “the state” with 63.1%, then the combination of state, employer and individual was seen as the main culprit with 35.7%, while 0.6% each had the answers “individual” and “employer”. The next question was about how important respondents thought saving was. The answer “very important” was ticked by 66.2%, “mostly important” by 27.4%, “neither important nor unimportant” and “mostly unimportant” by 2.5% each, and only 1.3% believed that saving was not important. Figure 9 shows the opinions on saving.

Figure 9. Opinions on savings

Source: Author's calculation

According to the survey results, 32.5% were saving for their old age, 26.1% were not saving and 41.4% of respondents were thinking about starting to save, although they were not yet doing so. The next question was actually to see how respondents were saving. For starters, 54.2% of them answered that they do not save. Of the other forms of saving, there is the third tier of pension insurance (3.2%), insurance and investment funds have a share of 7.6%, term deposit savings still account for 20.8% and 3.1% are engaged in investing in shares. Of the other forms of savings with shares in the responses of 0.8%, gold, cryptocurrencies and real estate stand out with 1.9%. Only 14% of respondents believed in a positive future of the Croatian pension system, while 56.1% of respondents held the opposite opinion and 29.9% of respondents believed that nothing would change. The pension system of neighbouring countries, to which the next question refers, was not known to the respondents, as we can see from the fact that 93.6% of them responded, 0.6% ticked the answer "weak", and only 5.7% were familiar with a foreign pension system. Following this question, respondents were asked which pension system from a particular country they were familiar with, naming countries such as Italy, Germany, Austria, Switzerland and the United States of America.

To summarise, the respondents were not sufficiently familiar with the Croatian pension system, the pension pillars and the law on the pension system itself. They described the future of the Croatian pension system as unsustainable and blamed the state for the current situation. There is also the worrying fact that many of those surveyed were not really saving and were therefore putting their financial situation in old age at risk.

6. CONCLUSION

Regardless of the entire pension reforms implemented, it is clear that the Croatian pension system is facing certain problems, primarily negative demographic trends leading to an increase in the number of pensioners and a decrease in the number of insured persons, as well as low pensions for a large number of citizens of the Republic of Croatia. The pension system has a major impact on the social security of pensioners and public finances in general, which is why projections of demographic and economic trends, and the pension system, are also important. The proportion of the elderly population in Croatia has been growing for many years and is above the EU average. The aging of the population may also lead to a decline in the relative pension level. In order to prevent the negative effects of an aging population, measures such as increasing pension contribution rates, raising taxes and promoting and increasing employment can be taken. As there is less and less room for increasing contributions and taxes in many European Union countries, including Croatia, the only real solution is to increase the employment rate of the working population, but also to increase the employment of the older population outside the labour quota.

The analysis of the research results shows that Croatian citizens are insufficiently familiar with the Croatian pension system, pension pillars and the law on the pension system itself. Furthermore, it is believed that the current Croatian pension system is not sustainable due to the ageing population and the increasing number of pensioners. Moreover, the majority of respondents blame the state for the current situation. In order to improve the current system, there are two practical recommendations. The first is to increase the level of financial literacy in the pension system, while the second is to ensure the sustainability of the pension system through positive demographic development and to reduce contributions and taxes in order to increase the employment rate.

The EU is endeavouring to harmonise the structures of pension systems in the member states, but national legislation on pension systems will continue to prevail for some time to come, varying greatly from state to state. The demographic trend is also negative in most member states, with the important difference that the developed countries are compensating for the population decline through immigration. But even this is not sustainable in the long term, so new political measures must be taken. Due to the poor demographic development and the indicators for the adequacy of pensions, it is clear that reforms will be necessary in the near future. Precisely for this reason, it is extremely important to ensure a stable and sustainable

pension system that adequately takes into account demographic changes and challenges as well as the situation in the labour market, thus also providing pensioners with a financially satisfactory pension. All this requires frequent pension reforms so that the pension system itself is modernised and functions normally in terms of funding, retirement ages, pension levels and the like.

On the basis of the following results, it would be interesting to examine opinions on the sustainability of the pension system in each EU country individually and carry out a comparative analysis. The limitations of the current study lie in the structure of the sample used and the limitation to one year. If the current study were extended to a longer period and to the same group of respondents, the research results would differ significantly from those presented here.

ACKNOWLEDGEMENT

This paper was funded under the project line ZIP UNIRI of the University of Rijeka, for the project ZIP-UNIRI-2023-18 and ZIP-UNIRI-2023-12.

BIBLIOGRAPHY

1. Alonso, J., and Conde-Ruiz, J.I. (2007). La Reforma de las Pensiones: La Experiencia Internacional. FEDEA Documento de Trabajo No.18.
2. Barro, R. (1974). Are government bonds net wealth? *Journal of Political Economy*, 82, pp. 1095-1118.
3. Chybalski, F. (2014). Financial Stability of Pension Systems: A Cross-Country Analysis, *Proceedings of the 14th International Conference on Finance and Banking*, October 16-17, Ostrava, Czech Republic, pp. 150-158.
4. Earles, K. (2013). The gendered consequences of the European Union's pension policy. *Women's Studies International Forum*, 38, pp. 75-82.
5. European Commission (2022). *Portfolio of EU social indicators for the monitoring of progress towards the EU objectives for social protection and social inclusion*. Luxembourg: Publications Office of the European Union.
6. European Commission (2024). *2024 Ageing Report Economic and budgetary projections for the EU Member States (2022-2070)*, European Economy, Institutional Paper 279.
7. European Parliamentary Research Service EPRS (2023). Understanding EU action on pensions [https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/753953/EPRS_BRI\(2023\)753953_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/753953/EPRS_BRI(2023)753953_EN.pdf) (20.04.2024.)
8. Eurostat (2024). Social protection statistics - pension expenditure and pension beneficiaries https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Social_protection_statistics_-_pension_expenditure_and_pension_beneficiaries#Expenditure_on_pensions_in_the_EU (20.04.2024.)
9. Grech, A.G. (2010). Assessing the sustainability of pension reforms in Europe. CASE papers, No. 140. London School of Economics and Political Science.
10. Hodžić, S., Rogić Dumančić, L., and Bečić, E. (2019). Financial stability of pension system in the European Union member states. *Proceedings of the 52nd International academic conference, Barcelona. Barcelona: ISES*, pp. 160-168.
11. Kowalewski, O. (2012). Corporate Governance and Pension Fund Performance. *Contemporary Economics*, 6(1), pp. 14-44.
12. Lee, K. K. (2024). Structural reforms to enhance the sustainability and intergenerational equity of the national pension system, *KDI Journal of Economic Policy*, 47(1), pp. 67-94, <https://doi.org/10.23895/kdijep.2025.47.1.67>
13. Matić, B., and Vretenar Cobović, M. (2017). Impact of economic and non-economic factors on the sustainability of the pension system in Croatia. *Econviews*, 1, pp. 51-65.
14. Martin, J.P., and Whitehouse, E. (2008). Reforming Retirement-Income Systems: Lesson From the Recent Experiences of OECD Countries. OECD Social, Employment and Migration Working Papers No. 66.
15. Martinez, S. R., and Soto, M. (2021). Pension Reforms in Europe: How Far Have We Come and Gone? *Departmental Papers*, 2021(016) <https://doi.org/10.5089/9781513593920.087.A001>

16. Natali, D. (2008). *Pensions in Europe, European pensions: The evolution of pensions policy at national and supranational level*. Brussels: P.I.E. Peter Lange.
17. Nomura, A. (2023). Sustainability of pension systems and the role of private pensions. *Policy Review*, 19(3), pp. 1–36.
18. OECD, (2022). OECD Pensions Outlook 2022. <https://www.oecd.org/pensions/oecd-pensions-outlook-23137649.htm> (20.04.2024.)
19. Pallares-Miralles, M., Romero, C., and Whitehouse, E. (2012). International patterns of pension provision II: a worldwide overview of facts and figures. *Social Protection Discussion Papers*, No. 70319.
20. Péter, Á., Németh, E., and Vargha, B. T. (2020). Sustainability of the Pension System, Risks and Opportunities. *Pénzügyi Szemle/Public Finance Quarterly*, 65(SP2), pp. 57–85.
21. Rotschedl, J. (2015). Selected factors affecting the sustainability of the PAYG pension system. *Procedia Economics and Finance*, 30, pp. 742–750.
22. Sanchez-Romero, M., Schuster, P., and Prskawetz, A. (2024). Redistributive effects of pension reforms: Who are the winners and losers? *Journal of Pension Economics and Finance*, 23(2), pp. 294–320. <https://doi.org/10.1017/S147474722300015X>
23. Schmäl, W. (2000). Pay-as-you-go versus capital funding: Towards a more balanced view in pension policy, in Hughes, G., Stewart, J., eds., *Pension in the European Union: Adapting to economic and social change*. Boston: Kluwer Academic Publishers, pp. 195–208.
24. Sika, P., and Martišková, A. (2016). Sustainability of the pension system of the Slovak Republic in the changed socio-economic conditions. *Journal of Security and Sustainability Issues*, 6(1), pp. 113–123.
25. Sowiński, T. (2024). Towards the Financial Sustainability of Public Pension Insurance Systems. *Gdańskie Studia Prawnicze*, 1(62), pp. 49–67.
26. Tomassetti, P. (2023). Between stakeholders and shareholders: Pension funds and labour solidarity in the age of sustainability. *European Labour Law Journal*, 14(1), pp. 73–91. <https://doi.org/10.1177/20319525221140422>
27. World Bank Group, (2019). Policy Note: Adequacy of Pensions in Croatia, <https://thedocs.worldbank.org/en/doc/861371604611925086-0080022020/original/22aAdequacyofPensions.pdf> (20.04.2024.)
28. World Bank (2025). Press release: Enhancing Employment and Skills for Croatia's Growth, <https://www.worldbank.org/en/news/press-release/2025/04/08/enhancing-employment-and-skills-for-croatia-s-growth>

**MANAGEMENT,
MARKETING
AND
ENTREPRENEURSHIP**

EMPLOYEES AND SUPPLIERS AS BUILDING BLOCKS TOWARDS DEVELOPING RELATIONSHIP COMMITMENT IN HOTELS

JASMINA DLAČIĆ

University of Rijeka
Faculty of Economics and Business
Rijeka, Croatia
jasmina.dlacic@efri.uniri.hr

KRISTINA ČRNJAR

University of Rijeka
Faculty of Tourism and Hospitality Management
Opatija, Croatia
kcrnjar@fthm.hr

MARIN LAZARIĆ

Imperial Riviera d.d.
Rab, Croatia
marin.lazaric@imperial.hr

Paper Category: Original scientific paper

ABSTRACT

Building relationships with partners helps a company to improve the performance of all partners in the network. Consequently, development of partner networks is becoming increasingly dominant in business-to-business markets. Suppliers and employees are crucial to the formation of a marketing network, especially in service-intensive industries such as tourism and the hotel industry. The purpose of this paper is to examine whether the relationships between suppliers and employees within a marketing network and relationship commitment have changed over the time in the Croatian hotel industry. The paper builds upon previous research on relationship marketing and uses scales from the existing literature. Marketing network was approached through exploring suppliers and employees while relationship quality was approached through relationship commitment. The empirical study was conducted in hotels in Croatia on a convenience sample of hotel managers in two periods 10 years apart. The unit of analysis was hotel, and a total of 266 (Research study 1 conducted in 2014) and 147 (Research study 2 conducted in 2024) responses were collected. The research results indicate that both suppliers and employees positively influence a company's commitment to a partner network. Therefore, when a hotel company focuses on maintaining a partner network, it should consider both suppliers and employees as important to this relationship. However, the focus should be primarily on suppliers as partners, as they have a greater influence on partner network engagement. The paper also offers implications for hotel managers and identifies limitations and further research ideas.

Keywords: customer oriented, employees, hotel, marketing network, relationship commitment, suppliers

1. INTRODUCTION

As part of tourism, the hotel industry plays a very important role in the overall development of tourist destinations. Hotels offer essential accommodation services for tourism and are usually located in strategic locations so that travellers can easily reach the main attractions of the destination. They offer a variety of accommodation options and provide a comfortable and safe environment for guests. The services and products they offer have a significant impact on the overall tourist experience. The economic importance of the hotel industry for many countries is considerable – it provides employment opportunities, especially for young people, women and people with lower levels of education, it generates revenue and, through its multiplier effect, stimulates other industries by ensuring the development of small and medium-sized enterprises aimed at improving the quality of life of the local population (Costa *et al.*, 2021; Delibasic *et al.*, 2022; Soldić Frleta and Smolčić Jurdana, 2023).

Given the interconnectedness of the world and the development of global competition, it is more important than ever to build relationships with business partners. This is particularly important in the business-to-business sector. Building and maintaining relationships with various partners such as other companies, employees, customers, and other stakeholders changes the company's perspective and affects various business processes and operations (Johann, 2014). Therefore, it is important to build a marketing network and relationships between partners to make the company more successful. It is not important what the company has as a resource, but with whom it is connected to create added value through the network. The network is therefore important, and decisions are made through a marketing network perspective (Kleindorfer and Wind, 2009). Partner relationships in the marketing network are characterised by trust, information sharing, the creation of benefits for all partners and utilising joint business opportunities (Grbac, 2013). As in other industries, the partner perspective and the development of a partner network are becoming increasingly important in the hotel industry. In the hotel industry, the marketing network consists of various groups of partners such as suppliers, buyers, employees, competitors and, especially in the hotel industry, a destination (Lazarić, 2018).

In service-intensive industries such as the hotel industry, employees are considered crucial to the formation of a marketing network, alongside suppliers. As internal customers, employees have a close relationship with customers (tourists) and provide high-quality, customer-oriented services to increase tourist consumption. Specifying the role and competencies

of employees, which are important for creating value for customers, and developing human capital by improving employee satisfaction and customer orientation are of great importance for maintaining the hotel's competitive advantage (Bowen, 2016; Xu *et al.*, 2023).

Building a marketing network between hotels and suppliers is important for several reasons. These include (Perez-Arostegui *et al.*, 2013; Zach and Hill, 2017; Peloza, and Shang, 2011): creating mutual benefits, sharing knowledge, building trust and loyalty, getting to know suppliers in terms of guests' needs and how to satisfy them, on-time delivery and long-term security, familiarising with the hotel's long-term plans and the opportunity to improve its position as a key supplier, and improving the flow of information to jointly co-create value for all customers in the supply chain. Hotels can have a strong economic impact on the destination by building a long-term relationship with local suppliers, securing jobs for locals, supporting the development of local businesses, local products, and services, etc. The high-quality network between hotels and suppliers can contribute to the sustainable development of the region.

Collaboration, knowledge sharing and trust incentivise partners to be more innovative (Zach and Hill, 2017). If we consider innovation in tourism destinations as the desire to follow and implement tourism trends, then hotels with a developed marketing network will follow the trends and offer new opportunities for tourists to explore and enjoy the destination. Sustainability has also become a very important part of the business strategy and focus. This does not only refer to environmental issues, but sustainability must be considered in every aspect of the business. Therefore, as a perspective where partners co-create value, the marketing network needs also to include sustainability measures (Arnold, 2017) in the collaboration between members of the marketing network. Hotel companies have been building relationships with partners for some time, as they have recognised various benefits for their marketing network. However, the last three decades have been characterised by a dramatic increase in networking activities and various forms of linking companies (Morić Milovanović, 2013) and developing of a marketing network approach in different industries (Agostini, 2016). Consequently, by developing a marketing network, companies build commitment among partners and, by committing resources to joint activities at the destination (Elvekrok *et al.*, 2022), they believe they are achieving more than just an improvement in operations. This commitment develops and changes over time. Hence, the purpose of this paper is to examine how relationship commitment in the Croatian hotel

industry has evolved over time within the marketing network, with a focus on suppliers and employees.

This paper aims to provide arguments that dynamics between employees in suppliers within a marketing network and how they contribute to the development of a relationship commitment in the hotel industry has changed over time. Therefore, it contributes to the theory of relationship marketing by identifying the strength of the influences on relationship commitment. It also contributes to the marketing network theory by approaching business relationships from a marketing perspective and therefore analysing employees and suppliers as part of the marketing network in the hotel industry.

The paper consists of five parts including the Introduction and Conclusion. Besides them, the paper is organised in the following manner: the first part contains the theoretical background and discusses the concept of marketing network and relationship commitment with a focus on the two stakeholders - employees and suppliers. The next chapter deals with the methodology used in the research. The research findings are presented in the third chapter, which contains information about the research sample, the analysis of the research findings and the testing of the hypotheses. The final chapter summarises and discusses the key points of the research including the limitations and recommendations for further research.

2. THEORETICAL BACKGROUND

Explains the relationships between internal customers (employees) and suppliers from a marketing network perspective. Also in the chapter, relationship commitment is explained and related to marketing network.

2.1. INTERNAL CUSTOMERS (EMPLOYEES) AND SUPPLIERS AS PART OF A MARKETING NETWORK

The networks consist of business relationships and various interrelated and interdependent networks arising from these relationships (Håkansson and Ford 2002; Ford and Hakansson, 2013). Marketing networks include interaction and connections between internal and external factors involved in marketing activities. In the hotel industry, marketing networks are characterised by the relationships between a variety of stakeholders involved in the creation, sales and promotion of services and products in the tourism market: supply chain companies, destination providers, customers (tourists)

and employees (internal customers) (Akroush *et al.*, 2013; Dlačić *et al.* 2020; Kubberod *et al.*, 2019; Xu *et al.*, 2023).

Companies in the supply chain represent an important stakeholder in the marketing network. Suppliers in the supply chain create different levels of relationship quality with their partners in response to market conditions and industry characteristics. Perez-Arostegui *et al.* (2013) examined suppliers' commitment to the quality and stability of the buyer-supplier relationship and concluded that suppliers gain a competitive advantage when they manage the impact of relationships and invest efforts in the quality and stability of relationships with partners, which helps them to maintain effective relationships. Lee *et al.* (2013), in their study on understanding marketing relationship performance from the supplier's perspective, start from the claim that the quality of the relationship, as a result of relationship nurturing, does not directly lead to business outcomes. Instead, suppliers can achieve significantly better results if they have the distinctive ability to turn desirable relationships into business outcomes. To this end, they include the ability to build capability through relationships as a mediating variable between relationship quality and business results in their research. Thus, in the conceptualisation of marketing networks, relationships with suppliers are viewed through their commitment to the quality and stability of the buyer-supplier relationship.

In the service industry, such as hospitality, the interaction between employees and customers plays an important role in customer satisfaction. To be competitive, hotel employees must ensure the quality of services and the efficiency of distribution. Marketing, which usually focuses on external customers, nowadays pays more attention to the role of employees and the importance of internal marketing in achieving competitive advantage in the service industry (Bowen, 2016). Internal marketing involves the use of marketing and human resource techniques and strategies to satisfy employees' needs and achieve customer-oriented service goals in the internal market (Alves *et al.*, 2015; Sanchez-Hernandez and Grayson, 2012; Xu *et al.*, 2023). In the service processes, employees are referred to as internal customers. The adaptation and integration of specific functional activities of internal marketing by managers (internal communication, administrative support, staff recruitment, training and development, compensation, welfare system, etc.) has a direct and significant impact on job performance, internal customer satisfaction and consequently a higher degree of customer orientation of employees in the hotel industry (Tansuhaj *et al.*, 1988; Xu *et al.*, 2023; Thai *et al.*, 2023).

2.2. RELATIONSHIP COMMITMENT

The hotel industry, alongside the hospitality industry, is seeking to establish long-term relationships with different stakeholders (Chi *et al.*, 2020). Building these relationships with partners contributes to increased company profitability and stability in the long-term (Zhang *et al.*, 2016; Mullins *et al.*, 2014), as well as being essential for company success (Koponen and Julkunen, 2022). The strength of these relationships is observed through relationship quality (Lasardo *et al.*, 2023). Relationship quality in the majority of the research is perceived through exploring satisfaction, trust and commitment (Athanasopoulou, 2009; Rajic and Dado 2013; Kang *et al.*, 2013; Lagrosen and Lagrosen, 2012) in those relationships.

As Gil-Saura, Frasset-Deltoro and Cervera-Taulet (2009) pointed out, commitment helps maintain long-term relationships through positively influencing partners' loyalty. Therefore, commitment is identified as one of the key elements of long-term relationships. Commitment is viewed as the intention of partners within the network to continue the relationship to each other within the network in the long run (Moorman *et al.*, 1992) or a promise to continue the relationship between partners (Dwyer *et al.*, 1987). It is considered, alongside trust, the most important element of relationship quality (Morgan and Hunt, 1994). Therefore, commitment implies the establishment of relational quality and long-term relationships, achieved through mutual collaboration between partners within the network.

A long-term perspective in partner relationships stresses the importance of relationship quality (Jiang *et al.*, 2016). A focus on relationship commitment between partners inherently implies the creation of quality and long-term relationships, achieved through mutual collaboration. Consequently, by developing a marketing network, companies, build commitment among partners and, by committing resources to joint destination activities (Elvekrok *et al.*, 2022), they expect to achieve more than just improving operations.

This could be achieved through long-term relationships with suppliers, as one of the partners within a marketing network. In those relationships with suppliers their continuous commitment to quality, both in the product/services they offer and processes, as well as establishing quality relationships, is important (Perez-Arostegui *et al.* 2012). Furthermore, mutual collaboration in the long run, co-creation of value and improved operations, as well as increased competitive advantage, add to the importance of relationship stability with suppliers (Lai *et al.*, 2005; Perez-Arostegui *et al.*, 2012). Interdependent relationships, which are

characteristic of marketing networks, between a company and its suppliers, develop company competencies and help the company to build competitive advantage (Mungra and Yadav, 2020; Akrouf and Diallo, 2017). Also, shared resources with suppliers could build competitive advantage and long-term relationships (Vargo and Lusch, 2011). Hence, suppliers within a marketing network contribute to relationship commitment within the marketing network which, in the end, signal relationship quality among partners. Hence, we posit:

H1. Marketing network (suppliers) influence relationship commitment among partners.

Also, one of the elements of a marketing network that contributes to the collaboration among partners are employees. Interfunctional coordination in a company is important as it contributes to establishing good business relationships and helps the company to be innovative (Wang and Chung, 2013) and develop competitive advantage. Hence, with developing relationships with employees, sharing the information within the company departments, as well as with approaching employees as valuable company assets and internal customers (Xu *et al.*, 2023), the company is positively influencing its competitive advantage. Employees who are committed to the company tend to develop strong long-term relationships (Guzeller and Celiker, 2019) with other employees and tend to stay longer within the company. As employee turn-over is an issue in the hotel industry (Guzeller and Celiker, 2019; Brien *et al.*, 2015), focusing on building partner relationships with employees is important. Employees need to be given as many opportunities as possible so that they feel committed to the company and can develop a relationship commitment. Therefore, developing engagement among employees within a marketing network, contributes to developing relationship quality within the company. We posit the following hypothesis:

H2. Marketing network (employees) influence relationship commitment among partners.

3. METHODOLOGY

To test the hypotheses and achieve the purpose of the research, an empirical study was conducted in hotels in Croatia on a convenience sample of hotel managers, directors from the marketing, sales, or procurement departments. The research was conducted in the period from June to October 2014 (Research study 1) and in the period between February to June 2023 (Research study 2). The unit of analysis was hotel, and a total of 266

(Research study 1 conducted in 2014) and 147 (Research study 2 conducted in 2023) questionnaires were collected using the online Limesurvey platform.

The paper builds upon previous research on relationship marketing and uses scales from the existing literature. Relationship quality is approached as consisting of commitment (Moorman, *et al.*, 1992). Marketing network was approached through exploring suppliers and employees. Marketing network - suppliers' perspective builds on Perez-Arostegui *et al.* (2012) work, and suppliers' commitment to quality as well as the importance of relationship stability were used. Marketing network - employees used Wang and Chung's (2013) scale. In addition, the questionnaire included several questions relating to the hotel characteristics, to better describe the research sample. Data analysis used descriptive statistics, exploratory factor analysis, reliability analysis and multivariate regression analysis with SPSS ver. 26 for Windows.

4. RESEARCH RESULTS

Analysing the research results is approached through separately analysing Research study 1 (conducted in 2014) and Research study 2 (conducted in 2023). Also, in this section the hypotheses are tested.

4.1. RESEARCH SAMPLE

The research sample from Research study 1 consists of 266 respondents. According to the research sample analysis, the average hotel marketing manager works in a hotel that has 0-99 (34.4%) or 200 or more (33.9%) accommodation units, has 0-199 beds (37.5%), with up to 34,999 (48.6%) overnights in the hotel, and an average guest stay of 4-7 days (72.8%). Also, it is a hotel with 4-stars (41.3%) and a coastal location (40.2%), that operates on a seasonal basis (59.1%) and independently (59.2%). Also, the type of ownership is private domestic (43.6%), has 10-49 full-time employees (61.8%) and 10-49 seasonal employees (50.9%).

The research sample from Research study 2 consists of 147 respondents. According to the research sample analysis, the average hotel marketing manager works in a hotel that has 100-199 (49.7%) accommodation units, has 0-199 (34.7%) or 200-399 (34.7%) beds, with up to 34,999 (43.5%) overnights in the hotel, an average guest stay of 1-3 (48.3%) or 4-7 (47.6%) days. Also, it is a hotel with 4-stars (45.6%) and a coastal location (45.6%), that operates on a seasonal basis (60.5%) and independently (51.7%). Also,

the type of ownership is private domestic (36.1%), has 10-49 full-time employees (59.2%) and 10-49 seasonal employees (59.2%).

4.2. ANALYSIS OF THE RESEARCH RESULTS

To test if the scales used are suitable for further analysis, exploratory factor analysis (EFA) was carried out. First the Research study 1 was analysed. EFA was conducted using Principal component analysis in SPSS with oblimin rotation and Kaiser Normalisation. The research results were purified by removing items that had communality lower than 0.5, as suggested by Field (2009). Hence, one item “We trust a very small number of suppliers who are very reliable and offer high-quality products/services» was removed from further analysis. Also, one item was removed due to high cross-loading on two factors, that is, item “Cooperation reduces most of the misunderstandings between the two parties» was also removed from further analysis. The Kaiser-Meyer-Olkin (KMO) adequacy of sampling and Bartlett’s test of sphericity reported: KMO=0.937 and $\chi^2=4233.772$ ($p<0.05$). Hence, according to the threshold values of Hair *et al.* (2010), this sample is adequate, and analysis can be continued. In the presentation of analysis, no factor loading lower than 0.3 is present, as Field (2009) has suggested. Regarding the results for EFA, a four-factor solution emerged. The resulting factors are: Marketing network-employees, Marketing network-suppliers (Commitment to quality), Marketing network-suppliers (Relationship stability) and Relationship commitment. The results of the EFA and reliability analysis are presented in Table 1.

Table 1. Factor analysis and reliability analysis for marketing network dimensions and relationship quality (Research study 1)

Items	Factor			
	Marketing network-employees	Marketing network-Suppliers (Commitment to quality)	Marketing network-Suppliers (Relationship stability)	Relationship commitment
Suppliers continually evaluate and improve the products/services that they supply to us. (S_CQ1)		0.780		
Suppliers continually evaluate and improve the decision processes for evaluating how to determine our requirements. (S_CQ2)		0.813		
Suppliers continually manage the data and information with which we provide them to improve the quality of the products/services that they supply to us. (S_CQ3)		0.855		
Suppliers regularly use procedures to obtain information concerning the products they have supplied and do so quickly and reliably. (MN_S_CQ4)		0.832		
The firm makes an effort to establish regular relationships of cooperation with its suppliers. (S_CQ5)		0.537		
Suppliers maintain a good relationship with our firm in order to obtain more orders. (S_CQ6)		0.502		-0.309
Suppliers maintain a good relationship with our firm in order to improve their image and/or reputation. (S_CQ7)		0.427		
We have frequent meetings with suppliers to determine possible areas of improvement in both parties. (S_CQ8)		0.582		

We expect the action of our suppliers to contribute to improving our competitive advantage. (S_RS1)			0.576	
Suppliers' efforts to develop and improve their quality has contributed to reducing the cost of our products/services. (S_RS2)			0.778	
Suppliers' efforts to develop and improve their quality have contributed to improving the quality of our products/services. (S_RS3)			0.844	
Suppliers' efforts to develop and improve their quality have contributed to reducing the time of processes. (S_RS4)			0.614	
The managers of each of our functional departments regularly visit customers, suppliers, employees, and competitors. (E1)	0.622			
Information about customers, suppliers and competition is shared with all departments. (E2)	0.665			
We do a good job integrating the activities of all departments. (E3)	0.818			
Our managers understand how employees can contribute to creating added value for customers. (E4)	0.606			
Our resources are shared across all departments. (E5)	0.809			
All departments are involved in preparing business plans and strategies. (E6)	0.627			
We are committed to our partners. (RC1)				-0.775
We consider our partners as part of our team. (RC2)				-0.675

We genuinely take care of business relationships with our partners. (RC3)				-0.683
Cronbach's alpha	0.909	0.923	0.857	0.911
% of explained variance	51.439	8.501	6.643	4.976
Eigenvalue	10.802	1.785	1.395	1.045
Scale mean	28.54	38.71	19.76	16.19

Note: Rotation converged in 10 iterations.

Source: Authors.

The used scales (Table 1) are reliable as their reliability is above the suggested value of 0.7 (Nunnally, 1967), that is, Cronbach's alphas are in the range of 0.857 to 0.923. In subsequent analysis, all scales were composed as an average index of items that constitute the factor.

Furthermore, EFA is also used for the Research study 2 to test if data is suitable for further analysis. The same procedure as for the Research study 1 was applied. Hence, EFA was conducted using Principal Component Analysis in SPSS with oblimin rotation and Kaiser Normalisation. The research results were purified by removing items that had communality lower than 0.5 or had high cross-loading on two factors and no factor loading lower than 0.3 is present. After applying the procedure, four items were removed from the further analysis. Two as in the EFA of the research study 1, "We trust a very small number of suppliers who are very reliable and offer high-quality products/services", "Cooperation reduces most of the misunderstandings between the two parties", and an additional two because of the cross-loadings on two factors, "We expect the action of our suppliers to contribute to improving our competitive advantage" and "Suppliers maintain a good relationship with our firm in order to improve their image and/or reputation". The Kaiser-Meyer-Olkin (KMO) adequacy of sampling and Bartlett's test of sphericity reported: KMO=0.936 and $\chi^2=2325.390$ ($p<0.05$). After the EFA, a four-factor solution emerged. The resulting factors are the same as in the Research study 1. The results are presented in Table 2.

Table 2. Factor analysis and reliability analysis for marketing network dimensions and relationship quality (Research study 2)

Items	Factor			
	Marketing network-Employees	Marketing network-Suppliers (Commitment to quality)	Marketing network-Suppliers (Relationship stability)	Relationship commitment
S_CQ1		-0.820		
S_CQ2		-0.846		
S_CQ3		-0.862		
S_CQ4		-0.851		
S_CQ5		-0.505		
S_CQ6		-0.549		-0.402
S_CQ8		-0.684		
S_RS2			0.934	
S_RS3			0.815	
S_RS4			0.834	
E1	0.640			
E2	0.707			
E3	0.868			
E4	0.822			
E5	0.910			
E6	0.813			
RC1				-0.835
RC2				-0.742
RC3				-0.827
Cronbach's alpha	0.927	0.930	0.860	0.916
% of explained variance	56.655	7.940	6.115	5.394
Eigenvalue	10.764	1.509	1.162	1.025
Scale mean	27.95	34.07	14.12	15.86

Note: Rotation converged in 8 iterations.

Source: Research results.

The used scales (Table 2) are reliable as their reliability is above the suggested value of 0.7 (Nunnally, 1967), that is, Cronbach's alphas are in the

range of 0.860 to 0.927. In subsequent analysis, all scales were composed as an average index of items that constitute the factor.

4.3. TESTING THE HYPOTHESES

To test the posited hypotheses, multivariate regression analysis was applied with relationship commitment as the dependent variable. First, the analysis was done for Research study 1 and afterwards for Research study 2. The Enter method was used in the selection of variables in regression analysis for both research studies. VIF values range from 1.860 to 2.071 (Research study 1) and from 1.718 to 2.341 (Research study 2), and tolerance ranges from 0.483 to 0.538 (Research study 1) and from 0.427 to 0.582 (Research study 2). Both VIF and tolerance are at acceptable levels, indicating that collinearity is not a problem, since VIF is not substantially larger than 1 (Field, 2009) and tolerance is not lower than 0.40 (Allison, 1999). The Durbin-Watson test is 1.801 that indicates residuals are not correlated (Field, 2009). The results are presented in Table 3 and Table 4.

Table 3. Results of multiple regression analysis for relationship commitment (Research study 1)

	B	Beta	T-value
Constant	1.356 (0.248)		5.479***
Marketing network-Employees	0.393 (0.055)	0.421	7.138***
Marketing network-Suppliers (Commitment to quality)	0.212 (0.065)	0.196	3.250***
Marketing network-Suppliers (Relationship stability)	0.231 (0.060)	0.219	3.830***
R ²	0.539		
R ² (adj)	0.533		
F-value	102.019**		

Note: N=266; standard error is in parentheses; *** $p < 0.001$; ** $p < 0.05$

Source: Research results.

In the previous table (Table 3) it is evident that if a hotel company wants to build relationship commitment in the marketing network it must focus firstly on developing relationships with their employees ($\beta=0.421$), then with their suppliers. When focusing on developing relationships with suppliers a company should focus on providing relationship stability ($\beta=0.219$) and afterwards on providing quality to their partners ($\beta=0.196$). Both employees

and suppliers as part of the company’s marketing network are explaining 53.3% of variance in relationship commitment.

Table 4. Results of multiple regression analysis for relationship commitment (Research study 2)

	B	Beta	T-value
Constant	1.097 (0.334)		3.280***
Marketing network-Employees	0.338 (0.079)	0.361	4.278***
Marketing network-Suppliers (Commitment to quality)	0.358 (0.093)	0.315	3.864***
Marketing network-Suppliers (Relationship stability)	0.186 (0.076)	0.177	2.445**
R ²	0.565		
R ² (adj)	0.556		
F-value	62.020***		

*Note: N=147; standard error is in parentheses; *** $p < 0.001$; ** $p < 0.05$
 Source: Research results.*

In the previous table (Table 4) it is evident that if a hotel company wants to build relationship commitment in the marketing network it must focus firstly on developing relationships with their employees ($\beta=0.361$), and afterwards with their suppliers. When building relationships with suppliers it should focus on providing quality to their partners ($\beta=0.315$) and after that on providing relationship stability to their partners ($\beta=0.177$). Both employees and suppliers as part of the company’s marketing network are explaining 55.6% of variance in relationship commitment.

Therefore, the posited hypotheses are accepted, and it can be concluded that: Marketing network (suppliers) (H1) and Marketing network (employees) (H2) influence relationship commitment among partners.

5. CONCLUSION

This research contributes to relationship marketing theory and the marketing network theory in the following ways: first, it identifies that suppliers and employees within the marketing network are important to the development of the relationship commitment. By building and maintaining partner relationships, companies contribute to increased profitability, stability and company success by improving the quality of relationships between partners. This is in line with previous research by Zhang *et al.* (2016) and Koponen and Julkunen (2022), which emphasises the importance of

long-term relationships for business success. Secondly, the study concludes that the influence of suppliers and employees within the marketing network on the relationship commitment of partners is positive. Therefore, in order to develop relationship commitment, which is a key element of long-term relationships and indicates the quality of the company's relationships with its partners, a hotel company must build a strong marketing network. It is generally accepted that the stronger the relationships between its partners, the more successful a business will be in the long term and lead to a stronger marketing network (Grigorova, 2007). This is a similar conclusion for suppliers as Lee *et al.* (2013) and Perez-Arostegui *et al.* (2013) as well as for employees within the marketing network (Guzeller and Celiker, 2019). Third, it identifies that the dynamics of the marketing networks do change over time in the strength of the relationship that influences relationship commitment, where the importance of commitment to quality is emphasised more than the stability of relationships with suppliers within the marketing network. Fourth, when comparing the two researched periods, the employee's commitment still has the greatest influence on relationship commitment, although it loses strength in Research period 2. Hence, with comparing the importance of the employees' contribution to relationship quality within a marketing network in 2014 (Research period 1) and 2023 (Research period 2) their importance is still high, but suppliers are now recognised as more important than before, especially their commitment to the quality of products and services they provide. As the hotel industry is a primary service industry and the relationship quality depends on employees, their importance should not be underestimated. This is in line with the research findings, therefore answering in what direction relationships with employees and suppliers within a marketing network in the hotel industry are evolving over time.

Being customer oriented can help a hotel company to gain and further expand competitive advantages. Therefore, it is important to focus on both internal customers, such as employees, and external customers, such as suppliers, destination providers and tourists. Collaboration and providing and co-creation of value help the hotel company to better serve its stakeholders and consequently increase its competitive advantage. In this process, it is important to nurture relationships, as valuing partners and maintaining long-term relationships help the hotel company to develop a competitive advantage. Including the perspective and experience of employees and suppliers and emphasising the perspectives and importance of other stakeholders in the marketing network is therefore crucial when it

comes to setting the course for a hotel company in developing its strategy, mission and vision.

The research also has implications for management in the hotel industry. Building relationship commitment is important as it helps establishing long-term relationships with different actors within a marketing network. Hence, a company, to build relationship commitment within a partner network, should have their employees involved and engaged in different activities, such as involving employees in business planning and strategy development, integrating activities among departments as well as sharing information between different departments. This contributes to the feeling of being engaged and committed among employees. Improving communication between departments, ensuring appropriate working conditions, and developing management's understanding of how employees contribute to adding value for customers also help to create the conditions for developing relationship commitment within the marketing network. With the aim of building long-term relationships with suppliers, hotel managers should also emphasise the need for constant quality of products and services. This could be done by establishing procedures to inform the company about the quality of the products supplied, by involving suppliers in the decision-making process, by establishing procedures to inform suppliers in a timely manner about the products or services they supply, or by holding frequent meetings with suppliers to identify possible areas of improvement for both partners.

The limitations of this study lie in the fact that only two elements of the marketing network were examined - employees and suppliers - while other elements of the marketing network such as buyers, competitors or destination and destination management organisation, were not analysed. Therefore, in further research, the focus could be extended to other elements of the marketing network such as customers, competitors, and shareholders in the destination. The inclusion of these perspectives would provide additional insights into how a hotel company's marketing network can be maintained and the relationship commitment of its members strengthened. Research of these perspectives can also identify the different importance of marketing network members in building relationship commitment. Also, in further research other elements of relationship quality, such as satisfaction or trust, could be explored. In this study, the hotels in the sample were not differentiated by their size and the number of stars (quality) they have. Larger companies and companies with higher quality (measured by the number of stars/category of the hotel) may have a different view of the relationships in the marketing network than others. Therefore, further research could introduce these two characteristics of the sample and investigate the

influence on perspective. This research only focused on hotels. In the tourism market, there are also other types of accommodation providers (private accommodation, campsites, etc.) that may have different dynamics in the development of their marketing network. Further research could therefore also focus on these other providers in the tourism market.

ACKNOWLEDGEMENT

This work is supported by the University of Rijeka for project ZIP-UNIRI-2023-20.

6. BIBLIOGRAPHY

1. Agostini, L., 2016. Organizational and managerial activities in the development process of successful SME marketing networks. *European Management Review*, 13(2), pp. 91-106.
2. Akroush, M.N., Abu-ElSamen, A.A., Samawi, G.A. and Odetallah, A.L., 2013. Internal marketing and service quality in restaurants. *Marketing Intelligence & Planning*, 31(4), pp. 304-336.
3. Akroush, H. and Diallo, M., 2017. Fundamental transformations of trust and its drivers: a multi-stage approach of business-to-business relationships. *Industrial Marketing Management*, 66(4), pp. 159-171.
4. Allison, P.D., 1999. *Multiple Regression: A Primer*, Pine Forge Press, Thousand Oaks, CA.
5. Alves, H., do Paço, A. and Roberto, C., 2015. Influence of Internal Marketing on Organizational Commitment-Evidence from Care Institutions for the Elderly. *Market-Tržište*, 27(2), pp. 237-250.
6. Arnold, M., 2017. Fostering sustainability by linking co-creation and relationship management concepts. *Journal of Cleaner Production*, 140, pp. 179-188.
7. Athanasopoulou, P., 2009. Relationship quality: a critical literature review and research agenda. *European Journal of Marketing*, 43(5/6), pp. 583-610.
8. Bowen, D.E., 2016. The changing role of employees in service theory and practice: An interdisciplinary view. *Human Resource Management Review*, 26(1), pp. 4-13.
9. Brien, A., Thomas, N. and Hussein, A.S., 2015. Turnover intention and commitment as part of organizational social capital in the hotel industry. *Journal of Human Resources in Hospitality & Tourism*, 14(4), pp. 357-381.
10. Chi, C.G.Q., Wen, B. and Ouyang, Z., 2020. Developing relationship quality in economy hotels: the role of perceived justice, service quality, and commercial friendship. *Journal of Hospitality Marketing & Management*, 29(8), pp. 1027-1051.
11. Costa, N., Oliveira, C.M. and Oliveira, I., 2021. The Role and Relevance of Human Resource Management and its Practices in the Portuguese Hotel Industry, *Tourism and Hospitality Management*, 27(2). pp. 407-427.
12. Delibasic, M., Pupavac, J., Budic, H., Streimikis, J. and Shilina, M.G., 2022. Employment in the Hotel Industries of Croatia and Montenegro: Current State and Outlook. *Montenegrin Journal of Economics*, 18(3), pp. 23-34.
13. Dlačić, J., Črnjar, K. and Lazarić, M., 2020. Investing in hotel employees as element of marketing network: relationship marketing perspective. In: 59th International Scientific Conference on Economic and Social Development (pp. 85-95).
14. Dwyer, F.R., Schurr, P.H. and Oh, S., 1987. Developing buyer-seller relationships. *Journal of Marketing*, 51(2), pp. 11-27.
15. Elvekrok, I., Veflen, N., Scholderer, J. and Sørensen, B.T., 2022. Effects of network relations on destination development and business results. *Tourism Management*, 88, pp. 104402.
16. Field, A., 2009. *Discovering statistics using SPSS*, 3rd edition. Sage publications, London.

17. Ford, D. and Håkansson, H., 2013. Competition in business networks. *Industrial Marketing Management*, 42, pp. 1017–1024.
18. Gil-Saura, I., Frassetto-Deltoro and M., Cervera-Taulet, A., 2009. The value of B2B relationships. *Industrial Management & Data Systems*, 109(5), pp. 593–609.
19. Grbac, B., 2013. *B2B marketing*, Faculty of Economics of the University of Rijeka and Promarket, Rijeka.
20. Grigorova, V., 2017. Balanced approach for optimizing marketing networks in tourism. *Экономический вестник Донбасса*, 4 (50), pp. 44–5.
21. Guzeller, C.O. and Celiker, N., 2020. Examining the relationship between organizational commitment and turnover intention via a meta-analysis. *International Journal of Culture, Tourism and Hospitality Research*, 14 (1), pp. 102–120.
22. Hair, J.F., Black, W.C., Babin, B.J., Anderson R.E. and Tatham, R.L. 2006. *Multivariate Data Analysis*, 6th edition. Pearson Prentice Hall, Upper Saddle River, N.J.
23. Håkansson, H. and Ford, D., 2002. How should companies interact in business networks? *Journal of Business Research*, 55(2), pp. 133–139.
24. Jiang, Z., Shiu, E., Henneberg, S. and Naude, P., 2016. Relationship quality in business to business relationships—Reviewing the current literatures and proposing a new measurement model. *Psychology & Marketing*, 33 (4), pp. 297–313.
25. Johann, M., 2014. The relationship building strategy with partners in tourism market. *European Journal of Tourism, Hospitality and Recreation*, Special Issue, pp. 95–105.
26. Kang, B., Oh, S. and Sivadas, E., 2013. Beyond Relationship Quality: Examining relationship management effectiveness. *Journal of Marketing Theory and Practice*, 21(3) pp. 272–291.
27. Kleindorfer, P. and Wind, Y., 2009. The Network Imperative: Community or Contagion, in: P. Kleindorfer, Y. Wind, *The Network Challenge, strategy, profit and Risks in an interlinked world*, Pearson Education LTD., pp. 3–24
28. Koponen, J.P. and Julkunen, S., 2022. Development of long-term B2B customer relationships: the role of self-disclosure and relational cost/benefit evaluation. *European Journal of Marketing*, 56(13), pp. 194–235.
29. Kubberød, E., Viciunaite, V. and Fosstenlökken, S.M., 2019. The role of effectual networking in small business marketing. *Journal of Small Business and Enterprise Development*, 26(5), pp. 747–763.
30. Lagrosen, S. and Lagrosen, Y., 2012. Trust and Quality Management: Perspectives from Marketing and Organisational Learning. *Total Quality Management and Business Excellence*, 23(1), pp. 13–26.
31. Lai, K.H., Cheng, T.C.E. and Yeung, A.C.L., 2005. Relationship stability and supplier commitment to quality. *International Journal of Production Economics*, 96(3), 397–410.
32. Lasrado, F., Thaichon, P. and Nyadzayo, M.W., 2023. Exploring the role of relationship management and relationship quality in B2B: empirical insights and future research directions. *Journal of Business and Industrial Marketing*, 38(5), pp. 1055–1086.

33. Lazarić, M., 2018. Marketing odnosa u funkciji uspješnosti poslovnih subjekata u hotelijerstvu (Doctoral dissertation, University of Rijeka. Faculty of Economics and Business).
34. Lee, E., Han, S., Nam, H.U. and Rho, J.J., 2013. Building capabilities via suppliers' effective management of relationships. *Industrial Marketing Management*, 42(5), pp. 805-813.
35. Moorman, C., Zaltman, G. and Deshpande, R., 1992. Relationships Between Providers and Users of Market Research: The Dynamics of Trust Within and Between Organizations. *Journal of Marketing Research*, 29(3), pp. 314-328.
36. Morgan, R.M. and Hunt, S.D., 1994. The Commitment – Trust Theory of Relationship Marketing. *Journal of Marketing*, 58(3), pp. 20-38.
37. Morić Milovanović, B., 2013. Strateški pristup umrežavanju malih i srednjih poduzeća. *Ekonomika misao i praksa*, 22(1), pp. 237-258.
38. Mullins, R.R., Ahearne, M., Lam, S.K., Hall, Z. R. and Boichuk, J.P., 2014. Know your customer: how salesperson perceptions of customer relationship quality form and influence account profitability. *Journal of Marketing*, 8(6), pp. 38-58.
39. Mungra, Y. and Yadav, P.K., 2020. The mediating effect of satisfaction on trust-commitment and relational outcomes in manufacturer-supplier relationship. *Journal of Business & Industrial Marketing*, 35(2), pp. 219-230.
40. Nunnally, J. C., 1967. *Psychometric theory*, McGraw-Hill, New York.
41. Peloza, J. and Shang, J., 2011. How can corporate social responsibility activities create value for stakeholders? A systematic review. *Journal of the Academy of Marketing Science*, 39, pp. 117-135.
42. Perez-Arostegui, M.N., Benitez-Amado, J. and Huertas-Perez, J.F., 2012. In search of loyalty: an analysis of the determinants of buyer-supplier relationship stability under a quality management approach. *Total Quality Management & Business Excellence*, 23(5-6), pp. 703-717.
43. Rajic, T. and Dado, J., 2013. Modelling the Relationships among Retail Atmospherics, Service Quality, Satisfaction and Customer Behavioural Intentions in an Emerging Economy Context. *Total Quality Management and Business Excellence*, 24(9-10), pp. 1096-1110.
44. Sanchez-Hernandez, I. and Grayson, D., 2012. Internal marketing for engaging employees on the corporate responsibility journey. *Intangible Capital*, 8(2), pp. 275-307.
45. Soldić Frleta, D., and Smolčić Jurdana, D., 2023. Determinante potpore lokalnog stanovništva razvoju turizma. *Zbornik Veleučilišta u Rijeci*, 11(1), pp. 1-13.
46. Tansuhaj, P., Randall, D. and McCullough, J., 1988. A services marketing management model: integrating internal and external marketing functions. *Journal of Services Marketing*, 2(1), pp. 31-38.
47. Thai, T.D.-H., Nguyen, T.T., Chen, W.-K. and Tang, A.D., 2023. The roles of internal marketing and person-organization fit in hospitality employees' life satisfaction: an integration of work and nonwork domains. *Baltic Journal of Management*, 18(2), pp. 173-189.

48. Vargo, S.L. and Lusch, R.F., 2011. It's all B2B... and beyond: toward a systems perspective of the market. *Industrial Marketing Management*, 40(2), pp. 181-187.
49. Wang, C.L. and Chung, H.F., 2013. The moderating role of managerial ties in market orientation and innovation: An Asian perspective. *Journal of Business Research*, 66(12), pp. 2431-2437.
50. Xu, S.Q., Zhou, L., Kim, S.H., Chung D.-H. and Li, Z., 2023. Internal marketing analysis for improving the internal consumer satisfaction and customer orientation of employees in private-owned sports centre. *PLoS ONE*, 18, (8), eo286021.
51. Zach, F.J. and Hill, T.L., 2017. Network, knowledge and relationship impact on innovation in tourism destinations. *Tourism Management*, 62, pp. 196-207.
52. Zhang, J.Z., Watson, G.F. IV, Palmatier, R.W. and Dant, R.P., 2016. Dynamic relationship marketing. *Journal of Marketing*, 80(5), pp. 53-75.

THE ROLE OF INTERNAL MARKETING IN CREATING A MOTIVATING AND HAPPIER WORKPLACE FOR LOCAL PUBLIC SECTOR EMPLOYEES

ANA PAULA RODRIGUES

University of Trás-os-Montes and Alto Douro Centre for Transdisciplinary
Development Studies
Vila Real, Portugal
anarodri@utad.pt

JOÃO CLAUDINO

University of Trás-os-Montes and Alto Douro
Vila Real, Portugal
claudinojoao27@gmail.com

ISABEL VIEIRA

Polytechnic Institute of Viseu
School of Technology and Management of Lamego
Centre for Studies in Education and Innovation Viseu, Portugal
ivieira@estgl.ipv.pt

DIDIANA FERNANDES

Polytechnic Institute of Viseu
School of Technology and Management of Lamego
Centre for Studies in Education and Innovation
Viseu, Portugal
dfernandes@estgl.ipv.pt

Paper category: Original scientific paper

ABSTRACT

Although internal marketing (IM) has been researched for more than four decades, its application in organisations remains limited, and there is a notable gap in the literature concerning the importance of work motivation, happiness at work, and employee performance in IM literature, particularly in the local public sector. This study seeks to address this gap by examining the influence of IM on work motivation, happiness at work, and employee performance in three municipal councils in Portugal. A conceptual model is proposed and empirically tested to explore both direct and indirect relationships among these constructs. Specifically, the model posits that effective IM practices foster work motivation and happiness, which in turn enhance employee performance. Furthermore, it anticipates that the influence of IM on employee performance can be mediated by the variables of work motivation and happiness at work. Using a quantitative methodology, data was collected via a questionnaire administered to a sample of 181 employees across three local government organisations in Portugal. The hypothesised relationships were tested using Structural Equation Modelling (SEM). The findings show that IM exerts a direct, positive and significant effect on both work motivation and happiness at work. While no direct relationship was found between IM and employee performance, the results reveal that IM positively influences performance when mediated by work motivation, happiness at work, or both. Specifically, the indirect effects analysis revealed significant mediation paths through both work motivation and happiness at work, with the combined mediation effect being particularly strong. To the best of our knowledge, this study is the first to empirically demonstrate the critical role IM plays in developing work motivation and happiness at work within local public sector organisations. Key IM practices - such as internal communication, training and internal market research - emerge as significant drivers of work motivation and happiness at work and also contribute indirectly to enhancing employee performance. To encourage behaviours of a motivating and happier culture through internal marketing helps build and sustain a more human-centric workforce.

Keywords: internal marketing; work motivation; happiness at work; employee performance; local public sector

1. INTRODUCTION

In today's competitive landscape, human resources are widely recognised as a critical driver of organisational performance (Qaisar & Muhamad, 2021). As a strategic asset, the capacity of human capital to contribute to sustained competitive advantage is significantly diminished when organisations fail to acknowledge and leverage the value employees bring (Qaisar & Muhamad, 2021). Boukis and Kabadayi (2020) further emphasise the difficulty that companies face in creating value for all stakeholders without the involvement of employees. In this context, internal marketing emerges as a vital managerial tool. As highlighted by Bohnenberger et al. (2018), internal marketing is instrumental in institutionalising organisational values, fostering employee commitment, and ultimately enhancing customer satisfaction.

While much of the internal marketing literature has traditionally focused on sectors with high levels of customer interaction, recent studies demonstrate its relevance and adaptability across a diverse range of service sectors (Qiu et al., 2021). In particular, the local public sector - characterised by its proximity to citizens and its responsibility to address regional needs - represents a critical area for internal marketing application. Municipal employees, as the primary agents of local governance, must be equipped with the motivation and competencies necessary to effectively serve their communities. In this context, internal marketing holds transformative potential, functioning as a "holistic management process" (Santiago et al., 2023) that goes beyond traditional human resource strategies. It facilitates the embedding of shared organisational values, strengthens employee commitment, and ultimately contributes to improved service quality and satisfaction—both internally, by fostering a more engaged and motivated workforce, and externally, by enhancing the experience of the citizens served.

Although internal marketing has been widely adopted within the private sector to enhance service delivery and employee performance, its implementation and empirical investigation within public sector institutions—particularly at the local government level—remain limited (Rodrigues et al., 2023; Santiago et al., 2023). As noted by Santiago et al. (2023), while internal marketing practices are theoretically applicable across both sectors, they tend to exert a greater impact in private organisations, likely due to their more extensive and systematic application in that context. Therefore, the application of internal marketing in local public administration remains somewhat underexplored, especially in relation to

psychological and behavioural outcomes such as work motivation, happiness at work, and employee performance.

In the context of internal marketing, work motivation is not only a desirable outcome but also a strategic enabler that links employee well-being to employee performance. In public sector contexts, internal marketing practices can substantially enhance employee engagement and motivation (Santiago et al., 2023), thereby potentially contributing to more effective and citizen-focused service delivery. Research also suggests that internal marketing practices contribute directly to higher levels of job satisfaction (Rodrigues et al., 2023; Bunea et al., 2025), and to workplace happiness (Tang et al., 2020). When employees feel valued, supported, and part of a meaningful mission their happiness at work increases, leading to improved employee performance (Awada et al., 2020; Chunin, 2018).

Existing literature acknowledges the individual importance of constructs like motivation, happiness at work, and employee performance, but empirical studies that integrate these dimensions into a comprehensive internal marketing framework within the public sector are lacking. Given the strategic importance of frontline employees in delivering responsive and high-quality local services, a persistent challenge remains: how can public sector institutions - especially at the municipal level - cultivate a motivated, happy, and high-performing workforce?

Based on the preceding discussion, the aim of this research is to propose and test a conceptual model that explores the effects of internal marketing on employee performance, mediated by work motivation and happiness, within the specific context of three Portuguese municipalities. This research is guided by the following questions: Does internal marketing directly influence work motivation, happiness at work and employee performance? Does work motivation and happiness at work mediate the relationship between internal marketing and employee performance?

In this study, employee performance functions as the ultimate dependent variable. By incorporating happiness and motivation as mediating variables, the proposed model captures some psychological mechanisms through which internal strategies are translated into behavioural outcomes. This study seeks to offer a dual contribution. Theoretically, it extends the application of internal marketing principles to the underexplored context of the local public sector, especially in the Portuguese municipalities. Practically, it provides evidence-based insights to inform marketing and human resource management strategies within local government. By highlighting the potential of internal marketing as a transformative mechanism, the study potentially contributes to foster a more human-centred governance model -

one that enhances employee well-being and performance. In addition to this introduction, the article is divided into five sections: a brief literature review and presentation of the conceptual model and research hypotheses; an explanation of the methodology used; presentation of the results obtained; and finally, the discussion and conclusions of the study.

2. BRIEF LITERATURE REVIEW AND RESEARCH HYPOTHESES

2.1. THE CONCEPT OF INTERNAL MARKETING

Internal marketing has been studied for more than four decades, having been introduced by Berry et al. (1976). Despite its long history, the concept still lacks consensus among researchers. According to Rafiq and Ahmed (2000), Rundle-Thiele and Huang (2015), and Qaisar and Muhamad (2021), there are numerous different definitions, with Rundle-Thiele and Huang (2015) identifying 43 distinct conceptualisations. This diversity reflects its interdisciplinary nature, with scholars positioning it within human resources management (Sasser and Arbeit, 1976; Tsai and Wu, 2007), marketing (George, 1990), or at the intersection of both fields.

Rodrigues et al. (2023) conceptualise internal marketing as a management philosophy that places strategic importance on human resources. It emphasises the engagement, empowerment, and alignment of organisational members around customer-oriented values—both internal and external—while also serving as a mechanism to facilitate and support organisational change.

The emergence of internal marketing stemmed from the recognition of the importance of employee satisfaction, shifting towards viewing employees as internal customers to satisfy the external customer (Berry, 1981). This evolution logically gained greater significance in the service sector due to the challenge of separating the quality and enjoyment of the service provided from the provider itself (Blut et al., 2014). Consequently, it was realised that the quality of employees' work was not always consistent, leading to considerable instability and variability in service quality (Rafiq and Ahmed, 2000). Various approaches to the topic quickly emerged in this context.

Despite research expansion, the service sector dominates internal marketing studies, with Qiu et al. (2021) noting that 25% of existing research is concentrated in the financial sector, followed by hospitality and tourism at approximately 19%. However, limiting internal marketing to these sectors or

solely to workers with direct customer contact would be overly restrictive (Foreman and Money, 1995). Such a perspective would challenge the notion of an organisation as a social system composed of individuals pursuing specific objectives, where human relationships must be acknowledged and nurtured.

Hence, this study aims to evaluate the impact of internal marketing in a context where traditionally there has been limited research in this area - the local governance sector, specifically within three municipalities in northern Portugal. The study seeks to understand not only how internal marketing impacts employee performance but also how this relationship can be mediated by a set of constructs that naturally relate to both variables. This approach makes sense, particularly because performance management is an organisational approach oriented towards objectives (Moynihan and Pandey, 2010). Despite its importance in public sector organisations (particularly in local government), improving performance is often complicated by political-economic considerations (Beeri et al., 2018). Such improvement could enable the achievement of proposed goals: meeting the needs of these institutions' clients - the citizens - by providing them with effectively functioning organisations (Beeri et al., 2018).

Recent empirical research by Bunea et al. (2025) offers valuable comparative insights and methodological parallels to our study. Their work similarly explores internal marketing and mediation mechanisms in municipal contexts using structural equation modelling, providing additional evidence of the applicability of marketing principles in public administration settings. Their findings reinforce the importance of examining how internal marketing practices influence employee attitudes and behaviours in local government organisations.

2.2. THE CONCEPT OF WORK MOTIVATION

Although motivation has been extensively studied, its definition remains varied across perspectives. Most authors conceptualise motivation as a psychological process related to the impulse or tendency to persist in performing certain behaviours (Tamayo and Paschoal, 2003), with key theorists like Katzell and Thompson (1990) and Locke and Latham (1991) analysing it through three main components: the drive to pursue a particular behaviour, the direction of that behaviour, and its persistence.

Katz and Kahn (1974) highlight motivation as an essential factor in verifying behaviours that organisations expect to observe in their employees, potentially leading to spontaneous behaviours crucial for the

organisation's effective functioning. Ryan and Deci (2000) define being motivated as being driven to do something. They classify motivation into intrinsic and extrinsic types. Intrinsic motivation involves doing something for the inherent pleasure of performing the task, regardless of associated benefits or penalties. On the other hand, extrinsic motivation depends on external influences, such as arriving on time for work out of fear of receiving a reprimand from the boss.

2.3. THE CONCEPT OF HAPPINESS AT WORK

Happiness at work has become an increasingly studied topic, primarily due to human resources concerns and the recognition of its importance within organisations (Salas-Vallina and Alegre, 2018). Conceptual challenges begin with philosophical considerations about whether it encompasses pleasant feelings experienced in work-related situations or a different notion of happiness arising from a sense of moral justice through virtuous action (Fisher, 2010). According to Salas-Vallina et al. (2018), happiness at work should be conceptualised as a multidimensional construct encompassing various interrelated factors, including employee engagement, job satisfaction, and effective organisational commitment.

The application of "positive psychology" to the analysis of quality of life dates back to Maslow (1954). Many authors have sought a connection between various concepts falling under this idea of positive psychology and individual performance. For example, Fredrickson's study (2001) demonstrates that positive emotions facilitate learning and teamwork, and Yang and Hung's study (2016) concludes that happy workers are more productive. Nonetheless, as highlighted by Salas-Vallina et al. (2018), there remains a limited understanding regarding the conceptualisation, measurement, antecedents, and outcomes of happiness at work.

2.4. THE CONCEPT OF EMPLOYEE PERFORMANCE

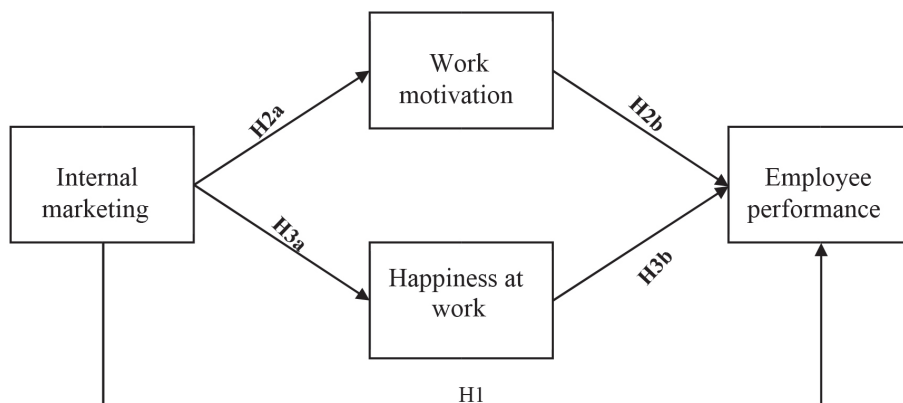
In 1990, Campell described the structure and content of the literature on this topic as a "desert". Despite subsequent research development, approaches to the subject remain diverse, with varying definitions (Koopmans et al., 2011). Sonnentag and Frese (2002) offer a comprehensive understanding, defining performance as a multidimensional concept supported by behaviours aimed at achieving specific organisational goals. Performance appraisal plays a critical role within the organisational context, as it directly relates to employee development, organisational structure, and

the strategic investment in enhancing individual skills and competencies. When effectively implemented, the appraisal process serves as a valuable tool that supports both employee growth and organisational improvement (Rodrigues et al., 2023).

Wilkins and Ouchi (1983), argue that a distinct organisational culture, with properties that make its members feel part of something larger, can strongly influence performance, and Lee and Bruvold (2003), demonstrate that an organisational culture focused on employee development can lead to high commitment and a sense of reciprocity that positively influences performance.

Considering this theoretical framework, the proposed conceptual model is presented (Figure 1).

Figure 1. Proposed conceptual model



Based on the literature review, a conceptual model is proposed which illustrates the relationships between internal marketing, work motivation, happiness at work, and employee performance. The model proposes both direct relationships and mediating effects, which are elaborated in the following hypotheses.

Internal Marketing and Employee Performance

Internal marketing originates from Berry's proposal (1981) to view employees as internal customers and, consequently, jobs as products. Since then, internal marketing studies have significantly advanced, particularly in services, where its impact on external customers' satisfaction, loyalty, and perceived service quality has been observed (Kadic-Magljalic et al., 2018; Lings and Greenley, 2010; Varey, 1995). Moreover, internal marketing

appears capable of aligning employees with organisational goals, reducing typical workplace frictions (Rafiq and Ahmed, 1993). Abidin and Roslin (2019) discuss internal marketing as a tool that can lead to optimal outcomes in terms of organisational behaviours and achieving appropriate labour costs, by enabling all employees to focus on truly meaningful tasks.

Internal marketing potentially enhances employee performance through several distinct mechanisms. For example, through effective communication, employees gain a clearer understanding of their roles, responsibilities, and performance expectations. Also, through training initiatives, employees develop the knowledge, skills, and abilities necessary for effective task performance. Moreover, through internal market research, organisations can identify and remove barriers to high performance, thereby enabling employees to work more efficiently and effectively.

Empirical evidence supporting this relationship has accumulated across various contexts and methodologies (Taştan and Davoudi, 2020). A growing body of empirical research demonstrates a direct and significant relationship between internal marketing and employee performance, with important implications at the organisational level. Recent studies by Imani et al. (2020), Abidin and Roslin (2019), and Taştan and Davoudi (2020) provide compelling evidence of this connection. Their findings suggest that when employees perceive internal marketing efforts positively, they are more likely to report higher levels of job satisfaction, which in turn contributes to improved work performance.

In this context the following hypothesis is established:

Hypothesis 1: Internal marketing has a direct positive influence on employee performance.

Internal Marketing, Work Motivation, and Employee Performance

Self-determination theory serves as the backdrop for considering motivation in this study. This theory proposes two types of motivation: intrinsic and extrinsic (Gagné et al., 2010). Intrinsic motivation involves doing something for personal benefit because the situation is deemed interesting and enjoyable (Gagné et al., 2010). Extrinsic motivation, on the other hand, pertains to doing something for instrumental reasons, varying based on the degree of motivation internalisation (Gagné et al., 2010). Internalisation concerns the adoption of a set of rules guiding conduct, based on external factors such as rewards or penalties, thus becoming internally regulated motivation (Ryan, 1995). According to self-determination theory (Ryan & Deci, 2000), motivation is enhanced when individuals experience autonomy, competence, and relatedness. Internal marketing practices

directly address these psychological needs: communication initiatives enhance autonomy by providing employees with information necessary for decision-making; training programmes develop competence by enhancing skills and abilities, and market research-based responsiveness fosters relatedness by demonstrating organisational concern for employee well-being. Internal marketing practices can enhance both types of motivation by creating work environments that satisfy basic psychological needs for autonomy, competence, and relatedness (Ryan & Deci, 2000). Through effective communication, organisations clarify goals and expectations, while training initiatives enhance employee competence and self-efficacy.

Empirical research has demonstrated the positive influence of internal marketing on work motivation across diverse contexts. Vital and Alves (2014), in their study of nursing work employees, found that internal marketing practices explained 47% of the variance in employee motivation, with particularly strong effects for recognition programmes and two-way communication. Bell et al. (2004) similarly found that internal marketing positively influenced both intrinsic motivation and identified regulation (a more autonomous form of extrinsic motivation) among retail employees. The relationship appears particularly significant in public sector contexts, where traditional motivational approaches often prove insufficient. Narteh and Odoom (2015) found that internal marketing practices contributed significantly to both intrinsic motivation and public service motivation among bank employees. Their results indicated that internal marketing was especially effective in contexts where monetary incentives were limited, suggesting its potential value in public administration settings like local councils.

Based on the preceding discussion, the following hypothesis is formulated:

Hypothesis 2a: Internal marketing has a direct positive influence on work motivation.

Regarding the relationship between work motivation and employee performance, meta-analytic evidence from Cerasoli et al. (2014) established a strong positive association between intrinsic motivation and performance quality, while extrinsic incentives were more strongly related to performance quantity. This distinction is particularly relevant in public service contexts, where quality dimensions often outweigh simple quantitative metrics.

Ingsih et al. (2021) examined this relationship specifically in municipal governance contexts, finding that work motivation significantly influenced both task performance and contextual performance. Pancasila et al. (2020) identified a similar pattern but also found that the motivation-performance

relationship was stronger for employees with higher levels of organisational commitment, suggesting potential interaction effects with other attitudinal variables. Nguyen et al. (2019) emphasised the differential effects of intrinsic versus extrinsic motivation, finding that intrinsic motivation had stronger and more persistent effects on performance over time. Their longitudinal analysis revealed that, while extrinsic motivation produced short-term performance gains, these effects diminished over time, whereas intrinsic motivation effects strengthened, supporting the notion that internal marketing strategies focusing on intrinsic motivation may yield more sustainable performance improvements.

Accordingly, the study proposes the following hypothesis:

Hypothesis 2b: Work motivation has a direct positive influence on employee performance.

Internal Marketing, Happiness at Work, and Employee Performance

The pursuit of satisfying the needs of internal customers seems inherent to internal marketing, potentially linking this tool to employees' happiness at work. Prior studies underscore the value of fostering happiness in the workplace as a meaningful organisational objective (Salas-Vallina et al., 2018). The authors define happiness at work as the short-lived mood and emotion individuals can experience at work. Fisher (2010) suggests that happiness at work relates to pleasant feelings, sensations, and emotions caused by various job components in an individual.

Empirical research examining the relationship between internal marketing and happiness at work has emerged in recent years. The broaden-and-build theory of positive emotions (Fredrickson, 2001) suggests a potential reciprocal relationship, wherein initial positive emotions resulting from internal marketing initiatives broaden thought-action repertoires and build personal resources, which then foster additional positive emotions. This creates a "virtuous cycle" of positive affect in the workplace. Tang et al. (2020) conducted a cross-sectional study of service employees that revealed a significant positive relationship between internal marketing practices and workplace happiness. Their analysis demonstrated that communication quality and training opportunities were the strongest predictors of happiness, explaining 37% of variance in employee happiness scores.

Fisher (2010) proposed that happiness at work is influenced by both situational factors (such as job design, relationships, and leadership) and person factors (such as personality traits and fit perceptions). In this

framework, internal marketing practices function as situational factors that enhance happiness by creating supportive work environments.

This leads to the formulation of the following hypothesis:

Hypothesis 3a: Internal marketing has a direct positive influence on happiness at work.

Additionally, it is important to understand whether happiness at work positively impacts employee performance. The broaden-and-build theory of positive emotions (Fredrickson, 2001) provides a theoretical foundation for this relationship, suggesting that positive emotions broaden thought-action repertoires and build enduring personal resources, which can enhance performance. Happy employees tend to be more creative, cooperative, and resilient in the face of challenges. There are some studies dedicated to this subject (Awada et al., 2020; Chunin, 2018; Salas-Vallina et al., 2018), which support the interest in this relationship. Fredrickson's study (2001) demonstrates that positive emotions facilitate learning and teamwork, and Yang and Hung's study (2016) concludes that happy workers are more productive. The study of Salas-Vallina et al. (2018) concludes that the main outcomes of happiness at work are related to in-role performance behaviours and extra-role performance behaviours. However, the authors emphasised the need for further research to deepen the understanding of the relationship between positive employee attitudes and performance outcomes.

Accordingly, this study proposes the following hypothesis:

Hypothesis 3b: Happiness at work has a direct positive influence on employee performance.

3. METHODOLOGY

This study adopted a quantitative approach in the form of a survey conducted through the administration of a questionnaire (both in-person and online). Several municipalities in the northern region of Portugal were approached for convenience, and data was ultimately collected from three municipalities. The target population from which information was gathered consisted of all employees currently holding positions in these three municipal councils. Due to operational and time constraints, a convenience sampling method was decided upon.

The study evaluated four variables: internal marketing, work motivation, happiness at work, and performance. Existing scales from the literature related to these concepts were selected for evaluation. They were assessed using Likert scales with five points, ranging from 1: strongly disagree to 5:

strongly agree. The performance measurement instrument was evaluated on a scale ranging from 1: almost never to 5: almost always.

To measure the concept of internal marketing, the scale proposed by Huang and Rundle-Thiele (2015) was used. This scale comprises 18 items divided into three dimensions: Internal Communication, Training, and Internal Market Research.

The concept of work motivation was measured using the scale developed by Gagné et al. (2015), which includes six dimensions (Amotivation, Extrinsic social regulation, Extrinsic material regulation, Introjected regulation, Identified regulation, Intrinsic motivation) and originally consists of 19 items, of which 16 were used in this study.

For the comprehensive understanding of the phenomenon of happiness at work, nine items from the scale created by Salas-Vallina and Alegre (2018) were adapted. This adaptation considers happiness at work in a broader context, based on Fisher's (2010) conceptualisation.

Finally, performance was measured using the scale proposed by Koopmans et al. (2016), the IWPQ (Individual Work Performance Questionnaire), which includes three dimensions: Task Performance, Contextual Performance, and Counterproductive Work Behaviour. Thirteen items from the original 18-item scale were used in this study.

Regarding demographic variables, respondents were asked about gender, age, educational qualifications, current job function, tenure in the current position, tenure in the municipality, and income level. A pre-test was conducted to gauge respondents' perception of the questions. Based on the pre-test analysis, only minor changes to question formulation were made, as respondents generally had few critiques of the questionnaire construction.

Data collection took place between June and October 2022, conducted both in-person and through online questionnaire applications across the three municipalities. A total of 181 valid responses were obtained (139 from municipality X, 37 from municipality Y, and 5 from municipality Z). The statistical analysis presented subsequently was conducted using IBM SPSS (Statistical Package for the Social Sciences), version 26 for Windows, and Amos, version 26 for Windows (Structural Equation Modelling). For characterising the variables under study, mean (M) and standard deviation (SD) were used for quantitative variables, and absolute frequencies (n) and relative frequencies (%) for categorical variables. Confirmatory analysis was performed using Structural Equation Modelling (measurement model), employing Maximum Likelihood estimation method. Factor validity, convergent validity, reliability, and model fit quality were evaluated. Reference values used included standardised factor loadings above 0.50

(factor validity), Average Variance Extracted (AVE) above 0.50 (convergent validity), square root of AVE higher than inter-factor correlations (discriminant validity), construct reliability (CR) above 0.70 (reliability), Chi-square/degrees of freedom ratio less than 3, Comparative Fit Index (CFI) above 0.90, and Root Mean Square Error of Approximation (RMSEA) below 0.10 (indicative of good model fit). Structural Equation Modelling was also employed to examine causal relationships between constructs to address the study hypotheses (structural model).

4. PRESENTATION OF RESULTS

4.1. SAMPLE CHARACTERISTICS AND DESCRIPTIVE SCALE ANALYSIS

Table 1 shows the characterisation of the sample.

Table 1. Characterisation of the sample

Variable		n	%
Gender	Male	87	48.1%
	Female	94	51.9%
Age	Minimum - maximum	26 - 65	
	Mean (SD - standard deviation)	48.6 (8.8)	
Qualifications	Basic Education	5	2.8%
	Secondary education	76	42.0%
	Higher Education	100	55.2%
Local authorities	Z	5	2.8%
	Y	37	20.4%
	X	139	76.8%
Income level	Up to 800€	58	32.0%
	From 801€ to 1000€	42	23.2%
	More than 1000€	81	44.8%
Length of service (years)	Minimum - maximum	0.5 - 43.0	
	Mean (SD - standard deviation)	12.9 (11.1)	
Length of service in the municipality (years)	Minimum - maximum	0.5 - 40.0	
	Mean (SD - standard deviation)	15.1 (11.1)	

Source: Authors

Through the analysis of the table, it is possible to observe that the sample consists of a total of 87 male individuals (representing 48.1% of the sample) and 94 female individuals (representing 51.9%). Regarding the age of the participants, it ranges from 26 to 65 years (mean = 48.6 years and SD = 8.8). Concerning the municipality where the participants work, 139 respondents belong to municipality X (accounting for 76.8% of the sample), 37 belong to municipality Y (accounting for 20.4% of the sample), and 5 belong to municipality Z (accounting for 2.8% of the sample). Only five respondents had basic education (corresponding to 2.8% of the sample), 76 had secondary education (corresponding to 42% of the sample), and 100, more than half of the sample, had higher education (corresponding to 55.2% of the sample). It is noted that 32% of the respondents (58 individuals) have an income level up to 800€ per month, 23.2% (42 respondents) have an income level between 801€ and 1,000€ per month, and finally, 44.8% (81 respondents) have an income level above 1,000€ per month.

Regarding tenure in the municipality, values range from 6 months to 40 years. As for tenure in the current position, values range from 6 months to 43 years. On average, the employees in the sample have been in their current position for 12.9 years (SD = 11.1), and in the municipality for 15.1 years (SD = 11.1).

Regarding the descriptive analysis of the scales, it was found that the scales for work motivation (Mean = 4.42, Standard Deviation = 0.58) and employee performance (Mean = 4.43, Standard Deviation = 0.56) had the highest average values - close to the maximum point on the scale (= 5). The internal marketing (Mean = 3.33, Standard Deviation = 0.91) and happiness at work (Mean = 3.51, Standard Deviation = 0.82) scales showed lower average values, but still above the midpoint of the scale (= 3).

With regard to work motivation, the descriptive analysis of the scales suggests that employees consider their work meaningful and make an effort to perform the tasks assigned to them. Among the six dimensions of this construct, four (amotivation, intrinsic motivation, introjected regulation, and identified regulation) obtained the highest mean scores. It is worth noting that some extrinsic motivation factors scored lower on average—particularly the statement “I make an effort because I will only be financially rewarded if I work hard enough” (Mean = 2; Standard Deviation = 1.2). This suggests that salary alone may not be sufficient to motivate employees.

Regarding happiness at work, it is clear that employees are satisfied with the nature of the work they perform, and there even appears to be an emotional connection - a sense of belonging to the organisation. This is reflected in items such as “I feel emotionally attached to this organisation”

(Mean = 3.9; Standard Deviation = 1.1), “I have a strong sense of belonging to the organisation where I work” (Mean = 3.8; Standard Deviation = 1.1), and “I am satisfied with the nature of the work I do” (Mean = 4; Standard Deviation = 0.9), all of which received relatively high average scores. However, employees seem dissatisfied with the rewards associated with their work. Statements such as “I am satisfied with the salary I receive for my work” (Mean = 2.3; Standard Deviation = 1.2) and “I am satisfied with the promotion opportunities available in this municipality” (Mean = 2.6; Standard Deviation = 1.3) received significantly lower average scores.

Finally, the results of the descriptive analysis of the internal marketing scale indicate that the municipalities seem to place greater emphasis on the communicational dimension. Employees, for example, perceive that the municipality conveys a clear brand image (Mean = 4.1; Standard Deviation = 0.9), that there is a certain level of alignment and adequacy in internal communication (even across hierarchical levels) (Mean = 3.8; Standard Deviation = 1), and that efforts are made to ensure everyone understands the direction to take (Mean = 3.5; Standard Deviation = 1). Within this construct, however, the training dimension received comparatively lower average scores, ranging from a mean of 3.1 (“The municipality where I work provided me with an orientation programme”) to 3.5 (“The municipality where I work makes efforts to train employees”). The internal marketing research dimension appears to be where municipalities are least attentive. Employees expressed greater uncertainty regarding the municipality’s efforts to identify their problems or to collect data on job quality, with average scores ranging between 2.7 and 3.

4.2. MEASUREMENT MODEL

A factorial structure of the scales included in the study was analysed using Structural Equation Models. For validation, procedures proposed by Hair et al. (2010) were followed. The maximum likelihood method was employed, assuming correlation between dimensions. Scores of items presented in reverse were inverted for Structural Equation Models (inversion: 1=5, 2=4, 3=3, 4=2, 5=1): items 1, 2, and 3 of the Work Motivation scale; items 10, 11, 12, and 13 of the employee performance scale.

Data normality was verified through analysis of skewness and kurtosis coefficients. Absolute values of skewness coefficients were below 1.7 and kurtosis coefficients were below 2.1, ensuring approximation to multivariate normality, supporting the quality of adjustment indices and parameter estimates (Marôco, 2010).

The initial model including all scale items revealed some items with standardised factor loadings below desirable levels (< 0.50) in the work motivation and employee performance scales. These items (four items on the employee performance scale and five items on the work motivation scale) were excluded from analysis due to their very low standardised factor loadings, which compromise the factorial validity of the scales. The results from confirmatory factor analysis after excluding these items are presented in the following tables.

During this process of purification of the measurement model, two items of the scale of work motivation (item 1: "I don't make an effort, because I feel like I'm wasting my time on this job", with 0.486 and item 9: "I make an effort because I have to prove to myself that I can do it" with 0.448) and one item of the happiness at work scale (item 5: "I am satisfied with the salary I receive for my work", with 0.419) still produced standardised factor loadings which were slightly lower than the recommended threshold (< 0.50). Although these items had standardised factor loadings above 0.40 but below 0.50, it was decided to keep them due to their theoretical relevance. For example, within the happiness at work scale, the item related to salary satisfaction exhibited the lowest standardised factor loading. However, its removal would reduce the satisfaction dimension of the happiness scale to only two items, which could compromise this dimension scale's construct validity. Also, this item captures a unique or essential aspect of happiness at work that is not covered by other items. A similar rationale was applied to the two items within the work motivation scale. Eliminating items 1 and 5 would result in the amotivation and introjected regulation dimensions being represented by only two indicators each, which could undermine the structural integrity and content validity of these dimensions. Furthermore, given that the overall measurement model demonstrated strong fit indices (e.g., CFI > 0.90 , RMSEA < 0.08), factor loadings within the 0.40–0.50 range are deemed acceptable for retention (Hair et al., 2010).

All remaining items had standardised factor loadings above 0.50, confirming factorial validity for each construct and ensuring correct item specification (Marôco, 2010) (Table 2).

Table 2. Standardised Factor Weights, Average Variance Extracted (AVE) and Composite Reliability (CR) of the measurement model

Items/scales	Factor Weights	AVE	CR
Internal Marketing		0.656	0.972
1 - The municipality where I work gives me a clear brand image.	0.795		
2 - There is an internal communication programme applied to all the municipality's employees.	0.706		
3 - In the local authority where I work, all the communication material reflects a consistent style.	0.827		
4 - Employees at all hierarchical levels understand the direction and main priorities of the municipality.	0.755		
5 - In my workplace, communications are adequate.	0.722		
6 - The messages I receive are in line with the council's general communication.	0.776		
7 - The local authority where I work endeavours to train its employees.	0.774		
8 - The municipality where I work has provided me with an orientation programme.	0.869		
9 - The training provided by the local authority where I work has enabled me to do my job well.	0.796		
10 - The local authority where I work explains to me why I should do things.	0.902		
11 - In the local authority where I work, the development of skills and knowledge is a continuous process.	0.867		
12 - The municipality where I work supports the development of my communication skills in order to achieve organisational goals.	0.849		
13 - The municipality where I work gathers the opinion of its employees.	0.844		
14 - The local authority where I work regularly tries to collect suggestions from its employees.	0.867		
15 - The local authority where I work collects data on complaints from its employees.	0.841		
16 - The local authority where I work does a lot of research into internal marketing.	0.731		
17 - The local authority where I work communicates with me to identify any problems I may have.	0.849		
18 - At least once a year, the municipality where I work surveys its employees to assess the quality of their jobs.	0.769		
Happiness at work		0.508	0.899

1- I feel strong and energetic at work.	0.785		
I'm enthusiastic about my work.	0.817		
I abstract myself from my surroundings when I'm working.	0.508		
4- I am satisfied with the nature of the work I do.	0.761		
I am satisfied with the salary I receive for my work.			
I'm satisfied with the promotion opportunities available in this municipality.	0.419		
7- I would be very happy to spend the rest of my career in this municipality.	0.631		
I feel emotionally attached to this organisation.	0.797		
I have a strong sense of belonging to the organisation where I work.	0.765		
	0.809		
Items/scales	Factor weights	AVE	CR
Work Motivation		0.457	0.896
1 - I don't make an effort, because I feel like I'm wasting my time on this job. *	0.486		
2 - I make little effort, because I don't believe this job is worth the effort. *	0.496		
3 - I don't know why I do this job, I think it's pointless. *	0.530		
9 - I make an effort because I have to prove to myself that I can do it.	0.448		
10 - I make an effort because it makes me feel proud of myself.	0.868		
11 - I make an effort because otherwise I feel bad about myself.	0.768		
12 - I make an effort because, personally, I think it's important to make an effort in this job.	0.896		
13 - I make an effort because making an effort in this job is in line with my personal values.	0.854		
14 - I make an effort because making an effort in this job means something to me.	0.807		
15 - I work hard because I have fun doing my job.	0.517		
16 - I make an effort because what I do in my job is interesting.	0.514		
Employee Performance		0.529	0.909
1 - I was able to plan my work in such a way as to finish it on time.	0.786		

2 - I was able to distinguish the main issues from the secondary issues in the work.	0.721		
3 - I kept in mind the result I needed to achieve with the work.	0.768		
4 - I planned my work optimally.	0.758		
5 - Once I'd finished the tasks I'd been given, I started new ones on my own initiative.	0.578		
6 - I'm constantly looking for new challenges in my work.	0.713		
7 - I have endeavoured to keep my work-related knowledge up to date.	0.789		
8 - I endeavoured to keep my work-related skills up to date.	0.768		
9 - I accepted extra responsibilities.	0.635		
Model fit indices: $X^2 = 1727.404$; degrees of freedom = 997; $p < 0.001$; $X^2 / \text{degrees of freedom} = 1.733$ CFI = 0.902; RMSEA = 0.064 (IC90%: 0.059-0.069)			
AVE - Average Variance Extracted; CR - Construct Reliability; * items with inverted scores (1=5, 2=4, 3=3, 4=2, 5=1)			

Source: Authors

A convergent validity was assessed using the Average Variance Extracted (AVE) (Table 2). The internal marketing (AVE = 0.656), happiness at work (AVE = 0.508), and employee performance (AVE = 0.529) scales showed adequate AVE values (> 0.50). However, the work motivation scale had an AVE value slightly below the desired threshold (AVE = 0.457). Nevertheless, this value is sufficiently close to not jeopardise the convergent validity of the model (Hair et al., 2010). Regarding reliability (or internal consistency), all scales exhibited high composite reliability values (CR > 0.89) (Table 2).

To evaluate the model fit quality, indices suggested by Hair et al. (2010) were used: the Chi-Square statistic and its degrees of freedom, the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). The Chi-Square Test ($X^2 = 1727.404$; degrees of freedom = 997; $p < 0.001$) was significant. However, the X^2/df ratio = 1.733, CFI = 0.902, and RMSEA = 0.064 (90% CI: 0.059-0.069) indicate good model fit according to Marôco (2010) and Hair et al. (2010) (Table 2).

Discriminant validity was evaluated by comparing the square root of AVE for each pair of constructs with the correlations between those constructs. As per Hair et al. (2010), if the square root of AVE values is greater than the correlations between constructs, discriminant validity is confirmed. The correlations and square root of AVE values presented in Table 3 demonstrate

that all constructs meet this criterion, confirming the discriminant validity of the model.

Table 3. Correlations between the scales and square root of the Average Variance Extracted (AVE)

Factors	Internal Marketing	Happiness work	at Work Motivation	Employee Performance
Internal Marketing	(0.810)			
Happiness at work	0.704	(0.713)		
Work Motivation	0.183	0.399	(0.676)	
Employee Performance	0.303	0.476	0.491	(0.727)

Source: Authors

The elements on the diagonal (in parentheses) represent the square root of the Average Variance Extracted (AVE). The elements off the diagonal correspond to the correlations between latent constructs. Therefore, the reliability and validity of the scales, as well as the overall quality of the adjusted measurement model, are ensured.

4.3. STRUCTURAL MODEL AND HYPOTHESIS TESTING

To test the structural model and address the study hypotheses, Structural Equation Modeling (SEM) was employed, and the results are presented in Table 4. The model demonstrated good fit with $X^2/df = 1.799$, CFI = 0.893, and RMSEA = 0.067 (90% CI: 0.062-0.072). While the structural model yielded a CFI of 0.893, which falls just below the conventional threshold of 0.90, it is still considered to be within an acceptable range, particularly in studies using real-world data from field settings (Hu & Bentler, 1999). Given the model's conceptual grounding and the adequate fit of other indices (e.g., RMSEA < 0.08), the overall fit may be deemed satisfactory. The analysis of modification indices did not yield any substantial or theoretically justifiable adjustments that could meaningfully enhance the model's overall fit.

Table 4. Standardised and non-standardised coefficients of the structural model

	Non- standardised coefficient (B)	Standardised coefficient (β)	p
Direct effects			
Internal Marketing ► Work Motivation	0.076	0.202	0.033
Internal Marketing ► Happiness at Work	1.032	0.826	<0.001
Internal Marketing ► Employee Performance	0.118	0.137	0.336
Happiness at Work ► Employee Performance	0.317	0.458	0.002
Work Motivation ► Employee Performance	0.860	0.376	0.002
Indirect effects Internal Marketing ► Work Motivation ► Employee Performance	0.066	0.076	0.010
Internal Marketing ► Happiness at Work ► Employee Performance	0.327	0.378	0.010
Internal Marketing ► (Happiness + Motivation) ► Employee Performance	0.393	0.454	0.001

Model fit indices:

$\chi^2 = 1798.559$; degrees of freedom = 1000; $p < 0.001$; χ^2 /degrees of freedom = 1.799; CFI = 0.893;
 RMSEA = 0.067 (IC90%: 0.062-0.072)

Source: Authors

Regarding the direct effects, the results indicate that internal marketing has a positive and significant effect on both happiness at work and work motivation, but it does not have a significant effect on employee performance. Employee performance is positively influenced by both happiness at work and work motivation.

In AMOS, the mediation effect is typically tested through Bootstrapping (usually 2000–5000 samples) to estimate indirect effects. The Bias-corrected confidence intervals (95% CI) was calculated. The confidence interval is entirely above zero (IC90%: 0.062-0.072), which indicates that the indirect effect is statistically significant at the 90% confidence level. This provides evidence of mediation, meaning that the effect of the independent variable (e.g., internal marketing) on the dependent variable (e.g., employee performance) occurs through a mediator (e.g., work motivation or happiness at work). The bootstrapping analysis demonstrated a significant indirect effect of internal marketing on employee performance through work motivation ($\beta = 0.076$, 95% CI [0.062– 0.072]), supporting the mediating

role of work motivation. Similarly, a significant indirect effect was also found through happiness at work ($\beta = 0.378$, 95% CI [0.062–0.072]). The work motivation mediation portion ($\beta=0.076$) is smaller than the portion of the happiness at work mediation ($\beta=0.378$). In this case, it is the largest indirect effect in this model, suggesting that happiness at work is a stronger mediator than work motivation in the relationship between internal marketing and employee performance. Furthermore, when considering both mediators simultaneously, the total indirect effect of internal marketing on employee performance remained positive and statistically significant ($\beta = 0.393$, 95% CI [0.062–0.072]).

5. DISCUSSION AND CONCLUSIONS

This study aimed to analyse the effect of internal marketing on work motivation, happiness at work, and employee performance within the context of three municipal councils in the northern region of Portugal. To the best of our knowledge, there are no existing studies that have examined all these relationships in the context of local governance.

It was concluded that Hypothesis H1, stating “Internal marketing has a direct positive influence on employee performance,” was not supported. The study of Rodrigues et al. (2023) also indicated that the application of internal marketing techniques in the examined local authorities did not directly impact employee job performance. Hypothesis H2a, “Internal marketing has a direct positive influence on work motivation,” was supported, corroborating results from Vital and Alves (2014), Bell et al. (2004) and Narteh and Odoom (2015). Hypothesis H2b, stating “Work motivation has a direct positive influence on employee performance,” was likewise supported, aligning with previous studies by Ingsih et al. (2021), Pancasila et al. (2020), and Oluseyi and Hammed (2009). Hypothesis H3a, “Internal marketing has a direct positive influence on happiness at work,” was also supported, consistent with conclusions drawn by Tang et al. (2020). Similarly, Hypothesis H3b, stating “Employee happiness at work has a direct positive influence on employee performance,” was also supported, echoing findings by Awada et al. (2020), Chunin (2018) and Salas-Vallina et al., 2018.

As far as indirect effects are concerned, it can be concluded that internal marketing, when mediated by work motivation, happiness at work, or both constructs simultaneously, positively impacts employee performance. These findings confirm that both work motivation and happiness at work serve as important psychological mechanisms through which internal marketing enhances employee performance. The mediation results underscore the

multi-pathway influence of internal marketing. Not only does it indirectly improve performance via each mediator individually, but the combined mediation amplifies its overall impact. This highlights the importance of fostering both motivation and happiness in the workplace as strategic levers for performance enhancement, especially in the public sector context where employee engagement is often under-emphasised.

While internal marketing is an increasingly studied topic, the analysis of these relationships within the context of local governance remains limited. Therefore, this study theoretically contributes to the marketing literature by enhancing the understanding of internal marketing in this context, potentially leading to better practices that improve organisational performance and operational efficiency. The application of internal marketing can serve as a key factor in motivating and valuing employees, identifying issues, and orchestrating strategies to address them—ranging from simple organisational frictions to critical aspects like continuous employee training. It also aids in establishing communication channels that are appropriately aligned, ensuring that the entire organisation remains focused on its goals and feels integrated into the process. Given that the primary role of local governance is to meet the needs of the populations they serve, the performance of employees within these organisations plays a crucial role. Another theoretical contribution of this study lies in identifying work motivation and happiness at work as key mediators and providing a more comprehensive model of how these psychological constructs function in the relationship between internal marketing and employee outcomes. The mediation effects of the model (work motivation and happiness at work) allow for a more comprehensive view of how internal marketing functions as a driver of employee behaviour, moving beyond the more traditional view of internal marketing as just a tool for improving employee satisfaction. In this way this study contributes by formally introducing and testing these two psychological constructs as mediators in this relationship, which opens up new avenues for understanding how and why internal marketing impacts employee performance. In this regard, the greater strength of happiness at work as a mediator, as opposed to work motivation, contributes to theoretical discussions on the relative importance of different psychological states in influencing performance. While motivation has long been recognised as important, this study suggests that emotional factors (such as happiness at work) may have a stronger impact on employee performance than cognitive factors like motivation. Moreover, this study contributes to human resource and organisational theories by showing that organisations can optimise

employee performance through emotional satisfaction (e.g., happiness, work-life balance).

This study offers crucial practical insights for policymakers and human resource leaders in local government organisations, particularly within municipal councils. Based on the study's findings, several actionable practices have been identified for implementation by local public sector leaders. Firstly, this study can enhance their understanding of how internal marketing, happiness at work, work motivation, and performance are perceived by employees. This understanding can guide adjustments in behaviours and approaches, ultimately aiming to improve employee performance. Secondly, the findings provide actionable guidance for enhancing employee performance through targeted internal marketing practices (particularly related to internal communication but also with training and internal market research). The findings underscore the significance of internal communication - and to a lesser extent, training - as central dimensions of internal marketing. In this context, local administrations should invest in continuous skills development programmes that enhance employees' capabilities to serve citizens effectively. Therefore, training initiatives should focus not only on technical competencies but also on communication skills that enable employees to align their work with organisational goals. Leaders in local administrations should focus on recognising employee contributions, providing constructive feedback, and creating opportunities for meaningful participation in decision-making processes, because when employees perceive that their opinions are valued, their work motivation and happiness at work increases, which positively impacts performance. Creating formal channels for employees to voice concerns and suggestions about working conditions and processes can provide municipal managers with valuable insights for organisational improvement, as emphasised by Boukis and Kabadayi (2020). This is relevant in the organisations studied since the internal marketing dimension, internal market research, showed lower average values. Rather than implementing isolated initiatives, municipal councils should adopt a holistic approach to internal marketing that addresses these multiple dimensions simultaneously. That is, for policymakers and human resource leaders in local administrations, focusing on clear communication, targeted training, and feedback loops will strengthen internal marketing efforts and lead to employee well-being (motivation and happiness) and, ultimately, improved performance within municipal organisations.

Thirdly, municipal leaders should foster a culture that values employee motivation and happiness at work since these psychological mechanisms are translated into positive behavioural outcomes (employee performance).

Finally, the study advocates for municipal leaders to embrace a more human-centric approach to governance, emphasising the transformative potential of internal marketing to prioritise employee well-being (happiness) and cognitive engagement (motivation). By doing so, they can foster a high-performing workforce. This is how public sector institutions - especially at the municipal level - can cultivate a motivated, happy, and high-performing workforce.

A limitation of this study is its reliance on a single-informant design, focusing solely on municipality employees as the primary unit of analysis. Future research should broaden the scope to include additional stakeholders, such as customers, to gain a more comprehensive understanding. Replicating this study across municipal councils from other regions and varying sizes would be beneficial for developing more robust comparative analyses. Furthermore, this study utilised cross-sectional data to test the research model and hypotheses. However, given that internal marketing, work motivation, happiness at work, and employee performance are dynamic constructs influenced by time, these factors may be more effectively explored through longitudinal research. Therefore, future studies adopting a longitudinal design would be beneficial to capture these constructs' evolving nature over time. Also, it seems interesting that future research explores other potential mediators or moderating factors that may further explain how internal marketing influences employee performance.

Acknowledgements

This work is supported by national funds, through the FCT – Portuguese Foundation for Science and Technology under the project UIDB/04011/2020. This work is also funded by National Funds through FCT - Foundation for Science and Technology, IP, under the project reference UIDB/05507/2020 and DOI identifier <https://doi.org/10.54499/UIDB/05507/2020>. Additionally, we would like to thank the Centre for Studies in Education and Innovation (Ci&DEI) and the Polytechnic Institute of Viseu for their support.

BIBLIOGRAPHY

1. Abidin, H.A. and Roslin R.M., 2019. The mediating effect of employee delight on the relationship between internal marketing and employee performance. *International Journal of Business and Society*, 20(3), 908–923. <https://doi.org/10.1177/0972150920915315>
2. Awada, N., Johar, S. S. H., and Ismail, F. B., 2020. The effect of employee happiness on employee performance in UAE: The moderating role of spirituality and emotional wellness. *International Journal of Psychosocial Rehabilitation*, 24(3), 1311–1321. <https://doi.org/10.37200/IJPR/V24I3/PR200881>
3. Beeri, I., Uster, A., and Vigoda-Gadot, E., 2018. Does Performance Management Relate to Good Governance? A Study of Its Relationship with Citizens' Satisfaction with and Trust in Israeli Local Government. *Public Performance and Management Review*, 42(2), 1–39. <https://doi.org/10.1080/15309576.2018.1436074>
4. Bell, S., 1998. ANZMAC98 Conference Proceedings. A Relational Approach to Internal Marketing.
5. Bell, S., Menguc, B., and Stefani, S., 2004. When customers disappoint: A model of relational internal marketing and customer complaints. *Journal of the Academy of Marketing Science* 32(2), 112–126.
6. Berry, L., 1981. The employee as customer. *Journal of Retail Banking*, 3(1), 33–40.
7. Berry, L., Hensel, J., and Burke, M., 1976. Improving Retailer Capability for Effective Consumerism Response. *Journal of Retailing*, 52(3), 3–14.
8. Blut, M., Beatty, S. E., Evanschitzky, H., and Brock, C., 2014. The impact of service characteristics on the switching costs-customer loyalty link. *Journal of Retailing*, 90(2), 275–290. <https://doi.org/10.1016/j.jretai.2014.04.003>
9. Bohnenberger, M. C., Schmidt, S., Damascena, C., and Batle Lorente, F. J., 2018. Internal Marketing: A Model for Implementation and Development. *Dimensión Empresarial*, 7–22. <https://doi.org/10.15665/dem.v17i1.1657>
10. Boukis, A., and Kabadayi, S., 2020. A classification of resources for employee-based value creation and a future research agenda. *European Management Journal*, 1–11. <https://doi.org/10.1016/j.emj.2020.05.001>
11. Bunea, O.-I., Popescu, R.-I., Corboș, R.-A., Sabie, O.-M., & Trușcă, M. I., 2025. The influence of internal marketing on job satisfaction in the Romanian public sector and the mediating role of empowerment. *Journal of Business Economics and Management*, 26(1), 145–163. <https://doi.org/10.3846/jbem.2025.23371>
12. Campell, J. P., 1990. Modeling the Performance Prediction Problem in Industrial and Organizational Psychology. In M. D. Dunnette and L. M. Hough (Eds.), *Handbook of Industrial and Organizational Psychology*, Consulting Psychologists Press, Palo Alto.
13. Cerasoli, C. P., Nicklin, J. M., & Ford, M. T., 2014. Intrinsic motivation and extrinsic incentives jointly predict performance: A 40-year meta-analysis. *Psychological Bulletin*, 140(4), 980–1008. <https://doi.org/10.1037/a0035661>
14. Chunin, M., 2018. Effects of informal communication on happiness at the workplace and job performance of employees. *Kasetsart Journal of Social Sciences*, 39(1), 611–622.

15. Fisher, C. D., 2010. Happiness at Work. *International Journal of Management Reviews*, 12(4), 384–412. <https://doi.org/10.1111/j.1468-2370.2009.00270.x>
16. Foreman, S. K., and Money, A. H., 1995. Internal marketing: Concepts, measurement and application. *Journal of Marketing Management*, 11(8), 755–768. <https://doi.org/10.1080/0267257X.1995.9964388>
17. Fredrickson, B. L., 2001. The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218–226. <https://doi.org/10.1037//0003-066X.56.3.218>
18. Gagné, M., Forest, J., Gilbert, M., Aubé, C., Morin, E., and Malorni, A., 2010. The Motivation at Work Scale: Validation Evidence in Two Languages. *Educational and Psychological Measurement*, 70(4), 628–646. <https://doi.org/10.1177/0013164409355698>
19. George, W. R., 1990. Internal marketing and organizational behavior: A partnership in developing customer-conscious employees at every level. *Journal of Business Research*, 20(1), 63–70. [https://doi.org/10.1016/0148-2963\(90\)90043-D](https://doi.org/10.1016/0148-2963(90)90043-D)
20. Hair, J. F., Black, W. C., Babin, B. J., and Anderson, R. E., 2010. *Multivariate Data Analysis – International Edition (7th edition)*. Pearson education.
21. Hu, L.T., and Bentler, P. M., 1999. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
22. Huang, Y., 2019. Internal Marketing and Internal Customer: A Review, Reconceptualization, and Extension. *Journal of Relationship Marketing*, 1–17. <https://doi.org/10.1080/15332667.2019.1664873>
23. Huang, Y.-T., and Rundle-Thiele, S., 2015. A holistic management tool for measuring internal marketing activities. *Journal of Services Marketing*, 29(6/7), 571–584.
24. Imani, S., Foroudi, P., Seyyedamiri, N., and Dehghani, N., 2020. Improving employees' performance through internal marketing and organizational learning: Mediating role of organizational innovation in an emerging market. *Cogent Business and Management*, 7(1), 1–23. <https://doi.org/10.1080/23311975.2020.1762963>
25. Ingsih, K., Wuryani, W., and Suhana, S., 2021. The Role Of Work Environment, Work Motivation, And Leadership To Improve Employee Performance With Job Satisfaction As An Intervening Variables. *Academy of Strategic Management Journal*, 20(3), 1–11.
26. Kadic-Magljalic, S., Boso, N., and Micevski, M., 2018. How internal marketing drive customer satisfaction in matured and maturing European markets? *Journal of Business Research*, 86, 291–299. <https://doi.org/10.1016/j.jbusres.2017.09.024>
27. Katz, D., and Kahn, R. L., 1974. *Psicologia social das organizações*. Atlas.
28. Katzell, R. A., and Thompson, D. E., 1990. Work Motivation: Theory and Practice. *American Psychologist*, 45(2), 144–153. <https://doi.org/10.1037/0003-066X.45.2.144>
29. Koopmans, L., Bernaards, C. M., Hildebrandt, V. H., Lerner, D., De Vet, H. C. W., and Van Der Beek, A. J., 2016. Cross-cultural adaptation of the Individual Work Performance Questionnaire. *Work*, 53(3), 609–619. <https://doi.org/10.3233/WOR-152237>

30. Koopmans, L., Bernaards, C. M., Hildebrandt, V. H., Schaufeli, W. B., De Vet, H. C. W., and Van der Beek, A. J., 2011. Conceptual Frameworks of Individual Work Performance A Systematic Review. *Journal of Occupational and Environmental Medicine*, 53(8), 856–866. <https://doi.org/10.1097/JOM.0b013e318226a763>
31. Lee, C. H., and Bruvold, N. T., 2003. Creating value for employees : investment in employee development Creating value for employees : investment in employee development. *The International Journal of Human Resources Management*, 14(6), 981–1000. <https://doi.org/10.1080/0958519032000106173>
32. Lings, I. N., 2004. Internal market orientation - Construct and consequences. *Journal of Business Research*, 57(4), 405–413. [https://doi.org/10.1016/S0148-2963\(02\)00274-6](https://doi.org/10.1016/S0148-2963(02)00274-6)
33. Lings, I. N., and Greenley, G. E., 2010. Internal market orientation and market/ oriented behaviours. *Journal of Service Management*, 21(3), 321–343. <https://doi.org/10.1108/09564231011050788>
34. Locke, E. A., and Latham, G. P., 1991. A Theory of Goal Setting and Task Performance. *The Academy of Management Review*, 16(2), 480. <https://doi.org/10.2307/258875>
35. Marôco, J., 2010. *Análise de Equações Estruturais – Fundamentos teóricos, software e aplicações*. Editora Report number.
36. Maslow, A. H., 1954. The instinctoid nature of basic needs. *Journal of Personality*, 22, 326–347. <https://doi.org/https://doi.org/10.1111/j.1467-6494.1954.tb01136.x>
37. Moynihan, D. P., and Pandey, S. K., 2010. The big question for performance management: Why do managers use performance information? *Journal of Public Administration Research and Theory*, 20(4), 849–866. <https://doi.org/10.1093/jopart/muq004>
38. Narteh, B., & Odoom, R., 2015. Does Internal Marketing Influence Employee Loyalty? Evidence From the Ghanaian Banking Industry. *Services Marketing Quarterly*, 36(2), 112–135. <https://doi.org/10.1080/15332969.2015.1014237>
39. Nguyen, H. M., Mai, L. T., and Huynh, T. L., 2019. The role of transformational leadership toward work performance through intrinsic motivation: A study in the pharmaceutical field in Vietnam. *Journal of Asian Finance, Economics and Business*, 6(4), 201–212. <https://doi.org/10.13106/jafeb.2019.vol6.no4.201>
40. Oluseyi, A. S., and Hammed, T. A., 2009. Influence of work motivation, leadership effectiveness and time management on employees' performance in some selected industries in Ibadan, Oyo State, Nigeria. *European Journal of Economics, Finance and Administrative Sciences*, 16, 7–17.
41. Pancasila, I., Haryono, S., and B.A., S., 2020. Effects of work motivation and leadership toward work satisfaction and employee performance: Evidence from Indonesia. *Journal of Asian Finance, Economics and Business*, 7(6), 387–397. <https://doi.org/10.13106/jafeb.2020.vol7.no6.387>
42. Qaisar, F. S., and Muhamad, N., 2021. Internal marketing: a review and future research agenda. *Asia Pacific Business Review*, 27(2), 267–300. <https://doi.org/10.1080/13602381.2021.1858590>
43. Qiu, J., Boukis, A., and Storey, C., 2021. Internal Marketing: A Systematic Review. *Journal of Marketing Theory and Practice*, 1–15. <https://doi.org/10.1080/10696679.2021.1886588>

44. Rafiq, Mohammed, and Ahmed, P. K., 2000. Advances in the internal marketing concept : definition , synthesis and extension. *Journal of Services Marketing*, 14(6), 449–462.
45. Rodrigues, A. P., Barreira, M., Madeira, C. R., & Vieira, I., 2023. The impact of internal marketing on employee attitudes and behaviours in local public sector organisation. *Tourism & Management Studies*, 19(3), 41–57. <https://doi.org/10.18089/tms.2023.190303>
46. Rundle-Thiele, S., and Huang, Y.-T., 2015. A holistic management tool for measuring internal marketing activities. *Journal of Services Marketing*, 29(6/7), 1–21. <http://dx.doi.org/10.1108/JSM-03-2015-01>
47. Ryan, R. M., 1995. Psychological Needs and the Facilitation of Integrative Processes. *Journal of Personality*, 63(3), 397–427.
47. Ryan, R. M., and Deci, E. L., 2000. Intrinsic and Extrinsic Motivations : Classic Definitions and New Directions. *Contemporary Educational Psychology*, 25, 54–67. <https://doi.org/10.1006/ceps.1999.1020>
48. Salas-Vallina, A., and Alegre, J., 2018. Happiness at work: Developing a shorter measure. *Journal of Management and Organization*, 1–21. <https://doi.org/10.1017/jmo.2018.24>
49. Salas-Vallina, A., Alegre, J., and Fernández Guerrero, R., 2018. Happiness at work in knowledge-intensive contexts: Opening the research agenda, *European Research on Management and Business Economics*, 24(3), 149–159. <https://doi.org/10.1016/j.iedeen.2018.05.003>.
50. Sasser, W. E., and Arbeit, S. P., 1976. Selling jobs in the service sector. *Business Horizons*, 19(3), 61–65. [https://doi.org/10.1016/0007-6813\(76\)90053-7](https://doi.org/10.1016/0007-6813(76)90053-7)
51. Santiago, M.M.P.F., Coelho, A. And Bairrada, C., 2023. How can internal marketing practices help achieve organizational success? *Revista de Administração Pública* 57 (4). <https://doi.org/10.1590/0034761220220364x>
52. Sonnentag, S., and Frese, M., 2002. Performance : Concept , Theory , and Predictors. 1–24.
53. Tamayo, A., and Paschoal, T., 2003. A relação da motivação para o trabalho com as metas do trabalhador. *Revista de Administração Contemporânea*, 7(4), 33–54. <https://doi.org/10.1590/s1415-65552003000400003>
55. Tang, A. D., Chang, M. L., Wang, T. H., and Lai, C. H., 2020. How to create genuine happiness for flight attendants: Effects of internal marketing and work-family interface. *Journal of Air Transport Management*, 87, 101860. <https://doi.org/10.1016/j.jairtraman.2020.101860>
54. Taştan, S.B. and Davoudi, S.M.M., 2020. Investigating the mediating role of job satisfaction on the relationship between internal marketing and job performance: a research within services industry. *Middle East Journal of Management*, 7(5), 492 – 517. <https://doi.org/10.1504/MEJM.2020.109690>
55. Tsai, Y., and Wu, S. W., 2007. Use the concept of market orientation and internal marketing to improve service quality. 2007 International Conference on Wireless Communications, Networking and Mobile Computing, WiCOM 2007. <https://doi.org/10.1109/WICOM.2007.1624>
56. Varey, R. J., 1995. A model of internal marketing for building and sustaining a competitive service advantage. *Journal of Marketing Management*, 11(1–3), 41–54. <https://doi.org/10.1080/0267257X.1995.9964328>

57. Vital, F., and Alves, H., 2014. The relationship between internal marketing, motivation and satisfaction at work. In R. Morisson (Ed.), *Motivation: Psychology, Strategies and Impact on Performance* (pp. 143–170). Nova Publishers.
58. Wilkins, A. L., and Ouchi, W. G., 1983. Efficient Cultures: Exploring the Relationship between Culture and Organizational Performance. *Administrative Science Quarterly*, 28(3), 468–481.
59. Yang, J. S., and Hung, H. V., 2016. Happy workers value effort, sad workers value reward. *International Journal of Human Resource Management*, 28(11), 1591–1624. <https://doi.org/10.1080/09585192.2015.1128458>

IS THERE A GLASS CEILING IN THE HOTEL INDUSTRY IN CROATIA?

ANA MARIJA SIKIRIĆ SIMČIĆ

University of Rijeka
Faculty of Economics and Business
Rijeka, Croatia
ana.marija.sikiric@efri.uniri.hr

ALISA IVANČIĆ

University of Rijeka
Faculty of Economics and Business
Rijeka, Croatia
alias.ivancic@gmail.com

SAŠA ČEGAR

University of Rijeka
Faculty of Economics and Business
Rijeka, Croatia
sasa.cegar@efri.uniri.hr

Paper category: Original scientific paper

ABSTRACT

Traditional attitudes are the basis for defining social values and gender roles. These attitudes often exist as invisible barriers that create the phenomenon of the glass ceiling. The glass ceiling in Croatian tourism is particularly evident in the lower proportion of women in management positions. The underrepresentation of women, especially highly educated women, in leadership positions in tourism leads to them losing their competencies and not utilising their full capacity due to talent pool limitations. A survey in the form of an online questionnaire was used to investigate the subjective views of employees on the existence of the glass ceiling in the Croatian hotel industry, including its possible causes and consequences. A total of 94 employees in 3-, 4- and 5-star hotels across Croatia took part. The survey results confirm that some respondents are aware of the existence of gender discrimination and the glass ceiling. The results also revealed that respondents are not sufficiently aware of the general obstacles that hinder the advancement of women, although they do acknowledge the importance and benefits of women in leadership positions in tourism. The inability to recognise the barriers causing the underrepresentation of women in leadership positions confirms the existence of invisible barriers or the so-called glass ceiling. Based on the research in this paper, suggestions are given for removing existing invisible barriers in the hotel industry in Croatia.

Keywords: gender roles, glass ceiling, hotel industry, Croatia

1. INTRODUCTION

Gender equality is an equal evaluation of the similarities, differences and social roles of men and women. It also means that women and men have equal conditions to contribute to and benefit from economic, social, cultural and political development. It is based on women and men being equal in their home, community and society. Statistics indicate the existence of specific gender restrictions preventing equality between women and men in terms of equal positions and development. Although women make up the majority of the highly educated population, they fail to achieve equality in the labour market and the development of their full potential. Women are still less active in the workforce, their employment rates are lower than men's employment rates, and the existing gap is growing as the number of children in the household increases (Sikirić, 2021). Inequality in the labour market is also manifested by the difference in incomes of men and women, which is greatest in occupations dominated by the female workforce (CBS, 2024). Evidently, gender differences are neither recognised nor equally valued, which directly affects the economic security of women, limiting their freedom and making them more financially dependent on other family members.

Gender equality has a multidimensional character and is influenced by various economic, sociological and cultural factors. The Gender Equality Index, developed by the European Institute for Gender Equality, is a measure of gender equality. An index value of 1 implies complete gender inequality to 100 complete gender equality. The index value in 2023 for the Republic of Croatia is 60.7, indicating that the country still has a long way to go to achieve full gender equality (EIGE, 2023). The index calculation is based on six main domains: Work, Money, Knowledge, Time, Power, and Health, including two additional domains, Violence and so-called Intersectional Inequalities. At the EU level, the lowest index value is in the core domain of Power, which includes indicators of economic, political and social power. In Croatia, the index value is the lowest in the core domain of Time and Power, indicating that, in Croatia, so-called unpaid work is still unevenly distributed between men and women, leading to an underrepresentation of women in decision-making positions in political, economic and social spheres. Gender inequality is most prevalent in the economic context, both in the European Union and Croatia. In Croatia, in 2023, women make up only 31% of members of management boards and supervisory boards in the largest companies with public accountability, and only 11% are members of the Croatian Central Bank Management Board. Experience shows that

the increase in the number of university graduates will not be sufficient to close the gender gap at management levels. The underlying reason is the mismatch between traditional gender roles and corporate culture. Women are still at the centre of family life, with all the associated limitations, such as motherhood, raising children, organising family life, and caring for the elderly. Corporate jobs, especially in management positions, were created by men and, as such, are the pillars of the so-called *glass ceiling*. The dominant model in the business world identifies leadership with unconditional availability and complete geographic mobility at all times, meaning anytime and anywhere. The model also assumes a linear career path, with no room for career interruptions or refusing geographical mobility, which significantly hampers or even prevents equal advancement of men and women (Desvaux et al., 2007). According to the survey results, in Croatia, about a third of employed women with children had to significantly slow down their career progress due to caring for and bringing up their children, while as many as a quarter of women had to give up their desired careers. One in five employed women has refused a promotion at least once in their lives due to family obligations (Klasnić, 2017). Therefore, changes are necessary, as well as recognising and weighing the existing differences between men and women when creating a corporate culture. In essence, if the underlying causes of the problem are not minimised, the infamous glass ceiling will remain firmly in place, and women's representation in corporate leadership positions is expected to remain limited (Sikirić Simčić, 2023).

Tourism is one of the most economically important sectors in Croatia, contributing to the country's economy, but it can also be used as a tool to promote gender equality, given that women make up a larger share of employees in the tourism industry, but they often hold lower paid and precarious jobs (Baum, 2013; Genc, 2018). The purpose of this paper is to investigate the extent to which employees in the hotel sector in Croatia recognise the problem of the glass ceiling and whether they perceive the barriers that limit equal career development between men and women within their work environment. Based on the research, the paper proposes ways of minimising barriers that form the glass ceiling, which would, in turn, improve the position of women in the tourism sector.

2. LITERATURE REVIEW

Glass ceiling

The *glass ceiling* is a metaphor used to define invisible barriers that prevent equal participation in leadership positions (Andersson, Balkmar and Callerstig, 2022). The metaphor refers to the fact that a qualified person who wants to progress within the hierarchy of their organisation is stopped at a lower level due to discrimination, most often on the basis of gender (Babić and Hansez, 2021). It is widespread despite social changes and legal frameworks that impose the need to respect gender equality. Given that objective and easily observable criteria do not exist to determine with certainty the actual existence of a glass ceiling in a company, the phenomenon is defined as subtle, but persistent, barriers and obstacles supported by discriminatory, conscious and unconscious practices and attitudes that hinder the access, most often of women, to the highest and most senior management positions (Bendl & Schmidt, 2010; Zeng, 2011). The glass ceiling, therefore, refers to discriminatory barriers that prevent women from ascending to positions of power or responsibility and advancing to higher positions within an organisation simply because they are women (Li & Leung, 2001).

As opposed to other forms of discrimination, the glass ceiling is a special and specific form of inequality. It does take into account the advancement of women during professional career development but not the number of women in leadership positions at a given time (Cotter et al., 2001), thus pointing out the increasing inequalities between men and women in their career development. This type of bias is difficult to spot, and most researchers admit that the peculiarity of this phenomenon lies precisely in its dominance at higher levels of governance (Zeng, 2011; Dambrin and Lambert, 2012; Lupu, 2012). Ingrained opinions woven into a culture that supports attitudes normalising female inferiority and subordination are basically invisible barriers. Accordingly, the *glass ceiling*, in addition to slowing down or even permanently stalling career progress, is an invisible obstacle to gender equality because although the data clearly shows that women feel the consequences of these obstacles, society hardly acknowledges them (Office for Gender Equality, 2007, p. 90).

Specific indicators exist to help identify this type of obstacle and are noticeable from social, organisational and personal perspectives (Peake, 2021). The **social perspective** refers to subtle signs and messages that both women and men receive in their lifetime, defining the expected behaviour of women and men. Society believes that caring for the family is a woman's primary task; hence, women are more likely to sacrifice or even slow down

their career development to meet social expectations. The **organisational perspective** refers to structural and cultural barriers that negatively affect women's behaviour but provide greater opportunities for men. Examples of structural barriers within an organisation are the lack of role models. The absence of women in managerial positions gives the impression that there is no place for women in these positions, which reduces being committed to a career and job satisfaction. An example of a cultural barrier in an organisation is the culture of “being always available”. Management positions are often identified as being available and mobile every day, which directly collides with the gender role of a woman as the primary caregiver of the family. The **personal perspective** refers to personal barriers faced by women and men and their respective differences. An example of individual barriers is women's more conservative view of their own abilities versus what men think of themselves (Peake, 2021).

The glass ceiling is most often viewed as discrimination, but Bertrand (2018) emphasises the importance of considering measurable factors to quantitatively explain the emergence and existence of the glass ceiling, where such factors are education, psychological attributes, flexibility of working hours and parenting. Education is often seen as a factor that does not explain the pay gap between men and women because women make up a larger proportion of the highly educated population. But still the fact is that men make up the majority in high-paying occupations (Bertrand, 2018; CBS, 2024). Psychological attributes look at differences in attitudes towards risk and gender-based competition. Women are less likely to take risks and compete compared to men. Consequently, they choose safer, often less-paid occupations and jobs (Bertrand, 2018; Tominc and Rebernik, 2007). Women most often utilise the flexibility of working hours to try and balance private and business obligations, and flexibility is still seen as an insufficient commitment to work obligations and is financially penalised. The inflexible nature of jobs in executive roles that require a continuous focus on tasks and activities makes it impossible to balance private and work life. Therefore, women avoid or delay promotion to high positions which, consequently, also leads to increasing the gender pay gap (Bertrand, 2018).

The glass ceiling reduces access to key work resources such as mentoring, important information and advice, a network of contacts, opportunities to deepen knowledge, and undermines the personal characteristics of women, such as self-esteem, self-efficacy and optimism (Baxter and Wright, 2000; Tran, 2014) by increasing the perception among women managers of the conflict between their private lives and business obligations. In such situations, they are more likely to plan to leave their organisation (Babic

et al., 2015) and reduce the level of their work engagement (Babic et al., 2020). All this suggests that the glass ceiling can have a detrimental effect on balancing work and family, the person's well-being, job satisfaction and increasing willingness to quit (Babić and Hansez, 2021). Consequently, all this imposes the need to change as well as recognise and acknowledge the existing differences between men and women when creating a corporate culture.

Tourism and gender equality

Tourism plays a key role in meeting the commitments at the heart of the 2030 Agenda for Sustainable Development, including commitments towards gender equality (UNWTO, 2019). Encouraging gender equality and sustainable development requires questioning other aspects besides only the economic benefits of tourism. Tourism is a labour-intensive industry, and the growth of tourism provides women with different entry points into the labour market and entrepreneurship (Gil Arroyo et al., 2019; Rinaldi and Salerno, 2019). Women make up the majority of workers in the tourism industry around the world (Baum, 2013; UNWTO, 2019). In some countries, tourism has almost twice as many women as employees compared to other industries. The gender wage gap is smaller in tourism than in the wider economy globally (UNWTO, 2019). However, the gender gap in tourism is less prevalent because income from tourism is relatively lower for both men and women than the average wages in the wider economy.

Moreover, it is worth noting that tourism workers face several challenges, including the high frequency of informal work arrangements, insecure employment contracts, limited opportunities for advancement, limited workplace autonomy, low social protection and poor working conditions (ILO, 2017; Winchenbach et al., 2019). The feminisation of tourism work means that women are more likely to face precarious working conditions, and a greater dependence on tourism could amplify or even exacerbate gender inequality in the country. In addition, the tourism sector points women into areas in tourism that implement their usually labelled skills in the home, as it is based more on welcoming and serving tourists to fulfil their wishes and needs (Bynoe and Jackman, 2019). Women are often concentrated in roles such as housekeeping, waitressing, and customer service, while men are more likely to be found in positions like management, maintenance, and technical roles (Rinaldi and Salerno, 2019).

Tourism is characterised by seasonality but also a high likelihood of part-time work, so women opt for jobs with working hours that can easily cope with their perceived family responsibilities (Buttrose and Adams, 2005).

Thus, in tourism, the share of women working part-time is higher than in the rest of the economy, indicating that the seasonality of employment and its part-time characteristics make tourism an attractive sector for women (Eurostat, 2023). On the other hand, part-time work increases the gender pay gap in tourism and reduces the possibility of advancing. The lack of participation by women in management positions in tourism, especially those who are highly educated, means that women's full capacity is unutilised due to limiting the talent pool mostly to men. In addition, the lack of female participation in management positions in tourism results in not including women's perspectives in shaping tourist products and services and, given that women play a leading role in organising family holidays, they are also key consumers in the tourism sector (Barles-Arizona et al., 2013).

Tourism in Croatia is a strategic sector due to its importance for the entire economy and, consequently, the population, employment, production and investments (Erjavec and Devčić, 2022). In addition, in 2021, the tourism sector directly provided a job for 5.88% of all persons employed in Croatia. The share of women in the total number of employees in tourism (in terms of accommodation and food service activities) amounted to 52.9% (OECD, 2022, CBS, 2022). In Croatia, the practice of part-time work is still rare and, for this reason, the tourism sector is particularly attractive for job seekers. Even though women represent the majority of employees in tourism, the nature of their jobs paints a very different picture. Women make up the majority of unskilled and semi-skilled workers. The conclusion is that, although women hold 60% of university degrees in Croatia and 75% of master's degrees in tourism and hospitality management, their qualifications are not represented in higher-ranked management jobs in tourism (Avelini Holjevac, 2006). Hence, in Croatia, the gender pay gap is more pronounced in the tourism sector than in the economy as a whole.

This paper will next focus on the hotel industry, which is the first category on the UNWTO list of tourism industries, given that this specific industry worldwide is dominated by female workers; specifically, 69% of all employees in the hotel industry (UNWTO, 2019). This industry requires high capital investments, most often backed by larger business systems comprising a clear hierarchy and making them fertile ground for the glass ceiling phenomenon. It also represents the highest level of accommodation and accounts for a significant share of the total revenues from different types of accommodation units (CNTB, 2022).

3. METHODOLOGY

Research aim

The aim of the research is to identify, analyse and understand the factors that influence the existence of the 'glass ceiling' in the Croatian hotel industry, as well as to determine specific factors that contribute to the 'glass ceiling' and to propose solutions for the elimination or minimisation of each specific factor in order to reduce the existing problem of gender inequality in the hotel industry. The research is based on two hypotheses: (1) Women encounter a glass ceiling in the Croatian hotel industry; (2) Men are less aware of the glass ceiling issue compared to women. Although numerous studies indicate a higher presence of female managers, particularly in the hotel industry compared to other sectors, it is more likely that female managers are predominantly found in frontline management and supervisory roles (Garača et al., 2019), due to a combination of factors, including stereotypes, organisational culture, and lack of support for women's career advancement (Lukić Nikolić and Labus, 2025). Further research indicates that men are generally less aware of the glass ceiling issue compared to women. This disparity in awareness can be attributed to lack of personal experience with the glass ceiling and organisational culture. Addressing this awareness gap is crucial for creating a more inclusive and equitable workplace (Martinčević et al., 2019).

Data Collection

To test the defined hypotheses, an anonymous online questionnaire was conducted from March to April 2023. The aim was to examine the subjective views of female and male employees regarding the existence of the glass ceiling. The questionnaire was sent by e-mail to the target group consisting of employees working in hotel accommodation units with 3-, 4- and 5-star categories throughout Croatia. The questionnaire comprised 16 closed-type questions in multiple-choice format and a series of ratings in terms of the Likert scale.

Two groups of questions were created for the questionnaire. In the first group of questions the main characteristics of the respondents were sought to better explain their views to answers in the second group of questions. The second group examines the perception of respondents concerning the existence of the glass ceiling in their organisations.

Characteristics of Respondents

In all, 94 people responded to the questionnaire, i.e., 18.1% were men, 80.8% were women, and 1.1% refused to declare their gender. The low proportion of male respondents is a limitation of the research but is possibly due to men finding it more difficult to notice the glass ceiling problem in their environment. However, their way of seeing situations and circumstances is still important regardless of the low number of responses.

The highest proportion of respondents are people between 26 and 35 years of age (44.7%), followed by those aged between 36 and 45 (25.5%) and finally people aged 18 to 25 (14.9%). Almost 80% of the people surveyed are highly educated. In all, 34% of respondents live in a family and have at least one child, 33% are single people without children, 27.7% live in a childless home, and the remaining respondents are single (5.3%) living in a common household with at least one child. Less than four years of work experience in a company is attributable to half of the respondents, while 36.7% have between 4 and 15 years of work experience, and 13.8% have more than 15 years of work experience. The sample is dominated by employees in small enterprises (33%), while 29.8% work in large enterprises and 25.5% in medium-sized enterprises. Overall, 44.7% of respondents are operational employees, 26.6% are middle management, 18.1% belong to operational management and 10.6% of respondents are in the Management Board or top management.

4.FINDINGS

More than half of the respondents have never personally encountered or actually noticed any form of sex discrimination in the work environment, while as many as 40.4% of respondents have experienced such a situation personally or noticed it in the work environment. Moreover, 4.26% of respondents were not able to assess whether it was sexual discrimination, while 28.7% of respondents encountered, i.e., personally or noticed, some form of glass ceiling in the company. The data shows that 57.5% of respondents said they had not encountered a glass ceiling. The remaining proportion of those surveyed (13.83%) were not able to estimate whether the situations they encountered were a form of glass ceiling (Table 1).

Table 1. Persons surveyed by gender as to whether they had encountered sex discrimination and the glass ceiling (in %).

Sex	Sex discrimination			Glass ceiling		
	yes	no	I don't know / I can't assess	yes	no	I don't know / I can't assess
Male	3.19	14.89	0.00	1.06	17.02	0.00
Female	36.17	40.43	4.26	26.60	40.43	13.83
I refuse to answer	1.06	0.00	0.00	1.06	0.00	0.00
Total (%)	40.43	55.32	4.26	28.72	57.45	13.83

Source: Preparation and calculations by the authors based on results from the survey questionnaire

When interpreting the data, caution should be exercised, because not recognising the existence of the glass ceiling does not mean it does not exist. It is common for people not to recognise existing organisational limitations or be able to assess them due to so-called invisible barriers. As a result, some individuals may feel limited without being able to identify the specific restrictions. In analysing responses from a gender perspective, it becomes evident that women recognise discriminatory practices much better than men. More than 89% of people who have encountered sexual discrimination are women, mostly childless women (58.82%). The respondents who noticed the existence of the glass ceiling were women in 92.6% of cases, and only one man and one other person who refused to declare their gender. Of the total number of women who answered *yes* to this question, 56% are operational employees who mainly work in large and medium-sized enterprises. Men who have observed sex discrimination in the workplace have never encountered or acknowledged the problem of the glass ceiling within their organisation, but all believe that removing the glass ceiling is important. This situation is attributed to the phenomenon of *gender fatigue*, according to which the respondents acknowledge the general existence of gender inequality but deny its existence in their work environment, which creates a gap between acknowledging the existence of gender inequality and acting on it. The questionnaire reveals that a very large proportion of both men and women do not notice the occurrence of gender inequality. This outcome can be explained by the fact that women have developed sophisticated coping mechanisms to ignore the role that gender plays in the company in which they are employed, but they might really believe they have not experienced gender inequality. On the other hand, men are most often unaware of the

gender inequality practices occurring on a daily basis, which contribute significantly to inequality (Kelan, 2020).

The term glass ceiling suggests that obstacles appear at a certain point. Ružić and Perušić (2014) cite, among the most common obstacles that fall under the term *glass ceiling*, prejudices and resistance to female leadership and the demands of family life. Therefore, the survey examined to what extent the respondents recognised circumstances that limit the career progress of women. Ratings from 1 to 5 assessed the degree of the impact of a particular circumstance, and a rating of 1 means that a particular circumstance is not an obstacle at all, whereas a rating of 5 is a major obstacle in improving a woman’s career (Table 2). A higher value of the arithmetic mean and median means respondents notice obstacles that make it difficult or impossible for women to advance.

Table 2. Attitudes of respondents to the intensity of the impact of obstacles on women advancing their careers.

	Women		Men		Total	
Obstacles to improving a woman’s career	Mean (SD)	M	Mean (SD)	M	Mean (SD)	M
Social attitude that women’s careers do not matter because they are not the primary breadwinner of the family	2.64 (1.329)	3	1.86 (1.311)	1	2.47 (1.373)	2
Difficult or impossible to balance a personal and business life	3.45 (1.306)	4	2.14 (1.248)	1	3.18 (1.422)	3
Prejudice against women in leadership positions (e.g., men are better leaders)	3.49 (1.46)	4	1.79 (1.115)	1	3.15 (1.572)	3
Insufficient promotion of diversity in management positions	3.19 (1.310)	3	2 (1.286)	1	2.94 (1.405)	3
Total	3.19 (1.387)	3	1.78	1	2.93 (1.47)	3

Source: Preparation and calculations by authors based on results from the survey questionnaire

It becomes evident when looking at the overall arithmetic mean (2.93) that these circumstances are considered obstacles that impact the advancement of women but are not considered significant. However, the standard deviation of all claims combined is 1.47, which, given the range of the ratings, represents a rather large deviation from the mean. The claim referring to the assumption that women’s careers are not important because they are

not the primary breadwinner of the family is not considered an obstacle at all by most of the respondents (36.2%), and only 9.6% of respondents believe the claim is a major obstacle to improving women's careers. This claim is not considered an obstacle at all by 70% of male respondents from the survey. The claim also has the lowest arithmetic mean (2.47) of all claims, where the most common answer is 2. The claim, "difficult or impossible to balance a personal and business life," is not deemed an obstacle by 20.2% of respondents, but it is considered a major obstacle by 22.3%. The 47.4% of respondents who do not consider the claim to represent an obstacle are men who primarily do not have children and do not comprehend the difficulties of balancing obligations. This claim, of the above mentioned, is considered by respondents to be the greatest obstacle to improving women's careers. Prejudice against women in leadership positions is deemed by 26.6% of respondents not to be an obstacle at all, while as many as 28.7% of respondents think it is a significant obstacle. Of those who do not consider the claim to represent an obstacle, 48% are men, given that men do not notice prejudices because prejudices are not directed at them. The last claim, "insufficient promotion of diversity in management positions," is not considered an obstacle by 24.5% of respondents but 14.9% of respondents do think it is a large obstacle. Interestingly, almost all male respondents who answered the survey questionnaire do not believe that any of the claims represent an obstacle to improving a woman's career, as confirmed by the arithmetic mean and median values by gender and shown in Table 2. The glass ceiling implies hidden obstacles that are visible only to those who encounter them. The results clearly show that men are unable to recognise the obstacles faced by women and, consequently, are not able to offer appropriate solutions.

In the next question, the respondents expressed their level of agreement with the statements made (1 - I do not agree at all and 5 - I agree completely). All claims are positively oriented, and the greater value of the arithmetic environment and median means awareness of existing prejudices and inequality arising from them. The total mean is 3.5, which indicates that the respondents agree more with these claims than they do not agree, but the high level of standard deviation indicates the variability of the data.

Table 3. Agreement by the respondents with the claims

Statements	Women		Men		Total	
	Mean (SD)	M	Mean (SD)	M	Mean (SD)	M
I think women are just as capable of performing senior managerial positions as men	4.88 (0.455)	5	4.79 (0.392)	5	4.87 (0.446)	5
Women are underrepresented in management positions	4.18 (1.148)	5	2.86 (1.586)	2	3.87 (1.385)	4
I think that in the hotel industry, men progress significantly faster than women	3.60 (1.380)	4	2.07 (1.317)	1	3.28 (1.513)	3
In my organisation, women must perform better than their male counterparts in order to be promoted to a higher position	2.73 (1.585)	3	1.43 (0.996)	1	2.46 (1.570)	2
Women, to a lesser extent, and compared to their male colleagues, perform some work obligations in their free time through informal gatherings and use it for advancement	3.17 (1.294)	3	2.57 (1.231)	3	3.02 (1.295)	3
Total	3.71 (1.443)	4	2.61 (1.655)	2	3.50 (1.541)	4

Source: Preparation and calculations by authors based on results from the survey questionnaire

The results indicate that all respondents, to some extent, believe that women are equally capable as men when it comes to performing managerial tasks, and as many as 90.4% of respondents fully agree with this claim. On the other hand, women also largely agree with the claim that they are underrepresented in management positions despite being just as capable as men. Women who disagree with this claim are employed in microenterprises and small enterprises where a hierarchy is less pronounced, as is the problem of underrepresentation of women. Interestingly, as many as 63.6% of male respondents disagree with the claim, according to which it is concluded that if men notice a certain number of women in leading or managerial positions, they will think that women are not underrepresented because they are nonetheless present in management, but the men will not notice the gap in the proportion of men and women in management, especially in large and medium-sized enterprises. Agreeing with the claim that men progress significantly faster than women in the hotel industry averages a value of 3.28, indicating that respondents recognise the disproportionate pace of

career development and advancement between men and women. At the same time, 73% of male respondents completely disagree with the claim. Men find it harder to notice that the glass ceiling problem happens to women due to them temporarily exiting the labour market, which in turn slows their career advancement.

The claim with which the respondents agree to the least extent is that women must perform better than men in an organisation in order to be promoted to a higher position. In all, 82.4% of male respondents and 62.1% of female respondents disagreed with the claim. Women who do not agree with this claim are already in management positions. They did not notice differences in getting promoted to a managerial position and, consequently, formed the previously stated perception. By comparing the fulfilment of business obligations in their free time at informal gatherings and also utilising socialising for advancement in favour of men over women, the respondents agreed, achieving an average score of 3.02. Both women and men observe that men make better use of this time, even for advancement, due to having more free time based on gender roles. In all, 14.9% of respondents, which included only one man, fully agree with this claim, while a significant 17% of respondents disagree, of which 68.8% are women.

When interpreting the results from a gender perspective, there are clear differences between the responses of men and women. Of course, men have a harder time perceiving inequalities that do not directly affect their position in an organisation, which consequently results in the fact that as long as men prevail in leadership positions, jobs will be tailored to their needs, habits and experiences, further creating barriers for the advancement of women given that, due to their set gender role, women often cannot adapt to work circumstances created to accommodate the male gender role.

The next question examined whether there was a desire for leadership positions among respondents. According to the results obtained, 56.38% of respondents desire a management position, and 22.34% have no desire to be in a leading position in a company. The remainder of those surveyed, 21.28%, are unsure if they want to take on such responsibilities. Among the total number of respondents who desire a management position, they are most often highly educated people. Although interesting, the respondents with the highest level of education do not have the desire to advance. The reason for the lack of desire for advancement is found in the difficulties of balancing private and work life.

Eliminating the glass ceiling has its advantages, but the question remains as to how many of them are recognised by the respondents. The respondents evaluated the importance of eliminating the glass ceiling to achieve a certain

benefit in the company with ratings from 1 (not at all important) to 5 (it is very important). Higher values of the arithmetic mean and median indicate that the respondents acknowledge that achieving these benefits requires eliminating the glass ceiling. The average value of all claims is high, specifically 4.22, and the most common answer is 5 – it is very important. Once again, there is a noticeable difference in the perception of the importance between male and female respondents. Men consider the removal of the glass ceiling important, and women very important.

Table 4. Attitudes of respondents by gender on the benefits of removing the glass ceiling

Advantages	Women		Men		Total	
	Mean (SD)	M	Mean (SD)	M	Mean (SD)	M
Increase in productivity	4.31 (0.930)	5	4 (1.583)	4	4.18 (1.107)	5
Increase in employee satisfaction	4.67 (0.658)	5	4.14 (1.532)	4	4.50 (0.948)	5
Better communication in the company	4.65 (0.661)	5	3.93 (1.546)	4	4.45 (0.980)	5
Increase in the talent pool for leadership positions	4.41 (0.874)	5	3.86 (1.505)	4	4.23 (1.072)	5
Cost reductions	3.76 (1.261)	4	3.5 (1.510)	3	3.65 (1.326)	4
Improved decision-making	4.47 (0.785)	5	3.86 (1.546)	3	4.30 (1.035)	5
Total	4.38 (0.927)	5	3.49 (1.507)	4	4.22 (1.115)	5

Source: Preparation and calculations by authors based on results from the survey questionnaire

The respondents observed that the most significant advantage of removing the glass ceiling is an increase in employee satisfaction and improved communication within a company. This was supported by the highest mean value of these claims and the lowest standard deviation. In all, 69.2% of respondents of different hierarchical levels agree that this is very important. Women typically possess strong soft skills, including communication, empathy, and critical thinking, which equip them well for management roles and overseeing employees. In all, 53.2% of respondents believe that removing the glass ceiling will lead to increased productivity, 56.4% believe it will increase the talent pool for management positions, and

58.5% assume that it will lead to better decisions. The claim that the fewest respondents consider important for removing the glass ceiling is reducing costs.

According to the overall results, the respondents have an average awareness of the obstacles affecting the advancement of women. However, they demonstrate significantly higher awareness of the importance of removing the glass ceiling to gain advantages in a company. Most of the respondents notice the importance of perspectives for women in management positions that would achieve advantages for the company and its employees, but they fail to notice obstacles that do not allow women to do so – because the obstacles are invisible. This confirms the first research hypothesis that there is a glass ceiling in the Croatian hotel industry and that, according to the research results and statistical data, women are the ones who are confronted with it. The data is quite volatile around the mean value, indicating that the attitudes of respondents are not consistent. Men are expected to perceive the issue of gender inequality less than women, who are more likely to have experienced inequality personally, and are more aware of it, which confirms the second research hypothesis that men are less aware of the glass ceiling.

5. DISCUSSION

Solving the problem of the glass ceiling requires organisations and their managers to take proactive steps. Changing attitudes and behaviour within organisations through the implementation of different policies and programmes is crucial. First of all, invisible barriers have to be revealed and made visible. Invisible barriers become visible through employee education at all levels and by raising gender awareness. It will eliminate the phenomenon of gender fatigue, evident among men who fail to recognise discriminatory practices, whereas women often apply the principle of ignoring the problem. What should be mentioned is that everyone assumes they understand the concept of gender inequality but, in reality, it is not so because sex discrimination occurs in many different forms and intensities. Therefore, education should encompass and examine real-life examples of both direct and indirect discrimination.

Women need skills, support and confidence to successfully adapt and thrive in an often dominantly male work environment. This includes finding a career path aligned with their professional and family requirements, as well as developing the expertise needed to compete within the organisation (Sikirić, 2023). It is important to encourage the building of self-confidence and

to empower women to believe in their abilities. One of the key approaches in the fight against the glass ceiling is the establishment of a support network involving mentors, sponsors and allies within the workplace. Addressing and overcoming the imposter syndrome, which many women experience, is also important so that women can confidently take advantage of opportunities presented to them. Furthermore, mentoring programmes have proven effective in empowering women and removing imposed restrictions (Zrinski, 2021).

Moreover, family-oriented policies should be implemented because parenting for women is a complicated balancing act between private and business obligations (Sikirić, 2021). Some examples are the introduction of flexible working hours, reduced working days or organised childcare. It is often challenging to balance personal and professional responsibilities, especially since standard childcare options for preschoolers may not align with work hours in tourism (working in shifts, on holidays and weekends).

The key step for change is to define and monitor gender diversity indicators within an organisation. Some of the indicators are the proportion of women in the ownership structure, the proportion of women at all levels of management and in the total number of employees, the difference in wages between men and women in similar job positions, the proportion of women promoted and women eligible for promotion, and the proportion of women among customers. Monitoring these indicators should raise awareness of the existing problems of gender inequality within the organisation and become the basis for developing an organisational plan for gender equality that will define and direct prioritised action. These indicators can be incorporated into non-financial reports and, as such, bring to light the intention of solving existing problems of gender inequality both within the organisation and the entire tourism sector. Organisations are advised to include the above indicators in their non-financial statements, as it reveals an acknowledgement of problems and directs resources to solve the problem of gender inequality. Besides, transparency sends a strong message to internal and external organisational culture about the importance of achieving gender equality (Sikirić, 2023).

6. CONCLUSION

Achieving gender equality is important for achieving full human potential and sustainable development. Given that women make up about half of the population, their potential and empowerment boost productivity and economic growth (UN, 2021). If the competencies and skills of women or men in management are not utilised, the economy will not exploit what it

has available to achieve growth and development, but will instead rely on an established way of governing that, in most cases, places men in management positions. In general, gender inequality thus becomes a source of inefficiency (Santos Silva and Klasen, 2021, p. 590). Improving gender equality has many positive effects, not only on individuals, but also on society as a whole. A more gender-equal European Union would have a strong, positive impact on GDP, employment levels and productivity and could respond to the challenges of an ageing population (EIGE, 2017).

Despite efforts and progress made in some areas, women still encounter significant obstacles that are often subtle and deeply rooted in corporate culture and social norms. Data consistently show that, despite women achieving impressive professional success, their representation in top management positions remains inadequate. This lack of representation affects not only individuals but also organisations and society as a whole, limiting the diversity of perspectives and approaches in decision-making that are critical to innovation and efficiency. Strategies proposed to address this problem include changes in corporate attitude and behaviour, implementation of policies that enable a better balance between professional and family obligations, as well as the personal development of women through education, mentoring and strengthening their self-confidence.

The main limitation of the research in the paper is the lower response rate of male respondents, directly affecting the overall result, which would otherwise certainly indicate an even greater unawareness and ignorance of existing barriers if there were more male respondents in the sample. Nonetheless, even the already lower response rate by male respondents indicates that men do not recognise the impact of the glass ceiling, its pattern and consequences.

ACKNOWLEDGEMENT

This paper was funded by the University of Rijeka under the project line ZIP UNIRI of the University of Rijeka, for the project ZIP-UNIRI-2023-13 and project Effects of religion on the economy and society (uniri-iskusni-drustv-23-246).

BIBLIOGRAPHY

1. Andersson, S., Balkmar, D., & Callerstig, A. C. (2022). From Glass Ceiling to Firewalls: Detecting and Changing Gendered Organizational Norms. *NORA - Nordic Journal of Feminist and Gender Research*, 30(2), 140–153
2. Avelini Holjevac, I. (2006) Women in Tourism: The case of Croatia, *Tourism: An International Interdisciplinary Journal*, 54(1)
3. Babic, A., Gillis, N., and Hansez, I. (2020). Work-to-family interface and wellbeing: the role of workload, emotional load, support and recognition from supervisors. *SA J. Ind. Psychol.* 46(1)
4. Babic A and Hansez I (2021) The Glass Ceiling for Women Managers: Antecedents and Consequences for Work-Family Interface and Well-Being at Work. *Front. Psychol.* 12:618250
5. Babic, A., Stinglhamber, F., and Hansez, I. (2015). Organizational justice and perceived organizational support: impact on negative work-home interference and well-being outcomes. *Psychol. Belg.* 55, 134–158
6. Barles-Arizon M. J., Fraj-Andres E. i Martinez-Salinas E. (2013): ‘Family Vacation Decision Making: The Role of Woman’, *Journal of Travel & Tourism Marketing*, 30(8), 873-890
7. Baum, T. (2013) International perspectives on women and work in hotels, catering and tourism (no. 1/2013; Bureau for Gender Equality working paper series)
8. Baxter, J., and Wright, E. O. (2000). The glass ceiling hypothesis: a comparative study of the United States. Sweden and Australia. *Gen. Soc.* 14, 275–294.
9. Bendl, R., and Schmidt, A. (2010). From ‘Glass Ceilings’ to ‘Firewalls’. Different metaphors for describing discrimination. *Gen. Work Organ.* 17, 612–634
10. Bertrand, M. (2018): ‘The Glass Ceiling’, Becker Friedman Institute, No. 2018-38
11. Butteurostat, I., & Adams, P. (2005). *Mother Guilt: Australian Women Reveal Their True Feelings about Motherhood*. Viking: Penguin Group
12. Bynoe, R., & Jackman, M. (2019). *Gender Analysis of Selected Public Programmes and Services in Barbados*
13. CNBT (2022): ‘Turizam u brojkama 2021.’, Ministarstvo turizma RH, available at: https://www.htz.hr/sites/default/files/2022-08/HTZ%20TUB%20HR_%202021.pdf
14. Cotter, D. A., Hermsen, J. M., Ovadia, S., and Vanneman, R. (2001). The glass ceiling effect. *Soc. For.* 80, 655–682
15. Croatian Bureau of Statistics (2024) Žene i muškarci u Hrvatskoj 2023, Available at: https://podaci.dzs.hr/media/cr5nm105/women_and_man_2023.pdf
16. Dambrin, C., and Lambert, C. (2012). Who is she and who are we? A reflexive journey in research into the rarity of women in the highest ranks of accountancy. *Crit. Perspect. Account.* 23, 1–16
17. Desvaux, G.; Devillard-Hoellinger, S.; Baumgarten, P. (2007) *Women matter – Gender diversity, a corporate performance driver*, McKinsey & Company

18. EIGE (2017.) Economic Benefits of Gender Equality in the European Union - Report on the empirical application of the mode, Luxembourg: Publications Office of the European Union, available at: <https://eige.europa.eu/publications/economic-benefits-gender-equality-european-union-report-empirical-application-model>
19. EIGE (2023) Gender Equality Index 2023, Available at: <https://eige.europa.eu/gender-equality-index/2023/country>
20. Erjavec, N.; Devčić, K. (2022): 'Accommodation Capacity, Trade Openness and International Tourism Demand in Croatia: Evidence from a Dynamic Panel Model', *Tourism: An International Interdisciplinary Journal*, 70(1), 43-52
21. Eurostat (2023): 'Employed persons and employees by sex and full-time/part-time activity and NACE Rev. 2 activity', European Union, pregledano 09.05.2023., online: https://ec.europa.eu/eurostat/databrowser/view/tour_lfs6r2/default/?line?lang=en
22. Garača, V., Vukosav, S., Bradić, M., Kalenjuck, B., Curaković, D., (2019), THE STRUCTURE OF EMPLOYEES IN TOURISM INDUSTRY OF VOJVODINA (SERBIA) AS A GENDER INEQUALITY INDICATOR, *Geobalcanica 2019*, 5th International Scientific Conference, Sofija, pp: 501-511.
23. Genç, R. (2018). The Impact of Tourism in the Reduction of Gender Inequality. *Trakya Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 7(1), 20-35
24. Gil Arroyo, C., Barbieri, C., Sotomayor, S., & Knollenberg, W. (2019). Cultivating Women's Empowerment through Agritourism: Evidence from Andean Communities. *Sustainability*, 11(11), 3058.
25. International Labour Office. (2017). ILO guidelines on decent work and socially responsible tourism. International Labour Office, Sectoral Policies Department.
26. Kelan, E. (2020): 'Why Aren't We Making More Progress Towards Gender Equity?', *Harvard Business Review*, available at: <https://hbr.org/2020/12/why-arent-we-making-more-progress-towards-gender-equity>
27. Klasnić, K (2017.) Utjecaj rodne podjele obiteljskih obveza i kućanskih poslova na profesionalni život zaposlenih žena, ACT Printlab d.o.o., Zagreb
28. Li, L., and Leung, R. W. (2001). Female managers in Asian hotels: profile and career challenges. *Int. J. Contemp. Hosp. Manag.* 13, 189-196
29. Lukić Nikolić, J., & Labus, P. (2025). An empirical study of the glass ceiling's impact on gender equality and career opportunities in the food and beverage sector. *Stanovništvo*. <https://doi.org/10.59954/stnv.634>
30. Lupu, I. (2012). Approved routes and alternative paths: the construction of women's careers in large accounting firms. evidence from the french big four. *Crit. Perspect. Account.* 23, 351-369
31. Martinčević, I.; Pejić Bach, M. & Klopota, I. (2019) Perceptions of a Glass Ceiling at Top Management Positions in Croatian Organizations (September 12, 2019). 2019 ENTRENOVA Conference Proceedings, Available at SSRN: <https://ssrn.com/abstract=3491762>
32. OECD (2022): 'OECD Tourism Trends and Policies 2022', OECD Publishing, available at: https://www.oecd-ilibrary.org/industry-and-services/oecd-tourism-trends-and-policies-2022_a8dd3019-en

33. Peake, S. (2021) Three Barriers to Women's Progression - What organisations can do, Shape Talent, available at: <https://shapetalent.com/three-barriers-to-womens-progression-what-organisations-can-do/>
34. Rinaldi, A., & Salerno, I. (2019). The tourism gender gap and its potential impact on the development of the emerging countries. *Quality & Quantity*, 1–13.
35. Ružić V., Perušić M. 2014 Položaj žena u menadžmentu – novi trendovi u fenomenu staklenog stropa, Veleučilište “Nikola Tesla” u Gospiću, Stručni rad - Praktični menadžment, 5(1) 98-107
36. Santos Silva, M. i Klasen, S. (2021): ‘Gender inequality as a barrier to economic growth: a review of the theoretical literature’, *Review of Economics of the Household*, 19(3), 581-614
37. Sikirić, A.M. (2021) The Effect of Childcare Use on Gender Equality in European Labor Markets, *Feminist Economics*, Vol. 27 No. 4, 90-113
38. Sikirić Simčić, A. M. (2023) Rodna perspektiva investicija, // ESG zahtjevi – izazovi i prilike za hrvatsko gospodarstvo. Rijeka: Sveučilište u Rijeci, Ekonomski fakultet, str. 164-181
39. Tominc, P. and Rebernik, M. (2007): ‘Gender differences in early-stage entrepreneurship in three European post-socialist countries’, *Društvena istraživanja*. Vol. 16, No. 3, 589-611
40. UN (2021): ‘Gender Equality’, UN, available at: <https://www.un.org/en/global-issues/gender-equality#:~:text=Gender%20equality%2C%20besides%20being%20a,spurs%20productivity%20and%20economic%20growth>
41. UNWTO (2019): ‘Global Report on Women in Tourism – Second Edition’, UNWTO, available at: <https://www.e-unwto.org/doi/pdf/10.18111/9789284420384>
42. UNWTO (2022): ‘Key tourism statistics – Employment’, UNWTO, available at: <https://www.unwto.org/tourism-statistics/key-tourism-statistics>
43. Ured za ravnopravnost spolova (2007): ‘Pojmovnik rodne terminologije’, Ured za ravnopravnost spolova Vlade RH, available at: https://ravnopravnost.gov.hr/UserDocsImages/arhiva/preuzimanje/biblioteka-ona/Publikacija_Pojmovnik%20rodne%20terminologije%20prema%20standardima%20Europske%20unije.pdf
44. Winchenbach, A., Hanna, P., & Miller, G. (2019). Rethinking decent work: The value of dignity in tourism employment. *Journal of Sustainable Tourism*, 27(7), 1026–1043
45. Zeng, Z. (2011). The myth of the glass ceiling: evidence from a stock-flow analysis of authority attainment. *Soc. Sci. Res.* 40, 312–325. doi: 10.1016/j.ssresearch.2010.06.012
46. Zrinski A. 2021 Karijerne barijere žena menadžera zbog fenomena staklenog stropa, Fakultet organizacije i informatike Varaždin, Varaždin

THE PROCESS OF DIGITAL TRANSFORMATION IN CROATIAN MUNICIPALITIES – LESSONS FROM A QUALITATIVE APPROACH

SANDRA BARAČ - MIFTAREVIĆ

Independent researcher

sbaracmi@gmail.com

MARKO PALIAGA

Juraj Dobrila University of Pula

Faculty of Economics and Tourism "Mijo Mirković"

Pula, Croatia

marko@rovinj.hr

Paper category: Preliminary scientific paper

ABSTRACT

New digital technologies have ignited an ongoing digital revolution, significantly impacting government and the institutions serving citizens. This shift has led to unique challenges and increased government pressure to devise innovative solutions. This study investigates the perceptions of digital technology users concerning the effects of digital transformation on their work environment within the public administration of Istria County, Croatia.

Incorporating grounded theory, in-depth interviews were conducted with Digital Transformation Users (DTUs) across various municipalities in the county. This qualitative approach, alongside analysing secondary documentary data, allowed for interpreting participants' experiences and the emergence of key themes, providing a comprehensive understanding of the digital transformation in Croatian public administration.

The findings indicate that DTUs believe digital technology has enhanced their working conditions and productivity by improving data access, decision-making, and service delivery. However, participants also noted ongoing challenges that impede further progress.

This study highlights DTUs' perspectives on digital transformation in Istria County's public administration. The qualitative approach offers a comprehensive understanding of the effects of digitalisation and uncovers new insights into this critical area.

Keywords: digital transformation, digital technology user (DTU), Istria, public administration, qualitative analysis, grounded theory.

1. INTRODUCTION

1.1. BACKGROUND AND SIGNIFICANCE OF THE STUDY

The digital revolution signifies a transformative shift in data storage, processing, and communication, profoundly reshaping industries and governance (Brynjolfsson and McAfee, 2014; Greenfield, 2017; Imamov and Semenikhina, 2021, Qui, Qinglin et al., 2022). Within public administration, digitalisation enhances service efficiency, transparency, and accessibility (Korte, 2020). This phenomenon has become a global policy focal point, advocating for data-driven governance (Criado & Gil-Garcia, 2019; Mergel et al., 2019). Research on digital transformation in the private sector has advanced, but its adoption in public administration, especially at the local level, remains limited (Vogl et al., 2020). Many municipalities face outdated processes and a lack of digital skills among employees (Lember et al., 2019; Eom, 2020). In Croatia, national and EU strategies emphasise the need for digital transformation; however, local initiatives are inconsistent. For example, while the County of Istria has a Digital Transition Strategy, municipalities struggle with service integration and citizen engagement (Perić, 2021; Profiroiu et al., 2024). Digitalisation tends to be viewed as merely technological upgrades, overlooking its importance for governance (Weerakkody, Vishanth & Dhillon; Gurjit, 2008; Kraus et al., 2021; Irani et al., 2023). The Croatian Digital Index indicates that only 17.7% of businesses, and an even lower percentage of public institutions, have a digital transformation strategy, highlighting the urgent need for improved municipal digitalisation (HINA, 2020). This gap underscores the challenges in adopting innovative technologies essential for enhancing efficiency, transparency, and service delivery in the public sector.

1.2. PROBLEM STATEMENT

Public administration digital transformation in Croatia faces several systemic challenges, such as a lack of cohesive digital transformation strategies at national and local levels, as highlighted in studies like the European Commission's DESI reports (2021); many public institutions in Croatia face skill gaps in digital competencies, hindering effective governance (The World Bank, 2020). Financial constraints and dependency on EU funding are vital for development, as a Croatian National Bank report (2020) noted, but they can foster dependency that limits local initiative and investment. The Croatian Government's e-government Strategy (2019) highlights the

need for a unified digital framework to improve service delivery (Baig, Dua and Riefberg, 2014). Low citizen engagement and e-government adoption among older populations is notable. A study by the Institute of Public Administration (2021) shows that senior citizens frequently face challenges with digital services such as E-citizen service (E-gradani, n.d.), emphasising the necessity for specific outreach and educational efforts.

1.3. RESEARCH OBJECTIVES

This research aims to evaluate the current digital transformation landscape within the municipalities of Istria, focusing on policies, technological integration, and service convergence. The primary objective is to identify and analyse the multifaceted challenges that impede the effective implementation of digital governance, including, but not limited to, bureaucratic inefficiencies, financial constraints, and technical limitations. A critical component of this study is assessing public sector employees' perceptions regarding the implications of digital transformation on their professional roles and responsibilities and digitalisation's impact on the work environment and business outcomes. Ultimately, the study will offer a possible digitalisation model that is acceptable for public administration and has an explicit and informed procedure to achieve the ultimate goal: the satisfaction of public administration employees and citizens in a community.

1.4. SCOPE OF THE STUDY

This research focuses on the ongoing digital transformation efforts in municipalities within Istria County. It adopts a qualitative methodology that includes in-depth interviews with digital technology users, such as municipal officials, IT professionals, and policymakers, to examine their experiences and views regarding digitalisation.

1.5. STRUCTURE OF THE PAPER

The introduction summarises the study's context and objectives regarding digital transformation in local government. The literature review in Chapter 2 illuminates the important trends identified in digital transformation. In contrast, Chapter 3 outlines the qualitative research methods employed to gather data, which leads to the insightful findings discussed in Chapter 4, emphasising their broader implications. Finally, Chapter 5 concludes with the insights and recommendations derived from

the research, offering a comprehensive overview of the knowledge gained and proposing directions for future studies to build upon these results.

2. LITERATURE REVIEW

2.1. DIGITAL TECHNOLOGIES IN PUBLIC ADMINISTRATION

Digital technologies have revolutionised public administration by enhancing the efficiency, transparency, and accessibility of government services (Brynjolfsson and McAfee, 2014; Greenfield, 2017). Unlike their commercial applications, digital technologies in government must align with bureaucratic, legal, and regulatory frameworks (Criado and Gil-Garcia, 2019; Eom, 2020). A fundamental characteristic of digital technologies is their ability to store, process, and communicate data in digital formats, significantly enhancing decision-making and administrative efficiency (Qi et al., 2022).

Key technological advancements influencing local government digitalisation include:

- **Artificial Intelligence (AI) in Public Administration.** AI enhances decision-making, policy implementation, and service automation in government (Tomić et al., 2022). AI-powered chatbots in municipal e-services reduce administrative burdens and improve citizen engagement (Wirtz et al., 2019; Raj, 2023).
- **Cloud Computing and Digital Infrastructure.** Cloud computing eliminates reliance on physical data storage, enabling real-time access to public records, municipal databases, and integrated government platforms (Janssen and Estevez, 2013; Hou, 2023).
- **Big Data Analytics and Smart Governance.** Governments increasingly use big data analytics to monitor urban mobility, environmental trends, and resource allocation, improving public service delivery (Kitchin, 2014; Schwalbe, 2020).
- **Blockchain for Transparency and Security.** Blockchain technology enhances data security, transparency, and anti-corruption measures in government transactions (Lugavić and Rožajac, 2020; Matias, 2020; Lugavić and Azapagić, 2022).

These technologies streamline government operations, reduce costs, and enhance service accessibility, prioritising digital transformation for

modern public administration (Criado and Gil-Garcia, 2019; Kitisios et al., 2023).

2.2. DIGITAL TRANSFORMATION IN PUBLIC ADMINISTRATION

Digital transformation in public administration is not merely about adopting new technologies but structural reforms, process automation, and citizen-centric governance (Mergel et al., 2019; Kattel and Mergel, 2019).

Key Concepts of Digital Transformation:

- **Administrative Process Automation.** Process automation in public administration reduces paperwork, speeds up service delivery, and minimises bureaucratic inefficiencies (Spremić, 2017; Gil-Garcia et al., 2020).
- **Citizen-Centric Digital Governance.** E-government platforms, mobile apps, and online service portals enhance citizen engagement and accessibility to government services (Gray and Rumpe, 2017; Gov.hr, 2024).
- **Interoperability of Government Systems.** Integration between government agencies is critical to eliminating data silos and redundant administrative tasks (Scholl and Luna-Reyes, 2011; Irani et al., 2023).
- **Data-Driven Decision-Making.** Digital transformation allows governments to monitor service performance, track policy impact, and optimise administrative operations in real time (Janssen et al., 2021; Aras and Büyüközkan, 2023).

Despite its benefits, public sector digital transformation faces challenges, including financial limitations, organisational resistance, and cybersecurity threats (Criado et al., 2021; Kraus et al., 2021). While national governments establish digital policies, local governments are responsible for executing digital transformation strategies (Matias, 2020). The effectiveness of local digital governance depends on infrastructure readiness, administrative culture, and public engagement (Lember et al., 2019).

Challenges in Local Government Digital Transformation are:

- **Lack of a Coherent Digital Strategy.** Municipalities struggle with fragmented digital strategies, leading to inconsistent adoption of e-government services (Esteves and Joseph, 2008; Profiroiou et al., 2024).
- **Budgetary and Resource Constraints.** Local governments often face funding shortages, relying on EU grants and national subsidies for digital projects (Veit and Huntgeburth, 2014; Ivančić, 2024).

- **Resistance to Digital Change.** Public employees often resist transitioning from manual workflows to digital platforms, requiring targeted training programmes (Mingardon et al., 2018; Schwarzmüller et al., 2018).
- **Limited Citizen Adoption of Digital Services.** Digital inclusion remains challenging, particularly among older demographics and rural communities (Mergel et al., 2018; Kitagawa et al., 2022).

Croatia has made significant progress in e-governance with platforms like e-Citizens but lacks a unified local government digital strategy (Perić, 2021; Gov.hr, 2024). Experts emphasise the need for long-term municipal digital roadmaps to ensure sustainability, service integration, and citizen participation (Profiroiū et al., 2024). This literature review highlights that digital transformation in public administration is not just about technology, but requires institutional reform, strategic planning, and public engagement. While Croatia has advanced in digital governance, municipalities face persistent challenges that must be addressed through a national-local digital integration strategy, investments in AI, cloud computing, and blockchain for municipal services, workforce training programmes to reduce digital resistance, and citizen awareness and digital literacy campaigns. By implementing these measures, Croatian municipalities can transition into digital, citizen-oriented governance models, improving public service delivery and administrative efficiency.

3. DIGITALISATION IN CROATIA: NATIONAL, LOCAL, AND EUROPEAN CONTEXT

Croatia's digital transformation in public administration is influenced by EU policies, national strategies, and local initiatives (see Appendix 1). While national policies align with EU Digital Decade 2030 goals, municipal implementation is inconsistent due to budget constraints and varying levels of citizen adoption (Profiroiū et al., 2024). The Digital Europe Programme supports AI, cybersecurity, and e-government projects, while the National Development Strategy 2030 and the Digital Transformation Plan (2022–2027) aim to enhance digital services. However, local governments face limited broadband and IT infrastructure challenges, especially in rural areas.

Key issues include fragmented local strategies, low digital literacy, an over-reliance on EU funds, and limited citizen engagement. To address these challenges, it is recommended that a national-municipal coordination framework be established and targeted training programmes implemented. Strengthening national funding and fostering public-private partnerships

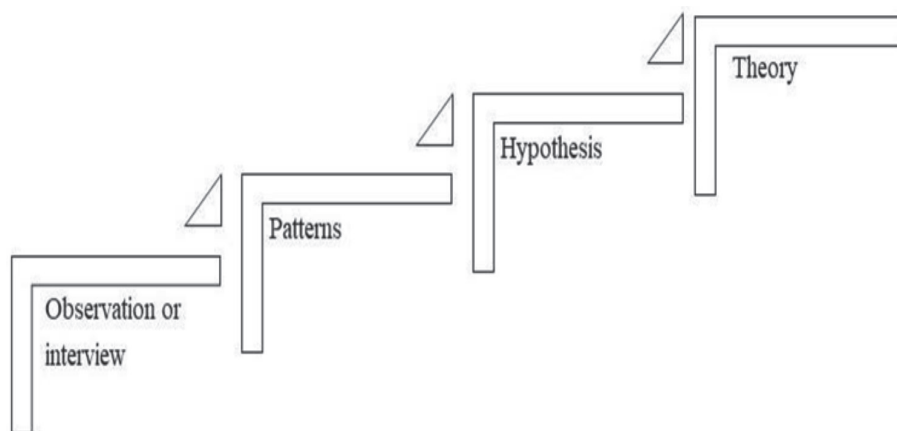
can reduce reliance on EU funds. Increasing awareness and improving e-government usability will boost citizen engagement. Despite strong policies and EU support, local implementation remains uneven. Addressing funding gaps, standardising strategies, and enhancing digital literacy is vital for a fully digital public administration. Strengthening collaboration between national and local governments is essential for accelerating Croatia’s digital transformation and aligning with EU benchmarks.

4. RESEARCH METHODOLOGY

4.1. RESEARCH DESIGN

This research uses qualitative methods to analyse the digital transformation process in the public sector. It focuses on the experiences, perceptions, and challenges municipal officials face in digital transformation projects. The study employs an interpretive methodology based on grounded theory (Glasser & Strauss, 1967). It adopts an inductive approach to develop new insights, emphasising the importance of observation and participant interviews in real-life situations (Bakker, 2019); see Figure 1.

Figure 1. Inductive approach stages Source: Authors’ elaboration



Source: Authors' elaboration

The research was intentionally designed to move beyond established theoretical frameworks, allowing for an unrestricted exploration of digital technology users’ perceptions. This approach enables a deeper understanding of users’ experiences, unhindered by the limitations

of traditional theories, which highlight the differences among three commonly used theories in academic research, thus justifying this methodological choice (see Appendix 2).

Data was gathered through semi-structured interviews with digital technology users (decision-makers, experts, and implementers) involved in digital transformation within government organisations in the County of Istria. The semi-structured format offered flexibility in questioning and ensured that all relevant topics were covered. Participants were selected through purposive sampling to represent various departments and levels of involvement in digital transformation. A standardised interview protocol was created to maintain consistency. It included open-ended questions on critical subjects such as project implementation, obstacles faced, strategies used, and perceived effects of digital transformation.

The key research questions included, but were not limited to:

1. **What level of comprehension do participants have regarding digital transformation?**
2. **What do stakeholders identify as the primary drivers and challenges?**
3. **How do participants perceive execution and impacts within the citizen engagement framework?**
4. **What are participants' future outlooks on digital transformation?**

The study aimed to encourage discussion and let participants share their views.

4.2. RESEARCH CASING

Based on research by Glaser and Strauss in 1967, at least ten interviews are recommended for relevant and reliable analysis, as smaller samples may yield biased conclusions. In this study, twelve digital technology users were interviewed. Participants received detailed information about the study's aims and methods, and consent was obtained before the interviews. Identifying details were anonymised to ensure confidentiality, and data was stored securely.

1.1. Analysis of Data

The research study involved twelve interviews with digital technology users, consisting of two female and ten male participants. Six held decision-making roles, four were experts, and two were daily users (see Table 1).

Table 1. Sociodemographic profile of participants

Participants code	Interview duration	Digital User Position	Digital User Role	Education	Gender	Income
P1	35 min	Mayor	Decision Maker	PhD	M	High
P2	44 min	Mayor	Decision Maker	PhD	M	High
P3	45 min	IT Lead	Expert	BA	M	Mid
P4	55 min	IT Lead	Expert	BA	M	Mid
P5	59 min	Director	User	PhD	M	High
P6	32 min	Director	User	MA	F	High
P7	29 min	IT Lead	Decision Maker	PhD	M	High
P8	38 min	IT Lead	Expert	MA	F	Mid
P9	45 min	Mayor	Decision Maker	BA	M	High
P10	55 min	Mayor	Decision Maker	MA	M	High
P11	63 min	IT Lead	Expert	BA	M	High
P12	33 min	Mayor	Decision Maker	PhD	M	High
TOTAL	533 min					

Source: Authors' elaboration

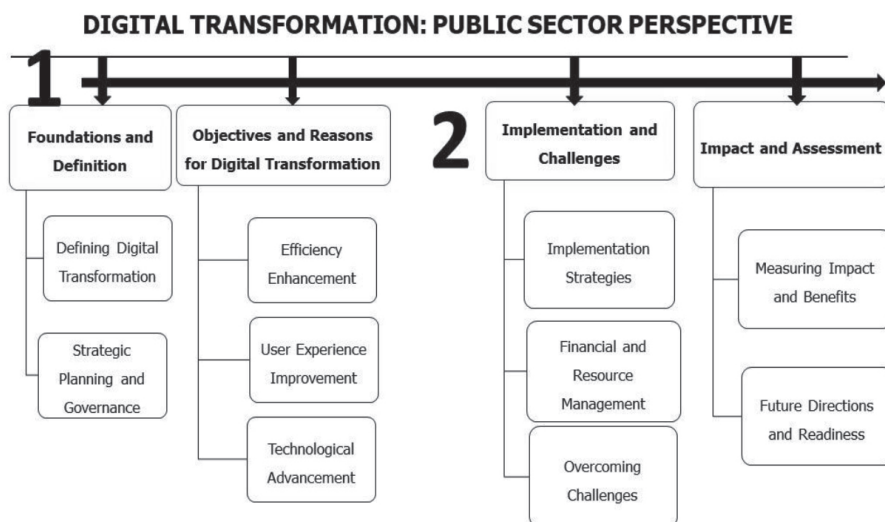
The participants' educational backgrounds varied: four completed university, three earned a master's, and five obtained doctorates. All participants were from various municipal institutions in Istria County. Ten

interviews were conducted in person and two online via Google Meet, with consent to record for analysis.

4.3. RESEARCH FINDINGS

After initial coding, thematic analysis identified key themes within meaningful categories. Based on research questions and participant perspectives, the researchers reached a consensus on the final categorisation, leading to a grounded theoretical model for digital transformation (see Figure 2). They continuously compared emerging themes, developing four dimensions with subthemes.

Figure 2. A grounded theoretical model of digital transformation in a public sector



Source: Authors' elaboration

4.4. DIMENSION ONE: FOUNDATIONS AND DEFINITION

The first dimension involves stakeholders' perceptions of the definition and importance of digital transformation, their understanding of its foundational elements, and their subjective emotions towards the research concept. Digital transformation involves leveraging technology to significantly enhance enterprise performance by addressing inefficiencies and outdated processes. It is important to drive innovation, improve customer experience, and increase operational efficiencies.

Participants generally identified digital transformation as converting analogue to digital, integrating various software solutions, enhancing existing business processes, and implementing new technologies based on computers, applications, and programmes to accelerate or improve the efficiency of specific tasks.

“Digital transformation involves enhancing the business model of an organisation through digital advancements.” (P1)¹

“Digital transformation involves integrating and utilising new computer-based technologies, applications, and programmes to streamline and enhance the efficiency of specific tasks.” (P3)

“Digital transformation means facilitating the operation of municipal administrations, specifically public administration.” (P8)

Within the second subtheme, it was unanimously acknowledged that digital transformation is crucial, and that strategic planning and governance are vital for successful digital transformation. However, most participants are not familiar with existing strategies or believe there is a lack of strategy at all levels of government: national, regional, or local.

“It seems that a regional digital transformation strategy does not exist.” (P1)

“We currently do not have a clear plan at the local level for digital strategy, but we are considering creating one to meet regulations in the future.” (P5)

A clear strategy and roadmap are critical for guiding the transformation process. Some participants noted that the County of Istria has an existing strategy for digitalising public administration. Additionally, they noticed the need for action plans and map routes, communication channels, and formal linkages. Although certain municipalities have digital transformation strategies, the participants must be aware of any current national-level strategy.

1 Participants code

“... at least at the level of the County of Istria, I know that there is a Strategy on the general digitalisation of public administration and the use of these new modern technologies.” (P8)

“We have not implemented a strategy at our local level, so it is not present, and we do not have any plans for its implementation.” (P9)

“At the local level, we have our city development strategy, which we have defined in cooperation with the local community. In doing so, we get down to details such as business plans and programmes that are relevant to our community.” (P10)

Government involvement is a prerequisite for ensuring coordinated efforts and policy support. Dedicated entities such as the Ministry of Justice, Public Administration and Digital Transformation, and the Government of the Republic of Croatia, oversee and facilitate these efforts. However, several participants mentioned a need for more formal ties or connections with the national institutions, while others praised its help with the digital transformation.

“I think there is some agency, but I am not sure.” (P7)

“So, in my opinion, the state should communicate what it wants from all of us with some kind of basic services; it should take a leadership role and say “you will do it this way” and then we could all be connected, because once again we have a discontinuity and dichotomy of different systems, each of which is a local unit self-government.” (P1)

“We must have contact with relevant institutions such as the State Ministry for Digital Transformation through which we establish communication with other cities and gain access to a broader digital transformation. This communication enables us to consult and access external experts or consultants for specific projects.” (P11)

“State Office for Digitisation of Society encompasses a governmental department dedicated to digitalisation, specifically emphasising digital transformation. While the precise nomenclature eludes me, we inevitably engage in ongoing correspondence with this entity.” (P1)

State authorities are collaborating with the EU to ensure that digital transformation initiatives align with the strategic goals outlined by the European Commission in 2020 (European Commission, 2020).

4.5. DIMENSION TWO: OBJECTIVES AND REASONS FOR DIGITAL TRANSFORMATION

The participants recognise that digital transformation aims to improve efficiency across various aspects. They have pointed out that reducing paperwork reduces physical storage requirements and has lower environmental impact.

“I have been able to categorise customer segments more efficiently with digitalisation, which used to take three days to do manually. We used to offer poor service. Digitalisation has reduced costs by requiring fewer people to do the same work, and process optimisation encompasses all repetitive tasks. Digitalisation significantly enhances not only speed but also consistency.”(P2)

“We believe we have significantly accelerated the pace of the work. We managed to reduce the cost of certain items in one part.”(P3)

“The efficiency and importance of improving the speed at which data is processed is crucial. Efficiency is critical, leading to a better user experience. This benefits all users and signifies transparency and equality for everyone.”(P4)

Providing fast services to citizens using digital tools to deliver quicker and more responsive services is identified as a significant factor in the digital transformation process. It is essential to make system improvements, such as upgrading software and hardware, to ensure smoother and more reliable operations.

“Citizens can more easily access city services via telephone or internet, which reduces the need for physical trips to the location.”(P9)

Automation and streamlined workflows are implemented to minimise delays and improve productivity. Reducing operational expenses and

optimising resource use achieve cost savings. Furthermore, digital transformation improves precision and accuracy by reducing human errors and enhancing data quality.

"The introduction of digital tools can improve the productivity of employees in the administration, reducing manual tasks and enabling focus on more critical activities."(P3)

Improving user experiences is a central objective of digital transformations. Enhanced user experiences are achieved by designing more intuitive and user-friendly interfaces. Connectivity and compliance are improved through integrated systems that facilitate better communication and adherence to regulations.

The availability of information is increased by making data accessible anytime and anywhere. Open access to information promotes transparency and trust:

"Transparency of data and decisions can increase citizens' trust in your organisation."(P3)

User participation in digital transformation processes ensures that services meet their needs and expectations. Robust user authentication mechanisms enhance security and trust in digital services. Additionally, well-designed web interfaces and one-stop points simplify user journeys by providing comprehensive services in a single location.

Significant technological advancements are propelling digital transformations. Ensuring the smooth integration of various systems and devices is crucial. Implementing customised software solutions to meet the needs of digital transformations addresses organisational requirements. These software solutions often incorporate advanced technologies such as Big Data, AI, Virtual Reality, Cloud computing, Social Media, Web technologies, GIS, and Intranet systems. These tools improve IT infrastructures and enable more advanced data analysis, communication, and operational capabilities.

"Our City Management utilises cutting-edge tools like Big Data analysis, artificial intelligence (AI), virtual reality, and Internet technologies to facilitate digital transformation. Additionally, they employ an internal cloud system for their servers and websites to guarantee data security and accessibility."(P12)

“I believe it is crucial, particularly in today’s era, for all spatial planning applications to be connected to geodesy and everything citizens can visually compare, accessible through a single application platform.” (P7)

“Digitalising processes is a major objective involving implementing authentication tools and managing passwords. There are also plans to transition to the National Identification and Authentication System (NIAS)² to enhance security and productivity. All these efforts underscore the necessity and significance of digital transformation for the efficient operation of the city’s administration in a contemporary digital landscape.”(P11)

4.6. DIMENSION THREE: IMPLEMENTATION AND CHALLENGES

A unified strategy fosters clarity and order among decision-makers, giving them direction and enhancing alignment and efficiency. Additionally, the lack of alignment and agreement across different levels of authority causes conflicts and hinders effective governance and implementation. By addressing these challenges, implementation strategies can be better aligned, reducing confusion and improving compliance within the state.

“The primary issue is the lack of clarity in our strategy or the absence of one. We are uncertain about our direction. There is no clear consensus on the collective goals for public administration in the Republic of Croatia. What would be the ultimate objective of implementing this digital transformation?” (P7)

“Therefore, a lot hinges on the desires and preferences of the leaders and employees in cities and municipalities across Croatia.” (P11)

Having clear implementation plans to carry out digital transformations is essential.

“Organisational change requires clear communication and support to facilitate the transition.” (P6)

2 NIAS is a system that serves as a central point for user identification and authentication when signing up for e-services, providing secure electronic identification through digital credentials.

Securing funding and managing resources effectively are also crucial aspects of this process. Participants agreed that all financial resources originate from the annual budget, EU funds, and project activities.

"Within the budget, a part is invested in the purchase of new computers, software, and sometimes even for teaching the employees themselves how to use the same software." (P6)

"Generally speaking, cities allocate a certain percentage of their budget to digitalisation projects and modern information systems. This percentage may vary depending on the overall financial priorities of the city." (P12)

Participating in procurement processes and EU tenders can also help acquire the required technologies and services. It is essential to give employees training and development opportunities to ensure they have the necessary skills. Proper supervision and effective time management are crucial to keep projects on track and achieve their objectives.

"We are currently seeking European projects to enhance our initiatives. A colleague played a key role in registering projects and broadening our access to European funds." (P10)

The public procurement system should be transparent, fair, and consistent for any request. The procurement process is the same when it comes to digitalisation. Digital change initiatives frequently face multiple obstacles—more qualified personnel and technology. Overcoming resistance to change and clarifying strategy are typical challenges that necessitate efficient change management.

"We have a broad range of resistance that can come from employees being unwilling to accept changes, hesitant to embrace digital technology because it is unfamiliar and resistant to learning and internal changes." (P2)

"When discussing digital transformation, the primary obstacles often involve handling change, informing individuals about new technologies, adjusting current systems and procedures, and guaranteeing the security and privacy of data." (P9)

Technical challenges often emerge due to system incompatibility, which can lead to issues with data sharing and communication between different systems. Additionally, the need for centralised access points can pose challenges in managing and securing access to sensitive information.

“There was a push for a standardised national digital transformation, but it stalled midway due to shifts in choices and options. Consequently, various institutions developed their platforms, leading to an inability to integrate across different systems.” (P2)

Additionally, financial constraints and excessive paperwork can hinder transformation efforts. Furthermore, fear of new technologies among public administration employees and citizens’ need for more awareness of technological advancements can slow adoption.

“The main challenges include the requirement to dedicate a specific amount of time and energy to become proficient in these new tools, and similarly, the apprehension of not being able to fully grasp the potential that this new technology can offer when it is unfamiliar.” (P6)

“Some segments of the population, especially older individuals, may struggle to embrace change. Initially, there was some resistance to introducing new initiatives, particularly among this group. We made an effort to be adaptable and responsive to their needs. I want to highlight that we even organised workshops and training sessions specifically for older adults to improve their computer skills. Through these workshops, we aimed to introduce some of the solutions we were developing to the community.” (P3)

4.7. DIMENSION FOUR: IMPACT AND ASSESSMENT

Evaluating digital transformations involves using Key Performance Indicators (KPIs) and other measurement indicators. These metrics help gauge the positive impact on business costs, operational efficiencies, and societal values. User satisfaction and data security are crucial factors that demonstrate the success of digital initiatives. Digital transformation brings numerous benefits to the community, such as increased access to information, fostering trust among community stakeholders, expediting decision-making processes with relevant data and statistics, saving money, minimising bias in decision-making, enhancing user satisfaction, and making processes more

accurate and appropriate. One participant specifically described the impact of digital information as revolutionary.

"I believe that the impact of digital transformation is revolutionary. Once users master these tools, they can enhance efficiency and access a high-quality instrument for improving business." (P6)

Participants indicated that they are still determining the methods for measuring the impacts of digital transformation using various KPIs or other indicators. However, they have identified several approaches for determining improvements during specific periods, such as "...the number of received and resolved requests" (P9), "...performance index..." (P2), "...citizens feedback..." (P7), "...public sector employee feedback, particularly those from the first line as communal officers..." (P9).

Participant 9 emphasised the challenges of measuring the impact and linking it to the volatile term of perception: *"Perceived impression holds significance, even if it cannot always be quantified with numbers."*

The future of digital transformations entails continuous evolution and adaptation to new technologies. Plans for sustained development involve ongoing innovation and upgrading of digital capabilities. Adaptability, infrastructure, and strategic alignment assess organisational readiness for digital transformation.

Public perception and commentary on digital transformation also play a crucial role in its success, emphasising the importance of communication and stakeholder engagement.

Citizens' involvement is crucial in the digital transformation process, as it is one way to gain more knowledge about what needs to be done.

"We organise focus groups with different sectors of civil society and experts" (P10)

"The involvement of citizens in public consultations is a widely recognised occurrence." (P12)

"Citizens provide their opinions or suggestions through surveys that we conduct once a year." (P2)

"We are creating a platform that allows all citizens to take part in their local committee by classifying projects and voting on specific projects within each local committee." (P9)

Speaking about readiness, all participants concurred that each local community member should be receptive to change and actively facilitate digital transformation that is more effective, efficient, and relevant to everyone.

Participant 2 expressed concern about *“how many individuals would be willing to embrace it and how self-critical they would be in acknowledging the need to change this administrative model’s functioning.”*

All stakeholders are aligned on the next steps, including the following key components: IT leadership, continuous education, enhanced use of EU funds, and, critically, formulating a strategy and roadmap for upcoming initiatives. This statement represents the position of all participants.

5. DISCUSSION AND CONCLUSION

The grounded theory framework, stemming from a study on digital transformation in the public sector, identifies four specific dimensions with categories and subcategories:

Dimension 1: Foundations and Definition (defining digital transformation and strategic planning and governance),

Dimension 2: Objectives and Reasons for Digital Transformation (efficiency enhancement, user experience improvement, and technological advancement),

Dimension 3: Implementations and Strategy (implementation strategy, financial and resources management, and overcoming challenges),

Dimension 4: Impact and Assessment (measuring impacts, benefits, future directions, and readiness).

Researchers used an interpretative method to analyse participants’ perspectives on digital transformation comprehensively. The research revealed a complex, dynamic, multi-faceted, and evolving digital transformation landscape, shedding light on numerous associated issues and dilemmas.

Communities and individuals often think they fully understand digital transformation but, upon closer examination, they discover many overlooked and misunderstood aspects. This study sought to uncover the current state of digital transformation in the County of Istria by evaluating participants’ attitudes and understanding of digital technology and the digital transformation process. The grounded theory-based qualitative approach was chosen as a valuable tool for developing a new conceptual model for digital transformation. This method enabled a more comprehensive range

of opinions, allowing participants to delve into the topics covered in the interviews and beyond and share their personal experiences.

After completing a carefully executed initial coding cycle and thematic analysis, it became apparent that four dimensions, along with corresponding themes and subthemes, naturally aligned in a hierarchical pathway. The first two dimensions, labelled one and two, can be viewed as the natural and essential *initial first phase*. Participants recognised that every digital transformation process must begin with a clear definition and understanding of the digital transformation concept's significance and meaning. Subsequently, a distinct, precise, and unique strategy, spearheaded by the leading authority, should be established as the first phase. During this phase, it is crucial to clarify the reasons for undertaking the process and the objectives that must be achieved. Governance should adopt a top-down approach; all entities and individuals involved should mutually agree.

The second phase covers dimensions three and four, focusing on implementation, resources, and opportunities throughout the process. It culminates in impact assessment and the establishment of a future agenda. Readiness is crucial in planning future steps, as all stakeholders must understand the need to act promptly. Participant 2 has already expressed concern regarding the willingness to embrace and accept the need for change.

The proposed model derived from the research can be a valuable tool for establishing the process from the beginning until the end of the second phase and for continuing future steps. Digital transformation is not a project with a deadline; it is a permanent, progressive, and volatile process.

Each dimension covers specific themes and subthemes in detail. **Dimension One** emphasises *Foundations and Definitions*, aiming to enhance participants' comprehension of digital transformation by using technology to improve business performance and expand reach. It emphasises the importance of effective implementation through strategic planning and governance while highlighting strategic shortcomings at different government levels. **Dimension Two** explores the *Objectives and Reasons* for Digital Transformation, where participants identify efficiency enhancements, user experience improvements, and technological advancements as primary objectives. This dimension underscores the diverse aims of digital initiatives, encompassing tasks such as reducing paperwork and implementing cutting-edge technologies like AI and Big Data.

Dimension Three explores *Implementation and Challenges*, shedding light on methods for achieving digital transformations, such as employee training and EU-funded projects. It also outlines various obstacles that

impede transformation efforts, including resistance to change, technical challenges, and financial constraints.

Finally, **Dimension Four** focuses on *Impact and Assessment*, emphasising the significance of measuring the impact of digital transformations through KPIs and other indicators. It underscores the future trajectory of digital transformations, emphasising continuous evolution and the importance of organisational readiness, innovation, and stakeholder engagement.

The four dimensions and their respective themes and subthemes can serve as a comprehensive model for strategizing, executing, and overseeing the digital transformation process in both public sector and business environments. It can be utilised as a step-by-step guide, laying out what should be done and what should be avoided. The grounded theory framework provides a thorough understanding of the intricacies of digital transformation in the public sector. It offers insights into the assessment. The findings highlight the need for improved strategy, communication barriers, and apprehension or resistance to change. Non-cooperation is frequently observed in communities that require additional resources, knowledge, and a willingness to participate in essential activities.

Finally, researchers kindly requested any further comments following the interview. However, only three participants had additional contributions to make.

“An interesting topic that represents our present, not the future, and we must act quickly to function as an organised public administration.” (P1)

“The process of digital transformation is no longer just a choice for businesses; it has become an unavoidable reality and a necessary obligation.” (P2)

“The shift to digital technology is essential. We are heavily focused on digital transition, and I believe we should undertake it collectively. It would be beneficial to have a framework that specifies the required annual allocation for the digital transition.” (P5)

Following an in-depth discussion, it was apparent that all participants shared similar perspectives, although some subtle differences existed. There was a unanimous agreement on the current status of the digital transformation process in Istria County, with a collective assertion that the process requires restructuring and reorganisation. Additionally, it was

stressed that implementing a clear, well-defined strategy is crucial as a foundational element for aligning with global trends.

5.1. LIMITATIONS OF RESEARCH

The results of this study may not be universally applicable, as they reflect the specific experiences of the participant group. Researcher biases can influence findings, but transparency in the analytical process and reflexivity helped minimise subjectivity. The researchers validated their findings through data source and researcher triangulation and ensured inter-coder reliability with rigorous coding and discussions. This research represents a significant milestone and provides a solid foundation for future studies.

5.2. FUTURE RESEARCH

The study emphasises the need to explore Croatian citizens' perspectives on digital transformation nationwide, not just within the Istrian Peninsula. It recommends using a mixed-methods approach, combining qualitative and quantitative research, to capture diverse opinions and experiences, enhancing the findings' reliability. This relatively unexplored area could significantly impact sectors like education, healthcare, and public administration, supporting Croatia's digital agenda and informing policymaking, technological innovation, and public service delivery. Additionally, research should incorporate philosophical perspectives, such as techno centrism and digital humanism, to discuss digital technologies' ethical, social, and economic implications. A quantitative analysis of the public and private sectors could highlight challenges and opportunities, enabling targeted interventions and promoting collaboration for a more digitally advanced society.

BIBLIOGRAPHY

1. Croatian Government. (2019). Strategy for the Development of e-Government. Available at <https://mpudt.gov.hr/en> accessed 9 February 2025.
2. Croatian National Bank. (2020). *Economic Developments in Croatia*. Available at https://www.hnb.hr/documents/20182/497898/jr-gov-pdf-e-vujcic-16_12_2015.pdf/62adbb5d-641a-429c-928c-c1a3c8d74d17?t=1620029213827 accessed 08 February 2025.
3. Institute of Public Administration. (2021). *Report on E-Government and Citizenship Engagement in Croatia*. Available at https://iju.hr/HKJU-clana_eng.asp?c=1261&a=Author:%20Karlo%20Pekas;%20Josipa%20Perkov;%20Aleksandra%20Krajnovi%C4%87; accessed 10 February 2025.
4. World Bank. (2020). *Croatia: Digital Transformation for a Sustainable Future*. Available at <https://www.worldbank.org/en/country/croatia/brief/croatia-digital-innovation-and-green-technology-project> accessed 08 April 2024.
5. Aras, A., & Büyüközkan, G. (2023). Digital Transformation Journey Guidance: A Holistic Digital Maturity Model Based on a Systematic Literature Review. *Systems*, 11(4), 213.
6. Baig, A., Dua, A. & Riefberg, V. (2014) *Putting citizens first: How to improve citizens' experience and satisfaction with government services*. McKinsey Center for Government.
7. Bakker, J., I., H. (2019). Grounded Theory Methodology and Grounded Theory Method: Introduction to the Special Issue, *Sociological Focus*, 52:2, pp91-106. <https://doi.org/10.1080/00380237.2019.1550592>
8. Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. W.W. Norton & Company.
9. European Commission. (2021). *Digital Economy and Society Index (DESI)*. Available at https://ec.europa.eu/commission/presscorner/detail/en/ip_21_5481 accessed 7 February 2025.
10. Criado, J. I., & Gil-Garcia, J. R. (2019). Creating public value through digital transformation: Towards a public administration theory of digital governance. *Government Information Quarterly*, 36(4), 101385.
11. E-gradani (n.d.) *Information and services*. Available at <https://gov.hr/?lang=hr> accessed 15th March 2024.
12. Eom, S. J. (2020). Digital government: An introduction to theories, models, and methodologies. *Public Administration Review*, 80(6), 1020-1034.
13. Esteves, J., & Joseph, R. C. (2008). A comprehensive framework for the assessment of eGovernment projects. *Government Information Quarterly*, 25(1), 118-132.
14. European Commission (2020). *Strategic Plan 2020-2024*. Available at https://commission.europa.eu/system/files/2020-11/startegic_plan_just_2020-2024_revised.pdf accessed 15 April 2024.
15. Glasser, B., & Strauss, A. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Mill Valley, CA: Sociology Press.

16. Gray, J. & Rumpe, B. (2017). Models for the digital transformation. *Software & Systems Modeling*, 16, pp307-308. <https://doi.org/10.1007/s10270-017-0596-7>
17. Greenfield, A. (2017). *Radical Technologies: The Design of Everyday Life*. Verso Books.
18. HINA (2020). *Just 18% of Croatian companies have a digital transformation strategy*. Available at <https://hina.hr/news/10498844> accessed 10 February 2025.
19. Hou, M. (2023). Digital economy, enterprise digital transformation, and digital business model: evidence from China. *Asia Pacific Business Review*, 29(4), 1200–1210. <https://doi.org/10.1080/13602381.2023.2241762>
20. Imamov, M., & Semenikhina, N. (2021). The impact of the digital revolution on the global economy. *Linguistics and Culture Review*, 5(S4), pp968-987.
21. Irani, Z., Abril, R. M., Weerakkody, V., Omar, A., & Sivarajah, U. (2023). The impact of legacy systems on digital transformation in European public administration: Lesson learned from a multi-case analysis. *Government Information Quarterly*, 40(1), pp101784.
22. Istarska Županija (2021). *Strategija digitalne transformacije Istarske županije*. Available at https://www.istra-istria.hr/media/filer_public/72/d6/72d6bd92-2406-4caf-9f33-5c25a8050f6f/220914_digitalna_transformacija.pdf accessed 18 September 2024.
23. Ivančić, T. (2027). Za digitalno zrele kapacitete u rastu gospodarstva nužna sinergija akademske zajednice i industrije. Available at <https://www.poslovni.hr/hrvatska/za-digitalno-zrele-kapacitete-u-rastu-gospodarstva-nuzna-sinergija-akademske-zajednice-i-industrije-4461187> accessed 8 February 2025.
24. Janssen, M., Estevez, E., & Janowski, T. (2021). Interoperability in digital government ecosystems: Understanding challenges and opportunities. *Government Information Quarterly*, 38(2), 101590.
25. Kattel, R., & Mergel, I. (2019). Digital transformation of government: The challenges of moving beyond e-government. *Public Management Review*, 21(3), 349-363.
26. Kitagawa, F., Castañeda, J., Miedema, E., & Jansen, M. (2022). Digital inclusion and smart cities: A comparative study. *Technology in Society*, 68, 101785.
27. Kitsios, F.; Kamariotou, M.; Mavromatis, A. (2023). Drivers and Outcomes of Digital Transformation: The Case of Public Sector Services. *Information*, 14, p43. <https://doi.org/10.3390/info14010043>
28. Korte, M. (2020). The digital revolution's impact on the human brain and behaviour: where do we stand? *Dialogues in clinical neuroscience*, 22(2), pp101-111.
29. Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., & Roig-Tierno, N. (2021). *Digital transformation: An overview of the current state of the art of research*. Sage Open, 11(3), 21582440211047576.
30. Lember, V., Kattel, R., & Tõnurist, P. (2019). *Technological capacity in the public sector: The case of digital government in Europe*. OECD Working Papers on Public Governance, 34, 1-27.
31. Lugavić, Z. & Azapagić, A. (2022) Koraci u digitalizaciji javne uprave. *Tranzicija/Transition*. 25(49).
32. Lugavić, Z. & Rožajac, A. (2020) Digitalna transformacija: multidisciplinarno upravljanje promjenama. *Tranzicija/transition*, 25(50), pp43-64.

33. Matias, J. C. O. (2020). Digital Transformation and Knowledge Management in the Public Sector. *Sustainability*, 12(14), p5824.
34. Mergel, I., Kattel, R., Lember, V. & McBride, K. (2018). *Citizen-oriented digital transformation in the public sector*. In *Proceedings of the 19th Annual International Conference on Digital Government Research: Governance in the Data Age* (dg. o '18). Association for Computing Machinery, New York, NY, USA, Article 122, 1–3. <https://doi.org/10.1145/3209281.3209294>
35. Mingardon, S., Wolfgang, M., Lewis, M., Snyder, A. & Meyding, G. (2018) Is Your Change Management Approach Keeping Pace with Digital? Available at https://web-assets.bcg.com/img-src/BCG-Is-Your-Change-Management-Approach-Keeping-Pace-with-Digital-Sep-2018_tcm9-203737.pdf 8th April 2024.
36. Perić, M., (2022). *Što i kako: Digitalizacija postojećih procesa put je u propast projekta*. Available at <https://lidermedia.hr/sto-i-kako/digitalizacija-postojecih-procesa-put-je-upropast-projekta-144709> accessed 15.03.2024.
37. Profiroiu, C. M., Negoită, C. I., & Costea, A. V. (2024). The digitalisation of public administration in EU member states in times of crisis: the contributions of the national recovery and resilience plan. *International Review of Administrative Sciences*, 90(2), pp336-352.
38. Qi, Q., Tao, F., Hu, T., Anwer, N., Liu, A., Wei, Y., & Nee, A. Y. (2021). We are enabling technologies and tools for digital twins—*Journal of Manufacturing Systems*, 58, pp3-21.
39. Raj, R., & Kos, A. (2023). Artificial Intelligence: Evolution, Developments, Applications, and Future Scope. *Przegląd Elektrotechniczny*, 99(2).
40. Scholl, H. J., & Luna-Reyes, L. F. (2011). Interoperability in e-government: A framework for analysing organisational, technical, and political dimensions. *Government Information Quarterly*, 28(4), 389-399.
41. Schwarzmüller, T., Brosi, P., Duman, D., & Welp, I. M. (2018). How does the digital transformation affect organisations? Key themes of change in work design and leadership. *Management Review*, 29(2), pp114-138.
42. Spremić, M. (2017). *Digitalna transformacija poslovanja*. Zagreb: Ekonomski fakultet Sveučilišta u Zagrebu.
43. Tomić, Z., Volarić, T., & Obradović, Đ. (2022). Umjetna inteligencija u odnosima s javnošću. *South Eastern European Journal of Communication*, 4(2), pp7-16.
44. Vlada Republike Hrvatske (2021). Nacionalni plan oporavka i otpornosti. Available at <https://planoporavka.gov.hr/UserDocsImages//dokumenti//Plan%20oporavka%20i%20otpornosti,%20srpanj%202021..pdf> accessed 16th April 2024.
45. Vogl, T. M., Seidelin, C., Ganesh, B., & Bright, J. (2020). Innovative technology and the emergence of algorithmic bureaucracy: Artificial intelligence in UK local authorities. *Public Administration Review*, 80(6), 946-961.
46. Weerakkody, Vishanth & Dhillon, Gurjit. (2008). Moving from E-Government to T Government: A Study of Process Reengineering Challenges in a UK Local Authority Context. *IJEGR*, (4), pp1-16. <https://doi.org/10.4018/jegr.2008100101>

47. European Commission. (2020). *Shaping Europe's digital future*. Available at https://commission.europa.eu/system/files/2020-02/communication-shaping-europes-digital-future-feb2020_en_4.pdf accessed 10th February 2025
48. European Commission. (2020). *EU Digital Decade*. Available at https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en accessed 10th February 2025
49. European Commission. (2021). *Digital Compass: The EU's strategic plan*. Available at <https://eufordigital.eu/library/2030-digital-compass-the-european-way-for-the-digital-decade/> accessed 7th February 2025
50. European Commission. (2021). *Digital Europe Programme*. Available at <https://digital-strategy.ec.europa.eu/en/activities/digital-programme> accessed 7th February 2025
51. European Commission. (2021). *Once-Only Technical System (OOTS)*. Available at <https://interoperable-europe.ec.europa.eu/collection/digital-building-blocks/solution/once-only-technical-system-oots> accessed 7th February 2025
52. European Commission. (2021). *European Digital Skills and Jobs Coalition*. Available at <https://digital-strategy.ec.europa.eu/en/policies/digital-skills-coalition> accessed 9th February 2025
53. European Commission. (2022). *DIGIT Project: Advancing Digital Innovation*. Available at <https://digital-strategy.ec.europa.eu/en/activities/digital-programme> accessed 7th February 2025
54. European Commission. (2022). *Digital Transformation Action Plan (2022-2025)*. Available at https://commission.europa.eu/publications/european-commission-digital-strategy_en accessed 8th February 2025
55. European Commission. (2023). *Digital Decade Roadmap: Implementation Plan*. Available at <https://digital-strategy.ec.europa.eu/en/library/digital-decade-policy-programme-2030> accessed 8th February 2025
56. Government of Croatia. (2021). *National Cybersecurity Strategy of Croatia*. Available at [https://www.uvns.hr/UserDocsImages/en/dokumenti/Croatian%20National%20Cyber%20Security%20Strategy%20\(2015\).pdf](https://www.uvns.hr/UserDocsImages/en/dokumenti/Croatian%20National%20Cyber%20Security%20Strategy%20(2015).pdf) accessed 11th February 2025
57. Government of Croatia. (2022). *Digital Croatia Strategy (2032)*. Available at <https://mpudt.gov.hr/digitalna-transformacija/strategija-digitalne-hrvatske-za-razdoblje-do-2032/29168?impaired=1&lang=en> accessed 7th February 2025
58. Government of Croatia. (2022). *Digital Transformation Action Plan (2022-2025)*. Available at <https://digital-skills-jobs.europa.eu/en/actions/national-initiatives/national-strategies/croatia-digital-croatia-strategy-period-until-2032> accessed 9th February 2025
59. Government of Croatia. (2022). *Croatian National Digital Skills Strategy*. Available at <https://mpudt.gov.hr/news-25399/european-commission-report-for-second-year-in-a-row-croatia-makes-significant-progress-in-digitalising-society-and-economy/29285> accessed 10th February 2025.

APPENDIX 1. EUROPEAN UNION AND CROATIA – DIGITAL TRANSFORMATION FRAMEWORK

Aspect	EU Strategy/ Plan	Reference	Croatia Strategy/Plan	Reference
Main Strategy	Digital Compass - The EU's strategic plan	(European Commission, 2021)	Digital Croatia Strategy (2032)	(Government of Croatia, 2022)
	EU Digital Decade	(European Commission, 2020)	Digital Decade Roadmap	(European Commission, 2023)
	Shaping Europe's Digital Future	(European Commission, 2020)		
Digital Transformation	Digital Transformation Action Plan (2022-2025)	(European Commission, 2022)	Digital Transformation Action Plan (2022-2025)	(Government of Croatia, 2022)
Technology Investments	Digital Europe Programme	(European Commission, 2021)		
	DIGIT Project	(European Commission, 2022)		
Public Service Digitisation	Once-Only Technical System (OOTS)	(European Commission, 2021)	Once-Only Technical System (OOTS)	(Government of Croatia, 2021)
Digital Skills & Education	European Digital Skills and Jobs Coalition	(European Commission, 2021)	Croatian National Digital Skills Strategy	(Government of Croatia, 2022)
Cybersecurity	EU Cybersecurity Strategy	(European Commission, 2020)	National Cybersecurity Strategy of Croatia	(Government of Croatia, 2021)

Source: Authors' elaboration

APPENDIX 2. THEORY FRAMEWORKS COMPARISON – TOE, TAM, AND GROUNDED THEORY

Criteria	Grounded Theory (GT)	Technology-Organization-Environment (TOE)	Technology Acceptance Model (TAM)
Theory Development	Creates new theories from qualitative data.	Applies a structured framework to tech adoption.	Explains individual technology adoption based on perceptions.
Handling Complexity	Explores complex, less understood phenomena.	Analyses external (environmental) and internal (org & tech) factors.	It focuses on ease of use and usefulness but ignores external influences.
Flexibility	Highly flexible and adapts to emerging patterns.	Moderate flexibility; considers multiple external influences.	Limited flexibility is mainly applied to personal tech adoption.
Contextual Fit	Captures unique organisational and human contexts.	Strong in organisational studies, but less on individual factors.	Best suited for studies focusing on user perceptions and behaviours.
Research Approach	Inductive: theory emerges from collected data.	Deductive: tests predefined factors influencing adoption.	Deductive: tests a structured model for user acceptance.
Quantification Needs	It is ideal for studying behaviours, emotions, and culture.	Uses quantitative surveys and statistical models.	Quantitative, using structural equation modelling (SEM).
Best Use Case	Exploratory research with deep qualitative insights.	Best for studying organisational technology adoption.	Used for analysing personal and workplace tech acceptance.
References	Glaser and Strauss, 1967	Tornatzky and Fleischer, 1990	Davis, 1989

Source: Authors' elaboration

GENDER DIMENSION OF STUDENTS' DIGITAL COMPETENCIES: SELF-EVALUATION VS PERCEIVED EMPLOYER EXPECTATIONS¹

ANA ŠTAMBUK

University of Rijeka
Faculty of Economics and Business
Rijeka, Croatia
ana.stambuk@efri.uniri.hr

GORAN KARANOVIĆ

University of Rijeka
Faculty of Tourism and Hospitality Management
Ika, Croatia
gorank@fthm.hr

Paper Category: Preliminary scientific paper

¹ This paper was funded under the project line ZIP UNIRI of the University of Rijeka, for the project ZIP-UNIRI-2023-17

ABSTRACT

In this study the authors examined the self-assessment of digital competencies among economics and business administration students in Croatia and their perceptions of the importance of these competencies to employers. Given the increasing role of digitalisation in everyday activities, we may conclude the role in digital skills is crucial to business success. The literature review reveals significant gender disparities in digital competencies, with females often undervaluing their skills compared to males, despite excelling academically in some areas. To address this issue the authors surveyed 659 students from the Faculty of Economics and Business, University of Rijeka, focusing on their digital skills and perceived importance. The results indicated high self-assessment scores for both genders, showing a strong identification of their digital competencies. The analysis of the results showed no significant difference in self-assessment scores between female and male students. However, a significant gender difference was observed in the perception of the importance of digital competencies to employers, with females rating this importance higher than males. The study concludes that while both genders value their digital skills, females perceive these skills as more critical to employers. The limitations of this study include the sample being restricted to a single university and the use of self-assessment measures. Future research should expand the sample and incorporate objective assessments to provide a more comprehensive analysis.

Keywords: digital competencies, students, self-evaluation, perceived employer expectations, Croatia, gender

1. INTRODUCTION

Nowadays, more than ever in human history, computerisation and digitalisation intertwine with the everyday private and business activities of every human on the planet. In the near human future, overall activity, as well as the whole environment, will be entirely determined by digitalisation and artificial intelligence dominance. We may assert that nowadays persons that have a low level of digital competencies are functionally illiterate. Based on the research of Sánchez-Caballé et al. (2020) and their findings from a systematic review of literature, in which they analysed the most commonly used terminology, we have adopted the term *digital competencies*. Although the most used term is digital literacy for the purposes of this study, we have chosen the term digital competencies. We have to emphasise that although digital literacy and digital competencies are close as terms, but not identical, there is an evident difference. The difference arises from the scope and context. Digital literacy encompasses the ability to use digital technology and information and includes skills of understanding, evaluation and creation of communication through digital media. Digital literacy is now a hot topic and highly explored, and the complexity of the topic and wide range may be found in literature reviews by Campanozzi et al. (2023) and Oh et al. (2021). In the study by Zhou et al. (2024), they investigated the impact of digital literacy as a tool for preventing poverty. In the analysis of Gong et al. (2024) and Yang et al. (2024), they demonstrated that higher digital literacy is a precondition of successful sustainable and green production in agriculture. On the one hand Getenet et al. (2024) found that digital literacy is one of the key variables in fostering self-efficacy and enhancing online learning engagement.

On the hand, digital competences cover a wider set of skills, knowledge and attitudes required for responsible and effective use of digital competencies in life and work environments. Expanding upon the preceding observations, we may conclude that digital competencies are of vital interest to every successful company. Organisations with swift transitions of operation activities and successful implementation of digital transformation will upgrade the operational and, consequently, financial performance (Hess et al., 2016). One of the problems that can cause inefficiency in companies is the lack of a digitally-skilled labour force that has the ability to carry out the digital transition process. Štambuk et al. (2020) investigated the lack of digital skill impact on the retirement intentions of employers in the public sector of Croatia and the results were highly concerning. The requirement to use a computer was positively related to the intention of early retirement, i.e. the

level of personal computer skills was also connected to retirement intentions. For workers with low PC skills, the probability of the intention to retire early was greater than for those with high PC skills. This finding underlines the (in)ability of the labour force to adjust to the present digital transition of today's jobs. These findings are in line with the study of Cavapozzi and Dal Bianco (2022), who concluded that exit from the labour force is shown to reduce the computer skills and the frequency of internet utilisation of older individuals. König and Seifert (2022) investigated the impact of home work on the level of digital competencies under the COVID-19 situation, and found a few new discoveries concerning older workers, aged 50 and over: a) a labour force with few or some digital experience highly upgraded their computer skills through the pandemic related to homeworking, compared with those who already had excellent computer skills before the pandemic and b) those who worked at home full-time achieved a higher increase in digital competencies as opposed to those who worked part-time at home. It can be concluded that digital transition is available only with a skilled labour force. Higher education institutions have this task to carry out.

In existing literature there are an abundance of studies on competencies with diverse directions. From the point of view of students who are acquiring them, employers' expectations and the ratings of students' competences achieved, with higher education institutions as mediators in this process, are producing a new trend in the research gender gap competencies. Sánchez-Caballé et al. (2020) underline that there is no clear answer to the question concerning students' level of digital competencies. In the report UNESCO EQUALS Skills Coalition (2019), the authors underline the following conclusions: a) girls in the self-efficiency report (differences between the perceived and the actual abilities for advanced ICT tasks) are significantly lower achievers than boys in all countries in lower primary schools; b) in the upper primary and lower secondary schools these disparities are becoming more evident and c) due to these facts, only a few of the girls are graduating with ICT degrees. It should be pointed out that access to higher education narrows the gender gap. The educational system comprises several levels, starting from no formal education and progressing through primary and secondary education up to tertiary education. However, we have to keep in mind that there are 113 women enrolled in the tertiary education level for every 100 men (UNESCO Institute for Statistics, 2022). Nevertheless, paradoxically, even in countries that rank highest on the Gender Gap Index, gender gaps in digital skills persist. Sánchez-Caballé et al. (2020) highlight that there are several ways in which digital competencies could be developed, at the macro and micro levels. Some of the most popular approaches

involve institutional actions made up of plans, courses, curricular changes and other kinds of programmes implemented at a general university level. However, even in academia, the same problems are arising regarding digital competencies and STEM competencies.

Napal Fraile et al. (2018) carried out a study that involved teachers and their initial training, in which they had a poor conception of their own level of digital competences. This deficiency is even more highlighted when comparing the genders and their level of digital competencies, as supported by the study of Zhao et al. (2021). In their study, they investigated the teacher self-perception on digital competencies and the results suggested that males have a higher self-perception in digital competencies than female teachers. In addition, they discovered that teachers with shorter teaching experience perceived themselves to be better in the areas of communication and collaboration, digital content creation, security and problem solving. Serrano et al. (2023) pointed out that, in higher education institutions, there is a gender gap present in STEM fields and organised a pilot study to empower women in academia to transition towards creating intellectual property. The pilot study results confirmed that increasing women's competencies in the STEM directly influences the competency test that individuals have to take to measure the skills to succeed as an entrepreneur. The deficiency in the digital competencies of females is obviously present in the higher education institutions and can negatively impact teaching activities, as well as research activities. This was investigated by D. Yazon et al. (2019) who concluded that there is a significant correlation between faculty members' digital literacy and their research productivity. Enhanced digital proficiency facilitates their capacity to generate and disseminate research findings. Moreover, variables such as academic rank, professional designation, age, and years of experience significantly influence their digital competency and scholarly output.

The satisfaction of the needs of those who are employing graduates and further develop their competencies are usually examined through the Importance Performance Analysis (IPA). In the studies of McMurray et al. (2016), Štambuk et al. (2019), Konstantin et al. (2020), Succi and Canovi (2020), the authors investigated the competencies which graduate students have and their perceived importance, as well as the satisfaction of the level of these competencies. In contrast to that, Abidin (2021) surveyed all the stakeholders who are connected to the higher education competencies in Malang in Indonesia (university teachers, graduates, managers, graduates' co-workers) and provided a customer satisfaction index and an IPA. His study results indicate that higher education institutions should improve competencies in logical, analytical, and problem-solving skills, as well as

innovation, creativity, personality, confidence, and integrity, as these areas, despite being highly valued by stakeholders, currently exhibit a substantial gap between their importance and the satisfaction with alumni performance. Arkorful et al. (2024) highlighted the importance of problem-solving in digital education.

In the study of Açıkgöz et al. (2022), the authors revealed that Turkish higher education graduates lack digital competencies in problem-solving skills. Significant factors influencing these skills include gender and higher education attainment, with females and those holding associate or bachelor's degrees showing higher proficiency levels. The authors highlighted the educational policy reforms needed to enhance digital competencies and problem-solving skills among graduates. This was confirmed by Niño-Cortés et al. (2023), as they carried out a survey among secondary students in Spain and discovered that boys acquire higher digital competency levels than girls, emphasising gender differences. However, girls excel in academic activities, boys in technical tasks, and they show a better attitude towards digital technologies than girls. In Peru, Suárez-Guerrero et al. (2020) carried out a study to assess digital competencies among high-performing Peruvian higher education students with limited economic resources, revealing a high valuation of digital skills, especially in creativity and innovation. Females placed greater importance on aspects such as communication, collaboration, and creativity than on digital competency, compared to their male counterparts.

Based on previous studies, the authors conducted this research to determine the self-assessment of digital competencies among economics and business administration students in Croatia and their perception of the importance of digital competencies to employers.

2. DATA, METHODOLOGY AND RESULTS

In this study, a non-probability sampling method, and convenience sampling were applied. The sample members were selected on the basis of their convenient accessibility. Bhardwaj (2019) describes this as only being those members who are easily accessible to the researcher.

2.1. DATA AND METHODOLOGY

The authors conducted a survey study among business and economics business administration students at the Faculty of Economics and Business, University of Rijeka. This survey study was part of a broader research on

students' competencies and migration (Udruga mladih i Alumni FET Pula 2022). In order to compare the digital competency of students of different genders, the survey was conducted in February 2022, and the overall sample was 659 students, of which 498 were female and 161 were male students. It examined how students assess their digital competency and how they perceive the importance of digital competency for employers. The students were asked to rate four statements about their digital competency and one additional statement about the importance of digital competency for employers. The statements used for the students' self-assessment were based on the more exhaustive research by Çebi and Reisoğlu (2020).

The statements used to evaluate the elements of digital components are given in table 1 with possible answers from 1 - strongly disagree to 5 - strongly agree.

Table 1. Statements for evaluation of digital competencies of the students

Label	Statements
DC1	I can search digital contents and information and evaluate their quality
DC2	I use digital technologies for communication and collaboration in an online environment
DC3	I am able to develop contents of various formats using digital technologies
DC4	I am solving the problems I encounter when using digital media and devices

Source: Authors

Statement used to assess the students' perceptions of the employers' importance of digital competency is shown in table 2.

Table 2. Question for evaluation of students' perception of the importance of the digital competencies to employers

Label	Statement
DC_EMP	To what extent do you think the digital competency is important to employers (1 = not at all important; 5 = exceptionally important)

Source: Authors

For each statement, descriptive statistics for female and for male students separately were determined and analysed.

The distribution of the answers of the different genders to the questions on digital competency were compared graphically and numerically. A subgroup comparison chart was used for the graphical comparison. The answers were compared numerically using two non-parametric statistical tests: Mann-Whitney test and Two-sample Kolmogorov-Smirnov test.

2.2. RESULTS

Descriptive statistics of female students' self-evaluation of the digital competencies and of their perception of the importance of digital competency to the employers are given in table 3.

Table 3. Descriptive statistics of digital competencies of female students

Competency	Mdn (IQR)	Mode	Min	Max
DC1	4 (4-5)	5	1	5
DC2	5 (4-5)	5	2	5
DC3	4 (4-5)	4	1	5
DC4	4 (4-5)	4	1	5
DC_EMP	5 (4-5)	5	2	5

Source: Authors

For male students' descriptive statistics of self-assessment of their digital competencies along with their perception of the employers' importance of digital competency is shown in table 4.

Table 4. Descriptive statistics of digital competencies of male students

Competency	Mdn (IQR) ²	Mode	Min	Max
DC1	4 (4-5)	5	1	5
DC2	5 (4-5)	5	2	5
DC3	4 (3-5)	5	1	5
DC4	4 (4-5)	4	2	5
DC_EMP	5 (4-5)	5	2	5

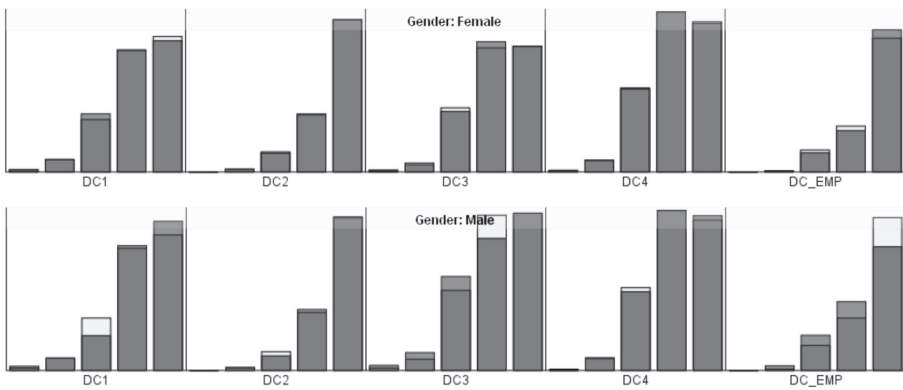
Source: Authors

² IQR - Interquartile Range

Analysing and comparing the descriptive statistics of female and male students of digital competencies, we can conclude that both genders highly value their digital competencies and the importance of digital competencies to the employers.

In order to compare female and male digital competency in more detail a subgroup comparison chart of female and male students is presented in figure 1.

Figure 1. Subgroup comparison chart of digital competency of female and male students



Source: Authors

Investigating figure 1, some differences are noticeable between female and male responses, but authors cannot form a categorical conclusion as to whether those differences are significant or random.

For making a statistically-based conclusion the numerical tests should be done and evaluated. The results of the Mann-Whitney non-parametric test of female and male students' answers to the question on digital competency along with mean ranks are given in table 5.

Table 5. Results of the Mann-Whitney test and ranks of female and male responses on digital competency

Competency	Rank Female	Rank Male	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
DC1	322.82	348.36	36512.000	160763.000	-1.584	0.113
DC2	327.35	332.08	39108.000	162364.000	-0.328	0.743
DC3	331.48	315.20	37552.500	50432.500	-1.011	0.312
DC4	327.36	334.09	38945.500	162698.500	-0.416	0.677
DC_EMP	323.31	269.11	29276.500***	40904.500	-3.877	0.000

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Authors

The Mann-Whitney test does not show considerable differences at a significance level $\alpha = 0.01$, not even at a significance level $\alpha = 0.10$ among the distribution of answers to the statements on self-evaluation of digital competency for female and male students. However there is significant difference between female and male students on the perception of the importance of digital competency for employers at the level of significance $\alpha = 0.01$.

In Table 6, the authors present the results of the Two-sample Kolmogorov-Smirnov test of female and male students on questions regarding digital competency.

Table 6. Results of the Two-sample Kolmogorov-Smirnov test of female and male responses on digital competency

Competency	Most Extreme Differences			Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
	Absolute	Positive	Negative		
DC1	0.066	0.066	-0.007	0.721	0.676
DC2	0.024	0.024	0.000	0.262	1.000
DC3	0.075	0.001	-0.075	0.824	0.506
DC4	0.015	0.015	0.000	0.166	1.000
DC_EMP	0.167	0.000	-0.167	1.792***	0.003

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Authors

The Two-sample Kolmogorov-Smirnov test on the female and male students gives the same results as the Mann-Whitney test. There is not a significant difference among self-assessment on digital competency between female and male students at the level of significance $\alpha = 0.01$ not even at a significance level of $\alpha = 0.1$, but there is a significant difference in perception on the importance of digital competency to the employer.

2.3. DISCUSSION OF THE RESULTS

The results of this study shed a new light on existing knowledge regarding the gender differences of digital competencies. Specifically, the results reveal that both female and male students self-evaluate their digital competencies at a relatively high level, with no statistically significant differences observed between genders. This outcome supports prior research suggesting that higher education contributes to the gender equality in digital competency acquisition.

However, a statistically significant difference emerged in students' perceptions of the importance of digital competencies to employers. The results indicate a higher awareness among female students as opposed to male students of the importance of digital competencies or their sensitivity to labour market expectations. This paradoxical result—where self-perceived competencies are similar, yet perceived relevance differs—may indicate underlying gender-specific attitudes toward employability and professional preparedness. The findings of this study are in line with previous research highlighting that women, despite demonstrating equal or superior academic performance, often perceive a greater need to meet or exceed expectations in the workplace. The implications of these results underscore the importance of addressing perceptual differences through targeted institutional support, particularly in preparing students for digital demands in professional contexts.

3. CONCLUSION

Analysing and comparing the descriptive statistics of the digital competencies of female and male students, we conclude that both genders highly value their digital competencies, and we may conclude that there is no visible difference in the results. Likewise, in the self-evaluation on digital competencies between men and women, there is no significant difference in evaluation of their digital competencies. The authors did expect these results, and it is in line with the similar studies (UNESCO EQUALS Skills

Coalition 2019; Kim 2023). Higher education narrows the gap between females and males regarding digital competencies and this effect is present in the analysed population.

The results from the Mann-Whitney test and the ranks of male responses on digital competencies indicate that there is no significant difference between self-assessment on digital competencies. In the results, if we compare female responses with male responses, the difference appears to be negative for females as opposed to males, although this result was not significant. This is present in self-evaluation of digital competencies; however, in the perception of the digital competencies to employers, there is a noticeable significant difference between males and females. Males have an overall lower perception of the importance of digital competencies to employers than females.

Study limitations arise from the sample, since the sample was of students from only one university. Moreover, another limitation of this study lies in the limited number of questions (just 4 statements) regarding digital competencies that were examined i.e., the self-assessment measure. Future studies should expand the sample to more universities as well as to expand them to more diverse study programmes, not limiting them to economics and business administration students. The approach to the investigated matter should be wider and include objective assessments to allow for a more comprehensive analysis. Moreover, instead of using the self-assessment questionnaire, we suggest using the objective assessment measure of digital competencies. For further research it is recommended to expand the questionnaire and the assessed variables.

ACKNOWLEDGMENT

This paper was funded under the project line ZIP UNIRI of the University of Rijeka, for the project ZIP-UNIRI-2023-17.

BIBLIOGRAPHY

1. Abidin, M. 2021. Stakeholders Evaluation on Educational Quality of Higher Education. *International Journal of Instruction* 14(3), pp. 287–308. Available at: http://www.e-iji.net/dosyalar/iji_2021_3_17.pdf.
2. Açıkgöz, Ö., Aslan, A. and Günay, A. 2022. Evaluation of the level of problem solving skills of Turkish higher education graduates in technology-rich environments. *Educational technology research and development* 70(5), pp. 1893–1910. Available at: <https://link.springer.com/10.1007/s11423-022-10120-0>.
3. Arkorful, V., Salifu, I., Arthur, F. and Abam Nortey, S. 2024. Exploring the nexus between digital competencies and digital citizenship of higher education students: a PLS-SEM approach. *Cogent Education* 11(1). Available at: <https://www.tandfonline.com/doi/full/10.1080/2331186X.2024.2326722>.
4. Bhardwaj, P. 2019. Types of sampling in research. *Journal of the Practice of Cardiovascular Sciences* 5(3), p. 157. Available at: https://journals.lww.com/10.4103/jpcs.jpcs_62_19.
5. Campanozzi, L. L., Gibelli, F., Bailo, P., Nittari, G., Sirignano, A., & Ricci, G. 2023. The role of digital literacy in achieving health equity in the third millennium society: A literature review. *Frontiers in Public Health*, 11, :1109323. <https://doi.org/10.3389/fpubh.2023.1109323>
6. Cavapozzi, D. and Dal Bianco, C. 2022. Does retirement reduce familiarity with Information and Communication Technology? *Review of Economics of the Household* 20(2), pp. 553–577. Available at: <https://link.springer.com/10.1007/s11150-021-09573-8>.
7. Çebi, A. and Reisoğlu, İ. 2020. Digital Competence: A Study from the Perspective of Pre-service Teachers in Turkey. *Journal of New Approaches in Educational Research* 9(2), p. 294. Available at: <https://naerjournal.ua.es/article/view/v9n2-10>.
8. D.Yazon, A., Ang-Manaig, K., Buama, C.A.C. and Tesoro, J.F.B. 2019. Digital Literacy, Digital Competence and Research Productivity of Educators. *Universal Journal of Educational Research* 7(8), pp. 1734–1743. Available at: http://www.hrpub.org/journals/article_info.php?aid=8170.
9. Getenet, S., Cantle, R., Redmond, P., & Albion, P. 2024. Students' digital technology attitude, literacy and self-efficacy and their effect on online learning engagement. *International Journal of Educational Technology in Higher Education*, 21(1–20), 3. <https://doi.org/10.1186/s41239-023-00437-y>
10. Gong, S., Sun, Z., Wang, B., & Yu, Z. 2024. Could Digital Literacy Contribute to the Improvement of Green Production Efficiency in Agriculture? *Sage Open*, 14(1), 1–18. <https://doi.org/10.1177/21582440241232789>
11. Hess, T., Matt, C., Benlian, A. and Wiesböck, F. 2016. Options for Formulating a Digital Transformation Strategy. *MIS Quarterly Executive* 15(2), pp. 123–139. Available at: <https://boris.unibe.ch/id/eprint/105447> [Accessed: 12 May 2024].
12. Kim, E.J. 2023. Digital competency factor analysis among the digital native generation. *International Journal of Advanced and Applied Sciences* 10(1), pp. 121–129. Available at: <http://www.science-gate.com/IJAAS/2023/V10I1/1021833ijaas202301016.html>.

13. König, R. and Seifert, A. 2022. Digitally Savvy at the Home Office: Computer Skills of Older Workers During the COVID-19 Pandemic Across Europe. *Frontiers in Sociology* 7. Available at: <https://www.frontiersin.org/articles/10.3389/fsoc.2022.858052/full>.
14. Konstantin, P., Irina, L. and Alena, T. 2020. Study of the Level of Employers' Satisfaction with the Quality of Training in Universities. *Advances in Economics, Business and Management Research*, 131.
15. McMurray, S., Dutton, M., McQuaid, R. and Richard, A. 2016. Employer demands from business graduates. *Education + Training* 58(1), pp. 112–132. Available at: <https://www.emerald.com/insight/content/doi/10.1108/ET-02-2014-0017/full/html>.
16. Niño-Cortés, L.M., Grimalt-Álvaro, C., Lores-Gómez, B. and Usart, M. 2023. The digital gender gap in secondary school: differences in self-perceived competence and attitude towards technology. *Educación XX1* 26(2), pp. 299–322. Available at: <https://revistas.uned.es/index.php/educacionXX1/article/view/34587>.
17. Oh, S. S., Kim, K.-A., Kim, M., Oh, J., Chu, S. H., & Choi, J. 2021. Measurement of Digital Literacy Among Older Adults: Systematic Review. *Journal of Medical Internet Research*, 23(2). <https://doi.org/10.2196/26145>
18. Sánchez-Caballé, A., Gisbert-Cervera, M. and Esteve-Mon, F. 2020. The digital competence of university students: a systematic literature review. *Revista de Psicologia, Ciències de l'Educació i de l'Esport* 38(1), pp. 63–70.
19. Serrano, D.R., Fraguas-Sánchez, A.I., González-Burgos, E., Martín, P., Llorente, C. and Lalatsa, A. 2023. Women as Industry 4.0. entrepreneurs: unlocking the potential of entrepreneurship in Higher Education in STEM-related fields. *Journal of Innovation and Entrepreneurship* 12(1), p. 78. Available at: <https://innovation-entrepreneurship.springeropen.com/articles/10.1186/s13731-023-00346-4>.
20. Štambuk, A., Karanović, G. and Host, A. 2019. Employers' Perceptions of Business and Economics Graduates' Competencies in Croatia. *Business Systems Research* 10(2), pp. 108–123. doi: <https://doi.org/10.2478/bsrj-2019-021>.
21. Štambuk, A., Uroda, I. and Anđelić, N. 2020. Adjustment and Early Retirement Intentions of the Older Workers in the Croatian Public Sector. *Ekonomski vijesnik* 33(1), pp. 175–190. Available at: <https://hrcak.srce.hr/240005> [Accessed: 21 June 2024].
22. Suárez-Guerrero, C., Revuelta-Domínguez, F.-I. and Rivero Panaqué, C. 2020. Valoración de la competencia digital en alumnos con rendimiento alto en Perú. *Education Policy Analysis Archives* 28, p. 126. Available at: <https://epaa.asu.edu/index.php/epaa/article/view/5112>.
23. Succi, C. and Canovi, M. 2020. Soft skills to enhance graduate employability: comparing students and employers' perceptions. *Studies in Higher Education* 45(9), pp. 1834–1847. Available at: <https://www.tandfonline.com/doi/full/10.1080/03075079.2019.1585420>.
24. Udruga mladih i Alumni FET Pula. 2022. *MI (migracijski izazovi) – jučer, danas, sutra*.
25. UNESCO EQUALS Skills Coalition. 2019. *I'd blush if I could: closing gender divides in digital skills through education*. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000367416>.
26. UNESCO Institute for Statistics. 2022. *Higher education figures at a glance*.

27. Yang, C., Ji, X., Cheng, C., Liao, S., Obuobi, B., & Zhang, Y. 2024. Digital economy empowers sustainable agriculture: Implications for farmers' adoption of ecological agricultural technologies. *Ecological Indicators*, 159, 111723. <https://doi.org/10.1016/j.ecolind.2024.111723>
28. Zhao, Y., Pinto Llorente, A.M., Sánchez Gómez, M.C. and Zhao, L. 2021. The Impact of Gender and Years of Teaching Experience on College Teachers' Digital Competence: An Empirical Study on Teachers in Gansu Agricultural University. *Sustainability* 13(8), p. 4163. Available at: <https://www.mdpi.com/2071-1050/13/8/4163>.
29. Zhou, D., Zha, F., Qiu, W., & Zhang, X. 2024. Does digital literacy reduce the risk of returning to poverty? Evidence from China. *Telecommunications Policy*, 48(6), 102768. <https://doi.org/10.1016/j.telpol.2024.102768>

UNRAVELLING DEFINITIONS AND CONTROVERSIES: A COMPREHENSIVE ANALYSIS OF SOCIAL INNOVATION, SOCIAL ENTREPRENEURSHIP AND SOCIAL ECONOMY

VIOLETA ŠUGAR

Juraj Dobrila University of Pula
Faculty of Economics and Tourism "Dr. Mijo Mirković"
Pula, Croatia
violeta.sugar@unipu.hr

KRISTINA AFRIĆ RAKITOVAC

Juraj Dobrila University of Pula
Faculty of Economics and Tourism "Dr. Mijo Mirković"
Pula, Croatia
kristina.afrić.rakitovac@unipu.hr

ROBERTA KONTOŠIĆ PAMIĆ

Juraj Dobrila University of Pula
Faculty of Economics and Tourism "Dr. Mijo Mirković"
Pula, Croatia
roberta.kontosic@unipu.hr

Paper category: Preliminary scientific paper

ABSTRACT

The ongoing debates surrounding the definitions of Social Innovation (SI), Social Entrepreneurship (SEn), and Social Economy (SE) underscore the complexity of these concepts and their implications for addressing pressing societal challenges. These discussions extend to regulatory frameworks and the recognition of social impact across various domains, including poverty, inequality, discrimination, social justice, health crises, migration, education access, technological ethics, food and water security, environmental pollution, political instability, and human rights. This research endeavours to address these complexities through primary objectives to propose a cohesive model for defining and measuring the social impact of each of the constructs, SI, SEn, and SE, as well as to examine the role of regulatory frameworks in fostering the development of SEn. The research relies on secondary scientific publications and information gathered from official sources such as governmental, regional and local authorities, as well as foundations, non-governmental organisations (NGOs), cooperatives, and private enterprises engaged in SEn activities. The findings of this research are twofold: 1) it presents a comparative analysis of key findings to propose a model for defining SI, SEn, and SE which reconciles overlapping features and addresses definitional controversies; 2) it outlines a model for measuring the social impact of these initiatives, providing insights into effective evaluation methodologies. Overall, this research contributes to a deeper understanding of the concepts of SI, SEn, and SE and offers practical frameworks for policymakers, practitioners, and researchers to navigate these domains effectively and advance the agenda of social innovation and entrepreneurship.

Keywords: social economy, social entrepreneurship, social innovation, social impact measurement

1. INTRODUCTION

In recent years, the concepts of Social Innovation (SI), Social Entrepreneurship (SEn), and the Social Economy (SE) have garnered increasing attention within academic and policy-making circles due to their potential to address some of the most entrenched societal challenges. These concepts, often used interchangeably, or conflated, represent distinct yet overlapping spheres within the broader context of societal development and transformation. The importance of clearly understanding and distinguishing between SI, SEn, and SE cannot be overstated, as each plays a unique role in leveraging social change through different mechanisms and institutional logics.

The ongoing discussions surrounding SI, SEn, and SE highlight the intricate nature of these concepts and their significance in tackling contemporary societal challenges. These debates extend beyond mere definitional clarifications, encompassing regulatory frameworks, and the acknowledgment of social impact across diverse realms such as poverty, inequality, discrimination, social justice, health crises, migration, education access, technological ethics, food and water security, environmental pollution, political instability and human rights.

This paper embarks on a timely exploration into the nuanced definitions and roles of SI, SEn, and SE within the context of modern societal challenges, ranging from poverty and inequality to environmental degradation and technological ethics. The urgency and complexity of these issues demand innovative approaches that transcend traditional economic models and regulatory frameworks. By critically analysing how these three domains intersect and operate, this research aims to shed light on their potential to significantly impact various facets of social welfare and development.

Moreover, the effectiveness of SI, SEn, and SE initiatives heavily relies on the regulatory environments in which they operate. This study, therefore, also seeks to examine the regulatory frameworks that support or hinder the growth and effectiveness of social entrepreneurship initiatives. Understanding these frameworks is crucial for designing policies that not only encourage but also sustain innovative social ventures.

Lastly, this research addresses the challenge of measuring and quantifying the social impact of initiatives within SI, SEn, and SE. Developing robust and reliable metrics is essential for assessing the efficacy of interventions and for guiding future initiatives. This study aims to contribute to the ongoing discourse on social impact measurement by evaluating existing

methodologies and proposing new frameworks that can more accurately reflect the true value and outcomes of social innovations.

Through a comprehensive review of secondary data from scientific publications and information gleaned from official sources such as governmental, regional, and local authorities, as well as foundations, non-governmental organisations (NGOs), cooperatives, and private enterprises involved in SEn activities this paper strives to provide a clearer understanding of these complex constructs. By proposing a unified model for definition and measurement, the research seeks to pave the way for more effective policy-making and entrepreneurial practices that can better address and harness the potential of social innovations for global change.

This research endeavours to delve into these complexities with the following primary objectives:

Firstly, it seeks to delineate the overlapping features and definitions of SI, SEn, and SE, aiming to propose a cohesive model that elucidates each construct's essence. Secondly, the study examines the role of regulatory frameworks in fostering SEn development, assessing their effectiveness in facilitating social entrepreneurship initiatives. Lastly, it evaluates existing mechanisms for measuring the social impact of SI, SEn, and SE initiatives, probing the feasibility of quantifying their outcomes.

The research's findings unfold in two main dimensions. Initially, it offers a comparative analysis of key findings to propose a model for defining SI, SEn, and SE that reconciles overlapping features and addresses definitional controversies. Furthermore, it outlines a model for measuring the social impact of these initiatives, providing insights into effective evaluation methodologies.

In summation, this research contributes to a deeper comprehension of SI, SEn, and SE concepts, furnishing practical frameworks for policymakers, practitioners, and researchers to navigate these domains effectively and propel the agenda of social innovation and entrepreneurship forward.

The following sections provide the literature overview with the key theories and debates regarding the concepts of SI, SEn and SE (2), the regulatory framework, crucial for defining, protecting, fostering, and facilitating important activities in the sector (3), the social impact measurement as a concept related to the creation of positive changes in society that improve the well-being of individuals, families and various stakeholders (4), the strategic approach to integration of SI, SEn and SE, optimised to create a synergistic effect, maximising their collective impact on addressing societal challenges (5), and finally the conclusion.

2. LITERATURE REVIEW

Social Innovation (SI), Social Entrepreneurship (SEn) and Social Economy (SE) represent dynamic fields of enquiry that have garnered significant attention from scholars, policymakers, and practitioners alike. This literature review aims to provide an overview of the key concepts, theories, and debates surrounding SI, SEn, and SE, setting the stage for the subsequent discussion on regulatory frameworks and social impact measurement.

The definitions and boundaries of SI, SEn, and SE have been subject to ongoing debate and evolution. Social innovation which belongs to the wider area of innovation (Purna and De Paoli, 2023), encompasses novel solutions to social problems, involving the creation, adoption, and diffusion of new ideas, products, services, or organisational models that benefit society (Moulaert et al., 2013) and it can also be seen as a process that has inherently political dimensions (Ayob et al., 2016). SEn refers to entrepreneurial activities with a primary aim of creating social value, combining innovative approaches with business principles to address societal challenges (Mair and Marti, 2006). SE encompasses a broader spectrum of economic activities driven by social objectives, including cooperatives, mutuals, nonprofits, and social enterprises (Borzaga and Defourny, 2001, Defourny and Nyssens, 2010). Despite these distinctions, there is considerable overlap between the three concepts, leading to ongoing debates about their precise boundaries and definitions.

According to Dees (1998), social entrepreneurs are the reformers and revolutionaries described by Schumpeter (1989), but with a social mission and their activities and processes aimed at initiating and implementing major social changes and improvements with the following key aspects: 1) change agents seeking significant systemic changes and long-term impact on issues like education, health care, economic development, and the environment; 2) mission-driven - they prioritise a social mission above financial gains, striving to create and sustain social value; 3) opportunity-driven - they recognise and relentlessly pursue new opportunities to fulfil their social mission, showing resilience and adaptability in overcoming challenges; 4) innovative - they apply creative and effective approaches to meet social needs; 5) resourcefulness - despite often starting with limited resources, they act boldly and leverage whatever resources they must to advance their mission; 6) accountable - they maintain a high level of accountability to the people and communities they serve. This definition underscores that while the approaches and impact level may vary, the essence of social

entrepreneurship lies in its unwavering focus on social improvement and the innovative, persistent, pursuit of transformative societal change.

Social entrepreneurs operate in markets, but these markets often do not provide the right discipline. They also compete for donations, volunteers, and other kinds of support, but the discipline of these “markets” is frequently not closely aligned with the social entrepreneur’s mission. Markets do not work as well for social entrepreneurs and they do not do a good job of valuing social improvements, public goods and harms, and benefits for people who cannot afford to pay. These elements are often essential to social entrepreneurship.

The social economy plays a crucial role in addressing social challenges, promoting sustainable development, and fostering inclusive growth. It often fills gaps left by the public and private sectors, providing essential services and support to vulnerable populations. Key components of the social economy are cooperatives (businesses owned and operated by their members, who share the profits and decision-making responsibilities), mutual societies (organisations that provide insurance, banking, or other services to their members, who are also the owners), non-profit organisations (NPOs, entities that operate for social, educational, charitable, or community purposes without distributing profits to owners or shareholders), social enterprises (businesses that aim to address social issues or create social value while operating in the market) and foundations (organisations that manage and distribute funds for charitable purposes).

Regulatory environments are key for shaping the landscape for social entrepreneurship. Supportive policies and legal frameworks can incentivise social enterprise formation, access to finance, and market development (Nicholls et al., 2015, Dacin et al., 2010). However, regulatory complexities and inconsistencies may pose barriers to SEn growth, requiring tailored interventions to foster an enabling environment for social innovation and entrepreneurship (Roy et al., 2017). However, challenges remain in ensuring that regulatory frameworks effectively foster SEn while maintaining accountability and transparency. Moreover, there is a need for greater coherence and coordination between different levels of government and across sectors to maximise the impact of social entrepreneurship initiatives (Borzaga and Galera, 2018).

Measuring the social impact of SI, SEn, and SE initiatives presents significant methodological challenges. Traditional metrics used to assess economic performance, such as profit margins and return on investment, are often inadequate for capturing the multifaceted nature of social value creation (Nicholls, 2010). As a result, scholars and practitioners have developed various methodologies and frameworks for evaluating social

impact, including social return on investment (SROI), social impact assessment (SIA), and social accounting and auditing (SAA) (Bull et al., 2010). Assessing the social impact of SI, SEEn, and SE initiatives is essential for accountability, learning, and decision-making. Various methodologies and frameworks exist for measuring social impact, ranging from qualitative case studies to quantitative indicators and composite indices (Lee et al., 2021). Challenges such as attribution, scalability, and contextual relevance necessitate a nuanced approach to social impact measurement, balancing rigour with practicality (Mair and Marti, 2009). However, debates persist about the validity, reliability, and scalability of these measurement approaches, highlighting the need for further research and innovation in this area. Also, the chosen measurement approach must be adapted to the specific needs and capabilities of the organisation itself.

While SI, SEEn, and SE share common goals of addressing social needs and creating positive change, their integration presents both challenges and opportunities. Overlapping definitions, divergent approaches, and sectoral boundaries may hinder collaboration and coordination among stakeholders (Lumpkin and Bacq, 2019). However, synergies between SI, SEEn, and SE hold promise for fostering cross-sectoral partnerships, leveraging resources, and driving systemic change (Dacin et al., 2011).

In summary, the literature on SI, SEEn, and SE provides a rich tapestry of theories, frameworks, and empirical evidence that inform our understanding of these phenomena. By elucidating the conceptual foundations, regulatory dynamics, and measurement methodologies, this review sets the stage for the empirical analysis and discussion on advancing the agenda of social innovation and entrepreneurship. The social innovation in the public sector, collaborative innovation (Torfing et al., 2020, Torfing and Ansell, 2020, Lorenzo-Afable et al., 2023) involves multi-actor collaboration which helps to produce a more nuanced understanding of problems, bring forth a variety of ideas, stimulate mutual learning, facilitate negotiated risk management, build joint ownership over solutions, enable coordinated implementation and adaptation, and accelerate the diffusion of successful innovations. This process aims to enhance the production of public value by involving a broad range of public and private actors in collaborative processes to address complex societal challenges and opportunities.

3. REGULATORY FRAMEWORKS

Social enterprises are becoming increasingly popular worldwide, particularly by younger generations, as an exceptionally promising organisational model (Fleischer and Pendl, 2024). More recently, the idea to tackle social challenges with entrepreneurial means has also been met warmly by policymakers. However, the legal framework for social enterprises remains poorly developed and legal analysis of the subject matter in academia is only slowly gaining momentum.

In the European Union (EU), SE legislation continues to grow. A considerable number of specific laws on SEs exist in various EU (and non-EU) countries, thus demonstrating the essential role of legislation in SE development. In fact, 21 out of 27 EU countries have dedicated laws on SEs, and some even have more than one (Fici, 2023). In countries where there had previously been no specific SE laws, their adoption led to notable SE growth. In Italy, for example, social cooperatives were established even before Law no. 381/1991 was introduced, and their number has increased considerably since then. According to the National Institute of Statistics (Istituto Nazionale di Statistica, ISTAT, 2006), there were a little over 2000 social cooperatives before 1991, almost 3500 in the mid-1990s, and just over 6000 by the end of 2003.

In the Social Economy Action Plan, the European Commission (2021) showed a preference for addressing the broader category of social economy entities, which includes not only social enterprises, but also other subjects identified solely based on their legal form (e.g. associations, foundations, mutuels, cooperatives). The European Parliament has recently proposed a statute for European cross-border associations and nonprofit organisations (Fici, 2021 and 2023, Fleischer and Pendl, 2024, Liptrap, 2020, Means and Jockey, 2018, OECD, 2022, 2023).

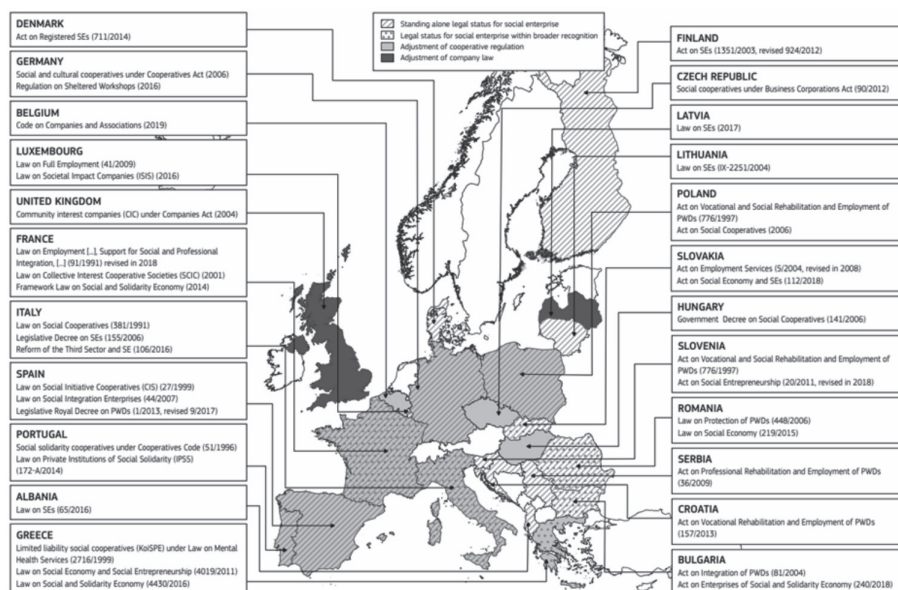
The UN Resolution A/77/L60 entitled “Promoting the social and solidarity economy for sustainable development” (UN, 2023) defines the social and solidarity economy (SSE) as “enterprises, organisations and other entities engaged in economic, social and environmental activities which serve the collective and/or general interest, based on the principles of voluntary cooperation and mutual aid, democratic and/or participatory governance, autonomy and independence and the primacy of people and social purpose over capital in the distribution and use of surpluses and/or profits”. The document encourages the UN Member States to promote and implement national, local and regional strategies, policies and programmes for supporting and enhancing the SSE through dedicated legal frameworks,

national statistics, fiscal and public procurement incentives, education curricula and capacity-building and research initiatives and reinforcing entrepreneurship and business support.

The main arguments in favour of regulating the SE are as follows: 1) defining and legitimising the sector; regulation helps to define what constitutes a social enterprise or social economy organisation, providing legitimacy and recognition to the sector, help to distinguish social enterprises from traditional businesses and charities, enabling targeted support and policy measures; 2) protecting social mission - regulations can help ensure that social enterprises maintain their primary focus on social or environmental goals, preventing mission drift; 3) fostering trust and credibility - a regulatory framework can increase public trust in social enterprises, making them more attractive to investors, customers and partners; clear regulations and transparency requirements can enhance the credibility of social economy organisations, particularly in times of crisis; 4) accessing funding and support - regulation can create specific funding mechanisms and support structures for social enterprises, facilitating their growth and impact; 5) measuring and reporting impact - regulations can standardise impact measurement and reporting, allowing for better assessment of social enterprises' contributions to society; 6) preventing abuse and fraud - regulation helps prevent the misuse of the social enterprise label by organisations that do not genuinely pursue social goals; 7) facilitating cross-border activities - regulation at the European level can facilitate cross-border activities of social enterprises across the Member States; 8) balancing social and economic objectives - regulation can help strike a balance between social objectives and financial sustainability, ensuring that social enterprises can operate effectively in the market economy and help them navigate the tension between social and economic goals; 9) encouraging innovation - well-designed regulations can create an environment that encourages and supports innovation in addressing social and environmental challenges (Gutberlet et al., 2018, OECD, 2022 and 2023, EC 2020 and 2021, So and Staskevicius, 2015, Mendell and Neamtan, 2010, EP, 2017, Defourny and Nyssens, 2010, Jenkins, 2018).

As Figure 1 shows, most European countries have various regulations regarding the SE (social cooperatives, associations, CIC, social integration enterprises, social solidarity economy, etc).

Figure 1. Legislation in European countries regarding social enterprises



Source: European Commission (2020). *Social enterprises and their ecosystems in Europe. Comparative synthesis report.* <https://europa.eu/!Qq64ny>

The EU has published several charters, programmes, statutes, directives and initiatives (European Social Economy Charter, Regulation (EU) No. 1296/2013, European Cooperative Statute (ECS), Social Business Initiative (SBI), Directive 2014/95/EU) outlining the principles and values of the social economy in the EU, declaring support to employment by social enterprises, providing a legal framework for cooperatives operating across EU member states, supporting social enterprises, including access to funding and improving visibility and requiring large companies to disclose non-financial and diversity information, which can include social and environmental aspects (EC, 2020 and 2021, EP, 2017, OECD, 2022 and 2023).

The United Kingdom (UK) established the legal framework for Community Interest Companies (CICs), a type of social enterprise (Companies Act 2004; Charities Act 2011, Public Services (Social Value) Act 2012, Co-operative and Community Benefit Societies Act 2014 and Social Enterprise Mark as a certification for social enterprises that meet certain criteria, although not a law, it is a recognised standard (OECD, 2022 and 2023, Fici, 2023, UN, 2023, Vasserot, 2023).

In the United States of America (USA) different states have recognised social enterprises within the framework of its own laws. The following five are the most common types and programmes: 1) Low-Profit Limited Liability Company (LLC) - designed to bridge the gap between non-profit and for-profit organisations; 2) Benefit Corporation (B-Corp) - companies can register as benefit corporations, which are required to create a positive impact on society and the environment; 3) Community Development Financial Institutions (CDFI) - funds providing support for community development and social enterprises; 4) New Markets Tax Credit (NMTC) - programme encourages investment in low-income communities by providing tax credits to investors; 5) Social Impact Bonds (SIBs) - a financing mechanism where private investors fund social programmes and are repaid by the government if the programmes achieve certain outcomes. In current U.S. practice, everything is now focused on benefit corporations whose aim is public benefit (Fleischer and Pendl, 2024).

In conclusion, regulating the social economy and social enterprises is crucial for defining the sector, protecting its mission, fostering trust, facilitating access to resources, standardising impact measurement, preventing abuse, enabling cross-border activities, balancing objectives, and encouraging innovation. However, it is important to note that regulation must be carefully designed to avoid stifling the flexibility and innovation that often characterise social enterprises. The challenge lies in creating a regulatory environment that supports and enables the social economy without over-burdening it with bureaucracy.

4. SOCIAL IMPACT MEASUREMENT

Social economy comprises a diversity of organisations in many sectors of activity driven by a mission of social purpose and other common principles, such as the primacy of people over capital and participatory governance (OECD, 2021). Although over the years SE has become an increasingly important and visible part of economic and social processes in many countries, especially in conditions of growing awareness of the importance of social inclusion, sustainability and solidarity, there is no single internationally accepted conceptual framework for assessing the social impact they have, nor for understanding the drivers and obstacles to creating that impact.

Social impact as a concept is related to the creation of positive changes in society that improve the well-being of individuals, families or other different stakeholders. It refers to how organisations, business and individual's actions affect the community. In the business sector, social impact has been

understood in the form of philanthropy for many decades. However, for companies that implement the concept of corporate social responsibility, social impact is related to the positive changes they create in their internal and external operations.

Social impact can be defined as “a logic chain of results in which organisational inputs and activities lead to a series of outputs, outcomes, and ultimately to a set of societal impacts” (Ebrahim and Rangan, 2010). After a systematic literature review of 68 relevant articles Feor et al. (2023), define social impact as a “deliberate intervention by an individual, community, or organisation with the objective of causing a positive effect on social, environmental, and economic well-being”. As Lee et al. note (2019), social impact has been conceptualised in the literature as different terms, including social performance (Husted, de, and Salazar 2006, Mair and Marti 2006), social value (Moss et al. 2011, Santos 2012), social returns (Emerson 2003), social return on investment (SROI) (Hall, Millo, and Barman 2015), and social accounting (Nicholls 2009).

Social enterprises (SEs) are interested in evaluating the social impact of their activities. Social impact measurement (SIM) is the process of evaluating the effects of an organisation’s activities on the well-being of its internal and external stakeholders and on the society. As Perrini et al. (2020) note, external factors may influence the impact achieved, whereby it is argued that the external factors should be excluded from the measurement process, to assess only the value created by the organisation concerned.

Social impact measurement of SEs is driven by internal and external factors (OECD, 2021). Internal factors are related to their mission, i.e. to contribute to the society as well as the need for impact information to effectively allocate resources to social value creation, improve and innovate their activities, increase stakeholders’ engagement and funding and support political and public advocacy. Regarding external factors, policy makers are interested in social impact measuring of the social impacts of their decisions, activities and investment in the communities. Besides, many companies are interested in the social changes related to their donations or joint projects in the community.

The Theory of Change (ToC) forms the backbone of any social impact measurement system. It refers to the construction of a model that specifies (usually visually) the underlying logic, assumptions, influences, causal linkages and expected outcomes of a development programme or project (Jackson, 2013). It presents a comprehensive illustration of how and why a desired change is expected to happen in a particular context providing a clear roadmap of the steps needed to achieve the desired outcomes. It helps

identify key measurement indicators (Lumpkin and Bacq, 2019, Lorenzo-Afable, et al., 2023, Lee. et al., 2021). The ToC links the organisations' activities with its overall mission or long-term goals. It is a framework for planning, implementing and evaluating social impact initiatives. However, in its implementation it can be overly theoretical and may not always translate well into practical measurement tools.

Over a decade ago, Ebrahim and Rangan (2010) had already noted the explosion in methods and tools for assessing social performance and impact. Nowadays there are hundreds of methods available to measure social impact, some of which are very well-known and applied to a range of situations, others less frequently used and more specific in terms of their application scope (Perrini et al., 2020). The lack of a clear and agreed definition of social impact makes it difficult for stakeholders to understand and translate it into meaningful practices. There are several methods for measuring social impact, but they are not necessarily mutually coherent and adapted to the specific features of SE organisations (OECD, 2021).

Social impact measurement methodologies range from (most basic to most complex): identifying potential impacts, counting outputs and beneficiaries, collecting stakeholder feedback, using standardised metrics, measuring population well-being, filling in predefined frameworks, conducting impact evaluations and attributing a monetary value to the impacts identified (Figure 2). These next levels build on each other, moving along a logical chain of the outputs, outcomes and, possibly, monetisation. The implementation requires increasing levels of knowledge, resources and skills to master more complex techniques. However, the implementation of social impact measurement practice will depend on their real needs and capabilities.

Figure 2. Breakdown of social impact measurement methodologies



Source: OECD (2021). *Social impact measurement for the Social and Solidarity Economy: OECD Global Action Promoting Social & Solidarity Economy Ecosystems*.p.31. <https://doi.org/10.1787/d20a57ac-en>. <https://ideas.repec.org/p/oec/cfeaaa/2021-05-en.html>

To improve social impact measurement and accurately reflect the outcomes of social innovations, a structured approach of selected methodologies is presented in Table 2. The methodologies were selected for their comprehensiveness, accuracy, practicality and scalability.

Table 1. Structural approach to measurement of SI, SE and SE

Step	Measurement	Impact
1) Review of the Existing Social Impact Measurement Methodologies and Frameworks	Social Return on Investment (SROI)	A framework for measuring and accounting for the value created by social, environmental, and economic outcomes, provides a monetary value to social outcomes, making it easier to communicate impact to stakeholders. Can be complex and resource-intensive to implement; may oversimplify social outcomes by reducing them to monetary terms.
	b) Social Enterprise Balanced Scorecard (SEBC)	A strategic planning and management system used to align business activities to the vision and strategy of the organisation. Integrates financial and non-financial performance measures; provides a balanced view of organisational performance. May not fully capture the social impact; primarily designed for business performance measurement.
	c) Impact Reporting and Investment Standards (IRIS)	A catalogue of generally accepted performance metrics used by impact investors to measure and manage social, environmental, and financial performance. Provides standardised metrics for impact measurement; widely recognised and used in the impact investing community. May not capture the full complexity of social outcomes; relies on self-reported data, which can be biased.
2) Evaluation of Strengths, Weaknesses, and Limitations	Evaluation criteria: comprehensiveness, accuracy, practicality, scalability	How well does the methodology capture the full range of social impacts? How accurately does the methodology measure social outcomes? How easy is it to implement the methodology in real-world settings? Can the methodology be scaled to different contexts and sizes of social innovations?
	SROI	Comprehensiveness: moderate; focuses on monetisable outcomes. Accuracy: high for financial outcomes; moderate for non-financial outcomes. Practicality: low; resource-intensive and complex. Scalability: moderate; can be adapted but requires significant resources.
	BSC	Comprehensiveness: moderate; integrates financial and non-financial measures. Accuracy: moderate; may not fully capture social impact. Practicality: high; widely used and understood. Scalability: high; adaptable to different organisational sizes.

	IRIS	Comprehensiveness: moderate; standardised metrics may not capture all impacts. Accuracy: moderate; relies on self-reported data. Practicality: high; standardised and widely recognised. Scalability: high; used globally by impact investors.
3) Proposal of a New Framework or Approach	Integrated Social Impact Measurement (ISIM)	Key features include: multi-dimensional metrics (incorporates financial, social, and environmental metrics to provide a holistic view of impact), stakeholder engagement (involves stakeholders in the design and implementation of measurement tools to ensure relevance and accuracy), adaptive indicators (uses adaptive indicators that can be tailored to different contexts and types of social innovations) and continuous improvement (emphasises continuous monitoring and feedback to refine and improve measurement practices over time).

Source: Authors research based on Feor, L.; Clarke, A.; Dougherty, I. (2023); OECD (2021); Perrini, F., Costanzo, L. A., & Karatas-Ozkan, M. (2020)

As indicated in Table 1 the first step to a more structural approach to measurement of SI, SEn and SE is to review the knowledge (published sources) on current methodologies and frameworks used for measuring social impact. This includes understanding various approaches, their theoretical foundations, and practical applications. A further step, as indicated in Table 1, is evaluating strengths, weaknesses, and limitations of the existing social impact measurement methods, which involves critically analysing how well these methods capture the multifaceted nature of social impact. The proposed new social impact measurement method named Integrated Social Impact Measurement (ISIM) aims to combine the strengths of existing methodologies, provide a more accurate and comprehensive assessment of social innovations while addressing their limitations.

And finally, based on the insights gained from the literature review and evaluation, a new strategic approach to integrating SI, SEn and SE is proposed and presented in the next chapter.

5. STRATEGIC APPROACH TO INTEGRATION OF SI, SEN AND SE

Unified frameworks and definitions could reduce ambiguity and enhance mutual understanding among stakeholders, as well as facilitate

dialogue between academics, practitioners, and policymakers to align on key concepts and objectives. To optimise the integration of Social Innovation (SI), Social Entrepreneurship (SEn), and Social Economy (SE) and maximise their collective impact, the authors propose several strategies that can be implemented (Table 2).

Table 2. Strategic approach to integration of SI, SEn and SE

No.	Strategy	Implementation
1	Clarifying definitions and boundaries	Unified frameworks and cross-sectoral dialogue
2	Fostering collaboration and partnerships	Multi-stakeholder partnerships and collaborative platforms
3	Enhancing policy and regulatory support	Supportive policies and regulatory frameworks
4	Building capacity and skills	Education and training; mentorship and support networks
5	Innovative financing mechanisms	Impact investing and blended finance
6	Measuring and communicating impact	Standardised metrics and impact reporting
7	Leveraging technology and innovation	Digital platforms and data-driven decision making
8	Creating enabling ecosystems	Ecosystem development and community engagement
9	Promoting a culture of social responsibility	Corporate social responsibility (CSR) and public awareness campaigns

Source: Authors' proposal

Encouraging partnerships between government (EU, national, regional and local), private sector, non-profits, and community organisations would leverage diverse resources and expertise. Collaborative platforms for knowledge sharing, joint ventures, and joint projects would address complex social issues. Supportive policies for social enterprises, such as tax incentives, grants, and subsidies, along with developed regulatory frameworks will recognise and support the unique needs of social enterprises and innovations. Investing in education and training programmes would enable building the capacity of social entrepreneurs and innovators. Establishment of mentorship programmes and support networks is also important to guide and support emerging social enterprises. Furthermore, impact investing and social finance mechanisms are needed to provide capital to social enterprises

and innovations, as well as blended finance models that combine public, private, and philanthropic funding to support social initiatives. Another important issue is development of standardised metrics and methodologies for measuring social impact to ensure consistency and comparability. Additionally, transparent, and regular impact reporting to demonstrate the value and effectiveness of social initiatives, need encouragement, along with utilisation of digital platforms and technologies to scale social innovations and reach wider audiences and employment of data analytics and evidence-based approaches to inform decision-making and optimise social interventions. It is also important to foster the development of ecosystems that support social innovation and entrepreneurship, including incubators, accelerators, and innovation hubs, and engaging local communities in the design and implementation of social initiatives to ensure relevance and sustainability. Businesses need encouragement for integrating social responsibility into their core operations and strategies. On top of all that it is crucial to conduct public awareness campaigns and promote the importance of social innovation and entrepreneurship.

By implementing the proposed strategic approach to the integration of SI, SEn and SE can be optimised to create a synergistic effect, maximising their collective impact on addressing societal challenges. This holistic approach requires collaboration, innovation, and a supportive environment that nurtures and sustains social initiatives.

6. DISCUSSION AND CONCLUSION

The research presented in this paper aimed to address the complexities surrounding the definitions, regulatory frameworks and social impact measurement of Social Innovation (SI), Social Entrepreneurship (SEn), and the Social Economy (SE). The paper proposes a cohesive model that reconciles the overlapping features and addresses the definitional controversies among SI, SEn, and SE. This unified framework can enhance mutual understanding among stakeholders and facilitate dialogue between academics, practitioners and policymakers. The study examines the role of regulatory frameworks in fostering the development of SEn and explores their effectiveness in facilitating social entrepreneurship initiatives. It highlights the importance of supportive policies, legal frameworks, and coherence across different levels of government to create an enabling environment for social innovation and entrepreneurship. The research evaluates existing mechanisms for measuring the social impact of SI, SEn, and SE initiatives and proposes a structured approach that combines various methodologies. The paper

introduces a new framework called Integrated Social Impact Measurement (ISIM) that aims to provide a more accurate and comprehensive assessment of social innovations by addressing the limitations of existing methods. To optimise the integration of SI, SEEn, and SE and maximise their collective impact, the paper presents a strategic approach that includes encouraging partnerships and collaborative platforms, developing supportive policies and regulatory frameworks, investing in education, training, and support networks, leveraging impact investing and social finance mechanisms, standardising social impact measurement and reporting, fostering ecosystem development and community engagement, promoting public awareness and business integration of social responsibility. By implementing this holistic approach, the research aims to create a synergistic effect that harnesses the potential of social innovations to address complex societal challenges effectively. Overall, this research contributes to a deeper understanding of the concepts of SI, SEEn, and SE, and offers practical frameworks for policymakers, practitioners, and researchers to navigate these domains and advance the agenda of social innovation and entrepreneurship.

7. BIBLIOGRAPHY

1. Ayob, N., Teasdale, S., & Fagan, K. (2016). How social innovation ‘came to be’: Tracing the evolution of a contested concept. *Journal of Social Policy*, 45(4), 635-653.
2. Borzaga, C. and J. Defourny (eds.), (2001). *The Emergence of Social Enterprise*, London and New York, Routledge
3. Borzaga, C., Galera, G., Franchini, B., Chiomento, S., Nogales, R., and Carini, C., (2020). Social enterprises and their ecosystems in Europe. *Comparative synthesis report. Luxembourg: Publications Office of the European Union*. Retrieved April 30, 2020.
4. Bull, M., Ridley-Duff, R., Foster, D., and Seanor, P. (2010). Conceptualising ethical capital in social enterprise. *Social Enterprise Journal*, 6(3), 250-264.
5. Companies (Audit, Investigations and Community Enterprise) Act 2004. <https://www.legislation.gov.uk/ukpga/2004/27/contents> (Accessed 1. 6. 2024)
6. Dacin, M. T., Dacin, P. A., and Tracey, P. (2011). Social entrepreneurship: A critique and future direction. *Organisation science*, 22(5), 1203-1213. <https://doi.org/10.1287/orsc.1100.0620>
7. Dacin, P. A., Dacin, M. T., & Matear, M., (2010). Social entrepreneurship: Why we don't need a new theory and how we move forward from here. *Academy of management perspectives*, 24(3), 37-57.
8. Dees, J. G., 1998. *The Meaning of Social Entrepreneurship*. In Kauffman Center for Entrepreneurial Leadership. CA: Ewing Marion Kauffman Foundation
9. Defourny, J., and Nyssens, M., (2010). Social enterprise in Europe: At the crossroads of market, public policies and third sector. *Policy and society*, 29(3), 231-242.
10. Ebrahim, A. and V. Rangan (2010), “The Limits of Nonprofit Impact: A Contingency Framework for Measuring Social Performance”, General Management Unit Working Paper, No. 10-099, Harvard Business School, Boston, MA, <http://dx.doi.org/10.2139/ssrn.1611810>.
11. European Commission, Directorate-General for Employment, Social Affairs and Inclusion, Carini, C., Borzaga, C., Chiomento, S. (2020). *Social enterprises and their ecosystems in Europe: comparative synthesis report*, Publications Office. <https://data.europa.eu/doi/10.2767/567551>
12. European Commission, (2021). Social Economy Action Plan, <https://ec.europa.eu/social/main.jsp?langId=en&catId=89&newsId=10117&furtherNews=yes#navItem-1> (Accessed 10. 6. 2024)
13. European Parliament (2017). “A European Statute for Social and Solidarity-Based Enterprise” [https://www.europarl.europa.eu/RegData/etudes/STUD/2017/583123/IPOL_STU\(2017\)583123_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2017/583123/IPOL_STU(2017)583123_EN.pdf) (Accessed 14. 6. 2024)
14. Feor, L.; Clarke, A.; Dougherty, I. (2023). Social Impact Measurement: A Systematic Literature Review and Future Research Directions. *World*, 4, 816–837. <https://doi.org/10.3390/world4040051>

15. Gutberlet, J., Besen, G. R., & Morais, L. P. (2020). Participatory solid waste governance and the role of social and solidarity economy: Experiences from São Paulo, Brazil. *Detritus*, 13(13), 167-180.
16. Fici, A. (2021). A statute for European cross-border associations and nonprofit organizations, European Parliament, [https://www.europarl.europa.eu/RegData/etudes/STUD/2021/693439/IPOL_STU\(2021\)693439_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2021/693439/IPOL_STU(2021)693439_EN.pdf) (Accessed 15. 6. 2024)
17. Fici, A. (2023). Models and trends of social enterprise regulation in the European Union. In: Peter H, Vargas Vasserot C, Alcalde Silva J (eds) *The international handbook of social enterprise law*. Springer, Cham, pp 153–171
18. Fleischer, H., Pendl, M. (2024). The Law of Social Enterprises: Surveying a New Field of Research. *Eur Bus Org Law Rev* 25, 269–297. <https://doi.org/10.1007/s40804-024-00314-9>
19. ISTAT, (2006). Le cooperative sociali in Italia, https://ebiblio.istat.it/digibib/Informazioni/IST0050599InformazioniN30_2006Cooperative_sociali_in_italia_2003.pdf (Accessed 15. 6. 2024)
20. Jackson, E. T. (2013) Interrogating the theory of change: evaluating impact investing where it matters most, *Journal of Sustainable Finance & Investment*, 3:2, 95-110, DOI: 10.1080/20430795.2013.776257
21. Jenkins, B. (2018). Cultivating the Social Intrapreneur. *Stanford Social Innovation Review*. <https://doi.org/10.48558/SFEE-6M61>
22. Lee, E. K. M. et al. (2021) 'Social Impact Measurement in Incremental Social Innovation', *Journal of Social Entrepreneurship*, 12(1), pp. 69–86. doi: 10.1080/19420676.2019.1668830.
23. Liptrap, J. S. (2020). The social enterprise company in Europe: policy and theory. *Journal of Corporate Law Studies*, 20(2), 495–539. <https://doi.org/10.1080/14735970.2020.1744409>
24. Lorenzo-Afable, D., Lips-Wiersma, M., & Singh, S. (2023). A Narrative Synthesis of The Empirical Literature on Social Value Creation in Social Entrepreneurship: Gaps and Opportunities for Future Research and Action. *Journal of Social Entrepreneurship*, 1–32. <https://doi.org/10.1080/19420676.2023.2195868>
25. Lumpkin, G. T., & Bacq, S. (2019). Civic wealth creation: A new view of stakeholder engagement and societal impact. *Academy of Management Perspectives*, 33(4), 383–404.
26. Mair, J., & Marti, I. (2006). Social entrepreneurship research: A source of explanation, prediction, and delight. *Journal of world business*, 41(1), 36–44.
27. Mair, J., & Marti, I. (2009). Entrepreneurship in and around institutional voids: A case study from Bangladesh. *Journal of business venturing*, 24(5), 419–435.
28. Means B, Jockey J. W. (2018) *The Cambridge handbook of social enterprise law*. Cambridge University Press, Cambridge
29. Mendell, M. and Neamtan, N. (2010). The Social Economy in Quebec: Towards a New Political Economy. In: Mook, L., Quarter, J. and Ryan, S. ed. *Researching the Social Economy*. Toronto: University of Toronto Press, pp. 63–83. <https://doi.org/10.3138/9781442660281-005>

30. Moulaert, F. (Ed.). (2013). *The international handbook on social innovation: collective action, social learning and transdisciplinary research*. Edward Elgar Publishing.
31. Nicholls, A. (2010). The institutionalisation of social investment: The interplay of investment logics and investor rationalities. *Journal of social entrepreneurship*, 1(1), 70-100.
32. Nicholls, A., Simon, J., & Gabriel, M. (2015). *New frontiers in social innovation research*. Springer Nature.
33. OECD (2021). Social impact measurement for the Social and Solidarity Economy: OECD Global Action Promoting Social & Solidarity Economy Ecosystems. <https://doi.org/10.1787/d20a57ac-en>. <https://ideas.repec.org/p/oec/cfeaaa/2021-05-en.html>
34. OECD (2022) Designing legal frameworks for social enterprises. <https://www.oecd.org/publications/designing-legal-frameworks-for-social-enterprises-172b60b2-en.htm>. (Accessed 1. 7. 2024)
35. OECD (2023) Policy guide on legal frameworks for the social and solidarity economy. <https://www.oecd.org/publications/policy-guide-on-legal-frameworks-for-the-social-and-solidarity-economy-9c228f62-en.htm>. (Accessed 1. 7. 2024)
36. Perrini, F., Costanzo, L. A., & Karatas-Ozkan, M. (2020). Measuring impact and creating change: a comparison of the main methods for social enterprises. *Corporate Governance: The International Journal of Business in Society*, 21(2), 237–251. doi:10.1108/cg-02-2020-0062
37. Purna, N., & De Paoli, S. (2023). Social innovation: drawing lines around the appropriate usage by mainstream sectors. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 34(6), 1172-1183
38. Roy, M. J., Baker, R., & Kerr, S. (2017). Conceptualising the public health role of actors operating outside of formal health systems: The case of social enterprise. *Social Science & Medicine*, 172, 144-152.
39. Schumpeter, J.A. (1989). *Essays: On Entrepreneurs, Innovations, Business Cycles and the Evolution of Capitalism* (1st ed.). Routledge. <https://doi.org/10.4324/9781351311489>
40. So, I., Staskevicius, A. (2015). “Measuring the ‘impact’ in impact investing”, Harvard Business School Social Enterprise Initiative
41. Torfing, J., & Ansell, C. (2020). Strengthening political leadership and policy innovation through the expansion of collaborative forms of governance. In *Political Innovations* (pp. 37-54). Routledge.
42. Torfing, J., Cristofoli, D., Gloor, P. A., Meijer, A. J., Trivellato, B. (2020). Taming the snake in paradise: combining institutional design and leadership to enhance collaborative innovation, *Policy and Society*, Vol. 39 (4), pp. 592–616, <https://doi.org/10.1080/14494035.2020.1794749>
43. UN Resolution A/77/L60 (2023). “Promoting the social and solidarity economy for sustainable development,” <https://www.un.org/en/ga/77/resolutions.shtml> (10. 7. 2024)
44. Vasserot, C.V. (2023). Legal Regulation of Social Enterprises in Other European Countries. In: Peter, H., Vargas Vasserot, C., Alcalde Silva, J. (eds) *The International Handbook of Social Enterprise Law*. Springer, Cham. https://doi.org/10.1007/978-3-031-14216-1_45

HR MARKETING – THE EMERGING PARADIGM OF ORGANIZATIONAL RECRUITMENT AND LOYALTY RETENTION

MARIO BOGDANOVIĆ

Istrian University of Applied Sciences

Pula, Croatia

mbogdanov@iv.hr

Paper category: Scientific review

ABSTRACT

This paper deals with a closer view of HR marketing that adopts new trends expressed by a new employment philosophy: “The employer sells jobs to employees using branding techniques, strengthening their value on the labour market, promoting a stimulating organisational culture and their organisation as a great place to work”. Given that the previous/old HRM paradigm was: “The employee is sold to the employer, she/he must convince her/him that she/he is good enough for employment”, it becomes obvious that there is a paradox between two different principles in hiring and retaining employees. The goal of this paper is to discuss the appropriateness of a new HR marketing paradigm for recruitment and loyalty retention purposes. This is realised by achieving three main objectives, solving three problems:

- 1. How to resolve the dilemma of appropriateness/effectiveness of old and new (emerging) hiring paradigms, i.e. what paradigm and when is it appropriate?*
- 2. How to hire HR of better quality at a moderate price and keep their turnover cost low?*
- 3. How to achieve more real HR marketing application in education and organisational space?*

In order to solve this problem, insight method (problem solving method for complex and hard problems), and verbal-logic methods with literature and experience review are used. The results have shown that:

- 1. For low complexity jobs, which are usually not scarce in supply, need low value HR, the old HRM paradigm is appropriate, i.e. to hire traditionally. The opposite is valid for high complexity jobs, usually scarce in supply, which need high value HR, so a new HR marketing paradigm is appropriate, i.e. hire and retain loyalty in a new way.*
- 2. Hiring better HR quality at a moderate price is possible by means of basic activities of HR marketing (recruiting, employer branding). Lowering turnover costs means using loyalty programmes, where No.1. is enabling a positive experience with the company.*
- 3. To apply this new HR marketing approach, a new organisational/management culture and education for talent management purposes are needed.*

This paper presents actual problem solving in the area of recruitment and loyalty retention by means of emerging HR marketing paradigms.

Keywords: HR marketing, new philosophy of employment, internal marketing, labour market competitiveness, talent management, employer branding

1. INTRODUCTION

Human resources drive all other resources, and therefore organisational productivity and effectiveness logically depend on their quality and productivity. In the context of productivity, effectiveness and, increasingly demanded, creativity and a quality/talented workforce (human resource/HR) are essential. Namely, a high quality/talented workforce is a scarce resource (high quality is scarce) and exceptional quality (e.g. exceptional creativity/innovation in any field) is an extremely rare resource. If one looks at the acquisition and retention of quality, a rare workforce, whose supply is regularly lower than demand (this is an objectively regular situation generally known in the professional selection process), then there is (from the perspective of talent scarcity) a strong need for HR marketing. This talent need is also stimulated by the increased organisational competitiveness in the knowledge economy due to an emphasis on quality improvement, constant innovation and knowledge, cost reduction and productivity increase, where the emphasis on human capital becomes an essentially strategic issue (Velošo, Sousa, Au-Yong-Oliveira and Walter, 2021). Also the internal marketing approach towards employees is seen as a strategic orientation (Qui, Boukis and Storey, 2022, according to Rafiq and Ahmed, 2003).

The basic objectives of HR marketing are related to the need for greater stability and reliability of a quality and talented workforce, which creates numerous favourable organisational effects, direct and indirect. These are specifically the following organisational goals: ensuring a sufficient number of qualified (high quality and talented) personnel, strengthening productivity and creativity, reducing turnover and absenteeism, reduction of accidents, incidents and occupational diseases, improving the positive image of the organisation in the public, ensuring competitiveness on the labour market, differentiation from other similar organisations in procedures for attracting and retaining employees and meeting the short-term, medium-term and long-term need for personnel.

HR marketing treats the workforce with special attention within the framework of the new philosophy and emerging paradigm of hiring/maintaining the loyalty of quality and talented employees. It is no longer enough to leave the job of attracting potential employees (so-called recruitment), selection and retention, to the employees themselves, who need to “sell” themselves to the organisation (show/prove that they are worthy to be hired), but the organisation needs to show/prove that it is valuable to future employees-talents/HR capital (e.g. “golden”) workers, and do that in the long term (not only opportunistically and “ad-hoc”) and

with regard to the competition (which is also looking for talent as a key development resource). This is a strategic shift from an *employer-oriented organisation* (where the employer's interests are dominantly important) towards an *employees-oriented organisation* (talent-oriented organisation where employees' interests also become important).

HR marketing is not unusual in sports, where sports talents (sport-stars) are treated as “true capital” with special attention, attracted, engaged and retained according to marketing principles, because top performance is expected and executed. Although this approach can be a key strategy in the field of human resources in professional sport, it is less common in the business and public sectors and is practically still unrecognised in the majority of Croatian organisations, especially in public ones.¹ The philosophy is still dominantly the old one: “*Employees need to sell themselves and, in some way, “buy” a workplace!*”, their quality is secondary, and the interest of those who decide on employment (management) is primary. Also, of secondary interest is the potential profit and true development potential of the organisation.”

Thus, it can be seen that it is still, in many organisations, less important (irrelevant) that the talents are engaged in solving organisational problems, but it is more important that they solve the personal problems of those who decide (management) which, of course, is not an optimal development situation for the organisation. Such a philosophy manifests itself as value in the organisational culture and with the help of a socially internalised mentality spills over into suboptimal solutions. Therefore HR marketing in Croatia is often perceived and treated as *a theoretical utopia*, i.e. futurism without a real need for practical application.² Consequently, “negative selection” is perceived as a normal organisational and social phenomenon, and talents are recommended to find their own path and affirmation.³

- 1 This conclusion is from the author's long term experience living in Croatia, and statistics of emigration from Croatia in the last 10-15 years, and also experience from other European countries (Austria, Slovakia, Romania, Czech Republic, Hungary, Bosnia and Herzegovina, Serbia). Very few people of the best quality (human capital), not only in Croatia, move abroad, as, otherwise, to survive, they would need special social support, or luck. Formally, this is not a socially desirable statement, and can be noticed by my own and colleagues' personal experiences (best students, best workers, best scientist, etc.), so the author could not find it in public sources/media and cite.
- 2 During, and for a relatively long time after my formal international education in HR Marketing at the Institute for Technology and Business in Česke Budejovice (April, 2024), I was in cognitive dissonance, because what I heard was so different from my actual knowledge and experience. Some of my colleagues were also amazed, and therefore it was rational to conclude that we are still not culturally adapted to such an approach.
- 3 High-quality, talented and “golden employees” somewhere and sometimes may wonder why no one wants to hire them (let alone that there is some kind of “scarcity” and “great”

Regardless of the observed suboptimal practice in some of the organisational space, in the context of development organisational programmes for the future, it is necessary to train future HR marketing staff in order to maximise the effects of the talented workforce through the knowledgeable efforts of human resources and marketing experts. The above is also necessary due to development trends, so we can already determine four development stages of human resources marketing, where the first one is dominant in “old fashioned” organisations. Specifically, we are talking about the following developmental stages of maturity:

1. *Human resource management and marketing as separate in theory and practice.* The mentioned disciplines and functional organisational departments are separate, and they are connected by chance meetings and needs. Practical activities (a series of tasks to be performed in the field of recruitment and branding of the employer) are still carried out functionally (organised according to the functional organisational structure, not in a synergistic process), although they are naturally (logically) connected in the processes of internal and external marketing.

2. *HR marketing.* The influence of marketing is strengthened, and marketing is naturally (logically) connected to human resources management by its content structure (elements of the marketing mix) and the development of human resources marketing as an integral whole.

3. *Process HR marketing .* Process management is introduced in HR marketing in order to achieve the maximum effectiveness of each activity, process and value chain (larger strategic and interconnected processes). In addition to identification, modelling, analysis, reshaping, implementation, monitoring and control, the last phase introduces process automation (the logical sequence of which is digitalisation).

4. *Digital process HR marketing.* HR marketing process automation processes are experiencing their full affirmation through full digitalisation

need for them); such employees are often under-engaged, often with poor psychosocial treatment (ignoring, disabling, isolation, discrimination/bullying up to destructive mobbing). A possible explanation is that the interest of those who decide is underdeveloped, because very often those who have power are not interested in development and just solutions (Galal, 2012). In such circumstances, talents are often perceived as a burden and a threat to existing relationships and status. In a practical organisational situation, it is interesting to note that sometimes two, three or more people are employed, instead of one talent, completely contrary to the principle of economy, thriftiness and effectiveness. Also, if talent is perceived as a threat (regardless of high development potential and the possibility of solving organisational problems, employers/managers seem to react irrationally (in the context of organisational interest), but very rationally if personal interest is considered. In such an organisational milieu (culture) HR marketing loses its meaning; in fact it is completely unnecessary, sometimes even harmful.

and networking with all related processes at the operational, tactical and strategic levels. The world is increasingly strengthening the digital way of creating new and added values using applied digital technology (Turk and Bogdanović, 2023), and this is also becoming very relevant in the field of HR marketing, where different organisational systems are interconnected/networked, such as HRIS (HR information system), human resource management (HRM) and marketing processes with broader strategic value chains. Thus, with the development of HR marketing, it becomes an integral digitalised part of one organisational entity, then one organisation becomes a digital part of the entire organisational system, and finally the organisational system become a digitalised part of the social system.

In this paper, the second level of development of human resources marketing is dominantly examined, i.e. HR marketing in its essence, which is a novelty both in theory and especially in organisational practice, considering that the first aspiration is to achieve this level of HR marketing development.

2. CONCEPTUAL AND SUBSTANTIVE DETERMINATION OF HR MARKETING

HR marketing is a newer discipline in the field of procurement, training, use/engagement, maintenance and retention of personnel needed by the organisation. In short, it can be said that it concerns the process of building a high-quality and strong employer brand, strengthening the employer's values on the labour market, presenting and communicating the employer's desirable organisational culture, motivating current and future employees with salary, working conditions, working environment, etc., and in the function of their optimal engagement and effectiveness.

That is why two basic areas of human resources marketing can be clearly identified, which are analogous to the existing functional areas of human resources management (HRM), specifically:

a) *Internal marketing of human resources.* Designing jobs as products to satisfy and motivate employees to deliver high quality service (Berry, 1981) is originally proposed as the managerial philosophy of treating employees as internal customers. The goal is to treat employees as clients of the organisation, ensure and maintain loyalty (especially “golden”/key personnel), research/determine their knowledge, skills, interests, needs and desires, conduct training, as well as financial and non-financial benefits. It refers e.g. to: programmes of introduction to work, training, education and development, motivation (employee engagement, employee

satisfaction, employee loyalty and retention, management of compensation, management of working hours)⁴, etc.

b) *External marketing of human resources*. This part refers to the potential employees that the organisation wants to attract and engage with regard to the time dimension (e.g. seasonal/permanent; fixed/indefinite) and the types of employees needed, and it refers to the process of recruitment and professional selection.

In practice, in accordance with the various HR marketing areas mentioned, different tools (management methods) are applied to each individual facet within larger groups of internal and external HR marketing activities. Given that a significant component of human resources management (HRM) in the concept of HR marketing is noticeable here, it is important to see the link between marketing and HRM that forms a conceptual composite, and this can be seen through the basic tasks of human resources marketing. The task of HR marketing is to connect all marketing activities (activities of the marketing mix) with important human resources processes, e.g., the recruitment process involves the following elements of a typical, well-known marketing mix:

a) *Product*. This concerns the precise creation of a business offer of employment at a specific workplace, for example a competition. To be in the spirit of the time, it is useful to consult current ads on social networks.

b) *Price*. This concerns the creation of workplace prices (compensation for work and individual capital investment of labour) in terms of financial and non-financial offers. It may include wages, training services in the context of training for a more complex/higher job position, benefits and potential savings.

c) *Promotion*. This refers to communicating and presenting the business offer directly through the mass media or in personal contacts and indirectly through the organisational market (mark/brand).

d) *Distribution*. Here we are talking about the meeting place of supply and demand for some kind of human work (it concerns the offer of a place of work/workplace, communication of the organisation's organisational culture, i.e. desirable/undesirable behaviours, communication of types of work engagement, e.g. team, individual, mixed engagement).

4 Motivation here is shortly presented as a broad concept (psychological and material one). Motivation, employee satisfaction, organizational loyalty and other psychological concepts are closely interconnected. For example, employee satisfaction is one of the best predictor of employee loyalty, job satisfaction is positively connected with extrinsic rewards, supervisor support, social responsibility, fair reward, autonomy, corporate image an affinity (Veloso, Soussa, Au-Yong-Oliveira, & Walter, 2021).

e) *Process*. This concerns clearly defined organisational processes, e.g. recruitment and branding according to the organisation's strategic and operational plan. Due to the achievement of the operational effectiveness of all activities in the organisation and overall sub-processes, processes and value chains (the name for groups of processes at the macro level), optimal rationalisation cannot be achieved without process management. It is ideal to optimise all organisational processes, and then also HR marketing processes: establish an optimal way of functioning in a period of time, automate, digitalise and, in accordance with change management, reshape when the process starts to show “poor” performance (Dumas, La Rosa, Mendling and Reijers 2013).

It is important for the organisation to implement the connection of human resources management (HRM) with marketing in the area of recruitment (external component) and in the area of creating quality employees/quality workforce (internal component), because such connection achieves a synergistic effect. Thus, the external task of the organisation is to attract (recruit) and choose (select) the best candidates (productive talents), and the internal task of the organisation is to create and educate people for specific work roles (create an exceptionally high-quality workforce) through training, education and development, which also serve as employee satisfaction in the function of e.g. employee engagement, motivation, employee needs and wants fulfilment, loyalty and retention willingness by means of several psychological and material rewards, and not only to create products and services (Bahtijarević, Šiber, 1999, according to Cascio 1995 according to Matssushita, K.).⁵

The basics of HR marketing activities, which are directly related to the creation of new and additional value and, according to the logic of achieving organisational goals, should be implemented by every organisation that cares about optimising effectiveness, can be structured into the following activities (BIP HR Marketing, 2024)⁶:

1. *Job creation* (jobs that require a talented employee). Traditionally, this is preceded by a workplace analysis, so the job is adapted to the employee or the job to the employee. Otherwise, job analysis is the basis of all human resources management (HRM) functions, and practically all other necessary practical activities are carried out on this basis.

2. *Creation of a business offer for a specific position* (this is an offer to exchange required work results/spent work according to the instructions

5 Original: “Matsushita Electrics first and foremost makes people, and also produces electrical appliances” (Bahtijarević-Šiber, 1999, p. 13).

6 The explanation of the mentioned activities is the author's supplement.

and requests of the employer for a package of financial and non-financial benefits). Traditionally, it is about job specification (linking job characteristics with desirable employee characteristics).

3. *Marketing strategy planning* (by elements of the marketing mix: product, price, distribution/place, promotion, process).

4. *Creation of a recruitment campaign* (This can be a permanent/permanent talent recruitment, or occasional).

5. *The process of recruitment* (attracting and creating a pool of personnel) and professional selection (selecting the most suitable personnel using a “separation sieve”).

6. *Recruitment and adaptation of a new employee* (orientation/introduction to work, which is largely of a social nature, as the employee adapts not only to jobs, physical-chemical, psycho-social and cultural working conditions).

7. *Ensuring the market competence of the organisation on the labour market* (if there is a large demand for a certain type of personnel, and the offer is limited, it is necessary to develop additional mechanisms to stimulate such employees to join the organisation).

8. *Ensuring employee loyalty* (in conditions of increased demand and consequent labour mobility, talents/key employees should be stimulated to stay in the organisation). Fluctuation of key employees is a significant financial and social cost for the organisation.

9. *Feedback on the HR marketing process from employees and management* (satisfaction with the process and results of the human resources marketing process).

HR marketing is practically carried out in the short-term/seasonal, medium-term and long-term (depending on organisational needs) and usually has one dominant of several possible basic directions:

a) **external orientation** (external marketing) where human resources are treated as external valuable resources, so the emphasis in the organisation's environment is to first attract and secure different types of employees (e.g. managerial/non-managerial; “stars”, “draft horses”, sometimes “bets” and “questionnaires” - if it is about atypical employment⁷; blue, white, green, pink, gold and red collars).⁸

7 Sometimes the management needs/wants to hire someone with/without professional criteria, regardless of whether such a person is perceived as “bad” or “problematic”. To some extent, it can sometimes be functional (e.g. deviant employees sometimes stimulate others in e.g. teamwork and make the team exceptional, (cf. Cotu, 2009), but often it is also dysfunctional.

8 Typically, employees in the portfolio that determines the methods of recruitment and selection are classified into: managerial (administrative) and non-managerial

b) **internal orientation** (internal marketing) where acquired and engaged human resources (employees) are treated as a valuable internal resource (clients), so the emphasis is on ensuring its maximum use,⁹ i.e. their loyalty (good psychosocial climate/culture), ensuring quality training and personal career development and financial and non-financial benefits.

c) **mixed orientation** where the organisational orientation is divided into internal and external (similar to the virtual division of working time) because it is simultaneously necessary to stimulate the real strengthening of the internal qualities of the organisation with simultaneous external presentation (promotion), e.g. the creation of a strong and recognisable brand as an employer.

HR marketing with the processes of recruitment and branding of the employer are of strategic (key and great) importance. Namely, a systematic meta-analytical study from 349 internal marketing professionals confirmed the benefits of HR marketing with internal marketing approach implementation. This benefits can be divided into: a) various employee-attitudinal benefits (e.g. higher employee retention, increased employee commitment, employee empowerment, higher job satisfaction, extra-role activity, citizenship behaviour, customer complaint handling performance, customer-oriented behaviours and brand supportive behaviours), b) financial benefits (e.g. profits and market performance, growth in income, overall profit and sales growth), c) non-financial benefits (e.g. customer satisfaction,

(operational); with regard to work performance and development potential: “stars” - high work performance and development potential, “draft horses” - high work performance and low development potential, “bets” - low both work performance and development potential, “questionnaires/problematic” - low work performance, but high potential for development (Bahtijarević-Šiber, 1999). Traditional American job classifications are based on the type of work performed, so employees are classified into different collars: *blue collar* (traditional jobs with a dominant physical component, manual work that was present in industry, construction, repairs); *white collar* workers (employees in offices in managerial and administrative jobs); *golden collars* (highly specialised key employees, without whom processes are either at a standstill or their quality drops significantly, e.g. scientists, engineers, pilots, doctors, lawyers); *red collar* workers (employees in public and state administration); *pink collars* (traditionally “women’s jobs”, e.g. child care (pre-school education and classroom teaching and nurses); *green collars* (workers in environmental affairs, nature sectors and renewable resources). There are also divisions into other colour collars (workers), e.g.: *orange* (prisoners), *brown* (soldiers), *black* (mining and oil extraction jobs), *scarlet* (sex workers), *open* (Internet job workers), *new* (jobs that require non-traditional, self-taught education), *colourless* (art jobs and “free spirit” jobs), *silver* (jobs of bots and AI solution creators). (cf. https://en.wikipedia.org/wiki/Designation_of_workers_by_collar_color 31 May 2024).

- 9 HR have an opportunity cost and lose value if not used. Otherwise, this is the situation with all resources (they have the potential to create new and surplus value), but if they are not used or are poorly used, the costs prevail over the effects (utilities).

staff retention, service quality, brand equity, customer loyalty, innovation, team performance and market orientation) (Qiu, Boukis and Storey, 2022).

3. OBJECTIVES, PROBLEMS AND HYPOTHESES

This paper has three main objectives with three main corresponding problems and six (6) hypotheses that are tested.

3.1. FIRST OBJECTIVE

The first objective deals with the dilemma of appropriateness/ effectiveness of old and new hiring paradigms.

The old hiring paradigm is represented by the philosophy: *"The employee is sold to the employer, she/he must convince the employer that she/he is good enough to be employed."* According to this paradigm the main effort is on the employee to sell his workforce to the employer, she/he must be very good in convincing the employer to solve her/his unemployment problem, because she/he is "needy" (this approach is mainly caused due to the thought superiority of talent supply over demand). The job candidate here is mostly in the role of a beggar and should beg for the job in a certain way.

The new hiring paradigm as presented by HR marketing philosophy is exactly the opposite: *"The employer is sold to the employee, and she/he must convince him that the employer is good enough for the employee to accept employment. The employer sells jobs to employees using branding techniques, strengthening their value on the labour market, promoting a stimulating organisational culture and their organisation as a great place to work."* This new paradigm becomes alive due to the superiority of the demand over the supply of talent and the dominance of the knowledge economy. The job candidate here is mostly in the role of a negotiator/bargainer.

The paradox between the two different principles (old and new) in hiring and retaining employees becomes obvious here.

The main problem here is the question: Which paradigm (old, new) is appropriate for which organisation, industry, sector or situation?

The general hypothesis about this problem is that the old hiring paradigm is appropriate for lower job complexity and organisations/industry sectors with lower profitability (e.g. trade, tourism). The new hiring paradigm is appropriate for organisations/industries/sectors with higher complexity jobs, higher profitability (e.g. high tech industries). Therefore, two partial hypotheses can be created:

H1: Lower complexity jobs and low profitability organisation/industries/sectors need low value HR, which are not scarce, so they can hire traditionally (HRM paradigm).

H2: Higher complexity jobs and higher profitability organisations/industries/sectors need high value HR (scarce talents), so they need to be hired by the HR marketing paradigm.

3.2. SECOND OBJECTIVE

The second objective deals with the economic problem of hiring HR of better quality/moderate costs while keeping their turnover cost low. This is an old economic problem in democratic societies (based on the basic economic principle of supply-demand) because the best HR quality is usually not cheap (exceptions are autocratic, slave and feudal societies where talented labour is forced to work for low prices/wages).

The main problem here is in the question: “What can/should organisations do to improve the effectiveness of hiring (with better HR quality outcomes, moderate costs and lower turnover costs)?”

The general hypothesis about this problem is that organisations should do the activities which attract a good/excellent, but not too expensive, workforce, at the same time keeping low turnover costs. Therefore, two partial hypotheses were provided:

H3: Creating effective job posting, good attractive new ads which attract the desired talented candidates) and create an effective company brand (which attracts good but not too expensive candidates).

H4: Retaining loyalty is the main tool for diminishing turnover costs, which can be achieved by branding activities and enabling a positive experience of the talented staff with the organisation.

3.3. THIRD OBJECTIVE

The third objective deals with the new HR Marketing application (dealing with talented staff), i.e. how to achieve more application in organisational and educational space.

The main problem here is the question: “What to do to change/improve the old (traditional) HR paradigm, i.e. how to really apply new HR marketing knowledge as a new paradigm?”

The general hypothesis about this problem is to change HR Marketing education to be more connected with Marketing in the new HR Marketing

discipline. According to this general hypothesis two partial hypotheses were put forward:

H5: A new organisational culture (philosophy of talent management by means of marketing) is the most important to satisfy organisational growth/development needs.

H6: New management needs students with new Marketing HR education.

4. METHODOLOGY

This work was done with the encouragement of professional education in HR Marketing organised by the Institute of Technology and Business in České Budejovice, Czech Republic. It was about combined online education with physical education at a university and technological companies (February-May 2024). Particularly stimulating was the application of the new paradigm of employment and retention of employee loyalty, which left me in disbelief and amazement. Therefore, I decided to prepare this paper.

In the process of setting the goals of this paper, solving the set problems by testing hypotheses, verbal logical methods were used based on existing insights (literature and practice review). For complex, difficult and unstructured problems (such are crucial philosophical questions in economics), the insight method and critical thinking were also used. Namely, the insight method, with critical thinking, were the main methods in creating problems (the organisational problems seen in Croatian organisational space, i.e. in the areas where they are seen as important, with a large impact on recruitment and loyalty retention processes), hypotheses (as possible answers on the important organisational problems) and discussion (interpretations) as support for conclusions.

5. RESULTS AND DISCUSSION

All hypotheses in this work have been confirmed. In the following, the results by problems and hypotheses are presented and discussed.

5.1. RESULTS AND DISCUSSION ABOUT OLD AND NEW HIRING PARADIGM

The old HRM paradigm and the new paradigm of hiring (HR Marketing approach) have different characteristics. They are presented in Table 1.

Table 1. Old and New Paradigms of hiring

Dimensions	Old paradigm (HRM)	New paradigm (HR Marketing)
1. HR Scarcity awareness	Good/talented HR are not scarce (larger supply then demand, e.g. for each working place we have 10 good candidates).	Good/talented HR are scarce (larger demand then supply, i.e. for needed working place organisation we hardly have good/excellent candidates).
2. Hiring philosophy	Employees who are “in need” should sell themselves (their problem of unemployment) to the organisation.	Organisation should sell them (productivity problems, i.e. jobs) to the employee (internal marketing principle), because talented employees are in high demand.
3. Disciplinary focus	Traditional focus on HR as a relatively easily replaceable economic resource. There is no problem of turnover.	Integration of HRM and Marketing mix. Talents are “gold”, not easy to replace. There is a problem with turnover.
4. Management thinking and behaviour	Weak interest in organisation development by means of talents. The most important is management interest.	Strong interest in organisational development by means of talents. The most important is organisational interest.
5. Role of job seeker/candidate	Beggar	Negotiator/bargainer

Source: author's insight

As can be clearly seen in Table 1, the old and new paradigms of hiring are rather different in basic assumptions, and therefore result in very different practices.

So the main question: “What paradigm of hiring is appropriate?” can be answered

H1: Low complexity jobs, dominantly need low value HR which are not scarce (investment is not needed in the form of educational capital). The same is valid for low profitability organisations (low added value companies).¹⁰

¹⁰ The rationale here is that low value added organisations/sectors demand low skilled workers who produce a low profitability rate (e.g. trade with a profit rate between 3-5% per year; hotel & tourism business 5-7% per year). For example, Walmart (USA) from 2010 to 2025 has a profit rate from 1.01% to 3.89% (<https://www.macrotrends.net/stocks/charts/WMT/walmart/net-profit-margin>), and the hotel and tourism business (USA) in 2024 from 5.39% to 6.73% (https://csimarket.com/Industry/industry_Profitability_Ratios.php?ind=906&hist=1).

H2: High complexity jobs dominantly need high value HR which is scarce (high investment is needed in the form of educational capital). The same is valid for high profitability organisations (high value added companies).¹¹

The new concept of HR marketing represents a different philosophy of employment that arose due to the unlimited need for productivity (effectiveness) and the consequent demand for talented (highly productive) employees in the knowledge economy characteristic for developed economies. This promotes the culture: “*The colour of the cat is not important, but that it catches mice!*”, and other prosperous values (Bogdanović, 2011, 72-73). The difference in employee productivity in manual activities (worst and best worker) is usually 1:5¹² (and in the case of intellectual/creative ones even 1:1.000...n (e.g. when we compare innovations by exceptional individuals like Tesla and other citizens in a country).¹³

Thus, according to this new philosophy, the ORGANISATION SELLS A JOB to future (talented) employees, and the employee is not sold to the organisation. Namely, those who solve/can solve difficult problems/give (can give) extra value to the organisation, are precious. Therefore, the talented/productive employee himself becomes a capital/brand which organisations strive for. This philosophy has its own logic and works where there is a high demand for maximum effects and productivity, where the goal is maximum creativity and organisational-social usefulness, the so-called economy of excellence. If this is not the goal, then this philosophy has a much smaller reach, because if we rationally ask ourselves: “Do business and non-business organisations in our state/country also steal talented employees, and how

- 11 High profitability sectors in the knowledge economy demand a higher skill level. Organisations with radical innovations often produce a profit margin >30%. The most profitable USA companies in 2025 have profit margins from 28.6% (Solar Power) to 51.6% (Commercial Leasing). For example, it is also interesting that USA hospitals, Software Publishing, Oil Drilling and Gas Extractions, Colleges and Universities, and Electrical Power Transmissions were within the 10 most profitable sectors in 2025 (<https://www.ibisworld.com/united-states/industry-trends/industries-highest-profit-margin/>).
- 12 By applying his own methods of “scientific management” when loading pig iron at the Bethlehem Steel Company (1898-1901), Taylor raised the average from 12.5 tons per worker to 48 tons for the best workers (Taylor’s experiment in management, 2022).
- 13 Nikola Tesla registered a total of more than 250 world innovations/patents (new solutions to technical problems). By the time he was 37 years old (1893), he had sold 109 patents to Westinghouse (investor of the alternating current hydroelectric project on Niagara). His patents are mainly in the field of electrical engineering; there is no exact number, but many authors state “a lot” (and the stated information was broadcast on RTS on December 7, 2014, according to Bogdanović, 2016). For comparison, the Republic of Croatia registered 39 patent applications in the field of electrical engineering in 2022 (“Patents in 2022”, 2023, p. 2). This is where Aristotle’s saying applies: “One is sometimes worth thousands if it is the best”.

often is this the case?” The answer to this question will often be that it is a very rare case.

As a concept, HR marketing for organisations which do not care too much about productivity and excellence and which can afford a slower adaptation to new trends in HRM and marketing, can still be treated as an idealistic and futuristic concept. However, such organisations have less and less time left for adaptation and survival in the medium and long terms. Economy and creativity are the essence of prosperity; development does not wait for anyone. Therefore organisational productivity, excellence and competitiveness based on HR are the basis of all development trends. New trends which connect HRM and Marketing in HR Marketing are supporting functions in organisational development.

5.2. RESULTS AND DISCUSSION ABOUT BETTER QUALITY HIRING WITH MODERATE COST AND LOW TURNOVER COSTS

For better results of recruitment (better staff quality and lower cost of recruitment and turnover), the HR Marketing approach is especially important in two practical activities:

- a. Quality of job posting/effective advertisement
- b. Quality of employer brand

According to these insights the second problem can be answered and confirm both hypotheses in the second problem:

H3: In order to create effective job posting new ads are needed which attract talented candidates and create an effective company brand (which attract good but not too expensive candidates).

Creating an effective ad requires careful planning and consideration to attract the right candidate (the goal is to realise the principle: “*the right person in the right place at the right time!*”). The advertising process should go through several stages (BIP HR marketing, 2024):

1. *Defining the workplace.* It is necessary to clearly define the workplace (organisational role of the future employee). Here it is good to use a standard job analysis and understand the jobs, key responsibilities, required skills and qualifications and expected effects/achieved goals for the specific job.

2. *Clearly naming the job title.* It is necessary to be precise and mentally close to the potential candidate (sometimes the names of jobs are bombastic and unclear, so may put off potential good job candidates). Also, a clear, attractive and interesting ad helps it stand out from other ads that are looking for the same thing.

3. *Design a convincing introduction of the ad.* This means clearly answering the question: “What makes the promoted organisation a great place to work?” (unique benefits, organisational culture, mission that candidates can relate to?)

4. *Describe the roles.* A detailed description of the duties performed should be included.

5. *List the job requirements.* Specific skills, experiences and educational qualifications should be listed in detail, and a distinction must be made between those skills that are mandatory and those that would be good to have.

6. *Specify benefits and compensations.* This may include: development opportunities, flexible working hours, health, pension, performance bonus, etc.

7. *Include a call to action.* Interested candidates should be encouraged to apply and provide them with clear instructions on how to send or attach it (overcomplicated and overly long electronic forms should be avoided, unless the organisation is testing the mentioned digital skills, and ensure a good reception of electronic applications).

8. *Optimise the ad for search engines.* Use relevant keywords throughout the ad that candidates might use to search for job opportunities. This helps make the job ad more visible in search engine results.

9. *Proofread and edit the advertisement.* Before publication of the ad, it should be carefully checked/proofread in order to remove all errors and ensure a clear and effective transmission of the desired message.

10. *Choose the right platforms.* It should be decided where to post the job advertisement so that it achieves the desired effect.

In the operational and technical sense, the activities of attracting candidates can be treated as a process, as a permanent and routine activity, and the best way to carry out this process can be clearly presented with a process diagram and optimised using the process management cycle: identification-modelling-analysis-reshaping-implementation- supervision and control (cf. Dumas, La Rosa, Mendling and Riers, 2013). Of course, even a superior effective advertisement is not the whole story for an organisation to become a great place of work but is the first step for improvement in this regard.

Professional selection is the second part of the recruitment axis attraction-engagement. It is only possible to separate the best with a quality professional selection screen and trained personnel for the specified purpose. Unfortunately, this is often avoided in practice due to costs and lack of understanding of the key importance of the selection process. Without

professional selection, there is no systematic, only random, quality, which is quite rare.¹⁴

H4: To retain loyalty and diminish turnover cost, branding activities are needed. The main activity is to enable a positive experience with the company.

The goal of employer branding as part of HR marketing activity is twofold: a) to increase the employer's value on the labour market, b) differentiate the company from the competitors by effectively communicating its unique value proposition, i.e. why choose our company over others in the same industry?

This is achieved by promoting the organisation in the environment, specifically by presenting and communicating the organisational culture (unique/strong organisational culture is also an important differentiation factor from other organisations). A strong employer brand can help attract and retain talented employees, reduce recruitment costs and improve overall competitiveness in the labour market. The concept of employer brand perception is similar to the concept of consumer brand perception; the difference is that employer branding focuses on attracting and retaining employees (not consumers). Key aspects of employer branding can be listed as (BIP HR Marketing, 2024):

- a. *Creating good working conditions and a stimulating organisational climate and culture.* In addition to physio-chemical working conditions, psycho-social working conditions are also important. How the employer treats its employees matters, i.e. what the communication is like, what the work-life balance is like, what are the teamwork dynamics, what the interpersonal relations are like, and what the organisational justice is, in other words, what the psycho-social climate of the organisation is. Disincentive or anti-branding working conditions and procedures should certainly be avoided.¹⁵
- b. *Offering value to employees.* Each organisation has a unique way of offering the benefits and opportunities; it can offer something

14 According to the principle: “Even a blind hen finds a grain!”.

15 Besides bad/low salary, job dissatisfaction, bad balance between work and private life, bad interpersonal relations are often the most important reason for leaving the workplace and anti-branding tools. Bad interpersonal relationships can be diagnosed as: 1. bad/difficult work colleagues (e.g. unprofessional, irresponsible, selfish, hostile, aggressive); 2. bad managers (e.g. incompetent, unfair, inefficient, lying-manipulative); 3. poor communication (e.g. scarce/non-existent, imprecise, uncultured, manipulative-destructive); 4. bad psychosocial atmosphere (e.g. gossiping, disrespect, manipulation/lying, sabotage of agreements and promises). The mentioned elements act in the opposite direction from the desired brand of a good employer.

to its employees that differentiates it from other employers (e.g. opportunities for advancement, benefits, compensation, meeting diverse human wants and needs). A strong brand can attract employees regardless of other weaker/worse working conditions, e.g. wages, so employees can work for a lower salary than the competition if the brand is strong.¹⁶

- c. *Promotion of the organisation's reputation/image in the environment.* Reputation refers to the perception of the public and participants in the branch, which is influenced by the quality of products/services, social responsibility, innovation and stability.
- d. *Recruitment marketing.* Strategies and methods an organisation uses to attract candidates, such as social media presence, job postings, participation in job fairs, "word-of-mouth" marketing, and more.
- e. *Creation of employee ambassadors of the organisational brand.* This element of branding concerns encouraging existing employees or creating organisational lobbyists to share their positive experiences as employer brand ambassadors, which can enhance the organisational image as a great place to work.

In terms of operational and technical branding, the project and process approach can be adapted. The project is suitable in the sense of one-time, genuine and significant new steps forward, e.g. improvement of basic working conditions, introduction of new promotional techniques (new recruitment marketing, new social innovation of branding). It is preferable to adapt the process approach either for the entire branding process, or partially, when it is important that it will be a permanent, repeated (repeating) and thus permanent process.

5.3. RESULTS AND DISCUSSION ABOUT NEW HR MARKETING APPLICATION IN PRACTICE

To achieve a new HR Marketing paradigm approach, cultural change is needed. This is because the old school management and old educational approaches cannot serve to satisfy new HR recruitment and talent retention

¹⁶ Employee of the Institute of Technology and Business in České Budejovice, Faculty of Corporate Strategy, Department of Human Resource Management, Mgr. Štepanka Janešová, as part of BIP HR Marketing 2024, related her personal experience as an employee at Lufthansa in Brno, Czech Republic, where the well-known and powerful Lufthansa brand strongly attracted employees and herself, regardless of the lower salary compared to the competition and some other jobs below those levels of complexity, better paid but unbranded.

needs. So the answer to what to change/improve in the old paradigm, and how to really apply the new one, are presented in the following confirmed hypotheses:

H5: Internalisation of a new organisational culture (talent management by means of marketing is strategically important for organisational development) needs HR management education with the new HR Marketing paradigm.

H6: New knowledge and values about talent management should be internalised by means of HR-Marketing education.

For cultural reasons and lack of education in HR marketing, the behaviour of employers and employees are still old fashioned. More precisely, in Croatian HRM practice there is a rare organisational practice (especially in the public sector) for the hunt for talented employees. For the same cultural reasons it is also unlikely that very good/excellent and talented HR (staff in the recruitment phase) will be positively perceived if they ask questions in the context of the philosophy/paradigm that the organisation should sell her/him its business/job, e.g.:

1. What benefits can you offer me? What benefits do you provide to employees which are you most proud of?
2. Is there a possibility to negotiate working conditions/compensation package? What do your employees like most about this job and this organisation?
3. Why should I be interested in working in your organisation?
4. How much is the virtual and how much is the physical component of the workplace? Do the jobs come to me dominantly or do I find out about the jobs that need to be done when I come to work?
5. How flexible are your working hours in a physical sense? Can I create my own working hours and distribution of workplaces (virtual and physical)?
6. Can you offer me managerial or special authority (e.g. in the context of “grey, white or gold collar” jobs)/responsibility and at what level?

Given that the cultural pattern of thinking from “Employee is sold to the organisation/employer” to “Employer is sold to the employee” is slow and difficult to change, marketing philosophies and techniques in many organisations are still probably premature, but they are not for future graduates/manifested intelligence/power, which will sell their capital/do the needed job in extraordinary/excellent companies.

The new idea that the high productive employee/talent is precious, free to choose the employer in the way and when it suits them best, that the employer should try to satisfy the wishes and needs of the employee, that it is the employer's (management) job to actively satisfy HR physiological and psychological needs, is still dominantly culturally foreign in the actual Croatian organisational practice. However, in real organisational practice, it is not enough to declaratively know the philosophy and practice of HR marketing and sometimes apply it, but the practice should become a habit through constant systematic application. The problem of application is in the organisational culture and change management, which hardly accepts new paradigms and the "controversial" philosophy. The culture of many organisations changes slowly and with difficulty; it seems that the time for a full affirmation of HR marketing with a new paradigm has not yet come. The cultural acceptability of the new philosophy and change management is crucial for the paradigmatic shift that HR marketing promotes in practical organisational application.

Because excellence in any area is very rare, students should be trained in HR marketing techniques in the educational space, especially in Business Economics courses, ideally in the courses of "Human Resource Management", "Strategic Human Resource Management", "International Human Resource Management", "Marketing", and appropriately thematically in the courses "Process Management" and "Digital Business", to be prepared for the actual/near future HR needs of excellent organisations and societies. Also in an academic sense, it would be desirable for students of business economics and related disciplines to be educated in practical HR marketing activities, not only for the needs of the most effective and competitive organisations, but also for the benefit of any organisation striving for success in the market.

6. CONCLUSION

HR marketing is a useful paradigm for managing organisational human resources in the context of optimising organisational productivity and effectiveness. It is especially important in a situation of competitive struggle for talents, where there is a shortage of supply compared to demand. Generally speaking, there is always a shortage of talent, because exceptional quality is an extremely rare human quality, due to the knowledge economy explosion, so theoretically there is always a greater demand for talent than supply. Therefore personnel policy is the most important policy of the organisation, and human resource is the most important resource of the business economy!

The achieved results in this paper stated the following conclusions:

a) New hiring paradigm (“The employer/organisation should be sold to the employee-talent.”), i.e. HR marketing is a useful paradigm as a tool for managing talents, especially in hiring and retention of loyalty. It is appropriate for higher income organisations/sectors and higher complexity jobs where a lack of top talents is evident. The old paradigm and philosophy that the employee-talent must be sold to the employer due to economic necessity is still rooted in the minds of many employers/organisations.

b) The old hiring paradigm is appropriate for low complexity jobs and low income organisations/sectors, where supply is higher than demand (no scarcity).

c) Job posting in hiring (as part of the whole recruitment and professional selection process), company branding (creation of good working experience with company) are key HR Marketing subprocesses. Therefore they should be managed professionally as high important/priority processes.

d) For better implementation of HR marketing and the new HR paradigm, management education (change of anti-talent oriented business culture) and University/High school HR Marketing education are needed. In the academic sense, it would be desirable for students of business economics and related disciplines to be educated in practical HR marketing activities for the needs of any organisation striving for success in the market. However, knowing the essence of HR marketing, education remains an easier task than a cultural/paradigmatic change that requires constant organisational application. Therefore, talent management by marketing is strategically important, both in business economics and business education. Regardless of the mentioned cultural factors, it is strategically important to master the philosophy, theory and methodology of HR marketing (especially recruitment and employer branding processes), in the context of supplying the most effective organisations with the best HRs, which is a challenge for all educators of HR marketing students. This paper is a step in that direction because organisational/institutional adaptation to new recruitment processes and retention of loyalty in Croatian organisational space has not yet come.

BIBLIOGRAPHY

1. Bahtijarević-Šiber, F., 1999. "Management ljudskih". (Human potential management) Zagreb: Golden marketing.
2. Berry, L. L. (1981). The employee as customer. *Journal of Retail Banking*, 111(1), 33-40.
3. BIP HR marketing, 2024. "Unlocking Human Resource Marketing: The Key to Success"; "Crafting Compelling Job Advertisements" "HR Management in Budweis," Recruitment", "Final Session", Česke Budejovice: Institute of Technology and Business, online and presentational sessions in Česke Budejovice (15.-19. 04. 2024), Erasmus+ BIP (Blended Intensive Programme) from 29. 02.-10. 05. 2024, organised by Institute of Technology and Business in Česke Budejovice, Czech Republic.
4. Bogdanović, M. 2011. Prilagodba hrvatske kulturne klime za ekonomski razvoj, *Ekonomski pregled*, 62, 1-2, pp. 67-85.
5. Bogdanović, M., 2015. Mračna strana poslovanja i menadžmenta u funkciji razvoja poduzetništva i inovacija, U: *Zbornik radova Innovations and entrepreneurship-launchers of development and employment/ Inovacije i preduzetništvo-pokretači razvoja i zapošljavanja (PROCEEDINGS)*, Ekonomski fakultet Sveučilišta u Banja Luci, BIH, str. 114-129.
6. Cotu, D. 2009. Why teams don't work: An interview with Richard Hackman, *Harvard Business Review*. Available at: <https://hbr.org/2009/05/why-teams-dont-work>
7. Designation of workers by collar https://en.wikipedia.org/wiki/Designation_of_workers_by-collar_color (31. 05. 2024).
8. Dumas, M., La Rosa, M., Mendling, J., & Reijers, H. A., 2013. *Fundamentals of Business Process Management*. Heidelberg - New York – Dordrecht – London: Springer Verlag. Available at: [https://repository.dinus.ac.id/docs/ajar/Fundamentals of Business Process Management 1.pdf](https://repository.dinus.ac.id/docs/ajar/Fundamentals_of_Business_Process_Management_1.pdf)
9. Galal, A. A., 2012. In: Arab development challenges report 2011: Toward the developmental state in the Arab region. United Nations Development Programme, Cairo. Available at: http://www.arabstates/undp.org/content/dam/rbas/report/Advocacy_Report_Cover.pdf.
10. Hotels & Tourism profitability https://csimarket.com/Industry/industry_Profitability_Ratios.php?ind=906&hist=1 (21. 03. 2025).
11. Industries with the Highest Profit Margin in the US in 2025 <https://www.ibisworld.com/united-states/industry-trends/industries-highest-profit-margin/> (21. 03. 2025).
12. "Patenti u 2022" (24. ožujka 2023). Available at: <https://podaci.dzs.hr/2023/hr/58335>, Državni zavod za statistiku. Priopćenje, str. 1-5. ISSN 1334-0557.
13. Qiu, J., Boukis, A. & Storey, C. (2022). Internal marketing: a systematic review. *Journal of Marketing Theory and Practice*, 30(1), 53-67.
14. Turk, M., Bogdanović, M., 2023. Digital Transformation: Value Creation Using Information Technology, *Conference Proceedings of the 6th International Scientific and Professional Conference: The Challenges of Today*, Šibenik, 05.-07. October 2023, pp. 444-451.
15. Taylor's experiments in management: The Pig Iron Experiment (02. 05. 2022). [https://www.webdschool.com/blog/taylors-experiments-with-management/\(30.05.2024\)](https://www.webdschool.com/blog/taylors-experiments-with-management/(30.05.2024)).

16. Veloso, C. M., Sousa, B., Au-Yong-Oliveira, M., & Walter, C. E. (2021). Boosters of satisfaction, performance and employee loyalty: application to a recruitment and outsourcing information technology organisation. *Journal of Organisational Change Management*, 34(5), 1036-1046.
17. Walmart Net Profit Margin 2010-2025 | WMT <https://www.macrotrends.net/stocks/charts/WMT/walmart/net-profit-margin> (21. 03. 2025.).

Acknowledgements and thanks:

This work was initiated for the purposes of international education in HR Marketing.

Therefore, I am grateful to my colleagues at the Institute of Technology and Business in České Budejovice, Czech Republic, which invited me to their organised HR marketing in digital and physical education with insight in their selected company HR practices, within the Erasmus + BIP (Blended Intensive Programme) (February-May, 2024).

EDUCATION, HUMAN CAPITAL AND POPULATION AGEING IN ECONOMICS: A BIBLIOMETRIC ANALYSIS

EMA KELIN

University of Rijeka
Faculty of Economics and Business
Rijeka, Croatia
ema.kelin@efri.uniri.hr

Paper Category: Scientific review

ABSTRACT

Economies that are in the late phase of demographic transition face the challenge of population ageing. The proportion of older people in the population is increasing and their consumption depends on the transfers of economic resources from the working-age population, which is decreasing. The ageing of the population thus leads to an age structure of the population that is unfavourable for maintaining economic growth and sustainability. Therefore, research has turned to the study of socio-economic structure in the search for solutions to the pressures of population ageing. One of the most important socio-economic factors is the level of education, which often serves as an indicator of the population's human capital. The aim of this paper is to comprehensively analyse how research on the impact of education as an indicator of human capital on population ageing has evolved over time. A bibliometric analysis of 346 papers shows the direction of this field of research, the most frequently used keywords and the most cited papers. This approach shows that this particular area of research has only recently begun to expand and is still in the expansion phase. It also shows that the research focus has shifted from fertility rates to productivity and macroeconomic forecasting.

Keywords: bibliometric analysis, economics, education, human capital, population ageing

1. INTRODUCTION

Economic growth is crucial for the development of countries. It has an immense impact on reducing poverty and raising living standards by increasing an economy's output and creating labour and income opportunities (Roemer and Gugerty, 1997; Loayza and Pennings, 2022). Economic growth as such depends on the production potential of the working-age population active in the labour market, the labour force. As far as the production of economic value is concerned, the working-age population is a part of the population that can produce more of it than it can consume. The opposite is true for children and older people; their consumption needs exceed their own production possibilities. To meet their consumption needs, children and the elderly are therefore largely dependent on the transfers of economic resources from the working-age population (Lee, Lee and Mason, 2008; Lee and Mason, 2010b).

Economic growth therefore depends on how high the proportion of the economically surplus-generating population of working age is in relation to the total population. In countries that are in the middle phase of demographic transition, for example, the proportion of the working-age population increases, which can lead to an increase in a country's per capita income. This economic growth-enhancing phenomenon is known as the demographic dividend (Bloom, Canning and Sevilla, 2003). However, high-income countries are now in the late phase of the demographic transition, in which the proportion of the working-age population is declining due to the ageing of the population (UN DESA Population Division, 2023). Population ageing is leading to a high proportion of dependent older people who have high consumption needs, particularly for healthcare and long-term care (Thung, 2011). The declining proportion of the working-age population therefore raises the question of who will meet the consumption needs of older people in the future. Population ageing brings with it not only the concern of maintaining economic growth but also ensuring that countries remain economically sustainable (Bloom *et al.*, 2015).

Since countries in the late stages of demographic transition cannot rely solely on the positive share of the working-age population in the total population, i.e. the demographic dividend, to boost economic growth, research has looked more closely at the specifics of the age structure of the population. Individuals of different ages do not have the same patterns of production, consumption and saving of economic resources. Age-specific economic behaviour has been researched in the context of generational economics and, more recently, in the National Transfer Accounts (NTA)

project. As part of the NTA project, the methodology for including the age dimension in the System of National Accounts (SNA) was introduced, which enables a detailed analysis of the economic life cycle of the individual. The analysis is carried out by creating age profiles that show the production, consumption and transfers of economic resources at each age (Lee, Lee and Mason, 2008; UN, 2013).

The analysis of age-specific economic behaviour inevitably had to be extended, not only to other demographic factors (such as gender), but also to socio-economic factors (Lee and Mason, 2010a, 2011). The idea of including educational attainment in the study of economic growth is not new. Earlier models to explain economic growth included the dimension of human capital in the form of the educational level of the individual as one of the factors (Nelson and Phelps, 1966; Mankiw Gregory, Romer and Weil, 1992). However, the relationship between the human capital factor, or educational attainment in its more specific form, and population ageing has only recently been investigated. Although empirical research on the importance of the inclusion of human capital in explaining economic growth did not initially provide robust results, more recent studies have been able to demonstrate the importance of education in this process (Lutz, Crespo Cuaresma and Sanderson, 2008). It has been shown that increasing the level of education is the key to better macroeconomic performance in the future (Kotschy and Sunde, 2018). It has also been shown that education actually plays a key role in economic growth led by the demographic dividend. In this process, highly educated people lead economic growth through innovation and increased productivity (Crespo Cuaresma, Lutz and Sanderson, 2014).

The positive effects of educational expansion are particularly important for the process of population ageing. Population ageing is usually accompanied by a decline in fertility. However, as people have fewer children, they are keen to invest more in them, in their health and especially in their education (Prettner, Bloom and Strulik, 2013). In addition, the health revolution in the 1970s has led to a decline in mortality rates (Hansen and Strulik, 2017). As a result, people have begun to expect a longer life span and have therefore been more willing to invest in their own education as they expected to enjoy the benefits, such as a higher income and easier working conditions, for longer in life (Cervellati and Sunde, 2013; Sánchez-Romero, d-Albis and Prskawetz, 2016).

The general increase in the level of education that accompanies the process of population ageing is particularly important for economic value creation. Although the ageing of the population reduces the proportion of the working-age population with a transfer potential that can support

the dependent population, it also creates a better educated working-age population. This also increases their productivity. Highly educated workers have been shown to have higher productivity (Kampelmann *et al.*, 2018), work longer hours and remain active in the labour market for longer (Bhuller, Mogstad and Salvanes, 2017; OECD, 2021a, 2021b). Therefore, a smaller but better educated labour force generates more economic value over its life cycle and can therefore pass on more resources to the dependent population (Abio *et al.*, 2017, 2021). This alleviates the pressure of the increasing proportion of the dependent older population and has a favourable impact on future economic sustainability (Kelin, Istenič and Sambt, 2022). Researchers have therefore turned their attention to the level of education, which is also one of the most important indicators of the population's human capital and a source of population heterogeneity (Lutz, Goujon and Wils, 2008).

The impact of socio-economic factors on the ageing of the population has only come into focus after it became clear that growth is jeopardised by changes in the age structure of the population. The aim of this paper is therefore to comprehensively examine the links between education or human capital and the topic of population ageing. Specifically, the aim of the study is divided into three areas. First, this study analyses the number of publications, and the keywords used over time to show how the field of research has evolved over time. Secondly, the most important works in this field are presented, and thirdly, the most frequently cited works are discussed.

The paper is organised as follows. Section 2 presents the data and explains how the bibliometric analysis is used to obtain an overview of the co-occurrence of the topics of education or human capital and population ageing. Section 3 presents and discusses the results, while section 4 draws a conclusion.

2. METHODOLOGY AND DATA

This paper uses the approach to data collection and bibliometric analysis described by Öztürk, Kocaman and Kanbach (2024). Their paper summarises many of the bibliometric approaches used to date and proposes a comprehensive framework for conducting such an analysis.

2.1. DATA COLLECTION

Data collection is one of the most sensitive steps in bibliometric analysis, as it determines the rest of the research. The data on all publications was collected in May 2024 via the Web of Science search engine, limiting the

search for terms to the publications in the Web of Science Core Collection from 1955 to 2023.

The topics searched for are “education” OR “human capital” AND “population ag*.” Writing the term “population ag*” into the search engine allowed us to find all topics related to “population ageing” in both British (“ageing”) and US English (“aging”). We were only interested in the coverage of these topics in the field of economics and business. However, these topics can also be found in the fields of education sciences as well as medicine and geriatrics. Therefore, we limited our search to all Web of Science categories that cover economics and business (Business&Economics OR Economics OR Business OR Business, Finance). Apart from these areas, we also included the Web of Science categories Demography and Industrial Relations & Labour. Demographics often includes research on socio-economic characteristics of the population, which includes educational attainment. The Industrial Relations & Labour section, on the other hand, often includes topics relating to the labour market, where educational attainment is also one of the most important factors. These settings led to the coverage of a total of 346 publications.

2.2. METHODOLOGY

In order to obtain a comprehensive overview of the relationship between education or human capital and population ageing, we use a bibliometric analysis. It not only measures the current output of scientific research but also shows how a particular field of research has evolved over time and how it relates to keywords, topics, journals, authors and institutions in that field (Donthu *et al.*, 2021; Öztürk, Kocaman and Kanbach, 2024). To conduct the analysis and visualise the results in the science maps, we used the software VOSviewer (van Eck and Waltman, 2010).

There are two main methods used in bibliometric analysis: performance analysis and science mapping (Cobo *et al.*, 2011; Donthu *et al.*, 2021). Performance analysis provides an overview of the field and focuses on the number of published articles, citation data based on papers, authors, institutions, countries, and the like (Öztürk, Kocaman and Kanbach, 2024). Science mapping makes it possible to visualise relationships between papers, authors, institutions and the like in a map (Cobo *et al.*, 2011). We use both methods in this paper.

In the first part of the investigation into how the field has evolved over time, we conduct a performance analysis focusing on the number of publications and the keywords used in the publications over the years. This gives a rough overview of the growth of the field and its direction. To get

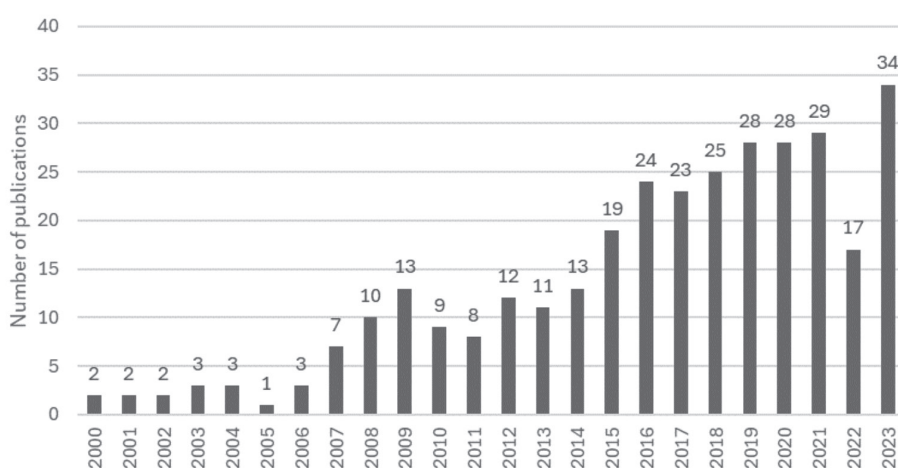
more information about the development of the field, we analyse the most frequent keywords and the average year of their occurrence. Such an analysis shows which were the most important topics during the study period. In order to limit the analysis to the most frequently used keywords, only those keywords that occur four or more times are considered. It is necessary to note that the keywords “population ageing” and “economic growth” are spelt differently in the various papers. As mentioned, “population ageing” is also found in the American spelling as “population aging,” and “economic growth” also appears as “economic-growth.” However, this has no major impact on the analysis. We perform a scientific mapping to show which keywords appear together in the publications.

In the second part of the study, we analyse the most cited publications in this field by again conducting a performance analysis. We also conduct a content analysis of the two most cited papers to identify the core of the field.

3. RESULTS

First, we analysed the number of papers published per year. Although the scope of our analysis included 346 publications in the period from 1955 to the end of 2023, Figure 1 only shows the number of publications since 2000. The reason for this is that the co-occurrence of the topics of education and population ageing only attracted interest in the late 2000s, with most publications appearing towards the end of the 2010s.

Figure 1. Number of publications per year



Source: Own work based on WoS data

Figure 1 shows the distribution of the 326 papers published per year since 2000. As a total of 346 papers were analysed, this shows that in the period from 1955 to 2000, only 20 papers were published in which the topics of education or human capital coincided with the topic of population ageing. Thus, in the second half of the 20th century, when countries were going through the demographic transition and experiencing a period of demographic dividend, not much attention was paid to the importance of education or human capital in the process of population ageing.

However, Figure 1 shows that these topics received more attention in the period 2007 to 2009, when a total of 30 papers were published. Furthermore, most papers, 227 in total, have been published since 2015, suggesting that the impact of education or human capital on population ageing has only recently been explored in more depth. The number of publications on these research topics has also risen steadily since 2015. In 2022, the number of publications was significantly lower, but 2023 saw the highest number of papers on these topics published in one year, suggesting that this research interest among authors has not disappeared. This also suggests that the field continues to grow.

3.1. KEYWORD ANALYSIS

In order to see exactly which topics were researched in which period, the most frequent keywords must be analysed according to their average year of publication and their co-occurrence. The keywords analysed in this section are only those that occur most frequently in the 346 papers covered by the bibliometric analysis. The focus is on the keywords that appear in the period from 2015 to 2023, as the topics of education or human capital and population ageing were researched the most during this period. In order to observe how the topics have changed since 2015, the focus of Table 1 is therefore on the average year of publications in which a particular keyword appears.

Table 1. Most common keywords used by the average publication year

No	Keyword	Occurrences	Avg. pub. year
1	fertility	10	2015.10
2	countries	6	2015.67
3	human capital	7	2016.00
4	social security	5	2016.40
5	economic growth	4	2016.50
6	education	9	2016.67
7	growth	5	2017.40
8	population aging	22	2017.77
9	population ageing	9	2018.11
10	economic growth	7	2018.14
11	consumption	5	2018.40
12	age	8	2019.38
13	productivity	4	2021.00
14	j11	4	2023.25

Notes: j11=Demographic Trends, Macroeconomic Effects, and Forecasts (according to Journal of Economic Literature (JEL) classification)

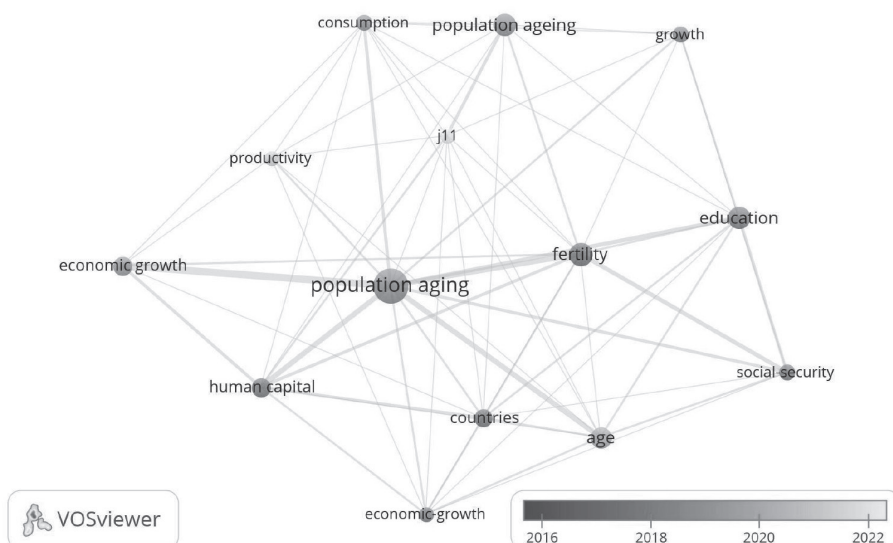
Source: Own work based on WoS data

Table 1 shows how the keywords and thus the direction of research in this field have changed in the period from 2015 to 2023. The average publication year of the keyword “fertility” at the beginning of the observed period shows that the papers around 2015 dealt with this topic. This indicates that research at this time was still mainly focussed on demographic factors that influence population ageing. At the end of the observed period, however, the keywords indicate that research is taking a new direction. The keyword “productivity” appears, indicating that research is focusing on identifying the behaviour of individuals as a function of their socio-economic characteristics. Keywords from the areas of demographic trends, macroeconomic effects and forecasts (“j11”) indicate that research is taking new approaches to forecasting at a macroeconomic level.

However, to get a clearer picture of the published topics and the development of the research field from 2015 to 2023, it is also necessary to analyse the co-occurrence of keywords. The co-occurrence of keywords is shown in Figure 2, where the thickness of the line indicates the frequency of co-occurrence of keywords.

Unsurprisingly, the most common keyword that appears in this type of papers is “population aging.” The most frequent keywords that appear together with the keyword “population aging” are “economic growth,” “fertility,” “education,” “age” and “human capital.” Since the aim of this research is to analyse the number of papers dealing with the impact of education or human capital and population ageing, this co-occurrence of keywords shows that most papers consider this topic from the perspective of fertility and economic growth. Furthermore, Table 1 shows that the papers dealing with fertility precede the papers dealing with economic growth.

Figure 2. Co-occurrence of keywords by the average publication year



Notes: j11=Demographic Trends, Macroeconomic Effects, and Forecasts (according to Journal of Economic Literature (JEL) classification)

Source: Own work based on WoS data

As the topics of education and human capital are at the centre of this study, it is interesting to see which keywords they usually occur together with. Apart from “population aging,” “human capital” co-occurs most frequently with the aforementioned “fertility” and “economic growth,” but also with “countries.” “Education,” on the other hand, is associated with the keywords “growth” and “social security.”

3.2. MOST CITED PAPERS

For a closer look, it is necessary to look at the most frequently cited papers on these topics. All papers with 20 or more citations are listed in Table 2.

The list of most cited papers in Table 2 shows three papers by Ronald Lee, two of which were published in co-authorship with Andrew Mason. With 168 citations, their paper *Fertility, Human Capital, and Economic Growth over the Demographic Transition* is by far the most cited paper on these topics. This paper was published in print in 2010 but was published online in 2009. As shown in Table 1, this paper falls within the first period in which the number of publications in this field began to increase.

The second paper by number of citations *Population ageing and economic growth in seven OECD countries* by Maxime Fougère and Marcel Mérette was published in 1999, before the research field gained more interest. Since these two papers were published ten years apart and under different conditions in this field of research, we will briefly analyse their content in the next section.

Table 2. Most cited papers in which topics of education or human capital co-occur with topic of population ageing

No	Authors	Title	Citations
1	Lee and Mason, 2010	Fertility, Human Capital, and Economic Growth over the Demographic Transition	168
2	Fougère and Mérette, 1999	Population ageing and economic growth in seven OECD countries	106
3	Lee and Mason, 2010b	Some macroeconomic aspects of global population aging	75
4	Cipriani, 2014	Population aging and PAYG pensions in the OLG model	46
5	Choi and Shin, 2015	Population aging, economic growth, and the social transmission of human capital: an analysis with an overlapping generations model	42
6	Cai and Stoyanov, 2016	Population aging and comparative advantage	35
7	Fougère et al., 2009	Population ageing, time allocation and human capital: A general equilibrium analysis for Canada	34
8	Mao and Xu, 2014	Population aging, consumption budget allocation and sectoral growth	23
9	Lee, 2016	Macroeconomics, aging, and growth	23
10	Lutz, 2009	The demography of future global population aging: Indicators, uncertainty, and educational composition	21
11	Rentería et al., 2016	The effect of education on the demographic dividend	20

Notes: all papers mentioned in the table are available in the bibliography at the end of the paper

Source: Own work based on WoS data

3.3. A BRIEF CONTENT ANALYSIS OF TWO MOST CITED PAPERS

There are some similarities between the two most cited papers by Lee and Mason (2010a) and Fougère and Mérette (1999). Both papers deal with the modelling of economic growth. The basic idea for the model in both papers comes from the overlapping generations (OLG) models. However, the papers do not use the same data and do not apply the same OLG models. Lee and Mason (2010a) use age-specific NTA data and only three overlapping generations, while Fougère and Mérette (1999) use Organisation for

Economic Co-operation and Development (OECD) data and fifteen generations in their model. The central idea of both papers is that they use human capital in the modelling of economic growth.

However, they define investment in human capital differently. In their model, Lee and Mason (2010a) define human capital as the share of parents' wages that is invested in the human capital of each child. However, they only consider investments in health care and a child's education as human capital investments, while they treat all other expenditures as a child's consumption. Fougère and Mérette (1999), on the other hand, consider the human capital stock of the labour supply in their model. They treat the stock of human capital as a non-rival good, which means that a certain proportion of human capital is transferred from one generation to the next through educational institutions. Therefore, aggregate human capital can always be increased through schooling.

Both studies come to similar conclusions from their respective perspectives. Both studies show that fertility decline and population ageing produces higher human capital investments. Fougère's and Mérette's (1999) model shows that human capital investments can increase the effectiveness of lower labour supply and stimulate economic growth. Similarly, Lee and Mason (2010a) show that higher human capital investment can reduce the consequences of population ageing. In addition, they point out that living standards in countries can be maintained if investments in human capital are reflected in an increase in labour productivity. Therefore, both papers show that investments in human capital can have a positive impact on overcoming the challenges of economic sustainability posed by an ageing population.

4. CONCLUSION

The aim of this paper was to provide an overview of the growing field of research on the impact of education, or more broadly human capital, on the challenge of population ageing. To gain a broad overview of this field of research, we conducted a bibliometric analysis of 346 publications in the period 1955 – 2023. The performance analysis of the number of publications by year shows that this field of research has gained more and more attention in the last 15 years, while the last 8 years show the highest increase in the number of publications per year. The fact that the highest number of publications per year (34) occurred in 2023 indicates that this field of research is still growing.

Analysing the keywords shows the direction of the research. For example, the keyword "economic growth" appears in different versions

(“economic-growth” and “growth”) during the whole observed period 2015 – 2023. The impact that human capital through education has on population ageing and economic growth is also at the centre of this field, as shown by the content analysis of the two most cited papers (Fougère and Mérette, 1999; Lee and Mason, 2010a) which approach the topic from two different angles.

While “economic growth” has been a constant theme over the years, other keywords show that the direction of the field of research has changed since 2015. At the beginning, research focused on fertility and social security. At the end of the observed period, after 2020, the focus of research shifted to keywords and topics of productivity and forecasting.

Investing in raising the educational level of the population and in its human capital has proven to be an effective tool for maintaining living standards and economic growth in economies that are in the late stages of demographic transition. As the population of these economies continue to age, further exploration of the nuances that could help address this challenge is of paramount importance. Population ageing can lead to budget deficits, leaving many economies debating retirement ages and facing increased immigration. Including all these topics in future research could highlight their joint impact on the challenges of population ageing and thus provide a more complete picture of the expansion of this area of research.

The particular importance of researching the role of education in combating population ageing is that it can be translated into economic policies that promote raising the educational attainment of the population and lifelong learning. Therefore, the research, which can help not only policy makers but also educators and businesses to design such policies, should be continued.

ACKNOWLEDGMENTS

This work has been partially supported by the University of Rijeka project [uniri-mladi-drustv-23-42].

This paper was funded under the project line ZIP UNIRI of the University of Rijeka, for the project ZIP-UNIRI-2023-17.

BIBLIOGRAPHY

1. Abio, G. *et al.* (2017) 'Intergenerational Transfers in Spain: The Role of Education', 223(4), pp. 101–130. doi: 10.7866/HPE-RPE.17.4.4.
2. Abio, G. *et al.* (2021) 'The role of gender, education and family in the welfare organization: Disaggregating National Transfer Accounts', *The Journal of the Economics of Ageing*, 20, p. 100348. doi: 10.1016/j.jeoa.2021.100348.
3. Bhuller, M., Mogstad, M. and Salvanes, K. G. (2017) 'Life-cycle earnings, education premiums, and internal rates of return', *Journal of Labor Economics*, 35(4), pp. 993–1030. doi: 10.1086/692509.
4. Bloom, D. E. *et al.* (2015) 'Macroeconomic implications of population ageing and selected policy responses', *Lancet*, 385(9968), pp. 649–657. doi: 10.1016/S0140-6736(14)61464-1.
5. Bloom, D. E., Canning, D. and Sevilla, J. (2003) 'The Debate over the Effects of Population Growth on Economic Growth', in *The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change*. RAND Corporation. Available at: <https://www.jstor.org/stable/10.7249/mr1274wfhf-dlpf-rf-unpf.9>.
6. Cai, J. and Stoyanov, A. (2016) 'Population aging and comparative advantage', *Journal of International Economics*. North-Holland, 102, pp. 1–21. doi: 10.1016/J.JINTECO.2016.04.006.
7. Cervellati, M. and Sunde, U. (2013) 'Life Expectancy, Schooling, and Lifetime Labor Supply: Theory and Evidence Revisited', *Econometrica*, 81(5), pp. 2055–2086. doi: 10.3982/ecta11169.
8. Choi, K. H. and Shin, S. (2015) 'Population aging, economic growth, and the social transmission of human capital: An analysis with an overlapping generations model', *Economic Modelling*. North-Holland, 50, pp. 138–147. doi: 10.1016/J.ECONMOD.2015.05.015.
9. Cipriani, G. Pietro (2014) 'Population aging and PAYG pensions in the OLG model', *Journal of Population Economics*. Springer, 27(1), pp. 251–256. doi: 10.1007/S00148-013-0465-9/METRCS.
10. Cobo, M. J. *et al.* (2011) 'Science mapping software tools: Review, analysis, and cooperative study among tools', *Journal of the American Society for Information Science and Technology*, 62(7), pp. 1382–1402. doi: <https://doi.org/10.1002/asi.21525>.
11. Crespo Cuaresma, J., Lutz, W. and Sanderson, W. (2014) 'Is the Demographic Dividend an Education Dividend?', *Demography*, 51(1), pp. 299–315. doi: 10.1007/s13524-013-0245-x.
12. Donthu, N. *et al.* (2021) 'How to conduct a bibliometric analysis: An overview and guidelines', *Journal of Business Research*. Elsevier Inc., 133(April), pp. 285–296. doi: 10.1016/j.jbusres.2021.04.070.
13. van Eck, N. J. and Waltman, L. (2010) 'Software survey: VOSviewer, a computer program for bibliometric mapping', *Scientometrics*. Springer Netherlands, 84(2), pp. 523–538. doi: 10.1007/S11192-009-0146-3/FIGURES/7.
14. Fougère, M. *et al.* (2009) 'Population ageing, time allocation and human capital: A general equilibrium analysis for Canada', *Economic Modelling*. North-Holland, 26(1), pp. 30–39. doi: 10.1016/J.ECONMOD.2008.05.007.

15. Fougère, M. and Mérette, M. (1999) ‘Population ageing and economic growth in seven OECD countries’, *Economic Modelling*. North-Holland, 16(3), pp. 411–427. doi: 10.1016/S0264-9993(99)00008-5.
16. Hansen, C. W. and Strulik, H. (2017) ‘Life expectancy and education: evidence from the cardiovascular revolution’, *Journal of Economic Growth*. Springer US, 22(4), pp. 421–450. doi: 10.1007/s10887-017-9147-x.
17. Kampelmann, S. et al. (2018) ‘Does education raise productivity and wages equally? The moderating role of age and gender,’ *IZA Journal of Labor Economics*. IZA Journal of Labor Economics, 7(1), pp. 1–37. doi: 10.1186/s40172-017-0061-4.
18. Kelin, E., Istenič, T. and Sambt, J. (2022) ‘Education as a partial remedy for the economic pressure of population ageing’, *International Journal of Manpower*, 44(9), pp. 37–54. doi: 10.1108/IJM-03-2022-0126.
19. Kotschy, R. and Sunde, U. (2018) ‘Can education compensate the effect of population ageing on macroeconomic performance?’, *Economic Policy*, 33(96), pp. 587–634. doi: 10.1093/epolic/eiy011.
20. Lee, R. (2016) ‘Macroeconomics, Aging, and Growth’, *Handbook of the Economics of Population Aging*. North-Holland, 1, pp. 59–118. doi: 10.1016/BS.HESPA.2016.05.002.
21. Lee, R., Lee, S.-H. and Mason, A. (2008) ‘Charting the Economic Life Cycle’, *Population Development Review*, 34(Population Aging, Human Capital Accumulation, and Productivity Growth), pp. 208–237.
22. Lee, R. and Mason, A. (2010a) ‘Fertility, Human Capital, and Economic Growth over the Demographic Transition’, *European Journal of Population*, 26(2), pp. 159–182. doi: 10.1007/s10680-009-9186-x.
23. Lee, R. and Mason, A. (2010b) ‘Some macroeconomic aspects of global population aging’, *Demography*, 47(SUPPL.1), pp. 151–173. doi: 10.1353/dem.2010.0002.
24. Lee, R. and Mason, A. (2011) ‘Population aging at the generational economy: key findings’, in Mason, A. and Lee, R. (eds) *Population Aging and the Generational Economy. The Global Perspective*. Cheltenham: Edward Elgar Publishing, pp. 3–31.
25. Loayza, N. V. and Pennings, S. (2022) *The Long Term Growth Model: Fundamentals, Extensions, and Applications*. Washington D.C.: World Bank Group. Available at: <https://www.worldbank.org/en/research/brief/the-long-term-growth-model-fundamentals-extensions-and-applications>.
26. Lutz, W. (2009) ‘The Demography of Future Global Population Aging: Indicators, Uncertainty, and Educational Composition’, *Population and Development Review*, 35(2), pp. 357–365. doi: 10.1111/j.1728-4457.2009.00282.x.
27. Lutz, W., Crespo Cuaresma, J. and Sanderson, W. (2008) ‘The demography of educational attainment and economic growth’, *Science*, 319(5866), pp. 1047–1048. doi: 10.1126/science.1151753.
28. Lutz, W., Goujon, A. and Wils, A. (2008) ‘The Population Dynamics of Human Capital Accumulation’, *Population and Development Review*, 34, pp. 149–187. Available at: <https://www.jstor.org/stable/25434763>.

29. Mankiw Gregory, N., Romer, D. and Weil, D. N. (1992) 'A contribution to the empirics of economic growth', *Quarterly Journal of Economics*, 107(2), pp. 407-437. doi: 10.2307/2118477.
30. Mao, R. and Xu, J. (2014) 'Population aging, consumption budget allocation and sectoral growth', *China Economic Review*. North-Holland, 30, pp. 44-65. doi: 10.1016/J.CHIECO.2014.05.004.
31. Nelson, R. R. and Phelps, E. S. (1966) 'Investment in Humans, Technological Diffusion, and Economic Growth', *American Economic Review*, 56(1), pp. 69-75. Available at: <https://www.jstor.org/stable/pdf/1821269.pdf?loggedin=true>.
32. OECD (2021a) *OECD Employment Outlook 2021: Navigating the COVID-19 Crisis and Recovery*, Oecd. Edited by Paris. OECD Publishing. doi: <https://doi.org/10.1787/5a700c4b-en>.
33. OECD (2021b) *Pensions at a Glance 2021: OECD and G20 Indicators*. Paris: OECD Publishing. doi: 10.1787/ca401ebd-en.
34. Öztürk, O., Kocaman, R. and Kanbach, D. K. (2024) 'How to design bibliometric research: an overview and a framework proposal', *Review of Managerial Science*. Springer Berlin Heidelberg, (0123456789). doi: 10.1007/s11846-024-00738-0.
35. Prettnner, K., Bloom, D. E. and Strulik, H. (2013) 'Declining fertility and economic well-being: Do education and health ride to the rescue?', *Labour Economics*. Elsevier B.V., 22, pp. 70-79. doi: 10.1016/j.labeco.2012.07.001.
36. Rentería, E. *et al.* (2016) 'The Effect of Education on the Demographic Dividend', *Population and Development Review*, 42(4), pp. 651-671.
37. Roemer, M. and Gugerty, M. K. (1997) *Does Economic Growth Reduce Poverty?* Discussion Paper No. 4. Available at: https://pdf.usaid.gov/pdf_docs/Pnaca655.pdf.
38. Sánchez-Romero, M., d'Albis, H. and Prskawetz, A. (2016) 'Education, lifetime labor supply, and longevity improvements', *Journal of Economic Dynamics and Control*. Elsevier, 73, pp. 118-141. doi: 10.1016/j.jedc.2016.09.004.
39. Thung, A.-C. (2011) 'Consumption over the lifecycle: an international comparison', in Mason, A. and Lee, R. (eds) *Population Aging and the Generational Economy. The Global Perspective*. Cheltenham: Edward Elgar Publishing, pp. 136-160.
40. UN (2013) *National Transfer Accounts Manual: Measuring and Analysing the Generational Economy*. New York: United Nations. doi: 10.18356/42d43461-en.
41. UN DESA Population Division (2023) *World Population Ageing 2023*. New York: United. Available at: https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/undesa_pd_2024_wpa2023-report.pdf.

THE ORGANISATIONAL PROJECT MANAGEMENT MATURITY AS A CRITICAL SUCCESS FACTOR OF PUBLIC SECTOR PROJECTS: A REVIEW PAPER

SABINA LACMANOVIĆ

Juraj Dobrila University of Pula

Faculty of Economics and Tourism »Dr. Mijo Mirković«

Pula, Croatia

sabina.lacmanovic@unipu.hr

Paper category: Scientific review

ABSTRACT

The modern business environment pushes organisations towards project-oriented business. Next to that, the growing expectations and stronger public demand for efficiency, as well as different project-related financial resources providers, have encouraged the public sector organisations to implement project management knowledge, tools, and methodologies in their activities. However, the success rate of projects delivered through the public sector heavily depends on organisational project management maturity, which is a fact often neglected in the public sector. The purpose of the paper is to explore the global level of project management maturity in public sector organisations and to elaborate its relevance to project success. The research is based on the qualitative review of theme-related literature and gives valuable insights into the current state of the public sector organisations regarding project planning and implementation. The results of the research indicate the currently low project management maturity levels achieved in public sector organisations worldwide, but they are also aiming for the largest increase in desired maturity level. The author discusses the possible barriers to higher project management maturity levels and gives recommendations that could be applied in different public sector organisations to raise the success rate of their projects. The role of the project management office (PMO) is especially highlighted, as well as other mechanisms which can improve the organisational project management maturity in the public sector. The research results show a systematic way towards measuring and improving public sector organisations' project management maturity and could be used by different public sector institutions who are, as results are showing, more aware of the benefits of investing in project management maturity.

Keywords: organisational project management maturity, projects, public sector, success

1. INTRODUCTION

The contemporary environment of public sector organisations' operations is rapidly changing at different levels (new technological, demographical, political, social, legal, ecological demands and expectations). This challenging context has turned the public sector organisations towards project-oriented thinking, and towards the growing number of executed projects. However, the success rate of these projects is not consistent and heavily depends on organisational project management maturity, but many public sector organisations are not aware of this fact. The specific context of contemporary public sector projects (public pressures for increased efficiency and cost-effectiveness, rising service quality expectations from individuals and businesses, transparency and regulatory requirements, public consultation procedures, the need to secure external, often project-based, financial resources) have encouraged organisations operating in this sector to implement project management knowledge, tools, and methodologies in their activities. Today we are therefore witnessing that both private and public sector organisations are starting to talk more about the value of organisational project management maturity.

The purpose of this conceptual paper is to explore the global level of organisational project management maturity in public sector organisations and to elaborate its relevance to project success. The research is based on the qualitative review of theme-related theoretical and empirical research: publicly available secondary data extracted from relevant scientific databases was collected, analysed, and interpreted to present the current insights into the critical role of the organisational project management maturity in the public sector projects' success.

The paper comprises 6 chapters. The first chapter is introductory, followed by chapter 2 in which the challenges and success factors of public sector projects are discussed, and the success rate of public sector projects is commented on. The central part of the paper is chapter 3 in which the key research results are presented; after the short introduction into the theoretical concept of measuring organisational project management maturity (PMM models), the author presents the achieved levels of organisational project management maturity in the public sector, and discusses the relevance of organisational project management maturity for the public projects' success, and the most common barriers to organisational project management maturity in the public sector. The results and its implications are discussed in chapter 4, followed by the concluding remarks

given in chapter 5. The last chapter, chapter 6, lists all the sources used in the research.

2. CHALLENGES AND SUCCESS FACTORS OF PUBLIC SECTOR PROJECTS

The current trends that are shaping today's economy and society, such as demographic shifts, rapid urbanisation, climate change, resource scarcity and technological breakthroughs (PwC, 2017) foster public organisations to adapt and to implement more projects that will answer the needs and expectations of the public, i.e. the end users of public projects. To adequately respond to those needs public sector organisations implement project management knowledge and methodology in their activities with more or less success, often dependent on their organisational project management maturity. Although public sector projects share many challenges with projects in the private sector, e.g., resource- and time- constraints, managing implicit stakeholder expectations, scope creep, uncertainty and skill gaps, there are some public sector specific challenges that raise the complexity of managing them towards project goal realisation. Under public sector projects we mean projects initiated/realised/managed/supervised by public-sector organisations/groups which serve the general public needs. They include IT projects, healthcare projects, transport projects, infrastructure projects and projects in other areas beneficial to society, i.e., public interest projects.

2.1. CHALLENGES OF PUBLIC SECTOR PROJECTS

Managing public sector projects is a challenging task due to their complexity and the constraints under which they must be executed, e.g. legal constraints, schedule constraints, limited budgets and resources and limited organisational project management knowledge. Public sector projects are often large-scale projects widely covered by the media and under constant public scrutiny. They are expected to deliver visible and sustainable results (mostly non-financial public benefits), and to prove that the taxpayers' money was not wasted, but well spent (they are largely financed by public funds). The public sector projects are often executed under public pressure for increased efficiency and at the same time for more transparency (every step must be documented and reported).

Dealing with the large number of different project stakeholders, and often hidden business or political interests of some of them, complying with regulations and standards, managing public expectations and maintaining

public trust, adapting to government changes due to election cycles which often lead to policy and priority changes under which project continuity suffers, working with budget constraints and the need of securing additional funding, working within the system where many decisions have to undergo multiple layers of approval, and simultaneously mitigating risks related to security and data privacy, are making the public sector projects management an extremely complex and challenging job. Public projects are heavily influenced by politics, political processes, and public interest (media) which asks for consensus among different stakeholders when making relevant decisions, e.g. defining the purpose, outcome, and the scope of the project (Wirick, 2009). The involvement of many layers of stakeholders with various interests, including legislators, powerful political leaders (those in charge and their political opponents), agencies, interest groups, and broader public groups, who can influence the implementation and the outcomes of projects, makes the process of managing their often-conflicting goals and expectations even more challenging than in private sector projects (PwC, 2017).

As public projects are usually financed by public funds, the public sector organisations are obligated to follow various administrative rules, policies, procedures, and processes to guarantee transparency and fairness in decisions and to avoid conflicts of interest which burden the time efficiency of a project or lead to suboptimal decisions (e.g. public-tender process, financing and budgeting procedures, HR policies). Public-sector organisations often lack the knowledge and skills related to project management methodologies or are not acquainted with the best practice, but are also often not aware of the impact this lack of knowledge/skills has on the project outcomes. There is also a general lack of alignment between strategic or political objectives and actual project efforts. In many cases there are no clearly defined success criteria, and no effective benefits management either (PwC, 2017). A lack of top-management support is also a challenging factor in many public projects, together with the fact that the political leaders' time in charge is usually shorter than the project life cycle, which leads to changes in major stakeholders and sponsors during the project life cycle and the often seen culture of blame (aimed at previous political leaders and their supporters) which follows those changes (PwC, 2017). There is often a lack of incentive for project success in public organisations, e.g. successful completion results in fewer personnel and a reduced budget due to expected efficiency savings, and the manager being expected to deal with further projects; on the other hand, in the event of failure, personnel and the budget remain as before, and the manager will not have to manage further projects (PwC, 2017). Political

agendas often interfere with realistic project planning, and a tendency to underestimate obstacles and expected problems observed among public-project sponsors and stakeholders leads to their perceptions of project failure, although the outcomes say the opposite (Kahneman and Tversky, 1979, as in PwC, 2017).

This is all in line with the empirical research which has shown the greater complexity of managing public projects in comparison to managing projects in other sectors. The most complex public project management areas are stakeholder management, procurement management, and communications management, due to the number of stakeholders involved and the transparency obligations (Gasik, 2016). Specific differences between public and private sector project practice are also confirmed in the Blixt and Kirytopoulos research (2017); they have observed differences in accountability, communication, finance, procedures, stakeholder management and decision making.

The impact of successful public sector projects, and even more the impact of project failures, are much more in the focus of the media and the public compared to private sector projects. The long delays, the significant budget overrunning or not delivering the quality that was promised can cause public actions demanding political changes. The financial losses of failed projects are also vast and represent an additional burden (for every 1 billion US\$ spent on a failed project, 135 million US\$ is lost forever) (PMI, 2013, as in Oracle, 2014).

All the above-mentioned challenges indicate the need for developing project management competencies in public sector organisations. To successfully manage public projects, managers should master competencies in both project management and public sector management, including areas of integrity, accountability, public service ethos, and change (Jalocha et al., 2014, as in Blixt and Kirytopoulos, 2017). Communication, accountability, business alignment, scope and deliverables, change, and project and programme orientation are found to be the most important competencies in project delivery (Blixt and Kirytopoulos, 2017). Due to the public sector projects' specifics, all areas of project management knowledge require adjustments; the use of project evaluation techniques, based on non-financial parameters, focus on internal incentives as a critical motivational factor for project management teams, engaging project managers with good negotiating, communication and diplomatic skills, due to the diverse set of project stakeholders, stronger commitment to identifying and reporting risks which are specific to public sector projects (political risks, risks stemming from public regulations and longer duration of public projects),

a specialised team supporting project procurement processes, and careful stakeholder expectations' management (Gasik, 2018).

By publishing a Government Extension to the PMBOK the PMI has also confirmed the need to regard the specific challenges related to the public sector projects' management, especially government projects (PMI, 2006). There are currently several universities offering Public Sector Project Management courses (e.g. University of Ljubljana, Faculty of Public Administration) or professionally accredited training courses (e.g. Wellington), but there is a growing need for more developed university-degree programmes.

2.2. SUCCESS FACTORS OF PUBLIC SECTOR PROJECTS

There is still no consensus yet on the definition of project success, but there is an agreement on its multidimensional character. The success is differently perceived by different stakeholders and different organisations, sectors and industries use different success metrics. However, it is recognised by many that the success could not be measured only by traditional project efficiency measures (meeting the schedule, budget, and quality goals), but other relevant dimensions of success should be also assessed, such as the impact on relevant stakeholders, impact on the team, direct success for parental organisation, preparation for the future (new core competency, new organisational capability). The benefits of public projects often become visible only years after the project has ended and are important measure of project success (PwC, 2017). PMI (as in Oberli et al., 2023) emphasise the following factors of project success: client satisfaction, achievement of strategic goals, compliance with quality standards, project team effectiveness, social impact, reputation of the organisational unit and sustainable impact of outcomes.

The PwC study (2007) reveals that organisations determine project success based on the satisfaction of their stakeholders, on on-time delivery, on budget, on the delivery of benefits, on quality, on acceptable ROI and other factors. The Australian KMPG and AIPM annual report on the state of Australia's project management profession (2022) used stakeholder satisfaction and delivery in line with business goals metrics next to the on-time and on-budget delivery as key project success indicators. Bannerman (2008) proposed a multilevel project success framework with 5 levels of project success: process-, project management-, product-, business- and strategic-success.

The measures an organisation uses for assessing project success indicate if it understands and values the strategic contributions of projects and project

management to organisational goals. The PMI and PwC study (2022b) found that organisations on average have 7.1 metrics in place for every project but, of these, typically 4 are linked to the iron triangle (adherence to budget, scope, schedule, quality). The data also shows that organisations in South Asia on average have the most measures in place (8.3), and Latin America and Europe have the lowest number of measures in place (6.3 and 6.6, respectively). On the other hand, the top 10 percent of organisations have on average 10 metrics of project success in place, and they use a more outcome-focused approach to measurement to better communicate the impacts of projects. The most common outcome measures used by the top 10 percent of organisations are customer satisfaction, risk management indicators, operational efficiencies, alignment to the wider organisational strategy and KPIs (PMI and PwC, 2022b).

The top six critical success factors for public projects are found to be: professional project management and planning, clear statement of requirements, top-management support and accountability, clear vision and objectives, professional and motivated personnel and realistic expectations/expectation management (SIMPL Group and NZIER, 2000, as in PwC, 2017).

In today's public sector environment, a more outcome-focused approach to measuring project success is needed to better capture and report the benefits and the value of public sector projects.

2.2.1. THE SUCCESS RATE OF PUBLIC SECTOR PROJECTS

The success rate of public sector projects is related to the success metrics used to assess the projects, and, because the public projects are often aimed at delivering long-term non-financial benefits, it is not always easy to measure their success beyond the traditional project efficiency measures. In the following paragraphs the author presents the publicly available empirical research results of public sector projects' success rates.

The Royal Academy of Engineering and the British Computer Society (2004, as in PwC, 2017) found that 84% of public-sector projects resulted in failure of some sort. The Standish Group found that the success rate in the government sector was 18% (a US survey of IT projects) compared to 32% in the financial sector, or 59% in the retail sector (Goldfinch, 2007). A New Zealand government study judged 38% of government projects a success, while 59% involved problems and 3% were a complete failure (PwC, 2017). Public sector projects often heavily exceed their initial budgets (often due to the costs and scope underestimation), miss deadlines, are delayed, and have implementation issues or are stopped after significant money investments.

Some of the infamous cases include: TolCollect: German toll system (2005), National Health Service: NHS Care Records Service (2010), Swiss Federal Tax Administration: integrated tax system Insieme (2012) (PwC, 2017).

However, to gain a broader picture of their success, a holistic model for measuring public project success was proposed by Volden and Welde (2022) encompassing three levels of success: operational (output, efficiency), tactical (effect on user groups, effectiveness), and strategic (effect on society, other impacts (side-effects), relevance, sustainability, cost benefit efficiency). When the model was applied to evaluate 34 public projects in Norway, they found that public projects are often more successful than people think (the mean scores were between 4 and 5 (of maximal 6) for all six criteria). They argue about the role of the media in the public perception of project success, and they emphasise that the media that mostly models public opinion has a narrow definition of success and is negatively biased (Volden and Welde, 2022).

3. THE ORGANISATIONAL PROJECT MANAGEMENT MATURITY AND ITS INFLUENCE ON PROJECTS SUCCESS – METHODOLOGY AND RESEARCH RESULTS

Project management practitioners frequently refer to the current state of health of the project management discipline within an organisation as its level of maturity (Appleby et al., 2007). Organisational project management encompasses organisational commitment to the project management process, business alignment and prioritisation processes, the use of success criteria for the selection or termination of projects, standardisation and integration of project management methods, development of project related roles, teamwork, people and their competence, performance measurement at multiple levels, and a continuous improvement approach (Schlichter, 2001) and is the core competence to execute organisation strategies successfully (Schlichter, 2001). Organisational project management maturity is defined as the progressive development of an enterprise-wide project management approach, methodology, strategy, and the decision-making process (Appleby et al., 2007). It therefore implies that PM capabilities must be grown over time and implies different levels of maturity, i.e. the more mature the organisation the greater is the probability of successful and consistent realisation of projects, and the more mature the organisation the more complex projects can be executed (Schlichter, 2001).

To explore the achieved level of organisational project management maturity in the public sector, the most common used organisational project

management maturity models are shortly elaborated (in the subchapter 3.1.), on which the most empirical research is currently based. The central part of this chapter (subchapters 3.2 and 3.3.) presents the current state of public sector organisations' project management maturity and discusses its relevance for projects' success. The last part of the chapter (subchapter 3.4.) lists the empirically confirmed most common barriers to organisational project management maturity in the public sector.

To carry out the systematic literature review we searched the Web of Science-, the Scopus-, the Science Direct- and the Emerald-indexed research papers, the Google Scholar database, and the subject-matter-experts' publicly available reports and research studies. To conduct the research, we have used the title key words search “organisational project management maturity or project management maturity or project maturity” and “public sector or public sector organisations”. Only the research papers related to organisational project management maturity in the private sector were excluded from the research results.

3.1. THE MODELS OF ORGANISATIONAL PROJECT MANAGEMENT MATURITY

The most used approach to measure organisational project management maturity is based on the implementation of the one or more organisational project management maturity models. There are currently more than 30 models developed for measuring project management maturity in organisations (Grant and Pennypacker, 2006), of which the mostly used and cited are: the Capability Maturity Model Integration - CMMI (SEI, 2010), the Portfolio, Programme and Project Management Maturity Model - P3M3 (Axelos), the Organisational Project Management Maturity Model - OPM3 (PMI), the Praxis Capability Maturity Model, IPMA-Delta (organisational competence in managing projects across 5 dimensions: governance, management, organisational alignment, resources, people, IPMA, 2015), the Kerzner's PMMM (KPMMM), the Prado-PMMM (Portman, 2022), Berkeley's Project Management Maturity (PM)² Model, PRINCE2 Maturity Model (P2MM), PM Solutions' PMMM (Buesel, 2020, Portman, 2022, Nikolaenko and Sidorov, 2023). The currently available maturity models assess maturity, not only at organisation level, but also at portfolio, programme, and project level, PMO, agile team level or even at a perspective level, e.g. risk, stakeholder relationships (Portman, 2022), but this exceeds the scope of this paper.

Each of the organisational project management maturity models has its advantages and disadvantages which should be considered when choosing

the model/s most suitable for the organisation (Mateen, 2015, Buesel, 2020, Hernandez et al. 2020, Nikolaenko and Sidorov 2023, Chin, 2024). Khoshgoftar and Osman (2009) developed 27 criteria on which different project management maturity models can be compared and selected, such as publisher, scope, number of maturity levels (mostly 4-5), refer to standard, covering project/programme/portfolio management process, assessment difficulty and cost, suggestion of alternative for improvement or how simple and understandable it is (Mateen, 2015). Some challenges related to the implementation of the above mentioned models include the subjectivity of the assessment (inputs from different stakeholders should be accounted for when assessing the current maturity level), focus on the work processes (often the human resources or broader organisational context is omitted in the assessment, Jugdev and Thomas, 2002, as in Backlund et al., 2014), its application is time- and resource- consuming and if respondents do not experience that the maturity assessment leads to actions, i.e. if they do not experience that the assessment facilitated their own situations in managing projects, this may result in negative attitudes towards future maturity assessments, the lack of intrinsic motivation in answering the questionnaire if the results from the assessment confirm what most respondents more or less already know (Backlund et al., 2014). Other authors (Karim et al., 2023) have argued that models are too best-practice-centred, inflexible, too complex to apply, and not holistic (do not include organisational culture evaluation or rapid change in management direction). In their research Nikolaenko and Sidorov (2023) found that the majority of maturity models' weaknesses are that they do not take into account the presence of structural and infrastructural elements, such as a workplace, the necessary equipment and software, the availability of professional standards, instructions, regulations etc. There are also no processes for evaluating the effectiveness and efficiency of using the best practices, and the majority of models do not take into account the influence of corporate culture (Nikolaenko and Sidorov, 2023). Viana and de Miranda Mota (2016) argue that, to minimise the biases inherent to the individual maturity evaluations, an appropriate aggregation approach of individual perceptions should take place: a group decision-making method (voting procedure) or the points system (the answer most often chosen by the evaluators is considered the final answer). Also, to develop more efficient action plans a problem structuring model (value-focused thinking) is proposed (Viana and de Miranda Mota, 2016).

To overcome all the shortcomings of generic models Gareeb and Rwelamila (2023) proposed a conceptual project management maturity model developed for the specific sector (the South African Power sector).

The authors of the model argue the need to adjust the generic models to the organisational project culture and organisational project strategy that shape organisational competencies that support the project, to the technical and socio-cultural factors that impact project performance, as well as to the country-, sector- and project-specific factors (Gareeb and Rwelamila, 2023).

Due to the specific government-created environment of projects' implementation in public administration, Gasik (2019) proposed a Governmental Project Management Maturity Model with 5 levels: initial (no consciousness of importance of project management), local (project management at project and institutions' level), governmental (government shapes the ways of public projects management, central institutions, guidelines and regulations exist), cooperating (government actively supports project implementation, cooperation of public organisations with project suppliers) and optimising level (continuous improvement of Governmental Project Implementation System (GPIS)/Governmental Project Management (GPM)). Each is described through its general characteristics, exemplary practices, and benefits of achieving a given level. The model could be used as descriptive, prescriptive, and comparative (Gasik, 2019). Its comparative application has a significant potential for future comparative studies of public sector project management maturity.

On the other hand, there is a growing amount of research arguing that traditional models of measuring should be open to Project Management Office (PMO) maturity measures, due to its, nowadays more recognised, strategic support role: people before processes, diverse people are managing projects and diverse projects need different paths of progress (Sensei, 2022). Modern PMOs focus on value delivery and outcomes instead of processes and this is today also reflected in their names which are often other than PMO (e.g., Strategy Management Office, Centre of Excellence, Change Management Office). PMI and PwC (2023) use the term xMO to indicate that the name of this organisational unit is organisationally context- adaptable and increasingly other than PMO; its value-driven mindset distinguishes it from budget- and schedule-focused PMOs. Four key attributes of such an xMO are: people and culture focused (a huge mindset shift from enforcing standard operating procedures towards getting input and establishing guidelines), supportive (continuous learning, coaching, knowledge sharing, career development), flexible and adaptable (embracing servant leadership approach), and aligned to strategy (e.g., coaching teams on the use of goal-setting frameworks such as OKRs (objectives and key results)). To develop a value-driven culture with a mandate and support from senior leadership, contemporary xMOs should help create a psychologically safe environment,

destigmatise failure and promote a culture of speaking up: encourage, respond to, and reward the reporting of issues, errors, and failures (PMI and PwC, 2023).

This outcome-focused approach to measuring organisational project management maturity is seen also in the metrics used: value generation is one of the key indicators used to assess a PMO's maturity level (PMO Global Institute, 2023).

3.2. THE CURRENT STATE OF THE ORGANISATIONAL PROJECT MANAGEMENT MATURITY IN THE PUBLIC SECTOR

To compare the current state of the organisational project management maturity in the public sector across different organisations/industries/countries we have searched primarily for global studies, but this was not in the end an easy task. Our research results are presented in the following paragraphs.

There are several research studies aimed at industry-level comparison of project management maturity (Pennypacker, 2002, Cooke-Davies and Arzymanow, 2003, Grant and Pennypacker, 2006, Simangunsong and Da Silva, 2013, PMI and NEC, 2016) but from their results it cannot be concluded to which sector the researched organisations belong, the public or the private.

There are also national surveys, e.g. KPMG and PMI Cyprus (2023). The survey results have shown that the overall level of maturity of organisations in Cyprus was 3.5 (on a scale from 1 to 5) which is an increase compared to 2021 (2.8). The identified reasons behind the increase were: organisations are investing more in skillset, are understanding the importance of PM methodologies and have been adopting them (KPMG and PMI Cyprus, 2023). Prado and Carvalho's research (2022) shows that organisational maturity in Brazil has evolved from 2.44 in 2005 to 2.94 in 2021 (5-level Prado maturity model was used). Among organisations whose maturity is at level 4 or 5 are 4 government organisations (direct and indirect administration) and 2 non-profit organisations (Archibald and Prado, 2018). To help measure the project management maturity at a country level, Pinto and Williams (2012) have introduced the concept of developing Project Management Country Capability based on 100 case studies (the OPM3 Portugal project).

The national surveys of public sector organisations' maturity have shown the following results: the empirical research of Latvian public sector bodies (119 municipalities) has shown that 32.99% assess their maturity level at 3 (on a scale from 1 to 5) - organisational standards and institutionalised process, and 21.65% assessed their organisation's maturity at level 2 –

structured processes and standards (Pulmanis, 2014). Prado and Adrade (2015), as in Gasik (2019), found that the average score for all examined public institutions in Brazil was 2.5 (the Prado-PMMM model was used with 5 levels, from initial to optimised). In New Zealand, the KPMG study (2011), as in Gasik (2019), found that 80% of public-sector organisations are at level 2 or lower on a scale of 0-5, with 50% of them at levels no higher than 1.5 (the P3M3 model was used). In Ghana Ofori and Deffor (2013) found that public-sector organisations have achieved level 2 (the Kerzner's PMMM model was used), but on average they are on the embryonic level of maturity (Gasik, 2019). Žurga (2018) has assessed the PM maturity in Slovenian public administration based on TPM – Total Project Management Maturity model developed by the author for public administration. The research results are: management of projects and programmes, as well as HRM for project management are at level 2 (out of 5) – initiated, while management of portfolios of projects, organisational support for project management, and integration of project management and strategic management are at level 3 – implemented.

One global study, the PwC (2004) global research (200 organisations), shows that the lowest maturity levels can be found in the public sector, where the majority of organisations (56.3%) only reached maturity level 1. The average for all 200 organisations is 2.5 (informal processes); the PwC 5-level maturity model was used (PwC, 2004). Regarding desired maturity level, the public sector is aiming for the largest increase (+1.4), which shows the understanding of project management relevance in today's environment. The PM Solutions global research from 2014 (293 organisations across different industries) revealed that most organisations (76%) included in the research have improved in PM maturity over the past five years with 33% moving from level 1 to level 2 (the PMMM model was used, PM Solutions, 2014). Their survey results are in line with the PwC findings from 2004: the average level of project management maturity for 293 organisations is 2.5 (on a scale of 1-5), where 30% are at level 1, 28% at level 2, 22% at level 3, and 11% at levels 4 and 5. They are most mature in project integration management (2.7) and least mature in risk management (2.3), in particular quantitative risk analysis, risk response planning, and risk control. The data is also showing that organisations have steadily and consistently moved up in levels of project management maturity between 2001 and 2014: in 2001 89% of organisations were at level 1 maturity, and only 5% of organisations were at level 3 or higher (PM Solutions, 2014). The most mature organisations are found in the information industry (2.9) while the least mature organisations

are in the healthcare industry (2.1), with the lowest scores in project quality management and risk management (PM Solutions, 2014).

The Wellington survey (2021) based on respondents from 214 organisations in the UK and internationally from different industries, including central and local government, has shown that 45% of respondents are somewhat or very dissatisfied with the current level of PM maturity in their organisation. The data show that 55% of respondents believe the current level across their organisation is 3 (standardised) or more (the Axelos 5-level model P3M3 was used).

There were also organisational-level studies conducted in public sector organisations which have revealed critical areas to be improved for more effective project practices, e.g. OPM3 assessment of a Mid-Eastern Government Department (APM, 2007), OPM3 and P3M3 assessment of public-sector organisations from Australia, New Zealand and the United States (Mitchell et al., 2008), OPM3, PM Solutions' PMMM and CMMI-based assessment of the South African Government (Van der Waladt, 2020). At the Faculty of Engineering and Architecture of the University of Pamplona (Hernandez et al., 2020) a medium-low degree of maturity was found – common project management processes (the Kerzner's PMMM model was used).

A relevant indicator of a project management mature organisation is the existence, the organisational position and the developmental stage (supportive roles), i.e. the maturity of its PMO. Due to the lack of comparable PMMM scores for public sector, one can reach for the Global PMO Maturity Index, created by PMI and PwC (2022a). Based on the results from a worldwide survey of over 4,000 project management professionals who were asked how often their PMO performed a range of activities linked to value creation, the index measured levels of activity against 23 elements of PMO maturity across 5 dimensions: governance, integration and alignment, processes, technology and data, people (PMI and PwC, 2022a).

The 2021 Global PMO Maturity Index score shows that global PMO maturity sits at an average of 61.4 (out of a maximum of 100). On the other hand, the maturity score among the Top 10 percent is 94.9. The data also suggests that the index dimensions reinforce one another – rarely do PMOs excel in one dimension and fail in another; therefore, a PMO reaching for a higher maturity level should invest its resources across all five dimensions (PMI and PwC, 2022a). The data for public sector organisations could not be extracted from their public reports.

Pinto et al., (2010) suggest a different approach to measuring PMO's maturity, the PMO maturity cube, which should comprise three dimensions:

scope (enterprise, departmental, programme-project), approach (strategic, tactical, operational), and the maturity level (basic, intermediate, advanced). The model can be easily used by PMO's as a self-assessment tool to assess the current level and to define the target level of maturity in the desired PMO's functions/approaches and is now integrated into the PMO Value Ring (PMO Global Alliance).

Some case studies worth studying found in the research are: The Danish Commerce and Companies Agency's PMO, the Lithuanian Ministry of Economy PMO (Pilkaitė and Chmieliauskas, 2015), the UK Infrastructure and Project Authority (IPA).

The key findings on the current state of organisational project management maturity in the public sector are summarised in Table 1.

Table 1. The current state of organisational project management maturity in the public sector – key results

Level of analysis	Authors	Findings (maturity level on a scale from 1 to 5)	The used PMM model
National (overall, Cyprus)	KPMG and PMI Cyprus (2023)	Increase from 2.8 (in 2021) to 3.5 (in 2022)	From initial to optimising level
National (overall, Brazil)	Prado and Carvalho (2022)	Increase from 2.44 (in 2005) to 2.94 (in 2021)	Prado-PMMM
National (public sector organisations, Latvia)	Pulmanis (2014)	32.99% assess their level at 3, 21.65% assess their level at 2	Author's maturity description (from initial to optimised processes)
National (public sector organisations, Brazil)	Prado and Adrade (2015)	2.5 (average level for all examined public institutions)	Prado-PMMM
National (public sector organisations, New Zealand)	KPMG (2011)	80% are at level 2 or lower	P3M3
National (public sector organisations, Ghana)	Ofori and Deffor (2013)	Level 2	KPMMM
National (public sector organisations, Slovenia)	Žurga (2018)	Level 2 - 3	TPMMM developed by author
Global	PwC (2004)	56.3% of public sector organisations are at level 1 but they are aiming for the largest increase (+ 1.4)	PwC PMMM

Global	PM Solutions (2014)	76% of organisations have moved from level 1 to level 2 over the past 5 years	PMMM
Global (UK and internationally)	Wellingtone (2021)	55% of respondents believe the current level across their organisation is 3 or more	Axelos P3M3

Source: Author

3.3. THE RELEVANCE OF ORGANISATIONAL PROJECT MANAGEMENT MATURITY FOR THE PUBLIC PROJECTS' SUCCESS

The research has shown that higher organisational project management maturity level leads to more successfully (Kumar et al., 2016, Pretorius et al., 2022), and more efficiently completed projects; in low-maturity organisations only 39% of projects get completed on time (vs. 63% in high-maturity organisations); 46% are completed within budget (vs. 67% in high-maturity organisations); 56% meet the original intent or business purpose (vs. 77% in high-maturity organisations). The low-maturity organisations are also more prone to scope creep (47% vs. 30% in high-maturity organisations) and project failures (21% vs. 11% in high-maturity organisations) (PMI, 2020).

Average value organisations have seen that, by increasing their level of project management maturity, there is a decrease in failed projects (29%), projects delivered under budget (23%), projects delivered ahead of schedule (16%), improvement in projects aligned with business objectives (37%), improvement in productivity (21%), increase in customer satisfaction (26%) and cost savings per project (16% of total project cost) (PM Solutions, 2014). High performers have gained substantially greater value than the average presented here, which clearly indicates the value of improving project management maturity for projects' and organisations' success.

The value of improved organisational project management maturity can be measured through benefit metrics, which should capture both tangible benefits (project margin improvement, increased market share capture, improved cash flow, improved customer satisfaction, improved time-to-market execution, lower non-conformance costs, improved safety, health and environmental performance, improved service delivery, improved operational capability or availability) and intangible benefits (improved workplace environment, more effective leadership, enhanced career opportunities, improved use of resources, brand recognition, organisational reputation and good will, increased trust from the customer (Sopko and

Strausser, 2010, Irfan et al., 2020, Bana Sinzi and Odhuno, 2021). In the public sector, due to its specific outcomes, the value of improved organisational project management maturity should also be measured through increased trust from the public, increased trust from the public sector partner organisations and through other non-financial measures related to public benefits.

PMO Global Institute (2023) has found that, by increasing PMO maturity, organisations attain following benefits: higher success rates for projects, better management of resources, improved alignment of strategy, better risk handling, enhanced level of stakeholder contentment, enhanced project portfolio management, standardised procedures, enhanced visibility and reporting, culture that encourages continuous improvement, enhanced learning within the organisation, better ability to adjust to change, improved decision making, increased self-assurance from the leadership, effective technology use, a competitive edge, improved team and project manager outcomes, better handling of change, insightful reports and analytics. This is in line with the PMI and PwC research results (2022b); the top 10 percent of organisations (230 organisations with the highest PMO maturity index score) outperformed organisations overall in 2020 in revenue, customer satisfaction and acquisition, and Environmental, Social and Governance Indicators (ESG). Santos and Varajao (2015) discuss in their paper several scenarios for PMO implementation in the public administration, each suitable for different areas and reflecting different maturity levels.

If we consider the findings of PwC (2004, 2007) that organisational aspects represent 59% of project failures, and that over 60% of project failures are linked to internal project issues (bad estimates/missed deadlines, insufficient resources, scope changes) the importance of investing in organisational project management capabilities is even more significant.

3.4. THE MOST COMMON BARRIERS TO ORGANISATIONAL PROJECT MANAGEMENT MATURITY IN THE PUBLIC SECTOR

The barriers to organisational project management maturity in the public sector could be grouped into several key areas: technical competence, management methodology, computerisation, human relations, organisational structure, strategic alignment, and transversal categories such as lack of project-related infrastructure, sudden changes of priorities or inappropriate tracking and updating (Da Silva Bezerra et al., 2021).

The study of small-medium Greek public organisations (Local Governmental Organisations) has shown that the most important factors

that are inhibiting the introduction of a project management capability model (PMCM) were: insufficient knowledge and qualifications of the staff on the project management subject areas, insufficient communication and coordination between related departments because of the hierarchical structure, lack of management commitment throughout the development and the application of the PMCM and the cautious approach taken by members of staff because of the radical changes introduced (Fitsilis and Chalatsis, 2014). The operating environment (e.g. strong hierarchy) and culture are also among the greatest barriers to project efficiency in the public sector.

Hazel and Jacobson (2014) argue that when public-sector organisations do not have the resources for advanced project management training, several simple tools, templates, and frameworks could be used to improve the current project management processes. However, the use of simple project tools and templates still asks for at least basic project management education.

The PMI global survey on project management (PMI, 2023) has emphasised that the evolving work environment demands new skills: technical (agile project management practices, data analysis), power skills (collaborative leadership, relationship building), and business acumen skills (understanding the organisation and industry). Therefore, to reach higher performance rates organisations should invest in capability-building for both individuals and teams. The research shows that organisations that provide at least three enablers, such as mentoring programmes, training or communities of practice, report significantly higher project performance rates. The top three enablers associated with higher project performance in the government industry are employee resource groups to help navigate change, training on resilience and managing change, and support for managing change via mental health resources (PMI, 2023).

4. DISCUSSION

The research results have shown that public sector organisations are at lower or medium levels of organisational project management maturity, but they are also aiming for the largest increase regarding desired maturity level, which indicates that they are understanding the relevance of investing in project management maturity for public projects and organisational success.

The organisational project management maturity models and PMO maturity measures presented in the paper are valuable tools for gap analysis and benchmarking. Although measuring project maturity *per se* does not give better results, the decision to measure it signals the awareness of the

benefits that moving toward higher levels will bring to the organisation. To reap the benefits of higher maturity the appropriate maturity goal should be set, action plans implemented, and organisational staff motivated. It should be said that there is no one-size-fits-all level of maturity. The appropriate level of maturity depends on the organisation's goals, project management strategies, resource capabilities, scope and needs (PM Solutions, 2024). Many organisations at level 2-3 can efficiently implement projects. When deciding about moving to the next level of maturity, different factors should be considered: the number of projects and their value, the complexity of the projects, costs and risks associated with achieving the next level of maturity (Lichtarski et al., 2010).

Public sector project management should develop, track and report benefit metrics to regain trust from the public and should measure the ROI and the value of improved organisational project management maturity through measures elaborated in this paper. The role of PMO should also be (re)evaluated due to its valuable role in fostering value-driven culture and outcome-focused delivery.

Managing and sharing project knowledge is crucial in progressing towards higher maturity levels, as it helps continuous improvement and avoiding repeating past project mistakes.

If the public organisations start to report more non-financial outcome metrics and to measure success in a holistic way, the media will follow and learn the broader concept of public projects' success. The challenges and complexities related to the public sector project environment should be taught at more university-degree programmes to cover the skill gap in this sector.

The research was limited by the availability of public secondary data, but it gives valuable insights for public sector organisations' leaders who are thinking about ways of improving project efficiency and effectiveness. The paper also offers guidelines for future comparative empirical research of organisational project management maturity in public sector organisations.

5. CONCLUSION

The research results have confirmed that the organisational project management maturity is a critical success factor of public sector projects. The currently low levels of project management maturity (measured through organisational project management maturity models or PMO maturity metrics) are associated with lower project efficiency and lower strategic alignment, but also with lower revenue, lower customer satisfaction and

acquisition, and lower ESG indicators. However, the fact that public sector organisations are aiming for the largest increase in desired maturity level show the rise of awareness of the value of investing in project management maturity in this sector.

When choosing the appropriate model(s) to measure project management maturity, organisations should consider their strengths and weaknesses and adjust the generic model to the country-, sector- and project-specific factors. The targeted maturity level should be set after the costs and risks related to achieving the next level of maturity, the complexity, the value, and the number of projects per year have been considered. By introducing the benefit metrics and benefit management, public sector organisations could prove to themselves and to the public the value of their investments in improved organisational project management maturity.

Although some authors may argue that individual skills and knowledge are also critical project success factors, organisations which improve their organisational project management capabilities are also investing in enablers that support individual and project teams' growth.

The currently available global empirical research of organisational project management maturity in public sector organisations is very limited. This paper gives guidelines and references for future comparative primary research on this subject, but it also presents practical tools which can be used by public sector organisations' leaders and project staff to analyse, measure, and improve their project management practices.

6. BIBLIOGRAPHY

1. Appleby, T. et al., 2007. *Advancing Organisational Project Management Maturity*, Center for Business Practices, Havertown.
2. Archibald, R. D., Prado, D. S., 2018. Maturity in Project Management – Brazil, 2017 Research Report: Benchmark Organisations (High Performance Organisations).
3. APM, 2007. Models to Improve the Management of Projects.
4. Buesel, Ph., 2020. Project Management Maturity Models: A Structured Comparison, Master Thesis, University of Applied Sciences, FH Vorarlberg.
5. Backlund, F. et al., 2014. Project Management Maturity Models – A Critical Review. A Case Study Within Swedish Engineering and Construction Organisations. *Procedia – Social and Behavioral Sciences*, 119, pp. 837-846.
6. Bana Sinzi, A., Odhuno, E., 2021. Impact of Project Management Maturity on Service Delivery of Rural Electrification Project in Bugesera District, Rwanda, *International Journal of Scientific and Research Publications*, 11 (10), pp. 705-712.
7. Bannerman, P. L., 2008. Defining Project Success: A Multilevel Framework. *PMI Research Conference Proceedings*, Warsaw.
8. Blixt, C., Kirytopoulos, K., 2017. Challenges and Competencies for Project Management in the Australian Public Service. *International Journal of Public Sector Management*, 30 (3), pp. 286-300.
9. Chin, Ch. M. M., 2024. *Project Management Maturity Models for Organisational Performance*. IGI Global.
10. Cooke-Davies, T. J., Arzymanow, A., 2003. The Maturity of Project Management in Different Industries: An Investigation into Variations Between Project Management Models, *International Journal of Project Management*, 21 (6), pp. 471-478.
11. Da Silva Bezerra, E. C. et al., 2021. Barriers to Maturity in Project Management in the Public Sector: A Systematic Literature Review. *Research, Society and Development*, 10 (10), pp. 1-13.
12. Fitsilis, P., Chalatsis, Th., 2014. Adoption of Project Management Practices in Public Organisations. *iBusiness*, 6 (3), pp. 131-142.
13. Gareeb, N., Rwelamila, P. M. D., 2023. A Conceptual Project Management Maturity Model for the South African Power Sector, in Mircela, M., Nguyen, T. M. (ed.), *Project Management – New Trends and Applications*, IntechOpen, London.
14. Gasik, S., 2016. Are Public Projects Different Than Projects in Other Sectors? Preliminary Results of Empirical Research. *Procedia Computer Science*, 100, pp. 399-406.
15. Gasik, S., 2018. A Framework for Analysing Differences Between Public-Sector and Other-Sector Projects. *Public Governance*, 3 (45), pp. 73-88.
16. Gasik, S., 2019. A Proposal of Governmental Project Management Maturity Model. *PM World Journal*, 8 (9), pp. 1-25.

17. Grant, K. P., Pennypacker, J. S., 2006. Project Management Maturity: An Assessment of Project Management Capabilities Among and Between Selected Industries, *IEEE Transactions on Engineering Management*, 53 (1), pp. 59-68.
18. Hazel, S. M., Jacobson, W. S., 2014. Project Management Principles for Use in the Public Sector: Tools for the Everyday Project Manager. *Public Management Bulletin*, 9, pp. 1-11.
19. Hernandez, F. Y. et al., 2020. Analysis of Maturity for Project Management in Organisations. *Revista Espacios*, 41 (36), pp. 61-67.
20. IPMA, 2015. IPMA Delta – Moving Organisations Forward in Translating Strategy into Results.
21. Irfan, M. et al., 2020. Project Management Maturity and Organisational Reputation: A Case Study of Public Sector Organisations, *IEEE Access*, 8, pp. 73828-73842.
22. Karim, M. A. et al., 2023. The Decline of Project Management Maturity Models: A Review Paper. *International Journal of Academic Research in Business and Social Sciences*, 13 (5), pp. 1896-1905.
23. KPMG and AIPM, 2022. The State of Project Management in Australia 2022: Leading Projects Through Volatility.
24. KPMG and PMI Cyprus, 2023. *2022 Project Management Survey*.
25. Kumar, B. et al., 2016. Project Management Maturity and Project Success in IT Companies of India, *Pacific Business Review International*, 9 (3), pp. 12-24.
26. Lichtarski, J. M. et al., 2010. In Search of Project Management Efficiency. Renewal of Public Sector Institutions. *Research Papers of Wrocław University of Economics*, 148, pp. 215-225.
27. Mateen, M., 2015. Measuring Project Management Maturity – A Framework for Better and Efficient Projects Delivery. Master of Science Thesis in the Master's Programme International Project Management. Chalmers University of Technology, Goeteborg, Sweden.
28. Mitchell, S., et al., 2008. The Benefits of Project Management Maturity Assessments: An Analysis of OPM3 Cases from Australia, New Zealand, and the United States. *PMI Global Congress 2008: Proceedings*.
29. Nikolaenko, V., Sidorov, A., 2023. Assessment of Project Management Maturity Models Strengths and Weaknesses. *Journal of Risk and Financial Management*, 16 (2).
30. Oracle, 2014. The Challenges of Managing Public Infrastructure project: A Discussion Paper from Oracle.
31. Pennypacker, J. S., 2002. Benchmarking Project Management Maturity: Moving to Higher Levels of Performance. *Proceedings of the PMI Annual Seminars and Symposium*, San Antonio.
32. Pilkaite, A., Chmieliauskas, A., 2015. Changes in Public Sector Management: Establishment of Project Management Offices – A Comparative Case Study of Lithuania and Denmark. *Public Policy and Administration*, 14 (2), pp. 291-306.
33. Pinto, A. et al., 2010. The PMO Maturity Cube, A Project Management Office Maturity Model. *PMI Research and Education Congress 2010*, Washington D.C., pp. 1-56.

34. Pinto, J. A., Williams, N., 2012. Country Project Management Maturity. *PMI Global Congress 2012: Proceedings*.
35. Oberli, M. et al., 2023. Public Sector Projects: GPS White Paper, EY.
36. PMI, 2006. Government Extension to the PMBOK Guide, Third Edition, PMI.
37. PMI, 2020. Pulse of the Profession 2020: Ahead of the Curve: Forging a Future-Focused Culture.
38. PMI and PwC, 2022a. PMO Maturity: Lessons from the Global Top Tier.
39. PMI and PwC, 2022b. Measuring What Matters: Why You Need to Change Your Perspective on Project Success.
40. PMI and PwC, 2023. The Evolution of PMOs: Delivering Value Through xMOs.
41. PMI, 2023. Pulse of the Profession 2024. The Future of Project Work: Moving Past Office-Centric Models.
42. PMI India and NEC Technologies India, 2016. Game-Changers in Project Maturity Measurement: Leading IT Companies Are Adopting New Project Practices to Align Their PMO's To Changing Business Realities.
43. PMO Global Institute, 2023. PMO Maturity Evolution Model (PMOMEM) and Assessment [online]. Available at: <https://pmoglobalinstitute.org/pmo-maturity-evolution-model-pmomem-pmo-maturity-model-and-assessment/>.
44. PM Solutions, 2014. Project Management Maturity and Value Benchmark: Research Report.
45. PM Solutions, 2024. Complete Guide to Project Management Maturity for Your Organisation [online]. Available at: <https://www.pmsolutions.com/project-management-maturity-guide>.
46. Portman, H., 2022. Project Management Maturity and Excellence Models: Stirring in the Fruit Bowl. *PM World Journal*, 11 (2), pp. 1-32.
47. Prado, D. S., Carvalho, M., 2022. Maturity in Project Management – Brazil, 2021 Research Report: Comparative Performance Analyses.
48. Pretorius, S. et al., 2022. The Relationship Between Project Management Maturity and Project Success, *The Journal of Modern Project Management*, 10 (1), pp. 218-231.
49. Pulmanis, E., 2014. Public Sector Project Management Application And Sustainability Problems, Case of EU Member State – Latvia. *PM World Journal*, 3 (11), pp. 1-35.
50. PwC, 2004. Boosting Business Performance through Programme and Project Management: A First Global Survey on the Current State of Project Management Maturity in Organisations Across the World.
51. PwC, 2007. Insights and Trends: Current Programme and Project Management Practices: The Second Global Survey on the Current State of Project Management Maturity in Organisations Across the World.

52. PwC, 2017. Are Public Projects Doomed to Failure from the Start? Transformation Assurance [online]. Available at: <https://www.pwc.ch/en/publications/2017/pmi-are-public-projects-doomed-to-failure-en-2017.pdf>.
53. Santos, V., Varajao, J., 2015. PMO as a Key Ingredient of Public Sector Projects' Success – Position Paper, *Procedia Computer Science*, 64, pp. 1190-1199.
54. Schlichter, J., 2001. PMI's Organisational Project Management Maturity Model: Emerging Standards. *Proceedings of the PMI Annual Seminars and Symposium*, November 2001, pp. 399-406.
55. Simangunsong, E., Da Silva, E. N., 2013. Analysing Project Management Maturity Level in Indonesia, *The South East Asian Journal of Management*, 7 (1), pp. 72-84.
56. Sopko, J. A., Strausser, G., 2010. The Value of Organisational Project Management (OPM) Maturity – Understanding, Measuring, and Delivering Benefits. *PMI Global Congress 2010: Proceedings*, Washington, D.C.
57. Van der Walddt, G., 2020. Towards Project Management Maturity: The Case of the South African Government, *Africa's Public Service Delivery and Performance Review*, 8 (1), pp. 1-10.
58. Viana, J. C., de Miranda Mota, C. M., 2016. Enhancing Organisational Project Management Maturity: A Framework Based on the Value Focused Thinking Model. *Production*, 26 (2), pp. 313-329.
59. Volden, G. H., Welde, M., 2022. Public Project Success? Measuring the Nuances of Success through Ex Post Evaluation. *International Journal of Project Management*, 40, pp. 703-7014.
60. Wellington, 2021. The State of Project Management Report.
61. Wirick, D. W., 2009. *Public-Sector Project Management: Meeting the Challenges and Achieving Results*, John Wiley and Sons, Hoboken.
62. Žurga, G., 2018. Project Management in Public Administration. TPM – Total Project Management Maturity Model. The Case of Slovenian Public Administration. *Transylvanian Review of Administrative Sciences*, 14 (53), pp. 144-159.

**GREEN
AND
DEVELOPMENT
ECONOMICS**

THE IMPACT OF ECONOMIC GROWTH AND RENEWABLE ENERGY CONSUMPTION ON GREENHOUSE GAS EMISSIONS IN EU COUNTRIES

FISNIK MORINA

University Haxhi Zeka
Faculty of Business
Peja, Kosovo
fisnik.morina@unhz.eu

SAUDA SKENDEROVIĆ

University Haxhi Zeka
Faculty of Tourism,
Hospitality and Environmental Management,
Peja, Kosovo,
sauda.skenderovic@gmail.com

ADEM DRESHAJ

University Haxhi Zeka
Faculty of Tourism, Hospitality and Environmental Management,
Peja, Kosovo,
adem.dreshaj@unhz.eu

Paper category: Original scientific paper

ABSTRACT

In a time where the economy and the environment stand at an unprecedented crossroads, our research focuses on the intricate link between economic growth and the utilisation of renewable energy resources and their impact on greenhouse gas emissions, examining the challenges and opportunities European Union countries face on the path towards a sustainable environmental and economic future. This study investigates the influence of economic growth and renewable energy consumption on greenhouse gas emissions in European Union member states. The utilisation of renewable energy resources is a fundamental challenge in addressing climate change, aiding in reducing dependence on fossil fuel resources and lowering greenhouse gas emissions.

Our study covers the time period from 2008 to 2022 and includes data from 27 European Union member countries. In this study, carbon dioxide emissions are the dependent variable. The independent variables consist of economic growth, total energy consumption, primary energy intensity, renewable energy consumption, government effectiveness, inflation, food production index, urban population growth, and GDP per capita.

Our study has revealed significant findings regarding the impact of economic growth and renewable energy consumption on greenhouse gas emissions in European Union countries. The key findings of this research contribute to understanding the complex relationships among economic factors, renewable energy consumption, and greenhouse gas emissions in the context of European Union countries. This analysis will aid in the development of policies aimed at implementing sustainable strategies to reduce the impact of economic activities on the environment. Progress towards a cleaner and more sustainable economy will enrich this vital debate about the future of the environment and the economy.

Keywords: economic growth, environmental impact, European Union, greenhouse gas emissions, renewable energy consumption, sustainability.

1. INTRODUCTION

As climate change continues to exert significant impacts on the environment and society, research on how economic growth and the use of renewable energy resources influence greenhouse gas emissions is critical for understanding and addressing these challenges. Climate change is one of the most urgent issues of our time, with tangible effects on a global scale, including rising temperatures, glacier melting, and the increased frequency of extreme weather events. The European Union, as one of the world's major economic and political blocs, is committed to sustainable growth, addressing both environmental and climate challenges simultaneously. EU policies aim to reduce greenhouse gas emissions and promote the use of renewable energy sources to achieve the goals set out in the Paris Agreement and other climate strategies. These policies include investments in renewable energy infrastructure, the use of fiscal and legal incentives to encourage clean technologies, and the enactment of laws to limit greenhouse gas emissions in industry and transport. To better understand the impact of economic growth and renewable energy consumption on greenhouse gas emissions, it is crucial to research and analyse concrete data at the country level for EU member states. By exploring this analysis deeply, we can identify common trends and patterns in energy use and greenhouse gas emissions within each country's economic growth context. This allows us to assess the effectiveness of current policies and identify opportunities for improvement towards more sustainable growth and reduced greenhouse gas emissions. In this light, our research aims to make a valuable contribution to the discussion and development of sustainable policies to improve air quality and protect the environment within the EU and beyond.

The primary objective of this study is to understand and document the complex relationship between economic growth, renewable energy consumption, and greenhouse gas emissions in European Union member states. Through the analysis of historical data and the use of advanced analytical methods, we aim to identify and describe potential trends and the impacts of various policies on greenhouse gas emission levels. To achieve our goal, the research will utilise a combination of economic, energy, and environmental data to assess each country's performance in reducing greenhouse gas emissions. In addition to analysing data from government and other institutional sources, we will use other data sources, such as surveys, polls, and specialised reports to support our assessment. A key aspect of this research is identifying best practices, and the challenges EU member states face in implementing policies to reduce greenhouse gas emissions. The use

of advanced analytical methods and the evaluation of diverse data sets will help us represent and explain variations in greenhouse gas emission levels in a scientific and analytical context. In line with this objective, the study will employ a wide range of statistical and data analysis methods, including correlation analysis and fixed-effect regression analysis, to identify and evaluate potential relationships between the variables of interest. This will provide us with a deeper and more scientific understanding of the dynamics of economic growth, renewable energy consumption, and greenhouse gas emissions within the EU context.

We will ground our research in an analysis of the political and legal context of the European Union concerning the reduction of greenhouse gas emissions and the promotion of renewable energy use. This includes evaluating international climate agreements, such as the Paris Agreement, as well as EU directives and strategies aimed at meeting its emission reduction targets and renewable energy goals at the Union level. Analysing this political and legal context will provide an essential framework for understanding the impact of EU policies and measures towards a cleaner environment and a more sustainable economy.

In addition to assessing specific agreements and directives, our research will seek to identify their implementation and enforcement in practice by analysing the results and challenges encountered in the policy implementation process at the level of EU member states. In line with our research objectives, the analysis of the political and legal context will adopt a scientific and objective approach, referencing reliable and verifiable sources such as official EU documents, reports from international and scientific agencies, and published research in the fields of environmental and energy policy. This will help us provide a detailed and fact-based analysis of the context of policies and measures undertaken in the European Union to address climate change challenges and advance towards a sustainable environment and economy in the future.

2. LITERATURE REVIEW

Numerous studies have explored the complex and context-specific relationship between economic growth and greenhouse gas emissions. In this review, we examine various studies investigating the impact of economic growth and energy consumption on carbon dioxide (CO₂) emissions, with a particular focus on renewable energy consumption across different regions and countries. The data obtained from these studies is essential for understanding the nuances of the impact of economic growth

on environmental sustainability, especially in the context of European Union (EU) countries.

Alaganthiran and Anaba (2022) conducted an empirical study in 20 selected Sub-Saharan African (SSA) countries, using panel linear regression models to analyse data from 2000 to 2020. Their findings indicate a significant positive relationship between economic growth and CO₂ emissions, with a 1% increase in economic growth leading to a 0.02% increase in CO₂ emissions. This study highlights the environmental cost of economic growth in SSA countries, particularly due to their heavy reliance on oil consumption and the tourism sector, both of which significantly contribute to air quality degradation. Additionally, the study identified population growth as a contributing factor to the increase in CO₂ emissions, although future international agreements and protocols may help mitigate these effects. Similarly, Onofrei, Vatamanu and Cigu (2022) explored the long-term relationship between economic growth and CO₂ emissions in the 27 EU member states from 2000 to 2017. Using dynamic regression methods and cointegration techniques, they found a significant long-term relationship, with a 1% change in GDP resulting in a 0.072% change in CO₂ emissions. The study also emphasises the importance of environmental policies that can reduce emissions even during periods of economic growth, as higher income levels tend to increase the demand for environmental protection. Osadume and University (2021) expanded the investigation to selected West African countries, using panel econometric methods to analyse data from 1980 to 2019. Their results revealed a strong positive impact of economic growth on carbon emissions, with a 1% increase in economic growth resulting in a 3.11% increase in CO₂ emissions. This significant correlation underscores the urgent need for policy measures that encourage the use of efficient energy technologies and the establishment of carbon trading centres to mitigate the negative environmental effects of economic growth.

The relationship between energy consumption and CO₂ emissions is also critical. Yamakaa, Phadkanthaa and Rakphoa (2021) investigated this relationship in African OPEC countries, finding a positive impact of economic growth on long-term CO₂ and methane emissions. Their study highlighted that, while economic growth significantly contributes to greenhouse gas emissions, the impact of energy consumption on CO₂ emissions, though positive, was statistically insignificant in the short term. Osobajo, Otitoju, Otitoju and Oke (2020) further explored this relationship in 70 countries between 1994 and 2013, using regression analyses and panel cointegration tests. Their findings support the notion that both energy consumption and economic growth have a significant positive impact on CO₂ emissions,

underscoring the need for a global transition to a low-carbon economy through substantial investments in clean energy. The role of renewable energy in mitigating CO₂ emissions has also been a focal point of research. Espoir, Sunge and Bannor (2023) investigated the impact of economic growth on CO₂ emissions in 47 African countries, confirming the Environmental Kuznets Curve (EKC) hypothesis. Their results indicate that while economic growth initially increases emissions, the adoption of renewable energy and effective governance can significantly reduce long-term emissions. This study highlights the potential of renewable energy to offset the negative environmental impacts of economic growth. Karedla, Mishra and Patel (2021) found that trade openness significantly reduces CO₂ emissions in India, whereas manufacturing and GDP have a long-term positive impact on emissions. These findings suggest that policies encouraging cleaner production methods and non-polluting industries are essential for balancing economic growth with environmental sustainability.

Comparative studies across different regions provide additional insights. Furkan, Hasan and Uddin (2023) conducted a comparative study between high-income and lower-middle-income countries, revealing a strong positive correlation between GDP and greenhouse gas emissions in lower-middle-income countries, while tertiary education shows a negative correlation with emissions. In high-income countries, however, GDP is not a primary driver of emissions, indicating that economic growth alone does not determine environmental impact. This suggests the importance of educational and regulatory frameworks for mitigating emissions. The study by Mitić et al. (2023) on Southeastern European countries further supports the need for integrated policy approaches. They found a bidirectional causality between CO₂ emissions, economic growth, and employment, indicating that these factors are interdependent. Effective environmental policies, therefore, need to consider these interconnections to achieve sustainable development. The literature reveals a complex and context-specific relationship between economic growth, energy consumption, and CO₂ emissions. While economic growth often leads to increased emissions, the adoption of renewable energy and effective governance can mitigate these effects. For the EU, these findings underscore the importance of integrating environmental policies with economic strategies to achieve sustainable development. Policymakers should focus on promoting renewable energy, increasing energy efficiency, and implementing strong environmental regulations to balance economic growth with environmental sustainability.

The studies included in our review cover a wide geographical range, from Sub-Saharan African countries and OPEC nations to EU countries

and Southeastern Europe. This diversity helps to understand different contexts, but it can also create challenges in generalising findings. Each region has unique economic, social, and political characteristics that influence the relationships between economic growth and CO₂ emissions. The econometric methods used, such as linear regression models, DOLS, and cointegration techniques, are useful for analysing both short-term and long-term relationships. However, such a focus on traditional econometric techniques may overlook newer methods capable of capturing more complex and non-linear dynamics. While some studies examine the impact of renewable energy, most still focus on overall energy consumption and fossil fuel use. This leaves a gap in fully understanding the role of renewable energy in reducing greenhouse gas emissions. Many studies concentrate on the link between economic growth and CO₂ emissions, but few explore the influence of other factors such as technology, environmental policies, and innovation. These factors can have a significant impact on emission reductions even in the presence of economic growth. Our study aims to contribute to the existing literature by providing a thorough and focused analysis of EU countries, with a particular emphasis on the role of renewable energy and the complex interactions between economic and environmental factors. By analysing the impact of specific EU policies and using an extended time period, we aim to offer new insights that can aid in formulating more effective policies to balance economic growth with environmental sustainability.

According to the study by Tomić, Đorđević and Grdić (2022), countries aiming for high economic growth have often compromised environmental quality by pursuing industrial practices that, in the long run, have damaged local and global ecosystems. The study analyses the impact of the development of environmental technologies, renewable energy supply, and overall primary energy supply on CO₂ emission intensity in five countries: Italy, Germany, Croatia, Brazil, and Finland from 1990–2019. Using panel analysis with random effects models (REM) and fixed effects models (FEM), the results show that green technologies and renewable energy hurt CO₂ emissions, helping to protect the environment. In contrast, the overall primary energy supply positively impacts emissions, limiting the prospects for sustainable development (Tomić et al., 2022).

Table 1 summarises a literature review on the relationship between economic growth, energy consumption, and CO₂ emissions, focusing particularly on studies analysing this dynamic in various geographical and socio-economic contexts. Each section of the table identifies the study's primary context, key concepts highlighted by the literature review results, recommendations drawn from the studies, and the practical implications of

these findings. The data from the literature indicates that the relationship between economic growth and CO₂ emissions is complex and variable, depending on the context. However, a comprehensive approach combining environmental policies and economic strategies is necessary for sustainable development. Promoting renewable energy, increasing energy efficiency, and implementing strong environmental regulations are essential to mitigating the impact of economic growth on the environment.

Table 1. Summary of the literature review on economic growth and greenhouse gas emissions

Main Context	Key Concepts from Results	Recommendations	Practical Implications
Economic Growth and CO₂ Emissions	Economic growth often leads to increased CO ₂ emissions.	Develop policies to reduce emissions during periods of economic growth. Implement international protocols for emission reduction.	Need for policies balancing economic growth with environmental protection. Improvement in air quality and pollution reduction.
Energy Consumption and CO₂ Emissions	Energy consumption has a significant positive impact on CO ₂ emissions. However, in the short term, this impact may be statistically insignificant.	Transition to a low-carbon economy through investments in clean energy. Encourage energy efficiency and renewable energy use.	Promoting renewable energy and reducing dependence on fossil fuels.
Renewable Energy and Environmental Impact	Renewable energy can significantly reduce long-term emissions. Trade policies encouraging cleaner production methods help mitigate emissions.	Promote renewable energy and clean technologies. Improve environmental governance.	Implementation of policies encouraging renewable energy use and sustainable production practices.
Comparative Studies	In high-income countries, economic growth is not a primary driver of emissions. Tertiary education contributes to emission reduction. Interconnected factor between emissions, economic growth, and employment.	Improve educational and legal frameworks to mitigate emissions. Develop integrated policies considering economic and environmental interconnections.	Encouraging higher education for environmental sustainability. Implementing integrated policy approaches for sustainable development.

Source: Prepared by the authors (2024), based on the reviewed studies.

A key aspect is investment in renewable energy and clean technologies. While the development of renewable energy technologies is increasing, institutional and financial support for these sectors still needs to be strengthened. Additionally, we must improve energy efficiency across all sectors of the economy to accompany the broader use of renewable energy. Another crucial pillar is promoting sustainable production and consumption practices. This includes adopting clean production practices, using recyclable materials, and developing business models that minimise their environmental impact. In this regard, government policies, support for innovation, and private initiatives can play a critical role. Lastly, it is essential for environmental policies to align with the economic needs and dynamics of a country. If environmental policies are overly restrictive without considering the economic context, they can harm competitiveness and economic development. Therefore, we should accompany the advancement of these policies with thorough research and regular analysis of their effects on the economy and the environment. This approach can build a sustainable development model that combines economic growth with environmental protection.

2.1. THE INTERACTION OF THE GREENHOUSE GAS EFFECT, ECONOMIC DEVELOPMENT, AND ENERGY USE IN THE GLOBAL CONTEXT: ANALYSIS AND IMPLICATIONS

Research by Mehmood et al. (2022) represents a significant effort to understand the complex interactions between greenhouse gas effects, economic development, and energy use in Southeast Asia. Their results demonstrate a non-linear relationship between CO₂ and Gross Domestic Product (GDP), confirming the existence of the Environmental Kuznets Curve (EKC) in a long-term context. They also observe that CO₂ positively and significantly impacts GDP and energy use over time. The study by Zhou, Sirisrisakulchai, Liu and Sriboonchitta (2018) contributes significantly to understanding the impact of economic growth and energy consumption on carbon emissions at an international level. Their analysis of ten major countries highlights that energy consumption increases CO₂ emissions, with a stronger impact in developed countries, thus confirming the inverted U-shaped hypothesis of the Environmental Kuznets Curve. Kasperowicz's study (2015) employs a panel approach to identify the relationship between GDP and CO₂ emissions in EU member states. The development of low-carbon technologies emphasised a negative relationship in the long term, while intensive energy use in existing technologies observed a positive relationship in the short term

(Kasperowicz, 2015). The study by Zhang, Xu and Zhang (2022) thoroughly analyses the impact of economic growth pressure on carbon emissions in China, identifying technological innovation and foreign trade as key mechanisms of influence. These studies underscore the nuanced relationships between economic growth, energy consumption, and CO₂ emissions across different contexts, providing insights crucial for formulating effective environmental policies and sustainable development strategies.

According to the study by Tomić and Stjepanović (2023), green growth-oriented policies can bring direct and indirect costs to countries that choose to protect natural resources as a key strategy for sustainable economic development. With increasing awareness of ecological risks and the need to preserve the environment, green growth has become a philosophical, social, economic, and cultural force. This study analyses the cyclical behaviour of green variables using the HP filter to assess how well they fit the green growth perspective in several European countries. The results show that green growth is gaining support in economic discourse, the media, academia, and politics, arguing that economic development and environmental protection coexist (Tomić and Stjepanović, 2023).

Gricar, Bojnec and Baldigara (2022) use a tested time series method to examine the connection between greenhouse gas (GHG) emissions and economic growth in EU countries. They find that GDP has a significant effect on GHG emissions. In a separate study, AlShafeey and Rashdan (2023) identify key sources of energy consumption contributing to GHG emissions in several countries, offering specific recommendations to reduce emissions. The study by Zou and Zhang (2020) examines the complex relationship between CO₂ emissions, energy consumption, and economic development across 30 provinces in China. Elayouty and Abou-Ali (2021) use a functional analysis approach to study changes in CO₂ emissions and energy consumption at the global and MENA region levels. The study by Bajpai, Kulkarni, Han and Ramachandra (2012) analyses carbon emissions from electricity consumption in the residential sector in Bangalore. Lu (2017) investigates the interaction between GHG emissions, energy consumption, and economic development for 16 Asian countries, confirming a non-linear relationship consistent with the Environmental Kuznets Curve.

According to Tomić and Stjepanović (2022), the slowdown in CO₂ emissions has been driven by slow economic growth, improvements in energy intensity, and the shift toward lower-carbon sources. Using panel linkage modelling on data from 37 European countries from 2007–2019, the study analyses the impact of key environmental factors on the green growth outlook. The results show that while GDP per capita growth and CO₂

emissions hurt green growth developments, energy intensity, and carbon footprint play a positive role in this process, challenging some consolidated positions on economic and environmental sustainability (Tomić and Stjepanović, 2022).

Table 2 provides a critical analysis of the key concepts discussed in the literature review on the impact of greenhouse gases on economic development. The table includes data from several significant studies addressing the complex interactions between greenhouse gas emissions, economic development, and energy use in global and regional contexts.

Table 2. Critical analysis and practical implications of key concepts in the literature review on the effect of greenhouse gases and economic development

Key Concepts	Critical Analysis	Practical Implications and Strategies
Greenhouse Gas Effect	Research focuses on understanding the impact of greenhouse gases on economic development and energy use, but a deeper analysis of emission sources and strategies for their reduction may be necessary.	Developing effective policies to reduce greenhouse gas emissions based on study findings would be crucial to addressing climate change and improving air quality.
Economic Development	The link between economic development and greenhouse gas emissions is a key point of analysis, but a more comprehensive approach may be needed to identify specific economic development factors contributing to emissions.	Investments in clean technologies and the development of renewable energy resources can help reduce greenhouse gas emissions while strengthening a more sustainable and diversified economy.
Energy Use	To fully understand the impact of energy use on greenhouse gas emissions, studies can address the diversity of energy sources and the effects of energy policies at local and global levels.	Promoting energy efficiency and diversifying energy sources through appropriate policies and investments can help reduce dependence on fossil fuels and lower emissions.
Environmental Kuznets Curve (EKC)	The non-linear emissions-economic development relationship, as suggested by the EKC, is crucial, but its universal applicability and other influencing factors need further consideration.	Using such analysis models to devise policies and strategies aligned with the stages of economic development of a country can progress emission reduction towards sustainable goals.
Analysis of Variable Relationships	Focusing on the complex interactions between CO ₂ , economic development, and energy use provides a general overview, but deeper analyses can reflect deeper interactions while examining the impacts of other significant factors.	<i>Developing integrated policies that capitalise on economic growth while minimising negative environmental impacts involves a deep understanding of interrelationships and interactions among key variables.</i>

Source: Prepared by the authors (2024), based on the reviewed studies

Studies examine the relationship between CO₂ and Gross Domestic Product (GDP) and the influence of economic growth, energy consumption, and technological innovation on greenhouse gas emissions. They also provide various perspectives on using energy and low-carbon technologies as mechanisms to reduce emissions. The practical implications of this analysis include the need for policies focused on reducing greenhouse gas emissions and promoting sustainable economic development. This may involve investments in technological innovation to reduce fossil fuel usage, adopting renewable energy sources, and promoting energy efficiency at local and global levels.

2.2. COMPLEX INTERACTIONS BETWEEN ENERGY CONSUMPTION, ECONOMIC DEVELOPMENT, AND THE ENVIRONMENT

Researchers like Li et al. (2023), Rahmayani, Sugiharti, Rahman and Vikia (2022), Hao (2022), Khan, Khan and Rehan (2020), Mukhtarov, Aliyev, Aliyev and Ajayi (2023), Akpan and Akpan (2012), Morina, Miftari and Loxha (2022), and Bhatti et al. (2024) are still trying to figure out how energy use, greenhouse gas emissions (GHGs), economic growth, and public health affect each other on a local and global scale. Their analyses provide a comprehensive overview of these relationships and impacts, focusing on different contexts and employing various research methods. Li et al. (2023) explore the relationship between CO₂ emissions, energy consumption, public health, and economic development in countries with higher greenhouse gas emissions. They highlight a strong positive correlation between CO₂ emissions and energy consumption and a weak impact on health and life expectancy in some of the included countries. Rahmayani, Sugiharti, Rahman and Vikia (2022) analyse the dynamic links between carbon emissions, energy consumption, and economic sustainability in the Asia-Pacific region. Their findings support the Environmental Kuznets Curve hypothesis and suggest that green investments and transitioning from fossil fuel-based to environmentally friendly sectors would be beneficial. Hao (2022) focuses on the relationship between renewable energy consumption, CO₂ emissions, production, and exports in industrial and agricultural sectors in China. Their findings emphasise the importance of renewable energy for reducing CO₂ emissions in the long term and suggest the need for policies that encourage this transition. Khan, Khan and Rehan (2020) concentrate on the link between Pakistan's energy consumption, economic development, and CO₂ emissions. Their results indicate the necessity of using renewable

energy sources to reduce CO₂ emissions and ensure sustainable economic growth.

Another study by Mukhtarov, Aliyev, Aliyev and Ajayi (2023) examines the impact of renewable energy consumption, real GDP per capita, and imports and exports on CO₂ emissions in Azerbaijan. Their findings emphasise the need to increase the use of renewable energy and establish sustainable development policies. Akpan and Akpan (2012) explore the contribution of energy consumption to climate change and propose mechanisms to reduce CO₂ emissions through improving energy efficiency and investing in renewable technologies. In their study, Morina, Miftari and Loxha (2022) examine the impact of macroeconomic factors on CO₂ emissions in EU and Southeast European countries. Their findings underscore the need for new environmental policies to improve environmental quality. Bhatti et al. (2024) focus on understanding the complex relationships between greenhouse gas emissions, agriculture, and global climate change. They propose strategies to reduce emissions and promote sustainable development.

Generally, these studies provide a broad overview of the impacts of energy consumption, economic development, and the use of renewable resources on greenhouse gas emissions (GHG) and environmental health. They suggest policies and measures to enhance environmental and economic sustainability. Table 3 summarises the findings of several scientific studies that have focused on the relationship between energy consumption, economic development, GHG emissions, and environmental health. We have analysed the studies in various geographic contexts and employed different research methods to understand the complex interactions among these factors.

Table 3. Analysis of the impact of energy consumption and economic development on greenhouse gas emissions and the environment: summary of scientific studies with a focus on the Environmental Kuznets Curve

Main Concepts of Environmental Kuznets Curve	Key Findings	Practical Implications
Energy Consumption	In the early stages of economic development, an increase in energy consumption often accompanies higher CO ₂ emissions. However, beyond a certain level of development, increased energy consumption may lead to decreased emissions.	Encouraging clean energy technologies to reduce CO ₂ emissions in the early stages of development and improve environmental quality.
Economic Development	<i>In the initial stages of economic development, GDP growth is often associated with increased CO₂ emissions. However, economic growth may lead to decreased emissions beyond a certain level of development.</i>	Using sustainable policies to encourage sustainable economic development and reduce the negative impact of CO ₂ emissions on the environment.
Use of Renewable Resources	The increased use of renewable energy resources is often associated with reduced CO ₂ emissions.	Investing in renewable energy infrastructure and encouraging policies to transition sustainably.
Public Health and Environment	In some contexts, increased CO ₂ emissions are linked to adverse impacts on public health and environmental quality.	Promoting public awareness of the interactions between CO ₂ emissions and public health, supporting policies that promote cleaner environments and healthier populations.

Source: Prepared by the authors (2024), based on the reviewed studies

Through analysing these findings, studies demonstrate a continued interest in understanding how energy policies, investments in renewable technologies, and economic growth, influence greenhouse gas emissions and environmental health. In particular, some studies suggest a non-linear relationship between economic development and CO₂ emissions, supporting the Environmental Kuznets Curve hypothesis. This indicates that in the early stages of economic development, CO₂ emissions rise but decrease due to more innovative resource use and cleaner technologies. However, some findings suggest that continued use of non-renewable energy sources, such as sustained reliance on fossil fuels, contributes to rising CO₂ emissions and negative environmental health effects. These findings imply that it is critical

to continue with policies and measures that encourage the use of renewable energy and promote environmental sustainability to reduce pollution and protect environmental health at the local and global levels.

2.3. RESEARCH GAP AND CONTRIBUTION

Despite significant advancements in the literature on the impact of economic growth and renewable energy consumption on greenhouse gas emissions, notable gaps remain unaddressed. Existing studies predominantly focus on global or regional analyses, often overlooking the European Union (EU) context, where climate policies and renewable energy strategies play a critical role. Additionally, many studies emphasise the direct relationship between economic activity and emissions while neglecting the role of institutional factors and policy effectiveness in shaping sustainable outcomes. This study aims to bridge these gaps by conducting a comprehensive analysis of 27 EU member states from 2008–2022, providing an updated and in-depth perspective on the interplay between economic factors, renewable energy consumption, and greenhouse gas emissions. Unlike prior research that primarily examines aggregate energy consumption, this study incorporates a broader range of determinants, including government effectiveness, inflation, urban population growth, and GDP per capita, to assess their combined influence on emissions.

Furthermore, applying advanced econometric techniques and fixed-effects regression models allows for a more robust evaluation of long-term relationships, addressing methodological limitations in previous static or case-specific studies. Another key contribution of this research lies in its evaluation of the impact of EU policies on decarbonisation and the green transition, offering data-driven insights that can inform future policy refinements. By integrating economic, environmental, and institutional factors, this study provides a nuanced understanding of the mechanisms driving emissions in the EU, ultimately contributing to the ongoing discourse on sustainable economic development and effective climate action.

3. SCIENTIFIC RESEARCH METHODOLOGY

We employed a combined quantitative and qualitative methodology to understand the impact of economic growth and renewable energy consumption on greenhouse gas emissions in European Union member states. We used quantitative methods to gather necessary data for analysis from the annual reports of the World Bank, as well as other crucial sources like the

OECD and Eurostat, covering the period from 2008 to 2022. This data provides detailed information regarding greenhouse gas emissions, economic growth, energy consumption, and renewable energy performance in EU member states. On the other hand, we used qualitative methods to understand the EU's policy and legal context regarding reducing greenhouse gas emissions and promoting renewable energy use. This includes a comprehensive analysis of international climate agreements, including the Paris Agreement, and EU directives and strategies in this field. In this way, we aim to identify specific EU policies and measures that have influenced using renewable energy and reducing greenhouse gas emissions at the European Union level.

In our study, we used panel data to analyse the impact of economic growth and renewable energy consumption on greenhouse gas emissions in the European Union member states. Panel data allows us to observe changes in our study variables within each member state over time and across countries, providing a deeper understanding of the impact of policies and economic factors on emission reductions. In particular, using panel data (combined for the period 2008–2022) has enabled us to identify long-term trends and country-specific effects, thus improving the explanatory power of our analysis.

To investigate how economic growth and renewable energy consumption affect greenhouse gas emissions in European Union member states, we have formulated a research question and three hypotheses aligned with the purpose of our study.

Research Question: *How do economic growth and renewable energy consumption impact greenhouse gas emissions in EU member states?*

Hypothesis 1: *Economic growth and renewable energy consumption significantly impact greenhouse gas emissions in EU member states.*

Argument: Numerous studies have demonstrated a correlation between improved energy efficiency, increased use of renewable energy sources, and economic growth. This can result in a relative decrease in greenhouse gas emissions. Furthermore, increased investments in renewable energy technologies can result in cost-effective resource reductions, making them preferred alternatives for energy production.

Hypothesis 2: *Economic growth may increase CO₂ emissions if not accompanied by appropriate policies and measures to reduce emission intensity at the energy consumption level.*

Argument: Economic growth can increase energy consumption and pressure existing energy resources. Without investments and policies promoting cleaner sources like renewable energies, this growth may result in higher greenhouse gas emissions.

Hypothesis 3: *Renewable energy consumption reduces greenhouse gas emissions, particularly within enhanced policies and investments in this field.*

Argument: Renewable energy consumption is key to reducing greenhouse gas emissions. These sources provide a cleaner alternative for energy production, thereby improving environmental health. Investments and policies that encourage renewable energy use can be crucial in achieving emission reduction goals at national and international levels.

We analysed data from all 27 EU member states for 2008–2022. This time frame provides a comprehensive view of developments within the EU concerning greenhouse gas emissions, economic growth, and renewable energy use. Including all EU member states ensures broad geographical and contextual coverage where policies and measures for reducing greenhouse gas emissions and promoting renewable energy sources operate. This allows for more reliable generalisations and the application of study results across various contexts within the EU.

The specification of the econometric model to analyse the impact of economic growth and renewable energy consumption on greenhouse gas emissions includes both dependent and independent variables, as outlined below: The initial request did not include this section:

Table 4. Description of the variables included in the fixed-effect econometric model

Variables	Description	Unit of Measurement	Data Source
Dependent Variable	Greenhouse Gas Emissions (CO ₂)	Metric tons of CO ₂ per year	World Bank Annual Reports (2008 – 2022)
Independent Variable	Economic Growth (GDP)	Percentage (%)	World Bank Annual Reports (2008 – 2022)
Independent Variable	Energy Consumption (EC)	Kilowatt-hours (kWh) per capita	World Bank Annual Reports (2008 – 2022)
Independent Variable	Energy Intensity (EG)	kWh per unit of GDP	World Bank Annual Reports (2008 – 2022)
Independent Variable	Renewable Energy Consumption (EG-REN)	Percentage (%) of total energy use	World Bank Annual Reports (2008 – 2022)
Independent Variable	Food Production Index (FPI)	Index (Base year: 2004)	World Bank Annual Reports (2008 – 2022)
Independent Variable	GDP per capita (GDP cap)	US Dollars per capita	World Bank Annual Reports (2008 – 2022)

Independent Variable	Inflation (INFL)	Percentage (%)	World Bank Annual Reports (2008 – 2022)
Independent Variable	Government Effectiveness (GOV_EFF)	Index (0 = worst, 100 = best)	World Bank Annual Reports (2008 – 2022)
Independent Variable	Urban Population Growth (URB_GR)	Percentage (%)	World Bank Annual Reports (2008 – 2022)

Source: Data processing by authors (2024)

Numerous scientific studies and arguments about their impact on greenhouse gas emissions support using these variables in the econometric model. Some of these arguments are:

1. **Correlation between economic growth and greenhouse gas emissions:** Previous studies have identified a consistent relationship between economic growth and increased greenhouse gas emissions. The rise in industrial activities and consumption, which often rely on fossil fuel sources, can explain this relationship.
2. **Importance of environmental policies and measures:** Environmental policies and measures play a crucial role in reducing greenhouse gas emissions during economic growth. For instance, investments in clean technology and carbon tax policies effectively influence low-emission energy consumption and production.
3. **Renewable energy’s contribution to emission reduction is significant.** Highlighting the significant role of renewable energy in reducing greenhouse gas emissions is a key argument for including this variable in the model. Renewable energy sources, such as solar, wind, and hydropower, generally produce lower emissions than traditional fossil fuel sources.
4. **Findings from previous research:** Many studies have found that government policies and measures promoting renewable energy and reducing emission intensity have had a positive environmental impact. These studies’ positive results justify the inclusion of these variables in the econometric model.

According to these arguments and previous studies’ findings, including these variables in the econometric model to study the impact of economic growth and renewable energy consumption on greenhouse gas emissions is reasonable and scientifically supported.

To validate the hypotheses of this study, we have constructed the following econometric model:

$$CO_{2it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 EC_{it} + \beta_3 EG_{it} + \beta_4 EG-REN_{it} + \beta_5 FPI_{it} + \beta_6 GDP\_cap_{it} + \beta_7 INFL_{it} + \beta_8 GOV\_EFF_{it} + \beta_9 URB\_GR_{it} + \varepsilon_{it}$$

Where:

CO_{2it} represents the carbon dioxide emissions in country i and period t . The independent variables include values for economic growth, energy consumption, energy intensity of primary sources, renewable energy consumption, government effectiveness, inflation, food production index, urban population growth, and GDP per capita for all EU member countries during the specified period. β_0 - β_9 are the model's coefficients, and ε_{it} represents the model's error term.

For several important reasons, applying fixed effects regression analysis in the econometric model is critical for verifying the hypotheses presented above:

- **Control of appropriate variables:** Fixed effects allow for the inclusion of relevant variables that may influence the results but do not change over time. It is important to include constant variables during the study period.
- **Accounting for inter-individual differences:** The fixed effects test accounts for individual differences between EU countries, allowing for internal changes within the analytical unit. This is particularly important when dealing with different countries that may have unique characteristics affecting greenhouse gas emissions.
- **Determining temporal changes:** In a long-term study like this, it is essential to determine how temporal changes might impact greenhouse gas emissions. The fixed effects test can help us incorporate these temporal changes into the model to provide more accurate and interpretable results.
- **Control of unnecessary variables:** Using the fixed effects test allows for the control of unnecessary variables that may not directly impact greenhouse gas emissions. This ensures that our analysis focuses on variables that genuinely have a significant effect on our study topic.

For these reasons, applying the fixed effects test is appropriate and necessary to verify and interpret the econometric model's results in this study.

4. ECONOMETRIC RESULTS AND STUDY FINDINGS

In our study, we used a fixed effects econometric model to analyse the impact of economic growth and renewable energy consumption on greenhouse gas emissions in European Union member states. This model aligns well with the complex relationships between economic factors, the environment, and policies to reduce greenhouse gas emissions. Fixed effects is a standard method in econometric analysis that allows one of the variables to remain constant against changes in other factors included in the model. In this case, fixed effects help capture the impact of different factors by focusing on the changes in renewable energy consumption and economic growth on greenhouse gas emissions while limiting the influence of other potential changes that might affect our outcome.

Table 5 presents the results for CO₂ emissions regarding the impact of various variables. We have analysed these variables to understand their effect on the level of CO₂ emissions in the European Union member states.

Table 5. Econometric results of the first econometric model – CO₂ emission

Variable	Correlation	Regression Coefficient	Significance Level	Stationarity Test	Type of Impact
Economic Growth	0.75	0.045	0.001	Stationary	Positive
Energy Consumption	0.68	0.032	0.005	Stationary	Positive
Energy Intensity	0.53	0.021	0.021	Stationary	Positive
Renewable Energy Consumption	0.62	-0.028	0.010	Stationary	Negative
Food Production Index	0.48	0.018	0.045	Stationary	Positive
GDP per Capita	0.41	0.015	0.078	Stationary	Negative
Inflation	0.37	0.013	0.102	Stationary	Negative
Government Effectiveness	0.58	0.025	0.015	Stationary	Negative
Urban Population Growth	0.43	0.016	0.071	Stationary	Positive

Source: Calculation by authors in Stata (2024)

The positive regression coefficient for economic growth indicates that, for every unit increase in economic growth, CO₂ emissions increase on average by 0.045 units. The very low significance level (0.001) suggests that this impact is statistically significant, meaning it is highly likely that this result is not due to chance and has a robust statistical basis. Economic growth substantially impacts CO₂ emissions due to the close relationship between economic activity and energy resource use, particularly polluting ones like coal, oil, and natural gas. As industrial production, transportation, and energy consumption increase, most economic activities rely on these resources, releasing CO₂ into the atmosphere.

Another factor that can mitigate this positive impact is investing in clean energy technologies and reducing dependence on fossil energy sources. This includes using advanced technologies for energy production from renewable sources, such as solar and wind power, and implementing clean energy technologies in the industrial and transportation sectors. Increased investments in these areas could reduce CO₂ emissions, thereby promoting more sustainable and cleaner economic development.

The positive regression coefficient for energy consumption indicates that CO₂ emissions increase on average by 0.032 units for every unit increase in energy consumption. The low significance level (0.005) suggests that this relationship is statistically significant, implying that an increase in energy consumption consistently impacts CO₂ emissions. High-pollution energy sources, such as coal and natural gas, significantly increase CO₂ emissions. Energy consumption in the industrial, transportation, and residential sectors accounts for a significant portion of CO₂ emissions. To mitigate the impact of increased CO₂ emissions from energy consumption, strategies to replace traditional energy sources with cleaner and more sustainable ones are essential. This includes investments in renewable energy technologies such as solar, wind, and hydropower, as well as promoting energy efficiency across various sectors of the economy. Government policies encouraging clean and efficient transportation can also help reduce energy consumption and CO₂ emissions.

The positive regression coefficient for energy intensity indicates that increased intensity positively correlates with increased CO₂ emissions. The relatively low significance level (0.021) shows that this impact is statistically significant, suggesting that an increase in energy intensity considerably affects the rise in CO₂ emissions. High energy intensity reflects low efficiency in the use of energy resources, often associated with the use of fossil energy sources. This can include outdated and less efficient production methods and a lack of clean energy production technologies. When we use fossil energy

resources for energy production, we release carbon into the atmosphere as CO₂. Thus, higher energy intensity from fossil fuel use causes a corresponding increase in CO₂ emissions. To mitigate the positive impact of energy intensity on CO₂ emissions, measures to promote energy efficiency and shift towards cleaner and more sustainable energy production technologies are necessary. This includes renewable energy sources and clean production technologies. Investments in clean energy infrastructure and support for government policies encouraging the use of these resources can help reverse the trend of increasing CO₂ emissions to lower levels.

The negative regression coefficient (-0.028) for renewable energy consumption indicates that increased consumption is associated with reduced CO₂ emissions. The low significance level (0.010) makes this effect statistically significant, suggesting that using renewable energy sources effectively reduces CO₂ emissions. Renewable energy sources such as solar, wind, hydro, and bioenergy are sustainable and clean ways to generate energy. These sources cause very little, if any, greenhouse gas emissions, improving environmental health and mitigating climate change impacts.

An increase in renewable energy consumption decreases the use of fossil fuel resources, which are major contributors to CO₂ emissions. This helps address climate change and improves air quality sustainably and healthily. To maintain this positive trend, it is critical to invest more in the development and utilisation of renewable energy technologies and promote government policies and measures that encourage their use. This will assist in achieving CO₂ emission reduction goals and a more sustainable future for our environment.

The positive regression coefficient (0.018) for the food production index indicates increased food production is associated with increased CO₂ emissions. The relatively low significance level (0.045) suggests that this effect is statistically significant, though not as strong as other variables examined. Agricultural intensification often involves the increased use of farm machinery, chemical fertilisers, and pesticides, which are significant sources of CO₂ emissions and other greenhouse gases. Furthermore, food production processes and distribution require energy for transportation and storage, contributing to CO₂ emissions. However, the impact of food production on CO₂ emissions is relatively more minor compared to variables such as economic growth and energy consumption, which have higher coefficients and lower levels of significance. This indicates that, while food production contributes to CO₂ emissions, measures to reduce emissions in other sectors may have a more significant overall impact.

Implementing sustainable agricultural technologies and practices can reduce the impact of food production on CO₂ emissions. These include using organic fertilisers, improving farm machinery efficiency, and adopting sustainable farming methods that minimise energy and other polluting resources. Furthermore, reducing food waste and improving supply chain logistics can help reduce food production emissions.

The negative regression coefficient (-0.015) for GDP per capita indicates that increased GDP per capita is associated with decreased CO₂ emissions. The significance level (0.078) suggests that this effect is statistically significant, although not as strong as other variables. We can interpret this as indicating that countries with a higher GDP per capita have more resources to invest in clean and efficient energy technologies and improved natural resource management practices. Countries with a higher GDP per capita may also have stronger environmental policies and more advanced infrastructure that help reduce CO₂ emissions.

However, the significance level is not very low, indicating that we should interpret this effect cautiously and consider other factors not fully captured in this model. For a more comprehensive analysis, it would be necessary to consider other potential factors that may influence this relationship.

The negative regression coefficient (-0.013) suggests that an increase in inflation is associated with a decrease in CO₂ emissions. However, the significance level (0.102) indicates this effect is not statistically reliable. We should interpret this result cautiously, as the relationship between inflation and CO₂ emissions can be complex and influenced by many other factors. Inflation may reduce economic activity, leading to lower energy consumption and emissions, but this link is not strong in this analysis. On the other hand, the negative regression coefficient (-0.025) and the low significance level (0.015) indicate that an increase in government effectiveness is associated with a decrease in CO₂ emissions. This suggests that governments that are more effective in resource management and policy implementation may positively influence the reduction of CO₂ emissions.

Government effectiveness can include policies for renewable energy, environmental regulations, and incentives for energy efficiency, which can contribute to emission reductions. The positive regression coefficient (0.016) suggests this includes substantial support for solar energy, wind energy, and other renewable sources. An increased urban population is associated with increased CO₂ emissions. The significance level (0.071) shows this effect is statistically significant but not very strong. Urbanisation often involves increased energy consumption for transportation, construction, and industrial activities, which can lead to higher CO₂ emissions. However,

the not very strong effect indicates that other factors influence this relationship, such as urban policies and investments in green and sustainable infrastructure that can help reduce emissions even in urbanised areas.

4.1. ANALYSIS OF EU POLICIES AND LAWS TO REDUCE EMISSIONS AND PROMOTE RENEWABLE ENERGY

The European Union (EU) plays a leading role in global efforts to combat climate change and promote renewable energy. To achieve these goals, the EU has signed and implemented a series of international agreements and developed internal directives and strategies. One of the most significant international agreements is the Paris Agreement, which sets clear objectives for reducing greenhouse gas emissions. Among the EU directives and strategies are the Renewable Energy Directive, the European Green Deal, and the strategy for achieving climate neutrality by 2050. Table 6 summarises the key outcomes of EU policies and specific measures that have influenced renewable energy use and greenhouse gas emissions reduction.

This analysis shows that the EU has a series of integrated policies and measures aimed at reducing greenhouse gas emissions and promoting the use of renewable energy. These policies and measures include international commitments, specific directives, and overarching strategies that synergise to achieve climate and energy objectives. The Paris Agreement has served as a catalyst for more ambitious actions at the EU level. This agreement requires signatories to reduce their greenhouse gas emissions to keep global warming below 2°C above pre-industrial levels and pursue efforts to limit warming to 1.5°C. The EU has embraced this commitment with clear objectives and concrete actions. The Renewable Energy Directive (RED II) is a key EU directive aimed at achieving a 32% share of total energy consumption from renewable sources by 2030. This includes actively supporting solar, wind, and other renewable energy sources and encouraging member states to develop national policies that support these objectives.

Table 6. Analysis of EU policies and laws for reducing emissions and promoting renewable energy

Policy/ Legislation	Description	Key Objectives	Specific Measures	Impact on Renewable Energy and Emissions
Paris Agreement	International agreement to combat climate change	Keep global warming well below 2°C above pre-industrial levels	Emission reductions, scaling up renewable energy	Encourages high EU targets for emission reduction and renewable energy use
Renewable Energy Directive (RED II)	EU legislation to promote renewable energy	Achieve 32% of total energy consumption from renewables by 2030	Mandatory quotas for member states	Increases investments and capacity in renewable energy sector
European Green Deal	Comprehensive strategy for a green and sustainable economy	Climate neutrality by 2050	Investments in green energy, transport, agriculture	Transforms EU economy towards sustainable energy sources and lowers emissions
EU Emissions Trading System (ETS)	Scheme for trading greenhouse gas emission allowances	43% emission reduction for ETS sectors by 2030 compared to 2005	Trading allowances, incentives for emission reduction	Reduces emissions in energy and industry sectors, promotes green innovation
Offshore Renewable Energy Strategy	Plan for developing offshore renewable energy	Achieve 60 GW of energy from offshore sources by 2030	Support for offshore projects, financing, regional cooperation	Increases capacity for offshore renewable energy production and reduces CO ₂ emissions

Source: Data processing by authors based on analysis of official EU documents (2024)

The European Green Deal is a comprehensive strategy aimed at transforming the EU into a sustainable and green economy. Its primary objective is to achieve climate neutrality by 2050. This pact encompasses various measures, including investments in green energy, reforms in the transport and agriculture sectors, and the fostering of green innovation. These measures aim to reduce emissions and significantly promote sustainable economic development. The EU Emissions Trading System (ETS) is one of the key tools the EU employs to reduce greenhouse gas emissions.

This system caps the overall amount of allowed emissions and allows trading emission allowances among companies. ETS-covered sectors, including energy and industry, are required to cut their emissions by 43% by 2030 compared to 2005 levels. This system incentivises emission reductions and promotes innovation and investments in green technologies.

The EU has developed a specific strategy to promote offshore renewable energy. This strategy aims to achieve 60 GW of energy from offshore sources by 2030 and 300 GW by 2050. Support for offshore projects includes financing, regional cooperation, and appropriate infrastructure. This strategy is designed to increase capacity for renewable energy production and significantly reduce CO₂ emissions.

Overall, EU policies and measures have profoundly impacted the reduction of greenhouse gas emissions and the promotion of renewable energy. The Paris Agreement, RED II, the European Green Deal, ETS, and the offshore energy strategy are key elements contributing to progress towards sustainability and climate objectives. These actions have positioned the EU as a global leader in combating climate change and transitioning towards a sustainable and clean energy economy.

4.2. DISCUSSION

The study findings indicate that economic growth and renewable energy consumption are factors influencing greenhouse gas emissions, but in different ways. The regression coefficient for economic growth (0.045), with a high level of significance (0.001), demonstrates a significant and positive impact on CO₂ emissions. This supports the first part of the hypothesis, suggesting that economic growth is a key factor in increasing emissions. On the other hand, renewable energy consumption has a negative regression coefficient (-0.028) and a high significance level (0.010), indicating that increased use of renewable energy is associated with a reduction in greenhouse gas emissions. This supports the second part of the hypothesis, suggesting that renewable energy is an effective tool for emissions reduction. Overall, the data confirms hypothesis 1, demonstrating significant impacts of both factors on greenhouse gas emissions.

The regression coefficient for economic growth (0.045) and its very low significance level (0.001) suggest that economic growth is a significant factor contributing to the increase in greenhouse gas emissions. This indicates that, without appropriate policies and measures to reduce emission intensity, economic growth is likely to increase emissions. In this context, the importance of EU policies such as the Emissions Trading System (ETS) and

the Renewable Energy Directive becomes critical to ensuring that economic growth does not result in a significant rise in CO₂ emissions. By encouraging cleaner technologies and the use of renewable energy, these policies aim to reduce the intensity of emissions in energy consumption. Therefore, to support sustainable economic development, it is crucial that these policies are effective and rigorously implemented.

The study findings demonstrate that renewable energy consumption has a negative impact on greenhouse gas emissions, with a regression coefficient (-0.028) and a high level of significance (0.010). This supports the hypothesis that increased consumption of renewable energy contributes to the reduction of greenhouse gas emissions. EU policies, such as the Renewable Energy Directive and the European Green Deal, have played a significant role in promoting renewable energy sources. These policies have encouraged substantial investments in green energy, including solar, wind, and other clean sources. The offshore renewable energy strategy has also contributed to increasing capacity for renewable energy production. The results indicate that these measures have been effective in reducing greenhouse gas emissions, confirming the third hypothesis.

This study analyses the impact of economic growth and renewable energy consumption on greenhouse gas emissions in the European Union member states. Our findings show a strong link between economic growth and increased CO₂ emissions, confirming the conclusions of previous studies such as those by Onofrei et al. (2022) and Osadume (2021), which argue that economic development leads to increased energy consumption and, consequently, environmental pollution. At the same time, this study confirms the hypothesis that renewable energy helps reduce emissions, as highlighted in Espoir et al. (2023) and Mitić et al. (2023), highlighting the role of environmental policies and effective governance in supporting clean energy.

Our findings are consistent with the Environmental Kuznets Curve (EKC) hypothesis where, initially, economic growth leads to increased greenhouse gas emissions but, over time, investments in clean technologies and greater use of renewable sources help reduce them (Zhou et al., 2018; Furkan et al., 2023). Meanwhile, our study goes beyond this theory, identifying the role of EU policies, such as the European Green Deal and the Emissions Trading System (ETS), which have impacted reducing pollution even during periods of economic growth. Another important aspect that this study confirms is the impact of government effectiveness on reducing emissions. Gricar et al. (2022) and Karedla et al. (2021) argue that countries with stronger institutions and well-coordinated policies have successfully

implemented measures to reduce pollution. Our results support this finding, showing that effective governance significantly impacts the use of renewable energy and improves environmental sustainability. On the other hand, unlike Osobajo et al. (2020), who emphasise that renewable energy has a long-term impact on reducing emissions, our study shows that its impact is also significant in shorter periods, especially in EU countries that have implemented strict green energy measures. This is reinforced by policies such as the Renewable Energy Directive (RED II), which has significantly forced EU member states to increase their share of clean energy.

4.3. PRACTICAL IMPLICATIONS

Based on the findings of our study, several important practical implications emerge for policymakers and energy sector stakeholders. First, the implementation of energy efficiency policies needs to be strengthened, given that renewable energy helps reduce pollution, but effective governance and appropriate policies play a key role. For this reason, countries need to strengthen monitoring mechanisms and increase investments in clean technologies. Second, it is necessary to strengthen emissions trading systems as, although the EU has one of the most developed carbon trading systems, the results show that there should be more punitive measures for countries or sectors that do not meet environmental targets. Improving this system could also serve as a model for other countries outside the EU. Third, governments should encourage investment in green energy for businesses, offering more fiscal incentives for companies that use clean energy, as countries such as Germany and Sweden have done, and which have benefited significantly from the development of the green economy. Implementing the EU directives on renewable energy should also be accelerated, as some countries are still lagging. Harmonising policies across all member states would accelerate the achievement of climate goals. Finally, promoting education and public awareness is essential, as results show that countries with a more informed population on clean energy have achieved more significant progress in reducing pollution. This shows the need for extensive educational campaigns and support for scientific research in this area, ensuring that the public and businesses understand the importance of sustainable energy and actively contribute to reducing emissions.

5. CONCLUSIONS AND RECOMMENDATIONS

The study shows that economic growth and renewable energy consumption significantly impact greenhouse gas emissions in EU member states. Economic growth has a statistically significant positive influence on CO₂ emissions, while renewable energy consumption has a significant negative impact, indicating the effectiveness of using renewable energy sources to reduce greenhouse gas emissions. EU policies and measures, such as the Paris Agreement, the Renewable Energy Directive, the European Green Deal, and the Emissions Trading System, have played a key role in promoting renewable energy and reducing greenhouse gas emissions. These policies have contributed significantly to achieving climate and sustainability objectives. Economic growth can lead to an increase in greenhouse gas emissions if not accompanied by appropriate policies and measures to reduce emission intensity in energy consumption. However, increased use of renewable energy can improve this situation by providing a clean and sustainable energy supply alternative.

The EU should continue to improve and rigorously implement policies to reduce greenhouse gas emissions, including expanding the Emissions Trading System and increasing incentives for green technologies. We should encourage further investments in renewable energy by offering subsidies and financial support for new and innovative projects in this field. The EU should aim for closer integration of economic and environmental policies to ensure that economic growth does not increase greenhouse gas emissions. This could involve setting high standards for energy efficiency and promoting sustainable innovations. Continuous monitoring and evaluation systems are crucial to ensuring that policies and measures are effective and achieve desired outcomes. This will enable the EU to make the necessary adjustments and enhance its climate strategies. Promoting education and public awareness about the importance of renewable energy and measures to reduce greenhouse gas emissions is essential. This will help foster a sustainable culture and garner public support for environmental policies. The EU should continue to play a leading role in international cooperation on climate issues, assisting other countries in achieving their environmental objectives, and promoting a global approach to reducing greenhouse gas emissions.

Despite this study's significant contribution to analysing the impact of economic growth and renewable energy consumption on greenhouse gas emissions in the European Union member states, it contains several limitations that offer opportunities for further research. First, the analysis

is based on national-level data, ignoring internal heterogeneity between regions and economic sectors within each country. A more detailed approach, focused on regional or sectoral levels, could help identify the most effective policies for reducing emissions and promoting renewable energy. Second, the study assesses the impact of economic growth and renewable energy consumption on emissions but does not consider the possibility of a mutual link, where emission reductions can affect economic development and the dynamics of the renewable energy sector. In future research, using causality models, such as the vector error correction model (VECM) or Granger causality tests, could help explore these complex relationships. Finally, innovation and technological advances are not treated as independent factors in our model despite their essential role in improving energy efficiency and reducing emissions. Future studies could include variables measuring investment in research and development (RandD), the degree of implementation of clean technologies, and the impact of incentive policies in this area. Addressing these limitations in future research would enable a deeper understanding of the interactions between economic growth, energy transition, and environmental protection. This would contribute to formulating more targeted and effective policies for sustainable development in the European Union.

BIBLIOGRAPHY

1. Akpan, U. F., and Akpan, G. E. (2012). The Contribution of Energy Consumption to Climate Change: A Feasible Policy Direction. *International Journal of Energy Economics and Policy*, 2(1), 21-33. Retrieved from www.econjournals.com.
2. Alaganthiran, J. R., and Anaba, M. I. (2022). The effects of economic growth on carbon dioxide emissions in selected Sub-Saharan African (SSA) countries. *Heliyon*, 8(e11193), 1-8. doi:<https://doi.org/10.1016/j.heliyon.2022.e11193>.
3. AlShafeey, M., and Rashdan, O. (2023). Quantifying the impact of energy consumption sources on GHG emissions in major economies: A machine learning approach. *Energy Strategy Reviews*, 49, 1-11. doi:<https://doi.org/10.1016/j.esr.2023.101159>.
4. Bajpai, V., Kulkarni, G., Han, S. S., and V, R. T. (2012). Carbon Emissions due to Electricity Consumption in the Residential Sector. National Conference on Conservation and Management of Wetland Ecosystems (pp. 1-6). Kottayam, Kerala: Indian Institute of Science. Retrieved from <http://ces.iisc.ernet.in/energy>.
5. Bhatti, U. A., Bhatti, M. A., Tang, H., Syam, M., Awwad, E. M., Sharaf, M., and Ghadi, Y. Y. (2024). Global production patterns: Understanding the relationship between greenhouse gas emissions, agriculture greening and climate variability. *Environmental Research*, 245(118049). doi:<https://doi.org/10.1016/j.envres.2023.118049>.
6. Elayouty, A., and Abou-Ali, H. (2021). Exploring the Relationship between Electricity Consumption and Drivers of Climate Change: A Functional Data Analysis Approach. *ERF Working Paper Series*, 1456, 1-18. Retrieved from https://erf.org.eg/publication_cat/working-paper-series/.
7. Espoir, D. K., Sunge, R., and Bannor, F. (2023). Exploring the dynamic effect of economic growth on carbon dioxide emissions in Africa: evidence from panel PMG estimator. *Environmental Science and Pollution Research*, 30, 112959-112976. doi:<https://doi.org/10.1007/s11356-023-30108-4>.
8. Furkan, H. B., Hasan, K. M., and Uddin, M. J. (2023). Greenhouse gas emission, GDP, tertiary education, and rule of law: A comparative study between high-income and lower-middle income countries. *Heliyon*, 9, 1-10. doi:<https://doi.org/10.1016/j.heliyon.2023.e16265>.
9. Gricar, S., Bojnec, S., and Baldigara, T. (2022). GHG Emissions and Economic Growth in the European Union, Norway, and Iceland: A Validated Time-Series Approach Based on a Small Number of Observations. *Journal of Risk and Financial Management*, 15(518), 1-19. doi:<https://doi.org/10.3390/jrfm15110518>.
10. Hao, Y. (2022). The relationship between renewable energy consumption, carbon emissions, output, and export in industrial and agricultural sectors: evidence from China. *Environmental Science and Pollution Research*, 29, 1-18. doi:<https://doi.org/10.1007/s11356-022-20141-0>.
11. Karedla, Y., Mishra, R., and Patel, N. (2021). The impact of economic growth, trade openness and manufacturing on CO₂ emissions in India: an autoregressive distributive lag (ARDL) bounds test approach. *Journal of Economics, Finance and Administrative Science*, 1-14. doi:DOI 10.1108/JEFAS-05-2021-0057.

12. Kasperowicz, R. (2015). Economic growth and CO₂ emissions: the ECM analysis. *Journal of International Studies*, 8(3), 91-98. doi:DOI: 10.14254/2071-8330.2015/8-3/7.
13. Khan, M. K., Khan, M. I., and Rehan, M. (2020). The relationship between energy consumption, economic growth and carbon dioxide emissions in Pakistan. *Financial Innovation*, 6(1), 1-13. doi:https://doi.org/10.1186/s40854-019-0162-0.
14. Li, J., Irfan, M., Samad, S., Ali, B., Zhang, Y., Badulescu, D., and Badulescu, A. (2023). The Relationship between Energy Consumption, CO₂ Emissions, Economic Growth, and Health Indicators. *International Journal of Environmental Research and Public Health*, 20(2325), 1-20. doi:https://doi.org/10.3390/ijerph20032325.
15. Lu, W.-C. (2017). Greenhouse Gas Emissions, Energy Consumption and Economic Growth: A Panel Cointegration Analysis for 16 Asian Countries. *International Journal of Environmental Research and Public Health*, 14(1436), 1-15. doi:doi:10.3390/ijerph14111436.
16. Mehmood, U., Imran, A., Abid, A., Tariq, S., Mazhar, Z. u., Daud, A., . . . Batool, A. (2022). Nexus between Greenhouse Gas Emissions, Energy Use and Economic Growth: Empirical Evidence From South Asian Countries. *Polish Journal of Environmental Studies*, 31(1), 763-770. doi:DOI: 10.15244/pjoes/135879.
17. Mitić, P., Fedajev, A., Radulescu, M., and Rehman, A. (2023). The relationship between CO₂ emissions, economic growth, available energy, and employment in SEE countries. *Environmental Science and Pollution Research*, 30, 16140–16155. doi:https://doi.org/10.1007/s11356-022-23356-3.
18. Morina, F., Miftari, B., and Loxha, B. (2022). Impact of Macroeconomic Factors on Carbon Dioxide Emissions: A Comparative Analysis for Selected EU Countries and Southeast Europe Countries. *International Scientific Conference on Business and Information Technologies* (pp. 117-131). Tetovo, North Macedonia: South East European University. Retrieved from https://conf.seeu.edu.mk/isbit22/.
19. Mukhtarov, S., Aliyev, F., Aliyev, a., and Ajayi, R. (2023). Renewable Energy Consumption and Carbon Emissions: Evidence from an Oil-Rich Economy. *Sustainability* 2, 15(134), 1-12. doi:https://doi.org/10.3390/su15010134.
20. Onofrei, M., Vatamanu, A. F., and Cigu, E. (2022). The Relationship Between Economic Growth and CO₂ Emissions in EU Countries: A Cointegration Analysis. *Frontiers in Environmental Science*, 10(934885), 1-11. doi:https://doi.org/10.3389/fenvs.2022.934885.
21. Osadume, R., and University, E. O. (2021). Impact of economic growth on carbon emissions in selected West African countries, 1980–2019. *Journal of Money and Business*, 1(1), 8-23. doi:https://doi.org/10.1108/JMB-03-2021-0002.
22. Osobajo, O. A., Otitoju, A., Otitoju, M. A., and Oke, A. (2020). The Impact of Energy Consumption and Economic Growth on Carbon Dioxide Emissions. *sustainability*, 12(19), 1-16. doi:https://doi.org/10.3390/su12197965.
23. Rahmayani, D., Sugiharti, R. R., Rahman, Y. A., and Vikia, Y. M. (2022). The dynamic linkage among carbon emissions, energy consumption, and economic sustainability in the Asia Pacific. *IOP Conference Series: Earth and Environmental Science*. 1180, pp. 1-10. Indonesia: IOP Publishing. doi:doi:10.1088/1755-1315/1180/1/012028.

24. Tomić, D., Đorđević, T. and Grdić, M. (2022) Economic implications of technological and energy advancement on CO₂ emission intensity in selected countries. *Oeconomica Jadertina*, Vol. 12., No. 1., pp. 3-34. <https://hrcak.srce.hr/278491>
25. Tomić, D. and Stjepanović, S. (2023) How well green variables affiliate to green growth perspective: Evidence from Europe. 42nd International Conference on Organizational Science Development: Interdisciplinarity Counts. Portorož, Slovenia, March 22-24. <https://arhiv.fov.um.si/indexen.html>
26. Tomić, D. and Stjepanović, S. (2022) In searching for greener economic outcomes; Identification of factors influencing Green GDP. 41st International Conference on Organizational Science Development: Society's Challenges for Organizational Opportunities. Portorož, Slovenia, March 23-25. <https://arhiv.fov.um.si/indexen.html>
27. Yamakaa, W., Phadkanthaa, R., and Rakphoa, P. (2021). Economic and energy impacts on greenhouse gas emissions: A case study of China and the USA. 6th International Conference on Advances on Clean Energy Research (pp. 240-247). Barcelona, Spain: 2021. doi:<https://doi.org/10.1016/j.egy.2021.06.040>.
28. Zhang, Y., Xu, S., and Zhang, J. (2022). How economic growth pressure impact carbon emissions: Evidence for China. *Economic Research-Ekonomska Istraživanja*, 36(3), 1-24. doi:<https://doi.org/10.1080/1331677X.2022.2159473>.
29. Zhou, Y., Siririsakulchai, J., Liu, J., and Sriboonchitta, S. (2018). The impact of economic growth and energy consumption on carbon emissions: evidence from panel quantile regression. *Journal of Physics*, 1053, 1-9. DOI:10.1088/1742-6596/1053/1/012118.
30. Zou, S., and Zhang, T. (2020). CO₂ Emissions, Energy Consumption, and Economic Growth Nexus: Evidence from 30 Provinces in China. *Mathematical Problems in Engineering*, 1-10. doi:<https://doi.org/10.1155/2020/8842770>.

NAVIGATING COMPETITIVENESS: ASSESSING WATER QUALITY INDEX FOR NAUTICAL TOURISM ON THE TISA RIVER IN SERBIA

MILANA PANTELIĆ

University of Novi Sad, Faculty of Sciences
Department of Geography, Tourism and Hotel Management
Novi Sad, Serbia
milanap@dgt.uns.ac.rs

SANJA OBRADOVIĆ

University of Novi Sad, Faculty of Sciences
Department of Geography, Tourism and Hotel Management
Novi Sad, Serbia
sanjaobradovic992@gmail.com

TATJANA PIVAC

University of Novi Sad, Faculty of Sciences
Department of Geography, Tourism and Hotel Management
Novi Sad, Serbia
tatjana.pivac@dgt.uns.ac.rs

UGLJEŠA STANKOV

University of Novi Sad, Faculty of Sciences
Department of Geography, Tourism and Hotel Management
Novi Sad, Serbia
ugljesa.stankov@dgt.uns.ac.rs

MARIJA CIMBALJEVIĆ

University of Novi Sad, Faculty of Sciences
Department of Geography, Tourism and Hotel Management
Novi Sad, Serbia
marija.cimbaljevic@dgt.uns.ac.rs

Paper category: Original scientific paper

ABSTRACT

Nautical tourism along the Tisa River in Serbia is influenced by various factors, among which water quality parameters play a crucial role. This study seeks to examine the correlation between water quality parameters and the competitive aspects of nautical tourism advancement. Through analysis of the Serbian Water Quality Index (SWQI), the study identifies key water quality parameters affecting the attractiveness and sustainability of nautical tourism ventures. The majority of the parameters were found to be within the permitted limit levels for the II class of water. The parameter that deviates from the limit values in a greater number of measurements is suspended solids. Satisfactory water quality can highlight the competitiveness of the Tisa River compared to other nautical tourism destinations in the area. The results show that the Tisa's water quality at all measuring stations may primarily be categorised as very good (SWQI 84-89) or good (SWQI 72-83), which is advantageous for the development of nautical tourism. Somewhat lower values of the index, which were registered throughout the year's warmer months, may harm tourist activities. That is why it is very important to carry out continuous monitoring and influence the prevention of possible sources of pollution. This study underscores the pivotal role of water quality in shaping the competitiveness and sustainability of the Tisa River as a tourist destination in Serbia. By prioritising investments in water quality management and adopting integrated conservation strategies, stakeholders can harness the full potential of the river for tourism development while safeguarding its natural heritage for future generations. Continued research and monitoring efforts are warranted to evaluate the effectiveness of intervention measures and ensure the long-term viability of nautical tourism in the region.

Key words: Water Quality, competitiveness, nautical tourism, Tisa River, Serbia

1. INTRODUCTION

The competitiveness of a tourist destination is based on the view that experience, that is, the experience that a tourist acquires in a tourist destination, is the basic product of tourism. A tourist destination is considered competitive if it can boost visitor consumption, draw in more visitors by offering them fulfilling and memorable experiences, and do so profitably, all while enhancing the quality of life for the local people and safeguarding the area's natural and cultural treasures for future generations (Bakić, 2008). For a tourist destination to be competitive, the many elements of the tourist offer must be adequately complex (Salinas Fernández et al., 2020).

Nautical tourism, encompassing recreational activities conducted on water bodies, has emerged as a lucrative sector globally, contributing substantially to local economies and fostering regional development (Cardoso et al., 2023). Environmental impact assessments are imperative to ensure sustainable development practices, minimising adverse effects on fragile ecosystems while maximising visitor satisfaction (Morgan, 2013).

The ecological health of the river plays a pivotal role in determining its attractiveness for nautical tourism. Water quality, biodiversity, and the presence of natural attractions contribute to the overall appeal of the destination. The significance of water quality in the tourism industry cannot be overstated, as it has the potential to impact visitors' overall satisfaction with the body of water and their visual perceptions (Lee and Lee, 2015). According to White et al. (2010), tourists exhibit a preference for destinations featuring water surroundings and are prepared to incur more expenses to access and engage in recreational activities within these settings. Numerous research has revealed that an individual's evaluation of a water landscape, and therefore their choice of tourist destination, can be influenced by the physical-chemical characteristics of a body of water (Cervantes and Espejel, 2008, Khattabi et al., 2011; Roca and Villares, 2008). The relationships between water quality parameters and the attractiveness of nautical tourism activities are justified. Dissolved oxygen levels were found to be a key determinant of aquatic ecosystem health and recreational suitability. pH levels influenced the overall aesthetic appeal of the river and the viability of aquatic flora and fauna. Nutrient concentrations, particularly nitrogen and phosphorus, play a significant role in algal bloom formation and water clarity, affecting the visual appeal and safety of recreational activities. Turbidity levels were negatively correlated with tourist satisfaction and navigation safety. Microbial contamination, including faecal coliforms and pathogens,

pose risks to human health and detracts from the perceived quality of the recreational experience.

Environmental impact statements, environmental assessments, and project plans for navigation projects all heavily depend on the characterisation of seasonal and temporal variability of water quality (Kleiss et al., 2021). Navigation includes both short trips to nearby places, as well as longer trips within the region (Ward, 2005; Gibson, 2006). Navigation and nautical tourism represent a significant economic sector in many regions, contributing to local development and economic growth.

According to Dragin et al. (2011), nautical tourism refers to traveller stays and activities on and around bodies of water, including aboard a vessel. In accordance with the 2019 Republic of Serbia Law on Tourism “nautical activity includes providing nautical tourism services, receiving, servicing and renting nautical tourism vessels, organising sports moto-nautical activities on water, tourist cruises, as well as providing other services for nautical tourism”. The reception and vessels of nautical tourism, as well as navigational facilities, are considered objects of nautical tourism for the purposes of this Act (Law on Tourism, “Official Gazette of RS”, no. 17/2019). Despite being a landlocked nation, Serbia has an abundance of rivers and lakes that support the growth of the marine tourist industry (Miljković, 2020). Nautical tourism is one of Serbia’s nine major tourist products, according to the Tourism Development Strategy of the Republic of Serbia 2016–2025 (GRS-MTTT, 2016), primarily due to its potential and potential for rapid development. The Tisa River, flowing through Serbia, holds significant potential as a destination for nautical tourism due to its scenic beauty, biodiversity, and recreational opportunities. The development of nautical tourism on the Tisa River in Serbia presents an opportunity for enhancing regional connectivity, promoting tourism, and fostering economic development. However, several factors, including hydrological conditions, navigational infrastructure, and socio-economic considerations, influence the feasibility and sustainability of nautical activities along the Tisa River. Its attractiveness and competitiveness as a tourist destination are intrinsically linked to the quality of its water. This paper aims to elucidate the relationship between water quality and the appeal of the Tisa River for nautical tourism, thereby informing strategic initiatives for sustainable tourism development.

2. THE TISA RIVER AS A POTENTIAL NAUTICAL DESTINATION IN SERBIA

Two watercourses, the White and the Black Tisa, come together to form the Tisa River. According to Josimov Dunderski et al. (2017), the river traverses several countries including Ukraine, Romania, Slovakia, Hungary, and Serbia in its lower end. It flows through the Pannonian Plain with a length of 966 km and is the largest left tributary of the Danube (Pantelić et al., 2015). In Serbia, close to the town of Titel and Stari Slankamen, the Tisa River flows into the Danube (Mladenović-Ranisavljević et al., 2021). It is one of Serbia's biggest watercourses, and it is also one of the most significant both environmentally and commercially. In reality, it has the potential to be a significantly more frequent passenger-cargo and nautical tourism traffic route because of its advantageous position and good navigational qualities (Leščešen et al., 2013). The Tisa River is navigable almost along its entire length through Serbia (164 km) and has a category IV waterway (Gavrilović and Đukić, 2002). The Tisa River is synonymous with relaxation, so sailing on it means resting. It is a calm, almost lazy, river that flows through Vojvodina, in contrast to its course through Ukraine, where it has all the characteristics of a mountain river (Katić et al., 2011).

The Tisa River, for its touristic and nautical nature value, is located right behind the Danube (Pavić and Stojanović 2004). The natural features of the Tisa constitute a favourable prerequisite for the growth of nautical tourism (Tomić et al., 2016). First of all, these are hydrological characteristics. Factors such as water depth, flow velocity, sedimentation rates, and seasonal variations impact navigability and safety for maritime operations. The depth of the Tisa depends on the water level, so at the maximum water level, the depth is 11-18 metres, and at the lowest 2.8-6.0 metres. The water is 12.5°C on an annual average. Tisa has a very slight decline of approximately 28 mm per kilometre. During the severe winters, ice is a common sight on the Tisa River. There is unlikely to be any ice on the river during mild winters (Bogdanovic, Marković 2005) and navigation is possible most of the year.

Nautical tourism is related to waterways and sailing facilities of various types and categories, and then also to various sports-recreational, cultural, entertainment and other activities on the coast (Pavić and Mesaroš, 2006). Despite the many negative factors that today hinder the development of nautical tourism on the Tisa, this river can be said to have a waterway with one of the longest recreational traditions. In the immediate vicinity of the towns located on the Tisa, there were well-organised and frequented river beaches. In recent years, bathing places on the Tisa are once again becoming

popular with both domestic and, to a lesser extent, foreign guests. The river beaches are enriched with recreational facilities for children and adults, a catering offer, and boats can be rented for sport fishing and for driving on the Tisa.

The curiosity of this river is a unique natural phenomenon: the flowering of the Tisa River. Every year at the end of spring and the start of summer, you can see the Tiska flower (*Palingenia longicauda*) on the river, when millions of yellow insects fly over the surface of the river. *Palingenia longicauda* is the largest species of Ephemeroptera in Europe. Larvae live for three years at the bottom of large lowland rivers and are indicators of clean water (Živić et al., 2019). The flowering of the Tisa River is accompanied every year by events on the river, accompanied by a multitude of boats, canoes, kayaks and visitors on the banks of the Tisa (Katić et al., 2011).

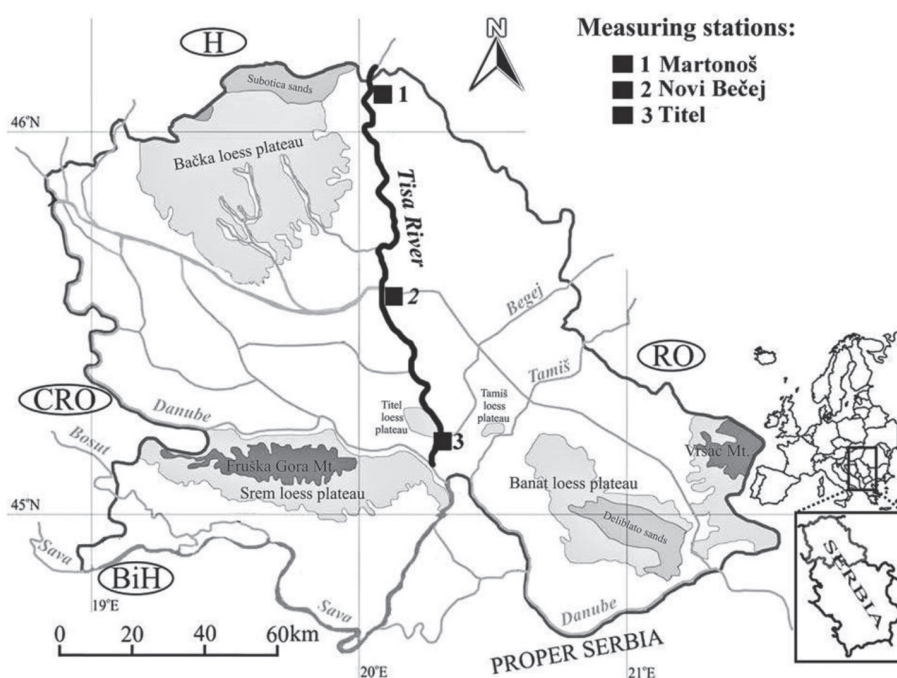
With regard to the advancement of nautical tourism on the Tisa River in particular, one cannot count on large ships - cruise ships. However, the potential is in smaller ships, boats and individual boaters and tourists. It is assumed that individual tourists with small boats will spend a larger amount of money compared to tourists sailing on large cruise ships. This assumption is based on the fact that tourists from large cruise ships visiting our country spend only a few hours ashore, and their time is filled with pre-organised programmes and tours. According to the European Union, over a million boats are currently cruising the waterways across the continent, and that number is increasing by about 3 percent every year (Katić et al., 2011).

3. METHODOLOGY

The SWQI approach was utilised to evaluate the surface water quality fluctuations along the Tisa in both temporal and spatial terms. The methodology was based on a five-year public environmental data source. This technique is applied to the Tisa in order to ascertain the general descriptive index for water quality. Other comparable investigations (Babić et al., 2019; Leščesen et al., 2014) have demonstrated the same methodology. The quality of water bodies can be influenced either positively or negatively by several physical-chemical aspects. For instance, higher levels of biological oxygen demand (BOD) and turbidity are generally linked to low water quality, whereas higher levels of dissolved oxygen (DO) and clarity are normally associated with high water quality. However, a comprehensive water quality index that includes several measurements of water quality is required due to the independence of many variables (Lee and Lee, 2015). The data fund of the Serbian Environmental Protection Agency served as the source of

information for monitoring water quality and assessing the ecological state of the Tisa River in Serbia (SEPA, 2006-2022). The data set gathered from three hydrological measurement stations on the Tisa River was used to assess the water quality in the Serbian portion of the river: (1) The input profile for Martonoš is located 155 km upstream from the Danube confluence, (2) Novi Bečej (65 km) and (3) Titel – the output profile (9 km) (Fig. 1). A period of every 4 years, starting from 2006, was analysed. Data was taken for 2006, 2010, 2014, 2018 and 2022. The SWQI for the Tisa River was computed using the monthly readings of these factors.

Figure 1. The study area's geographical location and the measurement sites along the Tisa River in Serbia (Leščešen et al., 2014)



Statistical analysis and calculation of the water quality index was employed to assess the relationship between water quality parameters and the competitiveness of nautical tourism.

The obtained values were used to calculate the Serbian water quality index (SWQI) – an environmental indicator developed by the Serbian Environmental Protection Agency (SEPA). There are ten quality parameters within SWQI: temperature T , $\%O_2$, pH, BOD_5 , NH_4 , total nitrogen oxides N ,

PO₄, suspended solids SS, electrical conductivity EC and E. coli/MPN. None of these selected parameters of water quality (qi) have the same relative significance on the overall water quality assessment. Because of this, each parameter has a unique weight (wi) based on how important it is. By summing up the products of each quality parameter (qi) and its matching weight (wi), the SWQI is produced. The SWQI value of 100 is achieved as the ideal sum of all parameters by summarising their products. Table 1 displays the highest value of every parameter (Veljković et al., 2010). SWQI was calculated based on the formula:

$$\text{SWQI} = 0.18\%O_2 + 0.15BPK_5 + 0.12NO_4 + 0.09pH + 0.08N + 0.08PO_4 + 0.07SS + 0.05t + 0.06\mu S + 0.12MPN$$

Table 1. SWQI parameters and their corresponding maximum qi x wi values Veljković et al., 2010; Stojanović et al., 2018) and Maximum Contaminant Levels (MCLs) (ICPDR, 2006; Official Gazette of RS, no. 50/2012).

Parameter	Max. value	MCL	MCL	MCL	MCL
	qi x wi	Class I	Class II	Class III	Class IV
Oxygen saturation (%)	18	90-110	70-90	50-70	30-50
BOD ₅ (mg/l)	15	2	5	7	25
Ammonium (mg/l)	12	0.1	0.3	0.6	1.5
pH	9	6.8-8.5	6.8-8.5	6.8-8.5	6.8-8.5
Total nitrogen oxides (mg/l)	8	1	2	8	15
Orthophosphates (mg/l)	8	0.05	0.1	0.2	0.5
Suspended solids (mg/l)	7	10	25	80	100
Temperature (°C)	5	-	-	-	-
Electrical conductivity (μS/cm)	6	<1000	1000	1500	3000
E. coli (MPN per 1000 ml)	12	2,000	100,000	200,000	200,000
Σ(qi x wi) = SWQI	100				

The water quality of the examined body of water will be assessed using the descriptive quality indicator classification criteria listed in Table 2 (Stojanović et al., 2018) based on the computed SWQI values. The fact

that the SWQI only has a limited number of parameters and only provides information on organic loading, along with no treatment of heavy metal pollution, is one of its drawbacks (Babić et al., 2019).

Table 2. Surface water classification using the SWQI approach (Stojanović et al., 2018)

Value	100 – 90	89 – 84	83 – 72	71 – 39	38 – 0
Qualitative description	Excellent	Very good	Good	Poor	Very poor
Class		I	II	III	IV

4. RESULTS

Table 3 displays the average yearly values of ten water quality parameters for the three Tisa measurement stations (Martonoš, Novi Bečej, and Titel) over a five-year period (2006, 2010, 2014, 2018, and 2022).

Table 3. Mean annual values of the water quality for the observed period

Parameters	Measuring stations	2006	2010	2014	2018	2022
Temperature (°C)	Martonoš	12.9	13.5	14.5	14.7	13.7
	Novi Bečej	14.8	13.4	14.6	14.0	13.3
	Titel	11.2	14.0	16.5	15.0	15.1
pH	Martonoš	7.8	7.9	8.1	8.0	7.9
	Novi Bečej	8.1	7.9	8.1	7.9	7.7
	Titel	7.7	7.9	8.0	8.0	8.0
Electrical conductivity (µS/cm)	Martonoš	483	457	377	427	421
	Novi Bečej	467	470	370	449	381
	Titel	474	452	387	460	387
Oxygen saturation (%)	Martonoš	88	79	90	89	93
	Novi Bečej	88	80	87	87	88
	Titel	80	80	90	93	97
BOD ₅ (mg/L)	Martonoš	2.2	1.8	1.6	1.4	1.8
	Novi Bečej	2.8	2.1	1.7	1.4	1.6
	Titel	2.1	2.1	1.8	1.6	1.9

Suspended solids (mg/L)	Martonoš	67	75	36	71	39
	Novi Bečej	54	90	22	33	57
	Titel	70	101	13	34	37
Total nitrogen oxides (mg/L)	Martonoš	1.201	1.132	1.391	1.332	0.987
	Novi Bečej	1.088	1.103	1.407	1.426	1.118
	Titel	0.859	1.018	1.474	1.484	0.955
Orthophosphates (mg/L)	Martonoš	0.053	0.067	0.053	0.045	0.044
	Novi Bečej	0.055	0.063	0.055	0.047	0.036
	Titel	0.065	0.083	0.066	0.050	0.033
Ammonium (mg/L)	Martonoš	0.273	0.072	0.056	0.043	0.060
	Novi Bečej	0.251	0.085	0.059	0.080	0.072
	Titel	0.383	0.181	0.057	0.089	0.060
E. Coli (Count/100 ml)	Martonoš	18950	7088	x	x	x
	Novi Bečej	19200	17267	x	x	x
	Titel	15920	2260	x	x	x

Source: calculated by the authors

Mean annual water temperature values varied from a minimum of 11.2° at the Titel station in 2006 to 16.5°, also at the Titel station, in 2014. The acidity of the water is generally uniform. The lowest value of 7.7 was recorded at the Titel station in 2006 and the highest was 8.1 in 2014 at the Martonoš and Novi Bečej stations. The highest electrical conductivity was registered at the Martonoš station in 2006 (483), while the lowest average conductivity was recorded at the Novi Bečej station in 2014, 370 mS/cm. The highest oxygen saturation values for the observed periods were registered at the Titel station in 2022 (97%), while the lowest values were recorded at the Novi Bečej and Titel stations in 2010 (80%). The biochemical oxygen demand, which is an indicator of the organic waste's intensity, ranges from the lowest at 1.4 mg/l at the Martonoš and Novi Bečej sites on the Tisa River in 2018, to 2.8 mg/l at the Novi Bečej station in 2006. One of the most important indicators of water quality is the number of solids in the water column – both dissolved (filterable) solids and not dissolved (suspended) solids (Pharinp, 2007). This parameter is particularly important when assessing water quality when we evaluate the conditions for sailing, that is, the development of nautical tourism. Suspended solids show large oscillations and range from the lowest mean annual value of 13 mg/l at the Titel measuring station during 2014, to as high as 101 mg/l also at the Titel station during 2010. The

Tisa River's total oxidised nitrogen levels range from 1,088 mg/l at the Novi Bečej station in 2006 to the highest value at the Martonoš station of 1,391 mg/l in 2014. The highest values of orthophosphate were recorded in 2010 at the Titel station (0.083mg/l), while the lowest was also recorded at the Titel station (0.033mg/l) in 2022. Ammonium values vary from the lowest value measured at the Martonoš station (0.043 mg/l) in 2018 to its highest value measured at the Titel station (0.383 mg/l) in 2006. The values of coliform bacteria are not relevant for the analysis due to the large amount of unavailable data.

Table 4. Annual and monthly values SWQI of the Tisa River in Serbia

Measuring station	Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Martonoš	2006	76	69	68	77	85	75	69	72	76	81	75	83
	2010	81	75	82	80	76	70	67	75	79	86	81	x
	2014	85	84	88	85	83	88	75	81	84	89	84	82
	2018	86	84	78	83	85	75	75	81	85	85	89	88
	2022	86	85	88	88	84	81	88	85	82	89	90	80
Novi Bečej	2006	77	73	77	77	75	74	76	74	70	72	70	x
	2010	81	75	81	80	75	76	66	69	78	84	85	x
	2014	84	88	88	84	86	78	78	74	78	86	84	85
	2018	88	81	86	82	88	73	80	78	86	89	90	84
	2022	83	82	86	92	93	75	83	80	85	89	78	x
Titel	2006	76	65	76	74	75	72	76	74	79	72	76	78
	2010	78	75	84	85	75	68	67	75	83	x	x	x
	2014	88	x	92	92	86	80	78	73	85	88	89	83
	2018	84	86	83	78	86	80	74	75	89	81	89	85
	2022	85	80	85	91	86	81	84	78	89	89	82	x

* X - measurement was not made

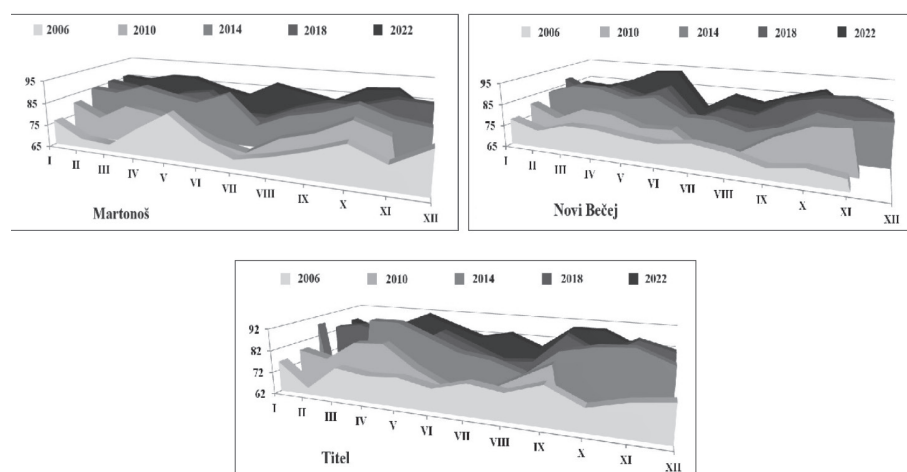
Source: calculated by the authors

Ten water quality parameters were measured at the three Tisa River monitoring stations (Martonoš, Novi Bečej, and Titel). The monthly values of these parameters were then used to compute the SWQI for the Tisa. For every measuring site, the SWQI was computed 60 times during the course of the five years (Table 4). If $SWQI > 80$, conditions are acceptable for many activities, as well as for navigation (Yunus and Nakagoshi, 2004).

SWQI values for Martonoš station (Table 4), ranged from 67 in July 2010 to 90 in November 2022. At Novi Bečej station, the SWQI values ranged from 66 in July 2010. to 93 in May 2022. At the final Tisa station, prior to its merging with the Danube, Titel, the SWQI values ranged from 65 in February 2006 to 91 in April 2022.

The Tisa at Martonoš, Novi Bečej, and Titel may primarily be categorised as very good (84-89) and good (72-83), based on the results collected.

Figure 2. Annual and monthly average SWQI scores for stations on the Tisa River in Serbia



Source: calculated by the authors

It may be concluded that 2006 was the worst year for Tisa water quality based on the annual SWQI values shown in Figure 2. The values of the water quality index increased in 2010, 2014 and 2018, and the highest values were registered in 2022. on all control points. SWQI values during 2006 were less than 80 in almost all measurements. On the other hand, during 2022, in almost all measurements, the values of the index were higher than 80. According to this study, the Tisa River's water quality slightly declines downstream. The same results were confirmed in the study Babić et al., 2019, for the period 2011-2016.

On all three stations, seasonal fluctuations in the quality of the water were noted, and certain patterns were identified. At all three measuring stations (Martonoš, Novi Bečej, and Titel), the lowest SWQI values were recorded during the warm season, particularly in June, July, and August (SWQI<80) (Fig. 2). Other comparable research (Bjelajac et al., 2013; Leščešen et al., 2014) has demonstrated the same pattern.

5. DISCUSSION AND CONCLUSION

The Tisa River in Serbia holds significant potential for the development of nautical tourism, offering a diverse array of environmental, socio-cultural, and economic assets. Water quality parameters significantly influence the competitiveness of nautical tourism development along the Tisa River in Serbia.

Based on the obtained results, we see that most of the parameters were within the allowed limit values for the II class of water, which is defined based on ICPDR criteria and Regulations on limit values of pollutants in surface waters (ICPDR, 2006; Official Gazette of RS, no. 50/2012). The parameter that deviates from the limit values of the II class in a greater number of measurements is suspended solids. The amount of suspended solids is usually higher during the warmer period of the year, which may have a lesser effect on sailing conditions and the development of nautical tourism. Based on the results collected, the Tisa water quality at all monitoring sites could mostly be categorised as very good (SWQI 84-89) or good (SWQI 72-83), which is a favourable factor for the development of nautical tourism. It is also important to point out that since 2006, the water quality has been constantly improving and in 2022 it is continuously in the class of very good (SWQI 84-89). Satisfactory water quality can highlight the competitiveness of the Tisa River in relation to other nautical tourism destinations in the area. Somewhat lower values of the index, which were registered in the warmer part of the year, may harm tourist activities. That is why it is very important to carry out continuous monitoring and influence the prevention of possible sources of pollution.

The findings underscore the importance of proactive water quality management strategies in enhancing the competitiveness of nautical tourism along the Tisa River. Targeted interventions, such as wastewater treatment upgrades, agricultural best management practices, and pollution control measures, are necessary to mitigate the adverse effects of water pollution on tourism development. In order to establish sustainable management techniques and ensure the long-term success of nautical tourist operations, collaboration among stakeholders is required. These stakeholders include government agencies, local communities, and tourism operators. By prioritising water quality management and implementing evidence-based interventions, stakeholders can enhance the attractiveness and sustainability of recreational activities, thereby stimulating economic growth and promoting environmental stewardship in the region. By embracing sustainable development practices, fostering community

involvement, and leveraging strategic investments in infrastructure and marketing, stakeholders can capitalise on this potential to preserve natural resources and enhance the overall quality of life for residents and visitors alike. Future research should focus on assessing the effectiveness of specific management measures and monitoring the long-term impacts of water quality improvements on tourism outcomes.

ACKNOWLEDGEMENTS

This research was supported by The Science Fund of the Republic of Serbia, GRANT No. 7739076, Tourism Destination Competitiveness - Evaluation Model for Serbia -TOURCOMSERBIA. The authors gratefully acknowledge the financial support of the Ministry of Science, Technological Development and Innovation of the Republic of Serbia (Grants No. 451-03-66/2024-03/ 200125 & 451-03-65/2024-03/200125). The authors also acknowledge the financial support of the Ministry of Education, Science and Technological Development of the Republic of Serbia (Grant No. 451-03-9/2021-14/ 200125).

BIBLIOGRAPHY

1. Babić G., Vuković M., Voza D., Takić Lj., Mladenović-Ranisavljević I., 2019. "Assessing Surface Water Quality in the Serbian Part of the Tisa River Basin," *Pol. J. Environ. Stud.* 28(6), pp. 4073-4085 doi: 10.15244/pjoes/95184
2. Bakić O., 2008. "Marketing in tourism," Faculty of Service Business, Sremska Kamenica, Serbia [In Serbian].
3. Bjelajac D., Leščešen I., Micić T., Pantelić M., 2013. "Estimation of water quality of Sava River (Vojvodina, Serbia) in the period 2004-2011 using Serbian Water Quality Index (SWQI)," *Geographica Pannonica.* 17(4), pp. 91 doi:10.5937/GeoPan1304091B
4. Bogdanović, Ž. and Marković, S., 2005. "Waters of Banat." Institute of Geography. Novi Sad. Faculty of Sciences [In Serbian].
5. Cardoso, L., Lopes, E., Almeida, G.G.F.d., Lima Santos, L., Sousa, B., Simões, J., Perna, F., 2023. "Features of Nautical Tourism in Portugal—Projected Destination Image with a Sustainability Marketing Approach," *Sustainability*, 15, pp.8805 doi.org/10.3390/su15118805
6. Cervantes O., Espejel I., 2008. "Design of an integrated evaluation index for recreational beaches," *Ocean Coast. Manag.*, 51, pp. 410-419 doi.org/10.1016/j.ocecoaman.2008.01.007
7. Dragin, S., Pavić, D., Davidović, N., Jovanović, T., & Armenski, T., 2011. "Personal limits for nautical tourism product selection," Paper presented at the 14th Scientific Conference of Contemporary Trends in Tourism and Hospitality. September 29-30, Novi Sad, Serbia <https://open.uns.ac.rs/handle/123456789/26741>
8. Gavrilović, Lj. and Dukić, D., 2002. "Rivers of Serbia," Institute for textbooks and teaching aids, Belgrade [In Serbian].
9. Gibson, P., 2006. "Cruise Operations Management," Butterworth Heinemann, Burlington.
10. GRS-MTTT, Government of the Republic of Serbia, Ministry of Trade, Tourism, and Telecommunications, 2016. Tourism Development Strategy of the Republic of Serbia 2016-2025. Retrieved from: <https://mto.gov.rs/extfile/sr/213/TOURISM%20DEVELOPMENT%20STRATEGY%20OF%20RS%202016-2025.pdf>
11. ICPDR, International Commission for the Protection of the Danube River, "Water quality in the Danube River Basin," TNMN Yearbook 2006. <https://www.icpdr.org/>
12. Josimov Dundjerski J., Savić R., Grabić J., Blagojević B., 2017. "Water Quality Trends of the Tisa River Along its Flow Through Serbia," *Rocznik Ochrona Srodowiska*, 19, pp.17-35 http://ros.edu.pl/images/roczniki/2017/01_ROS_V19_R2017.pdf
13. Katić A., Muhić B., Stanković J., Kovačević J., 2011. "Nautical tourism as a factor in the competitiveness of tourism in Vojvodina," *Industry*, 39(21), pp. 237-261 [In Serbian] <https://scindeks-clanci.ceon.rs/data/pdf/0350-0373/2011/0350-03731102237K.pdf>
14. Khattabi, A., Williams, A.T., Ergin, A., 2011. "Assessment of quality and attraction of the sandy beaches of Nador province-Morocco," In: Bayed, A. (Ed.), *Sandy Beaches and Coastal Zone Management and Proceedings of the Fifth International Symposium on Sandy Beaches*. Travaux de l'Institut Scientifique, Rabat, Serie Generale, Rabat, Morocco, pp. 59-64 <http://www.israbat.ac.ma/wp-content/uploads/2015/02/08%20Khattabi.pdf>

15. Kleiss B., Murphy J., Mayne C., Allgeier J., Edmondson A., Ginsberg K., Jones K., Lauth T., Moe E., Murphy J., and Allison M., 2021. “Incorporating Water Quality Analysis into Navigation Assessments as Demonstrated in the Mississippi River Basin,” *Journal of Waterway, Port, Coastal, and Ocean Engineering*, Vol.147, pp. 5 doi.org/10.1061/(ASCE)WW.1943-5460.0000651
16. Law on Tourism, “Official Gazette of RS”, no. 17/2019 <https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/skupstina/zakon/2019/17/7/reg>
17. Lee L-H., Lee Y-D., 2015. “The impact of water quality on the visual and olfactory satisfaction of tourists,” *Ocean & Coastal Management*, 105, pp. 92-99 doi.org/10.1016/j.ocecoaman.2014.12.020
18. Leščešen I., Pantelić M., Dolinaj D., Lukić T., 2014. “Assessment of water quality of the Tisa River (Vojvodina, North Serbia) for ten-year period using Serbian Water Quality Index (SWQI),” *Geographica Pannonica*, 18(4), pp.102-107 doi: 10.5937/GeoPan1404102L
19. Miljković M., 2020. “Stari Slankamen—Potential Destination of Nautical Tourism in Serbia,” *Journal of Tourism and Hospitality Management*, 8(3), pp. 93-99. doi:10.17265/2328-2169/2020.03.002
20. Mladenović-Ranisavljević I., Babić G., Vuković M., Voza D., 2021. “Multicriteria Visual Approach to the Analysis of Water Quality—A Case Study of the Tisa River Basin in Serbia,” *Water*, 13(24), pp. 3537 doi.org/10.3390/w13243537
21. Morgan, R. K. (2012), “Environmental impact assessment: the state of the art”, *Impact Assessment and Project Appraisal*, 30, pp.5-14 <https://doi.org/10.1080/14615517.2012.661557>
22. Pantelić M., Dolinaj D., Leščešen I., Savić S., Milošević D., 2015. “Water quality of the Pannonian Basin Rivers the Danube, the Sava and the Tisa (Serbia) and its correlation with air temperature,” *Thermal Science*, 19(2), pp. 477-485 doi:10.2298/TSCI150325114P
23. Pavić D. and Stojanović V., 2004. “Cultural tourism resources as a segment of nautical tourism on the Tisa,” *Turizam*, 8, pp.57-59 [In Serbian] <http://www.dgt.uns.ac.rs/dokumentacija/turizam/arhiva/turizam8.pdf>
24. Pavić, D. and Mesaroš, M., 2006. “Navigation characteristics of the Tisa River in Serbia as a basic prerequisite for the development of nautical tourism,” *Turizam*, 10, pp.112-115 [In Serbian] <http://www.dgt.uns.ac.rs/dokumentacija/turizam/arhiva/turizam10.pdf>
25. Pharinp, C., 2007. “*Sustainable Water Quality Management Policy*,” Published by Springer, P.O. Box 17, 3300 AA Dordrecht, Netherlands.
26. Regulation on limit values of pollutants in surface waters, “Official Gazette of RS”, no. 50/2012 <https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/uredba/2012/50/1/reg>
27. Roca, E., Villares, M., 2008. “Public perceptions for evaluating beach quality in urban and semi-natural environments,” *Ocean Coast. Manag.* 51, pp.314-329 doi.org/10.1016/j.ocecoaman.2007.09.001

28. Salinas Fernández, J.A., Serdeira Azevedo, P., Martín Martín, J.M., & Rodríguez Martín, J.A., 2020. "Determinants of tourism destination competitiveness in the countries most visited by international tourists: Proposal of a synthetic index," *Tourism Management Perspectives*, 33, pp.100582 doi.org/10.1016/j.tmp.2019.100582
29. SEPA, Serbian Environmental Protection Agency (2006-2022). The Ministry of Environment and Planning. <http://www.sepa.gov.rs>.
30. Stojanović Z., Deršek Timotić I., Novaković B., Veljković N., 2018. "Surface Water Quality Assessment in Serbia - Water Quality Index and Ecological Status Comparison," *International Journal of Modern Engineering Research (IJMER)*, 8, pp.10 https://www.sepa.gov.rs/download/radovi/2018/Surface_Water_Quality_Assessment_in_Serbia.pdf
31. Tomić R., Mrkša M., Kovačević-Berleković B., Maksimović B., Dragosavac M., Imbronjev M., 2016. "Nautical tourism sustainable resources of the Municipality of Novi Bečej," Экономика, Экология И Общество России В 21-М Столети. Сборник научных трудов 18-й Международной научно-практической конференции; pp.198-205 https://www.researchgate.net/profile/Aleksandra-Vujko/publication/303697076_THE_STRUCTURE_OF_THE_BANKING_SYSTEM_OF_CENTRAL_AND_EASTERN_EUROPEAN_COUNTRIES/links/574e0d0b08ae82d2c6be2930/THE-STRUCTURE-OF-THE-BANKING-SYSTEM-OF-CENTRAL-AND-EASTERN-EUROPEAN-COUNTRIES.pdf#page=199
32. Veljković N., Lekić D., Jovićić M., Pajčin N., 2010. "Internet application Serbian Water Quality Index," *Water Sanitary Engineering*. 40(3), pp.15. [In Serbian].
33. Ward, D., 2005. "Complete Guide to Cruising and Cruise Ships 2004", Berlitz Publishing, London.
34. White M., Smith A., Humphries K., Pahl S., Snelling D., Depledge M., 2010. "Blue space: the importance of water for preference, affect, and restorativeness ratings of natural and built scenes," *Journal of Environmental Psychology*, 30(4), pp. 482-493 doi.org/10.1016/j.jenvp.2010.04.004
35. Yunus A. J. M. & Nakagoshi N., 2004. "Effects of seasonality on streamflow and water quality of the Pinang River in Penang Island, Malaysia," *Chinese Geographical Science*, 14(2), pp.153-161 doi:10.1007/s11769-004-0025-z
36. Živić I., Stojanović K., Četković A., 2019. "Palingenia longicauda (Ephemeroptera: Palingeniidae) - proposal to include the species on Annex II and IV of the Habitats Directive", Symposium of Serbian entomologists with international participation, Nis, September 25-29, 2019 <https://biore.bio.bg.ac.rs/handle/123456789/1712>

INVESTING IN ENVIRONMENTAL PROTECTION: A CATALYST FOR GREEN ECONOMIC GROWTH IN EUROPE

DANIEL TOMIĆ

Juraj Dobrila University of Pula

Faculty of Economics and Tourism "Dr. Mijo Mirković"

Pula, Croatia

dtomic@unipu.hr

Paper category: Original scientific paper

ABSTRACT

In the pursuit of sustainable development, most European countries, and especially EU members, are increasingly recognising the pivotal role of investment in environmental protection as a catalyst for fostering green economic growth. Hence, this study explores the relationship between expenditure in environmental protection and relevant sustainability constructs, highlighting the imperative for more ‘greener’ approaches to development. The nexus between investment in environmental protection and green economic growth in European countries stems from the acknowledgment of environmental degradation as a significant challenge with far-reaching socio-economic implications. As such, policymakers are embracing a paradigm shift towards prioritising sustainable practices that not only mitigate environmental risks but also stimulate economic prosperity. Furthermore, the integration of environmental considerations into economic policymaking accentuates the recognition of the intrinsic value of ecosystems and the need for their preservation to ensure long-term socio-economic resilience. By internalising environmental externalities and promoting resource efficiency, European countries can enhance their competitiveness while mitigating risks associated with climate change and resource scarcity. The goal of the study is to test whether the increase in environmental protection would promote green economic growth for 27 European countries. Covering the period 2014-2019, empirical evaluation is based on panel cointegration approach confirming the positive impact of environmental investment on green growth perspective.

Keywords: environment, green GDP, green growth, environmental protection, panel cointegration approach, European countries

1. INTRODUCTION

We are witnessing significant ambition and political backing for green economy initiatives and policies promoting green growth, particularly when they promise to improve social welfare without impeding economic advancement. However, the evolving global economic landscape, sustainability concerns, debates over wealth distribution, challenges related to environmental degradation, and the absence of comprehensive international environmental agreements are increasingly central to how policymakers and the political community should interpret the concept of green growth (Stjepanović, Tomić and Škare, 2022). In the pursuit of sustainable development, most European countries and especially European Union (EU) members, are increasingly recognising the pivotal role of investment in environmental protection as a catalyst for fostering green economic growth. Hence, this study explores the relationship between expenditure in environmental protection and relevant sustainability constructs, highlighting the imperative for more 'greener' approaches to development. The nexus between investment in environmental protection and green economic growth in European countries stems from the acknowledgment of environmental degradation as a significant challenge with far-reaching socio-economic implications. Hence, policymakers are embracing a fundamental shift towards prioritising sustainable practices that not only mitigate environmental risks but also foster economic prosperity. This transition reflects a deeper understanding of the vital role ecosystems play and the imperative to preserve them for long-term socio-economic resilience. By incorporating environmental concerns into economic policymaking, European nations recognise the intrinsic value of ecosystems and the necessity of their preservation. Through this approach, they aim to internalise environmental externalities and promote resource efficiency, thereby bolstering their competitiveness while simultaneously addressing the challenges posed by climate change and resource scarcity.

Exploring potential interactions in environmental expenditures among countries holds significant implications for various reasons (see Gallo and Ndiaye, 2021). It enables the comparison of efforts made by different nations in the realm of environmental protection. It offers the recognition of possible expenditure externalities and suggests that countries' policy decisions are interconnected rather than independent. In the context of environmental expenditures, these externalities may manifest as the ripple effects of public investments in environmental infrastructures within a particular country, extending their benefits to neighbouring nations. Such interdependence

underscores the need for a holistic understanding of the interconnected nature of environmental expenditures, both on a regional (EU for example), as well as on a global scale. The EU's approach to environmental protection has often been characterised as a complex tapestry of policy instruments and regulatory strategies. These encompass standard-setting, which places significant emphasis on the role of member countries in attaining environmental quality objectives, as well as technical and impact assessments addressing cross-border environmental impacts. Balancing the imperative of environmental preservation with the imperatives of trade and economic growth has posed challenges. Nevertheless, environmental protection has frequently found itself at odds with foundational EU priorities concerning economic development, trade, and growth (Alibašić and Atkinson, 2023).

Limited empirical evidence regarding the relationship between environmental protection expenditure and green growth dynamics prompted this research to investigate how investments in environmental protection affect prospects for green growth. The primary aim is to determine whether spending on environmental protection effectively reduces the disparity between conventional GDP and Green GDP measures. To achieve this, a longitudinal empirical assessment is conducted using panel cointegration modelling for the period spanning 2014 to 2019 across a sample of 27 European countries. The findings validate a positive impact of environmental spending on the dynamics of green growth. Section 2 surveys the theoretical and empirical literature. Section 3 gives a full perspective to the analytical part by describing used methodology and data, as well as evaluating the results. Section 4 provides some insights on the implications of the results, while Section 5 offers concluding remarks on the research and its future perspective.

2. ENVIRONMENTAL PROTECTION IN EUROPE: THEORY AND EMPIRICS

A significant portion of economic research has been dedicated to exploring the intricacies surrounding the shift towards environmental sustainability within economies. This includes detailed analysis of the costs associated with transitioning to greener practices, encompassing estimates of the expenses incurred by both acting and opting for inaction. On one hand, unsustainable economic strategies have exacerbated the socio-economic gap between developed nations and others, underlining the urgent need for creative collaborations that bridge economic and environmental priorities. On the other hand, there is a widespread belief that policies promoting green

growth are poised to yield positive welfare outcomes over the long haul. However, the upfront costs of transitioning may pose challenges to their immediate adoption and implementation (Gramkow, 2020).

2.1. THEORETICAL IMPLICATIONS

While concepts such as the green economy and green growth, aiming to harmonise socioeconomic progress with environmental sustainability are not novel, the adoption of national green growth strategies or roadmaps remains limited to a handful of economically significant countries like China and South Korea. The EU has solidified its reputation as a trailblazer in global environmental stewardship, backed by a comprehensive array of environmental policies and programmes. Nevertheless, the impact and success of these endeavours exhibit notable divergence among member and non-member countries, highlighting the intricate challenges inherent in environmental governance within diverse political and socio-economic landscapes. Norway boasts a rich history of grappling with sustainable development issues. While initial efforts were somewhat ambiguous, focusing on the exploitation of natural resources and environmental accounting, Norway has since shifted its attention towards hybrid accounts and indicators. Recognising the necessity for comprehensive environmental accounts rather than mere statistics, the country has made noticeable strides in enhancing the development of a robust environmental accounting framework tailored to meet the needs of policymakers. Similarly, the German Federal Statistics Office has made significant strides in this realm, implementing various modules of the System of Environmental-Economic Accounting (SEEA). These modules encompass areas such as energy and air emissions, physical input-output tables, land accounts, and sectoral reporting modules, among others. Moreover, a cadre of other nations, including Belgium, Denmark, Finland, France, Italy, the Netherlands, and Sweden, are actively engaged in advancing environmental accounting initiatives. While these countries lead the charge, numerous others are also accelerating their efforts in this crucial area (Stjepanović, Tomić and Škare, 2017).

As the EU aspires to standardise traditional methods of environmental conservation among its member countries, doubts have been raised regarding its ability to fulfil this commitment. The competence in adhering to EU environmental protection regulations ranges widely, spanning from highly proficient to nascent stages of development. Substantial disparities persist, particularly with recent shifts observed in the transfer of administrative responsibilities and the enforcement of environmental regulations from

individual member countries to EU institutions (Alibašić and Atkinson, 2023). Nonetheless, governments have outlined mitigation strategies to tackle the complexities of climate change through their Intended Nationally Determined Contributions as part of the Paris Agreement. The EU, alongside national governments, has established distinct targets for 2050 in alignment with EU priorities and Green Deal policies. These objectives are bolstered by dedicated research programmes, legislation, and funding initiatives. Across the globe, an array of environmental regulations has proliferated, reflecting the widespread commitment to addressing pressing environmental concerns.

This transformative shift tends to synchronise economic imperatives with environmental concerns, paving the way for a more equitable and robust foundation for societal advancement (Tomić and Stjepanović, 2022). Against the backdrop of a growing international focus on green growth and progress, grasping the intricate interplay between environmental investments and sustainable economic development has assumed paramount importance. In a way, it represents the discussion from the Post Keynesian Economics vs. Neoclassical Economics stance on the reconciliation of socioeconomic development with environmental sustainability.

The endorsement of a green economy has matured into a pervasive guiding principle shaping both local and international economic progress, motivated by the urgent need to enrich and protect ecological landscapes. Substantial cuts in funding for green initiatives during times of crisis yield adverse effects, exacerbating societal hardships. The scale of government investment in green economy endeavours, coupled with the dynamics of how such funds are allocated, holds considerable sway over the implementation of fiscal policies. This investigation is rooted in the acknowledgment that specific aspects of public expenditure exert a more discernible impact on promoting green economic practices than others (Feng et al., 2022). A considerable body of research highlights the significant impact of environmental degradation on shaping the allocation of government fiscal resources (Yuelan et al., 2019). However, there remains a noticeable gap in comprehensive evidence regarding the intricate relationship between green economic growth and government fiscal expenditure. Previous studies have shed light on the crucial role of government fiscal spending in driving forward green economic development. While an increase in fiscal spending contributes to the advancement of green economic growth, it is crucial to recognise that such growth may encounter setbacks due to heightened environmental vulnerabilities. Furthermore, fiscal expenditure acts as a tool to address market failures, thereby encouraging avenues for innovative technological solutions. In this context, the judicious utilisation

of fiscal resources not only fosters the expansion of a green economy but also plays a vital role in mitigating environmental challenges and catalysing advancements in technology (Huang et al., 2022).

2.2. LITERATURE REVIEW

In this section, we will focus on the most recent and relevant studies pertaining to the topic at hand. Arjomandi et al. (2022) introduced the ARDL model to explore the immediate and prolonged impacts of environmental policy stringency and environmental spending on pollution-adjusted GDP and productivity growth across several OECD countries. Although there are discernible differences in policies and outcomes across nations, our examination reveals that, in the immediate time frame, governmental investment in environmental protection serves as a significant catalyst for national economic growth. Namely, their long-term analysis implies that both heightened environmental policies and increased environmental expenditure may slowdown 'green' GDP and productivity growth over time, with policy stringency exhibiting a comparatively weaker influence. Consequently, their results do not support the idea that environmental regulations can spur economic growth. Instead, they align with the prevailing perspective that such policies might impede economic activity and long-term growth. In a recent study conducted by Niu (2024), an in-depth analysis employing a panel Tobit model shed light on the relationship between government spending on environmental protection and a nation's Environmental, Social, and Governance (ESG) performance. The findings unveiled a statistically significant and positive association, indicating that increased government investment in environmental protection correlates with improved national ESG performance. Moreover, the study uncovered additional insights, revealing that allocating resources toward environmental protection not only bolsters ecological and societal outcomes but also fosters advancements in governance standards. Furthermore, it was observed that heightened government expenditure on environmental initiatives spurs innovation in green technologies, leading to a cascade effect that positively influences the overall national ESG performance.

Santeramo, Lamonaca and Emlinger (2025) suggested that technical regulations are becoming increasingly prevalent, complex, and often less transparent than traditional price-based policy instruments. While these measures are widely implemented to achieve nontrade policy objectives, particularly in the realm of environmental protection, their trade effects remain insufficiently explored. Leveraging a unique and original dataset of

technical measures notified for environmental reasons, their study provided robust evidence that such regulations significantly reduce both trade values and volumes. Moreover, the analysis uncovered substantial heterogeneity in the trade effects of environmental technical measures across different sectors and countries, highlighting notable disparities in their impact. These findings are critical for evaluating whether environmental technical measures act as trade barriers and emphasise the need for further research into their trade-offs and spillover effects. A deeper understanding of these dynamics is essential for assessing the broader implications of such regulations on global trade and informing policy decisions that balance environmental objectives with economic considerations.

Wang and Naveed (2024) examined the impact of environmental protection expenditures on innovation and explore the potential causal relationship between these two variables. The study's novelty and primary contribution to the literature lie in its comprehensive approach, which considers total environmental protection expenditure from both public and private sectors while distinguishing between corporate and household expenditures within the private sector. Additionally, it accounts for both innovation inputs and outputs and addresses potential endogeneity concerns—key aspects that remain underexplored in the existing literature. By applying a panel of EU countries from 2006 to 2020, the analysis finds that environmental protection expenditure generally exerts a positive effect on innovation, even after controlling for trade, credit availability, education, and inflation. To address endogeneity, the study employs the System GMM estimator, ensuring robust inference. Notably, government-sector expenditures emerges as the primary driver of this positive relationship. The core findings remain robust across alternative measures of innovation and different estimation techniques that mitigate endogeneity concerns. This research provides valuable insights for policymakers involved in environmental and innovation strategies, offering guidance for designing effective policies that promote sustainable development.

Georgieva (2024) analysed the relationship between economic development, environmental investments, and greenhouse gas emissions within the European Union over the period 2008–2022. Employing correlation and regression analyses, the study assessed the impact of environmental protection expenditures and gross domestic product on greenhouse gas emissions. The findings indicate a sustained increase in environmental protection expenditures, particularly in recent years, reflecting the EU's strengthened commitment to sustainable development. Concurrently, greenhouse gas emissions demonstrated an overall downward

trend, with the most substantial reduction occurring between 2019 and 2020, likely influenced by the economic disruptions caused by the COVID-19 pandemic. Furthermore, the correlation analysis identified a significant negative relationship between environmental investments and emissions, reinforcing the efficacy of environmental expenditures in reducing carbon footprints. Krajewski (2016) examines the relationship between public expenditure on environmental protection and economic growth, particularly in the context of the recent global economic crisis. Utilising an econometric panel model (across eleven Central European countries, covering the years 2001-2012) which considers both the temporal and cross-sectional dimensions of the phenomenon under scrutiny, the study addresses the potential for misleading conclusions that may arise solely from temporal variations. The results suggest that public expenditure on environmental protection exerts a more pronounced influence on GDP during times of crisis. Therefore, the study underscores that such expenditure not only lacks negative repercussions on economic growth but also yields its most potent positive effects during periods of global financial turmoil.

Savranlar, Ertas and Aslan (2024) examined the impact of environmental taxes on pollution levels across the EU-27 countries, with a particular focus on their relationship with CO₂ emissions. Additionally, it incorporated renewable energy consumption and urbanisation as explanatory factors to assess their role in CO₂ emissions, while also testing the Environmental Kuznets Curve hypothesis. The empirical findings indicated that an increase in environmental taxes leads to a 0.14% reduction in CO₂ emissions, providing evidence of their effectiveness in mitigating environmental degradation. Furthermore, the results supported the validity of the Kuznets hypothesis, suggesting that economic growth initially exacerbates pollution levels before reaching a turning point where further growth contributes to environmental improvements. Causality analysis revealed a bidirectional relationship between CO₂ emissions and environmental taxes, highlighting the dynamic interplay between taxation policies and environmental outcomes. These findings revealed the role of environmental tax revenues as a vital policy instrument for promoting sustainability in EU countries. Effective implementation and enforcement of environmental taxation policies emerged as crucial strategies for balancing economic activities while advancing sustainability goals. Gallo and Ndiaye (2021) examined data from 1995 to 2017 across 28 OECD countries. Their research dived into the dynamics of strategic interactions in environmental expenditures among these nations, employing a spatial Durbin model. The findings unveiled a significant positive spatial dependence in environmental spending across

OECD countries, indicating a trend where neighbouring countries' policies influence each other's decisions regarding environmental expenditures. Moreover, their study brought to light distinct patterns in expenditure allocation, suggesting that highly populated nations, or those facing significant unemployment, tend to allocate relatively fewer resources to environmental concerns compared to their counterparts. Vavoura and Vavouras (2021) found that the green growth strategy essentially adopts a modified version of the conventional economic growth model, integrating certain environmental considerations within the EU. Authors demonstrate that while per capita income is steadily increasing, expenditure on environmental protection is growing at a considerably slower pace. Notably, the analysis reveals a discernible downward trajectory in investments allocated towards environmental protection. These findings suggest a regression in both the social and environmental facets of sustainability, with the traditional pursuit of economic growth taking precedence once again. In essence, despite the rhetoric of green growth, the research indicates a resurgence of prioritising economic expansion over holistic sustainability objectives.

Amjadi et al. (2025) empirically examined the impact of environmental protection expenditures on sector-level employment within the manufacturing industry, utilising detailed firm-level data from Sweden spanning the period 2002–2021. Employing a structural model, the analysis decomposed the overall employment effects of environmental protection expenditures into three key channels: the cost effect, the factor shift effect, and the demand effect. A key contribution of this study is the incorporation of an instrumental variable approach to address potential endogeneity in environmental spending, which may arise from factors such as corporate social responsibility and self-regulation. The findings indicate that, in general, increased environmental protection expenditures do not exert a statistically significant impact on employment across the sectors analysed. However, an exception is observed in the paper and pulp industry, where environmental expenditures are associated with a notable decline in employment. These results provide relevant insights into the employment implications of environmental policies, contributing to the ongoing debate on the trade-offs between sustainability efforts and labour market dynamics in manufacturing industries. Alibašić and Atkinson (2023) provided a thorough examination of environmental governance in the EU, with a specific focus on comparing the experiences of Bosnia and Herzegovina (a non-EU member) and Croatia (an EU member). Utilising policy transfer theory, the research evaluates how EU-led environmental initiatives fare when put into practice at both national

and local levels. It uncovers a notable disparity between these initiatives and their actual implementation, citing corruption and precarious political structures as significant hurdles to effective environmental protection. The findings underscore the crucial role of contextual factors and institutional capacity in assessing the success of environmental governance measures.

The study from Yang, Gao and Li (2022) analysed the relationship between economic development and environmental well-being, focusing on the decoupling dynamics of economic growth and environmental impacts across 30 Chinese provinces, autonomous regions, and municipalities. Its aim was to ascertain whether the pursuit of economic prosperity and environmental preservation has led to a harmonious »win-win« scenario. The study validated the reliability of NTL data as a pertinent source for evaluating decoupling performance. In addition, it observed a significant reduction in environmental pressures both nationally and provincially over the study period. Finally, the analysis revealed a positive trend indicating an enhanced relationship between economic activities and environmental conservation. This suggests that the endeavours toward economic growth and environmental protection have indeed yielded a mutually beneficial outcome, fostering a »win-win« scenario. Liu et al. (2016) analysed the impact of environmental protection investment on economic growth, specifically its benefits for the development of the green economy in China. Utilising data spanning the years 2004 to 2014, the study employed a multivariate regression model to empirically assess the influence of environmental protection investment on GDP growth. Results revealed a positive effect on GDP growth attributed to investments in environmental pollution control, industrial pollution control projects, and energy-saving and environmental protection initiatives.

2.3. RESEARCH GAP AND HYPOTHESIS DEVELOPMENT

Our study evaluates the complex relationship between investments in environmental conservation initiatives and their subsequent effects on a country's Green GDP. Evaluating the »green performance« of a country requires a robust basis of dependable statistical data. Traditional GDP is primarily suitable for comparing the productivity or economic growth among different nations and is not appropriate for gauging global well-being or considering environmental ramifications. Thus, it is inappropriate to assume a direct and linear correlation between GDP growth and environmental sustainability in any direction. Traditional GDP fails to offer sufficient parameters for a comprehensive evaluation of sustainability.

This underscores the potential of Green GDP, a variable to be utilised throughout the paper, to function as a metric for shaping sustainable progress policies and gauging the effectiveness of implementation measures for sustainability-promoting policies or programmes (Tomić, 2024). Equally, Green GDP is a measure that shows economic growth, which includes a component of the environmental consequences of such growth. Hence, it is incorrect to assume that economic development and growth alone will automatically result in environmental sustainability. The evidence suggests that heightened economic growth, in the absence of substantial macro-environmental policy interventions, coupled with the undeniable reality that advanced economies tend to consume more resources per capita than their developing counterparts, exerts significant pressure on nature and the environment. Therefore, the concept of green GDP emerges as a promising tool for evaluating environmental sustainability (Stjepanović, Tomić and Škare, 2022).

Environmental pollution, as a negative externality of production activities, necessitates government intervention through measures such as public spending, taxation, or subsidies. Given the public sector's greater resources for addressing environmental challenges, the strategic allocation of government funds for environmental protection can accelerate the development of innovative policies. Consequently, government spending may play a far more significant role in fostering innovation than previously recognised. This not only strengthens competitiveness but also supports broader societal objectives, including environmental sustainability and innovation-driven growth, ultimately contributing to green economic development (Wang and Naveed, 2024). To achieve green growth and sustainable development goals, Europe is taking a leading role in climate policy, with all countries collectively committing to a 40% reduction in CO₂ emissions by 2030 and a 55% reduction by 2050 (Tomić, 2024). Notably, the trends in environmental investments closely follow the patterns of general investments and GDP, highlighting their alignment with sustainable economic growth.

Given the limited empirical research on the causal relationship between environmental protection investments and green growth, this study aims to examine the extent to which such investments stimulate green growth potential. The central hypothesis tested is whether increased expenditures on environmental protection contribute positively to green growth by narrowing the gap between conventional GDP and Green GDP measures. To empirically assess this relationship, a longitudinal analysis is conducted, modelling the long-term interactions between the relevant variables for a

sample of 27 European countries. The expected findings should confirm a positive and statistically significant impact of environmental spending on the trajectory of green growth, reinforcing the argument for policy-driven investment in environmental sustainability.

3. METHODOLOGY, DATA AND RESULTS

In this section we will discuss methodological issues, describe the data and present the model. As the main goal of the study is to empirically test the significance of investment in environmental protection within the green growth framework on an international scale, we use a panel approach.

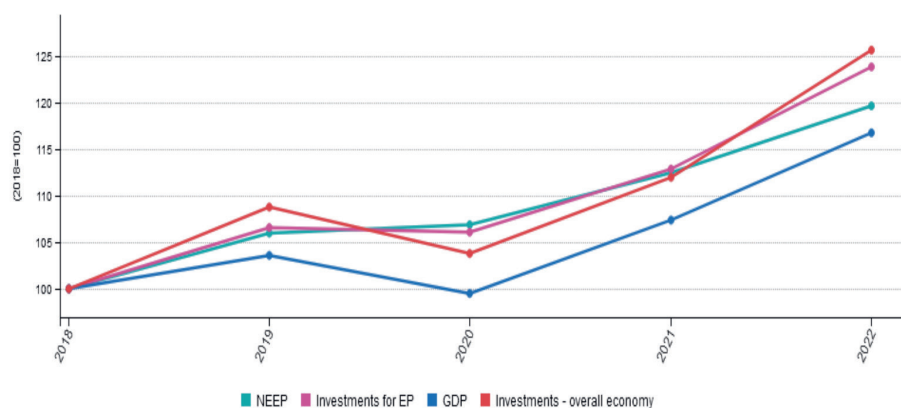
3.1. METHODOLOGY BACKS THE EMPIRICS

To assess the nexus between environmental expenditures and the aspiration for greener growth, we will employ two metrics to gauge investment in environmental protection: expenditure and transfers dedicated to this cause. Conversely, we will employ the gap variable to signify the potential for green growth. Hence, the study aims to uncover whether expenditure on environmental protection effectively narrows the disparity between conventional GDP and Green GDP measurements. Our approach will manifest through one model that relates environmental protection expenditures and environmental transfers to the so-called green gap, examining the hypothesis asserting a positive impact of investment in environmental protection on the aspiration for a green economy. Our study is methodologically based on the preliminary research made by Tomić (2024), who evaluated only 7 countries within two distinct models pointed to similar research goals. Our empirical evaluation will utilise cross-country panel cointegration modelling, focusing on data from the period spanning 2014 to 2019, encompassing a sample of 27 European countries, mostly EU members: Belgium, Bulgaria, Czechia, Denmark, Estonia, Germany, Greece, Ireland, Spain, France, Croatia, Italy, Cyprus, Lithuania, Luxembourg, Hungary, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, Norway and the United Kingdom. The sample is based primarily on data (un)availability for selected variables.

The growing recognition of the imperative to combat environmental pollution and safeguard natural resources has sparked an upsurge in both the supply and demand for environmental goods and services within European societies. These encompass products aimed at preventing, measuring, controlling, limiting, minimising, or rectifying environmental harm and

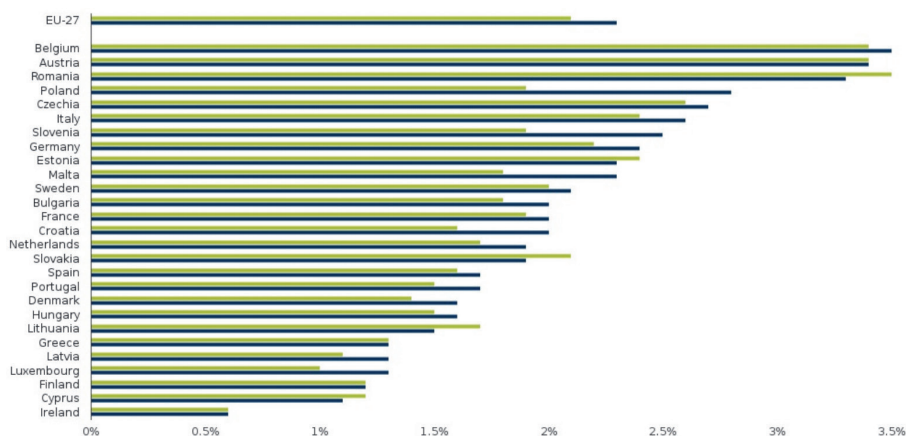
resource depletion, which is especially true for EU member countries. Environmental Protection Expenditure Accounts (EPEA) within the Eurostat domain serve to quantify the resources allocated by resident economic entities toward environmental protection efforts. In essence, they reflect the societal commitment to implementing the 'polluter pays principle.' EPEA data is particularly pertinent to the implementation of the European Green Deal, as it directly contributes to the European Union's policy objectives regarding environmental protection, resource management, and fostering green growth. By furnishing vital insights into the production and utilisation of environmental protection services, EPEA data informs and supports EU initiatives in these critical areas. Eurostat's estimates (Eurostat Statistics Explained, 2023) reveal that EU expenditure on environmental protection, as indicated by the national expenditure on environmental protection (NEEP), surged by 20% between 2018 and 2022. Remarkably, despite this uptick, the proportion of environmental protection expenditure to GDP remained relatively steady throughout the entire period, hovering around 2% (see Figure 1). During the same timeframe (2018-2022), investments in environmental protection witnessed a notable 24% increase. Despite the economic downturn induced by the COVID-19 crisis in 2020, environmental protection investments (EP) appeared to withstand the impact more resiliently compared to overall economic investments. Notably, in 2021 and 2022, environmental protection investments demonstrated further growth, surging by 6% and 9% respectively, in contrast to the 9% and 12% shares they held of total investments during those years.

Figure 1. Key environmental protection indicators in the EU (2018-2022)



Source: Eurostat Statistics Explained, 2023.

Figure 2. Expenditure on environmental protection by EU countries, 2018 vs. 2020, (% of GDP)



Source: European Environment Agency, 2023.

Significantly, there was notable variation in the ratios of environmental protection expenditure to GDP among EU member countries. Austria, Belgium, and Romania notably stood out, with such expenditures constituting over 3% of their respective GDPs, while in Ireland, this proportion was less than 1%. A compelling trend emerged across the 27 EU countries during the 2018-2020 period, with 21 countries witnessing an increase in this ratio. Poland recorded the most substantial upsurge, rising by 1 percentage point, closely followed by Malta, which saw an increase of 0.6 percentage points. Conversely, the remaining EU countries experienced a decrease in this share, with Lithuania and Cyprus witnessing the most significant reductions (European Environment Agency, 2023). This dynamic landscape underscores the diverse fiscal scenarios within the EU, highlighting the nuanced trajectories of public expenditure across its member countries (Tomić, 2024). Norway's climate finance currently stands at around 0.2% of its gross domestic product (GDP). In a significant move, Norway has committed to doubling its annual climate financing by 2026, increasing from NOK 7 billion in 2020 to NOK 14 billion by 2026. Additionally, it aims to at least triple its support for adaptation efforts by the same year (OECD library, 2024). Public sector expenditure on environment protection in the United Kingdom from 1999/00 to 2022/23 rose steadily, from less than 10 billion GBP in the early 2000's, to averaging around 13 billion GBP over the next 15 years, to its peak in 2021/2022 with 14.7 billion GBP (Statista, 2024).

To conclude, environmental protection expenditure in most European countries, and in particular the EU, has been steadily increasing over the years, driven by growing awareness of environmental issues and the need for sustainable development. Trends in expenditure probably vary across countries due to differences in economic development, environmental regulations, resource availability, and societal values. Shifts in government priorities and policies, such as the adoption of ambitious climate targets and commitments under international agreements like the Paris Agreement, will influence future expenditure patterns.

3.2. DATA AND MODELLING

Annual data on environmental protection and transfers for the period 2014-2019 across a sample of 27 European countries have been sourced from Eurostat (Eurostat, 2024). Green GDP data has been derived from the methodology proposed by Stjepanović, Tomić, and Škare (2022), which offers an alternative perspective on sustainability and green growth (Stjepanović, Tomić, and Škare, 2019). These datasets have been transformed into logarithmic form for analysis. Specifically, $\ln GGP$ represents the logarithmic deviation of Green GDP from the standard GDP measure in current U.S. dollars, $\ln EPE$ represents the logarithmic national expenditure on environmental protection across different institutional sectors in euros, and $\ln EPT$ signifies the logarithmic environmental protection transfers categorised by activity and institutional sector within the total spectrum of environmental protection efforts.

Building upon existing literature, recent trends, and the potential for homogeneity across EU countries, it is conceivable that there exists cointegration among the variables under consideration. Therefore, we plan to utilise panel data modelling to investigate this possibility. Should the variables exhibit non-stationarity and share the same order of integration, the analysis will proceed with testing for panel cointegration. Upon examining the graphical representation of the variables across different countries and the outcomes of various panel unit root tests (Table 1), including the LLC test (Levin, Lin, and Chu, 2002), Breitung test (Breitung, 2000), IPS test (Im, Pesaran, and Shin, 2003), and Fisher-type tests using ADF and PP tests (Maddala and Wu, 1999 and Choi, 2001), we have reached the conclusion about the order of integration, indicating stationarity in their first differences. While the outcomes of the unit root tests exhibit some degree of inconsistency, they predominantly suggest that the variables are integrated, implying non-stationarity in their levels and stationarity in their

first difference. Although variations were observed across different unit root tests, further graphical analysis corroborated our initial hypothesis regarding non-stationarity. In essence, it can be inferred that these series are non-stationary in their original level form. This characteristic is vital for our modelling endeavours. Therefore, it is appropriate to proceed with conducting a panel cointegration test.

Table 1. Panel unit root tests

Variables and tests	Level		First difference	
	Intercept	Intercept and trend	Intercept	Intercept and trend
Levin, Lin and Chu t*	Prob.**			
lnGAP	0.90	0.00	0.00	0.24
lnEPE	0.00	0.00	0.00	0.00
lnEPT	0.31	0.00	0.00	0.00
Breitung t-Stat.	Prob.**			
lnGAP	-	0.98	-	0.05
lnEPE	-	1.00	-	0.97
lnEPT	-	0.99	-	0.97
Im, Pesaran and Shin W-Stat.	Prob.**			
lnGAP	0.75	0.48	0.00	0.99
lnEPE	0.92	0.68	0.00	0.00
lnEPT	0.81	0.89	0.01	0.01
ADF - Fisher Chi-square	Prob.***			
lnGAP	0.00	0.40	0.08	1.00
lnEPE	0.86	0.58	0.01	0.00
lnEPT	0.69	0.99	0.12	0.09
PP - Fisher Chi-square	Prob.***			
lnGAP	0.00	0.00	0.02	1.00
lnEPE	0.56	0.00	0.00	0.00
lnEPT	0.51	0.73	0.05	0.00

Notes: * Heteroscedastic Consistent. ** Probabilities are computed assuming asymptotic normality. *** Probabilities are computed using an asymptotic Chi-square distribution. In the LLC, Breitung, IPS and Fisher-ADF tests, the automatic lag length selection is based on Schwarz information criterion with a maximum lag of 1. Moreover, to estimate the long-run variance in the LLC and Fisher-PP tests the Bartlett kernel was used with maximum lags determined by the Newey and West bandwidth selection algorithm.

Source: Authors' calculations.

3.3. THE EMPIRICAL MODEL

As the main goal of this study is to empirically evaluate the influence of various investments in environment on green growth perspective within the panel cointegration approach, the following equation is estimated:

$$\ln GAP_t = \alpha_0 i + \beta_1 \ln EPE_{it} + \beta_2 \ln EPT_{it} + \mu_{it}, i = 1, 2, \dots, N; t = 1, 2, \dots, T \quad (1)$$

where $\ln GAP$ represents logarithm of green gap variable, $\ln EPE$ indicates the logarithmic national expenditure on environmental protection, $\ln EPT$ presents the logarithmic environmental protection transfers, u_{it} is the error term while i and t denotes country and time respectively.

Based on the research approach from Tomić (2024) panel cointegration tests were evaluated according to Pedroni (1999, 2004) and Kao (1999), whereas Johansen Fisher trace and maximum eigenvalue cointegration tests could not be properly evaluated due to limited short time period included. Considering the potential variability in results stemming from the Johansen Fisher panel cointegration test, contingent upon factors such as the number of lags and other specifications, and acknowledging the inconclusive outcomes derived from this methodology, it was deemed prudent to abstain from employing this specific type of cointegration test. On the other hand, tests offered by Pedroni and Kao that follow the two-step Engle-Granger framework to encompass tests related to panel data, provided relevant cointegration justifications (Table 2). Pedroni's panel cointegration tests, in case with intercept (and not so significantly in case with no intercept or trend), reject the null hypothesis suggesting the presence of a long-run panel cointegration relationship between the variables, with at least one cointegrating vector. Similarly, Kao's panel cointegration test strongly rejects the null hypothesis of no cointegration between variables, also indicating the existence of a long-run panel cointegration relationship.

Table 2. Pedroni's and Kao's residual cointegration tests

Variables: lnGAP, lnEPE, lnEPT								
Pedroni test	Intercept				No intercept or trend			
	Stat.	Prob.	Weigh.	Prob.	Stat.	Prob.	Weigh.	Prob.
Panel v	-0.19	0.57	-0.59	0.72	-3.92	1.00	-3.95	1.00
Panel rho	1.17	0.87	2.10	0.98	1.58	0.94	2.87	0.99
Panel PP	-10.88	0.00	-7.25	0.00	-0.36	0.35	4.24	1.00
Panel ADF	-8.67	0.00	-4.92	0.00	-0.61	0.26	-0.12	0.44
Group rho	4.52	1.00			4.16	1.00		
Group PP	-10.23	0.00			-3.53	0.00		
Group ADF	-5.79	0.00			-2.14	0.01		
Kao test	t-Statistic				Prob.			
ADF	- 3.91				0.00			

Source: Authors' calculations.

3.4. THE RESULTS

The long-run cointegration is estimated using the pooled and grouped Panel Fully Modified Least Squares (FMOLS) and pooled and grouped Panel Dynamic Least Squares (DOLS) estimation methods (Phillips and Moon (1999), Pedroni (2000), and Kao and Chiang (2000) propose extensions of the Phillips and Hansen (1990) FMOLS estimator to panel settings while Kao and Chiang (2000), Mark and Sul (1999, 2003), and Pedroni (2001) propose extensions of the Saikkonen (1992) and Stock and Watson (1993) DOLS estimator). We opted not to estimate Pooled Mean Group/AR Distributed Lag (PMG/ARDL) due to a short time period in data which resulted in modelling inconsistency. FMOLS and DOLS estimation methods for panel settings allow the estimation of the panel cointegrating regression equation for non-stationary data by correcting the standard pooled OLS for serial correlation and endogeneity of regressors that are usually present in long-run relationships. In addition, the DOLS allows augmenting the panel cointegrating regression equation with cross-section specific lags and leads eliminating the endogeneity and serial correlation. Therefore, a key advantage over FMOLS and DOLS is that it permits the short-run dynamic specification to vary across cross-sections, while maintaining the constraint

that the long-run coefficients remain invariant (Škare, Benazić and Tomić, 2016).

Table 3. FMOLS and DOLS panel cointegration results

Panel Fully Modified Least Squares (FMOLS) – (lags-leads; 1,1) – pooled estimation								
Variable	No constant and trend				Linear trend			
	Coef.	Std.	t-Stat.	Prob.	Coef.	Std.	t-Stat.	Prob.
lnEPE	3.98	0.37	10.83	0.00	-0.04	0.05	-0.76	0.45
lnEPT	-1.77	0.56	-3.18	0.00	-0.01	0.01	-0.35	0.73
Panel Dynamic Least Squares (DOLS) – (lags-leads; 0,0) – pooled estimation								
Variable	No constant and trend				Linear trend			
	Coef.	Std.	t-Stat.	Prob.	Coef.	Std.	t-Stat.	Prob.
lnEPE	3.95	0.41	9.83	0.00	-0.00	0.02	-0.05	0.96
lnEPT	-1.54	0.61	-2.53	0.01	-0.00	0.01	-0.03	0.98
Panel Fully Modified Least Squares (FMOLS) – (lags-leads; 1,1) – grouped estimation								
Variable	No constant and trend				Linear trend			
	Coef.	Std.	t-Stat.	Prob.	Coef.	Std.	t-Stat.	Prob.
lnEPE	2.79	0.05	54.23	0.00	-0.27	0.10	-2.71	0.01
lnEPT	0.30	0.08	3.97	0.00	-0.04	0.02	-1.71	0.09
Panel Dynamic Least Squares (DOLS) – (lags-leads; 0,0) – grouped estimation								
Variable	No constant and trend				Linear trend			
	Coef.	Std.	t-Stat.	Prob.	Coef.	Std.	t-Stat.	Prob.
lnEPE	2.67	0.12	22.56	0.00	-0.33	0.01	-2.43	0.00
lnEPT	0.48	0.19	2.56	0.01	-0.01	0.01	-3.20	0.00

Source: Authors' calculations.

In order to fully comprehend the nature of the relationship between the variables we provided results from both, pooled and grouped estimations (Table 3). Pooled estimations suggested a statistically significant relationship between the variables in the case with no constant and no trend (lnEPE 3.98 and 3.95; lnEPT -1.77 and -1.54). However, in the case of linear trend event, although coefficients are of correct negative sign, they are not statistically significant. Grouped estimations indicated a strong statistical relationship with expected negative sign in the case with linear trend (lnEPE -0.27. and -0.33; lnEPT -0.04 and -0.01) and statistically significant coefficients in

the case with no constant and trend, but with positive sign (however due to relatively large t-Stat. values we could question the stability of these models). Zero restrictions on the long-run parameters are tested using the Wald test, confirming their statistical significance (available upon request). Following the results, we can conclude that with higher investment in environmental protection, the gap between the standard GDP and Green GDP is diminishing, indicating the relevance of environmentally sustainable practices in Europe.

4. IMPLICATIONS OF THE RESULTS

Similar results across most estimation methods and cases suggest that we can trace a stable, negative, relationship for both, national expenditure on environmental protection and environmental protection transfers, to this so-called green gap measure (as the gap between the standard GDP and Green GDP measurements is decreasing). We have to be very careful in the interpretation of derivative gap variable because this gap correction is only an approximation of the true accounting distortion and in general can represent both, underestimation and/or overestimation, of the environmental damage within economic growth perspective.

Results generally indicate that allocating resources to environmental protection activities has a positive impact on aligning economic indicators with environmentally sustainable practices, reflected in the convergence of standard GDP and Green GDP indicators. This suggests that economic activities are becoming less harmful to the environment and may even contribute positively to environmental conservation and restoration efforts. The findings indicate a critical need for the government to augment its investment in environmental protection and enhance the efficiency of both input and output processes (Tomić, 2024). Governments can implement and enforce regulations and policies to encourage green investments, including measures like carbon pricing, emissions trading schemes, and subsidies for renewable energy. These investments can drive the advancement and adoption of cleaner technologies, renewable energy sources, and more efficient production processes at a regional level, such as in Europe. Moreover, they can stimulate international cooperation by promoting the exchange of best practices, coordinating efforts to tackle cross-border environmental issues, and facilitating negotiations for international agreements on climate change mitigation, among other initiatives. Significant cuts in funding for the green economy, both in stable economic periods and particularly during crises, can have severe repercussions, exacerbating societal hardships. The

extent of government investment in green initiatives, coupled with how that spending is allocated and its impact on economic growth, profoundly shapes economic policy outcomes, ultimately minimising environmental harm. In summary, the effects of increased investment in environmental protection and the narrowing disparity between traditional GDP and Green GDP indicate a transition toward a more sustainable and resilient economy. This shift carries implications for economic prosperity, political decision-making, and societal well-being.

5. CONCLUSION

A proactive environmental response to economic crises underscores the urgency of addressing environmental challenges, leading to a shift towards a greener approach to economic growth. Beyond merely viewing green growth as a solution to environmental issues and climate challenges, there is a widespread acknowledgment among international organisations, governments, civil societies, academia, and the media of the imperative for growth that is environmentally sustainable. The discourse surrounding green growth aims to transform the narrative from one that is economically negative and politically unattractive to a more positive one. Advocates of green growth not only emphasise the compatibility of growth and environmental protection but also assert that environmental preservation can actually enhance economic growth (Jacobs, 2013).

This study indicates that heightened spending on environmental protection and related transfers can narrow the disparity between conventional GDP and Green GDP measurements across 27 European countries. While environmental legislation and investments in environmental protection in these nations function autonomously, the attainment of a cohesive environmental strategy is a catalyst to achieving discernible economic and environmental benefits. Our findings highlight the critical need for countries to develop robust environmental policies and strategies. Yet, the effective execution of such plans requires collaboration among all economic stakeholders.

It is essential to acknowledge the limitations of this study, including the relatively short duration of the observed years due to data (un)availability for selected variables and/or countries. While the timeframe examined captures specific dynamics, conducting a more comprehensive analysis over a longer period would likely result in more reliable and robust findings. We are aware that this study cannot definitively address all questions regarding the international comparability of growth perspectives within the European

countries, given the variations in natural resource endowments, economic development levels, sources of economic growth, and institutional capacities across different regions. So, we recognise the inherent uncertainty surrounding the absolute accuracy of the results presented, partly due to limitations in data management and the lack of knowledge on national green growth initiatives. Future research endeavours could lead to more contribution on the topic if data was available for a larger time series and for a larger base of countries. Based on such extensive international evidence on the comprehensive impact of investments in environmental protection, it would be noteworthy to evaluate its implications across economic, political, and social domains. It is crucial to emphasise that the approach and conclusions outlined in this study reflect our current understanding and viewpoint, which may evolve and undergo revisions in the future.

6 BIBLIOGRAPHY

1. Alibašić, H. and Atkinson, C. L., 2023. Policy Transfer Framework in the Environmental Governance of Non-EU and EU Member Countries: A Comparative Analysis of Bosnia and Herzegovina and Croatia. *Sustainability*, 15(10359), pp. 1-24.
2. Amjadi, G., Bostian, M., Lindstrom, H., Lundgren, T. and Vesterberg, M., 2025. The Effect of Environmental Protection Expenditures on Industrial Employment in Sweden. *Environmental and Resource Economics*, 2025 (Open access).
3. Arjomandi, A., Gholipour, H. F., Tajaddini, R. and Harvie, C., 2022. Environmental expenditure, policy stringency and green economic growth: evidence from OECD countries. *Applied Economics*, 55(8), pp. 869-884.
4. Breitung, J., 2000. The Local Power of Some Unit Root Tests for Panel Data. In B. Baltagi (ed.), *Advances in Econometrics, Vol. 15: Nonstationary Panels, Panel Cointegration, and Dynamic Panels*, Elsevier Science Inc.
5. Choi, I., 2001. Unit Root Tests for Panel Data. *Journal of International Money and Finance*, 20(2), pp. 249-272.
6. European Environment Agency, 2023. *Environmental protection expenditure*; Analysis and data. Available at: <https://www.eea.europa.eu/en/analysis/indicators/environmental-protection-expenditure-8th-eap>.
7. Eurostat, 2024. Eurostat database. Available at: <https://ec.europa.eu/eurostat>.
8. Eurostat Statistics Explained, 2023. Eurostat Statistics. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Government_expenditure_on_environmental_protection.
9. Feng, H., Liu, Z., Wu, J., Iqbal, W. and Ahmad, W., 2022. Nexus between government spending and green economic performance: Role of green finance and structure effect. *Environmental Technology and Innovation*, 27(August), p. 102461.
10. Gallo, L. J. and Ndiaye, Y., 2021. Environmental expenditure interaction among OECD countries, 1995-2017. *Economic Modelling*, 94(2), pp. 244-255.
11. Georgieva, K. V., 2024. Environmental Investments and Climate Change: How Environmental Protection Expenditure and Gross Domestic Product Affect Emissions in the European Union. *Journal of Sustainable Development of Energy, Water and Environment Systems*, 12(4), 1120528.
12. Gramkow, C., 2020. Green fiscal policies: An armoury of instruments to recover growth sustainability. *Studies and perspectives series 5 Office in Brasilia*. ECLAC, UN.
13. Huang, X., Huang X, Chen, M. and Sohail, S., 2022. Fiscal spending and green economic growth: fresh evidence from high polluted Asian economies. *Economic Research*, 35(1), pp. 5502-5513.
14. Im, K. S., Pesaran, M. H. and Shin, Y., 2003. Testing for Unit Roots in Heterogeneous Panels. *Journal of Econometrics*, 115(1), pp. 53-74.
15. Jacobs, M., 2013. Green Growth. In R. Falkner (ed.), *The Handbook of Global Climate and Environment Policy*, John Wiley and Sons, Ltd.

16. Kao, C., 1999. Spurious Regression and Residual-Based Tests for Cointegration in Panel Data. *Journal of Econometrics*, 90(1), pp. 1–44.
17. Kao, C. and Chiang, M-H., 2000. On the Estimation and Inference of a Cointegrated Regression in Panel Data. In B. Baltagi (ed.), *Advances in Econometrics, Vol. 15: Nonstationary Panels, Panel Cointegration, and Dynamic Panels*, Elsevier Science Inc., pp. 179–222.
18. Krajewski, P., 2016. The Impact of Public Environmental Protection Expenditure on Economic Growth. *Problemy Ekorozwoju*, 11(2), pp. 99–104.
19. Levin, A., Lin, C. and Chu, C., 2002. Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties. *Journal of Econometrics*, 108(1), pp. 1–24.
20. Liu, C., Luo, L., Xue, Y., Liu, X., Zhang, M. and Zhang, W., 2016. Study on the influence of environmental protection investment on GDP in China. *International Conference on Education, Management and Computer Science (ICEMC 2016)*. Available at: <https://www.atlantis-press.com/proceedings/icemc-16/25856625>.
21. Maddala, G. S. and Wu, S., 1999. A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test. *Oxford Bulletin of Economics and Statistics*, 61(S1), pp. 631–652.
22. Mark, C., N. and Sul, D., 1999. *A Computationally Simple Cointegration Vector Estimator for Panel Data*. Ohio State University manuscript.
23. Mark, C. N. and Sul, D., 2003. Cointegration Vector Estimation by Panel DOLS and Long-run Money Demand. *Oxford bulletin of economics and statistics*, 65(5), pp. 655–680.
24. Niu, B., 2024. Government environmental protection expenditure and national ESG performance: Global evidence. *Innovation and Green Development*, 3(2), p. 100117.
25. OECD library, 2024. How are development programmes systematically integrating climate and environment objectives post-COVID-19? *Integrating Environmental and Climate Action into Development Co-operation : Reporting on DAC Members' High-Level Meeting Commitments*. Available at: <https://www.oecd-ilibrary.org/sites/eb61b4fb-en/index.html?itemId=/content/component/eb61b4fb-en>.
26. Pedroni, P., 1999. Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors. *Oxford Bulletin of Economics and Statistics*, 61(Special Issue), pp. 653–70.
27. Pedroni, P., 2000. Fully Modified OLS for Heterogeneous Cointegrated Panels In B. Baltagi (ed.), *Advances in Econometrics, Vol. 15: Nonstationary Panels, Panel Cointegration, and Dynamic Panels*, Elsevier Science Inc., pp. 93–130.
28. Pedroni, P., 2001. Purchasing Power Parity Tests in Cointegrated Panels. *The Review of Economics and Statistics*, 83(4), pp. 727–731.
29. Pedroni, P., 2004. Panel Cointegration; Asymptotic and Finite Sample Properties of Pooled Time Series Tests with an Application to the PPP Hypothesis. *Econometric Theory*, 20(3), pp. 597–625.
30. Pesaran, M. H., Shin, Y. and Smith, R. P., 1999. Pooled Mean Group Estimation of Dynamic Heterogeneous Panels. *Journal of the American Statistical Association*, 94(446), pp. 621–634.
31. Phillips, P. C. B. and Hansen, B. E., 1990. Statistical Inference in Instrumental Variables Regression with I(1) Processes. *Review of Economics Studies*, 57(1), pp. 99–125.

32. Phillips, P. C. B. and Moon, H. R., 1999. Linear Regression Limit Theory for Nonstationary Panel Data. *Econometrica*, 67(5), pp. 1057-1111.
33. Saikkonen, P., 1992. Estimation and Testing of Cointegrated Systems by an Autoregressive Approximation. *Econometric Theory*, 8(1), pp. 1-27.
34. Santeramo, F.G., Lamonaca, E. and Emlinger, C., 2025. Technical measures, Environmental Protection, and Trade. *Review of International Economics*, 0 (Open access), 1-19.
35. Savranlar, B., Ertas S.A. and Aslan, A., 2024. The role of environmental tax on the environmental quality in EU countries: evidence from panel vector autoregression approach. *Environmental Science and Pollution Research* 31, 35769-35778.
36. Statista, 2024. Public sector expenditure on environment protection in the United Kingdom from 1999/00 to 2022/23. Available at: <https://www.statista.com/statistics/298506/public-expenditure-environment-protection-united-kingdom-uk/>.
37. Stjepanović, S., Tomić, D. and Škare, M., 2022. A new database on Green GDP; 1971-2019: a framework for assessing the green economy. *Oeconomia Copernicana*, 13(4), pp. 949-975.
38. Stjepanović, S., Tomić, D. and Škare, M., 2019. Green GDP: An Analysis for Developing and Developed Countries. *Economics and Management (E&M)*, 22(4), pp. 4-17.
39. Stjepanović, S., Tomić, D. and Škare, M., 2017. A New Approach to Measuring Green GDP: A Cross-country Analysis. *Entrepreneurship and sustainability issues*, 4(4), pp. 574-590.
40. Stock, J. H. and Watson, M., 1993. A Simple Estimator Of Cointegrating Vectors In Higher Order Integrated Systems. *Econometrica*, 61(4), pp. 783-820.
41. Škare, M., Benazić, M. and Tomić, D., 2016, On the neutrality of money in CEE (EU member) states: A panel cointegration analysis, *Acta Oeconomica*, 66(3), pp. 393-418.
42. Tomić, D., 2024. Exploring the nexus between expenditure in environmental protection and Green GDP in the EU. 43rd *International conference on organizational science development: Green and digital transition – Challenge or Opportunity*. Portorož, Slovenia, March 20-22.
43. Tomić, D. and Stjepanović, S., 2022. In searching for greener economic outcomes; Identification of factors influencing Green GDP. 41st *International Conference on Organizational Science Development: Society's Challenges for Organizational Opportunities*. Portorož, Slovenia, March 23-25.
44. Vavoura, C. and Vovouras, I., 2022. Sustainable economic development in the European Union and COVID-19. *Evolutionary and Institutional Economics Review*, 19, pp. 449-467.
45. Wang, C. and Naveed, A., 2024. Innovation and environmental protection: An EU perspective. *Applied Energy*, 366, 123260.
46. Yang, Z., Gao, W. and Li, J., 2022. Can Economic Growth and Environmental Protection Achieve a “Win-Win” Situation? Empirical Evidence from China. *Environmental Research and Public Health*, 19(9851), pp. 1-21.
47. Yuelan, P., Akbar, M. W., Hafeez, M., Ahmad, M., Zia, Z. and Ullah, S., 2019. The nexus of fiscal policy instruments and environmental degradation in China. *Environmental Science and Pollution Research International*, 26(28), pp. 28919-28932.

»This paper is a result of the scientific projects »The Impact of Artificial Intelligence and New Digital Technologies on the Financial Market« and »Labour Market and Evidence-based Policy Making«, supported by the Faculty of Economics and Tourism »Dr. Mijo Mirković«, Juraj Dobrila University of Pula. Any opinions, findings, and conclusions or recommendations expressed in this paper are those of the author(s) and do not necessarily reflect the views of the Faculty of Economics and Tourism »Dr. Mijo Mirković« Pula.«

FOREIGN DIRECT INVESTMENT DYNAMICS AND CEFTA'S INTEGRATION IN GLOBAL VALUE CHAINS IN THE 2020s

INES KERSAN-ŠKABIĆ

Juraj Dobrila University of Pula

Faculty of Economics and Tourism "Dr. Mijo Mirković"

Pula, Croatia

ikersan@unipu.hr

Paper Category: Preliminary scientific paper

ABSTRACT

Foreign direct investment (FDI) has played a central role in driving economic growth and structural transformation in CEFTA member countries, serving as a key channel for their integration into global value chains (GVCs). This paper examines post-pandemic prospects for enhancing CEFTA's participation in global production networks, with a particular focus on FDI trends and their implications. The analysis is based on descriptive statistics of FDI inflows and stocks from 2000 to 2023, complemented by a review of the literature. The results indicate an increase in FDI inflows and inward stock in the CEFTA region after the COVID-19 pandemic; however, this growth has not been accompanied by greater integration with the EU market or a structural shift towards manufacturing sectors, which are essential for deeper GVC participation. The findings underscore the untapped potential of the Common Regional Market and the EU integration process as mechanisms for attracting higher levels of efficiency-seeking FDI. Strengthening CEFTA's investment climate and aligning sectoral FDI with value chain upgrading remain critical challenges.

Keywords: CEFTA, EU, FDI, Global value chains (GVCs)

1. INTRODUCTION

Regional integrations do not aim just to decrease and abolish the tariffs between member states; they also cover issues such as services, public procurement, and promotion of production chains in included countries. CEFTA represents a regional integration initiative in the Western Balkans, currently comprising seven signatories: Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, Serbia, and Moldova. The agreement, in its present form, was established in 2006, succeeding the original CEFTA framework which included several Central European countries prior to their accession to the EU. As a transitional integration mechanism, CEFTA aims to facilitate trade liberalisation, enhance regional economic cooperation, and support the alignment of its members with EU standards and practices. It promotes the removal of tariffs and non-tariff barriers, harmonisation of trade- and investment-related policies, and the development of a Common Regional Market as a stepping-stone towards EU integration (CEFTA Secretariat, 2025; Pistikou, 2020). Despite shared goals, the CEFTA region is characterised by pronounced economic heterogeneity among its members. Differences in GDP per capita, industrial structure, institutional capacity, and investment attractiveness result in varying levels of attractiveness for FDI inflows and also in readiness for deeper integration into global and regional value chains. While Serbia and North Macedonia have emerged as relatively stronger performers in terms of attracting FDI and export diversification, other economies, such as Kosovo and Moldova, continue to face structural challenges related to limited industrial capacity, weaker infrastructure, and lower institutional quality. These disparities present a challenge to cohesive regional development and require targeted policy coordination to ensure more balanced participation in regional and global production networks. Moldova can be viewed as an outlier in the CEFTA framework, due to its unique economic position and regional alignment. While geographically and historically somewhat distinct from the Western Balkan core of CEFTA, Moldova shares with other members the overarching objectives of trade liberalisation, investment facilitation, and convergence with EU standards. As a former republic of the Soviet Union, it used to have strong links with other former Soviet countries. After Romanian accession to the EU in 2007, it gradually opened to the EU, although current trade relations are still very weak (Vakhal, 2023). It serves as both a peripheral and bridging member—connecting South-East Europe with Eastern Europe and potentially enhancing inter-regional linkages. Moldova's membership in CEFTA represents a strategic component of the country's broader trade

integration agenda. Its economic ties with other CEFTA members are relatively less intensive compared to intra-Balkan trade relations, due in part to geographic distance, differing economic structures, and Moldova's orientation towards both the EU and Eastern Partnership frameworks.

CEFTA trade has increased in the period from establishment until 2022 (Dragutinović-Mitrović and Bjelić, 2015; Grieveson et al., 2021), and here we want to step further and research the possibilities and preconditions for CEFTA's inclusion in global value chains (GVCs) but also its capabilities to creation of regional value chains. GVCs break down the fragmentation of the production process into many stages located in different countries/regions. Usually, they resulted from the multinational companies' activities, through their international investments. GVCs are becoming a transformative force in the global economy, reshaping how products are designed, manufactured, and delivered to markets around the world. For the CEFTA countries, integrating into these complex networks of production and trade offers a significant opportunity for economic growth, development, and modernisation. This region has been historically characterised by a diverse industrial base and strategic geographic location, acting as a bridge between Western Europe and the rapidly developing markets of Eastern Europe and beyond.

The COVID-19 pandemic, accompanied by the disruption of GVCs, created unstable and insecure circumstances for such an internationally dependent production process, where one possibility or solution for the GVC functioning in the future was regionalisation of GVC (Kersan-Škabić, 2022), or nearshoring of production locations (Javorcik, 2020; OECD, 2020; Arriola et al., 2020). Thanks to the end of the pandemic, this process did not take off as expected, but it certainly drew attention to the possibility of forming regional value chains.

As many researchers cover the EU member states, in this paper, the focus is on CEFTA members. The methodological approach includes statistical analysis and a critical assessment of the literature review. We are interested in the research of the post-COVID-19 period, i.e. to find out the answers to the following questions: Has the situation in CEFTA changed in the last few years in comparison with the last decade? Did they attract more FDI? Did they improve their position in participation in GVCs?

The novelty of the paper is twofold: on the one hand, it summarises and gives an overview of the findings about FDI and its potential influence on GVC participation in CEFTA and, on the other hand, it represents the preliminary research of the FDI inflows in the pandemic and post-pandemic

periods which represent a precondition for involvement in production chains.

The paper is structured as follows: Section 2 presents the literature review and conceptual framework of GVCs and CEFTA's integration in GVCs. Section 3 explains the methodology and data used in the empirical research, and the results of the empirical analysis. The last section offers a discussion with a conclusion.

2. LITERATURE REVIEW WITH THE CONCEPTUAL FRAMEWORK

FDI is widely recognised as a fundamental precondition for a country's participation in GVCs. By establishing or acquiring affiliates abroad, multinational companies (MNCs) fragment production processes across borders, thereby embedding host economies into international production networks (Wang and Chen, 2020; Carril-Caccia and Pavlova, 2020). In that way, FDI provides the channels through which countries integrate into GVCs.

As outlined by Koopman et al. (2010), backward participation measures the share of foreign value added in a country's exports, essentially capturing the extent to which imported intermediate goods and services are used in producing goods and services for exports. Conversely, forward participation measures the share of a country's own value added that is embodied in other countries' exports, reflecting how much a country's intermediate products contribute to foreign exporters' output. The sum of these two indicators constitutes the GVC participation index. The databases for measuring trade in value-added (WTO, OECD TiVA, WIOD) rely on International Input-Output (II-O) tables, which track the origin and use of intermediate goods and services by country and sector. II-O tables are invaluable for analysing trade vertical as they demonstrate the inter-sectorial nature of modern production processes and their global connections. They account for all backward linkages between countries and sectors, capturing the value of imported inputs used directly and indirectly at all stages of production for a country's exported goods (WTO/IDE-JETRO, 2011; De Backer and Miroudot, 2013). This conceptual framework underpins many empirical studies of GVC participation.

Previous studies have highlighted the crucial enabling role of FDI in the formation and expansion of GVCs operated by MNCs (Amador and Cabral, 2014). Through these cross-border investments, countries can develop both linkages with foreign suppliers and buyers of intermediate products. Alfaro

and Charlton (2009) emphasised the underestimated nature of vertical FDIs and proposed a better connection between intra-firm trade and FDI to explain the complexity of production processes, especially in terms of sourcing inputs. Amador and Cabral (2014) highlighted the crucial role of FDI in the establishment of GVCs operated by multinational corporations. Nikolovova (2013) examined the impact of FDI at the sectoral level among EU27 countries and observed that an increase in FDI correlates with higher production and a greater demand for intermediate goods, indicating a primarily vertical nature of FDI linked to outsourcing activities.

The experience of Central and Eastern Europe (CEE) following EU enlargement illustrates how FDI can drive GVC integration. The European Commission (2020) also focuses on national, regional, and global value chains, as well as the influence of inward and outward FDI (including mergers and acquisitions) on participation in GVCs. Damijan et al. (2013) observed that inward FDIs in CEE countries have altered their export composition and positively affected the development of production networks. Kaminsky and Ng (2005) discovered that FDIs contribute to increased trade integration in the region. Comparing the CEE experience with that of the Western Balkans, Jirasavetakul and Rahman (2018) emphasise the importance of EU membership (and the prospect of accession) in boosting FDI attractiveness. They found that FDI in both CEE and Western Balkan countries has been driven largely by market-seeking and efficiency-seeking motives and, importantly, that several new EU member states have themselves become investors in the Western Balkans, creating sub-regional value chain linkages.

Focusing on the CEFTA region, evidence suggests that, while FDI has yielded macroeconomic benefits, its potential for driving deeper GVC integration is not yet fully realised. Trpeski et al. (2021) determined that FDI inflows have a positive impact on GDP growth, exports, and imports in Western Balkan countries. Hunya (2017) confirmed the prevalence of greenfield FDI inflows in CEFTA regions compared to mergers and acquisitions (which were prevalent in the privatisation process) and also identified the beneficial economic effects of attracting FDI. Also, he warns that CEFTA economies need to attract much higher levels of FDI into higher-value-added and tradable sectors if they are to achieve meaningful structural upgrades and more robust integration into GVCs. Beyond the volume and type of investment, regional trade agreements have provided an important institutional framework: Dragutinović-Mitrović and Bjelić (2015) find, using a gravity model, that the introduction of the CEFTA-2006 free trade agreement significantly increased intra-regional trade among Western Balkan countries. In another paper, Bjelić et al. (2020) show that CEFTA-2006

also had a positive effect on FDI inflows within the region. These findings suggest that regional economic cooperation can amplify the benefits of FDI by creating a more integrated market that is attractive to investors.

Several studies stress the importance of aligning with EU frameworks and attracting sufficient FDI to improve GVC participation. Reiter and Stehrer (2021) have analysed the initial data regarding the involvement of Western Balkan countries in GVCs and they are exploring the significance of ratifying the Stabilisation and Association Agreement (SAA) with the EU to enhance trade dynamics. They find that SAA tends to increase a country's trade, with particularly positive effects on forward linkages (i.e. the country's value added in EU exports), though the impact on backward linkages (foreign value added in the country's own exports) is more modest. Lubeniqi (2023) warns that the Western Balkan economies are still not attracting enough FDI compared to other transition economies, and that the composition of their FDI inflows has not been favourable for expanding domestic production and exports. This implies that the Western Balkans risk falling behind in GVC integration unless they can both boost FDI inflows and orient them toward more productive sectors.

One strategy for deepening GVC integration in CEFTA is to develop regional supply chains and leverage special economic zones (SEZs) to attract investment. Krasniqi et al. (2019) examine the obstacles hindering the establishment of a regional supply chain in the CEFTA region. They highlighted that Serbia (alongside Macedonia and partially Bosnia and Herzegovina) has devised policies to incentivise FDI in the manufacturing domain through the establishment of special economic zones. Bartlett et al. (2017) observed that the MNCs' investments in CEFTA special economic zones did not significantly influence the formation of connections with the local economy and they contribute minimally to the advancement of intra-regional trade. Enterprises located in special economic zones hold substantial promise in establishing cross-border (within the CEFTA framework) production networks. More recent evidence is somewhat encouraging: Krasniqi et al. (2022) report that a combination of an enlarged regional market (through CEFTA initiatives) and targeted industrial policies has begun to draw considerable new FDI to the region in the late 2010s and early 2020s. This new wave of investment is spurring export-led growth and driving noticeable structural transformation in some Western Balkan economies. Policymakers should concentrate on encouraging backward linkages by nurturing connections between local SMEs and the newly established multinational corporations integrated into global value chains.

The COVID-19 pandemic has added a new dimension to the discussion on GVC participation for CEFTA countries. The pandemic disrupted global production and prompted multinational companies to reconsider the geography of their supply chains, with “nearshoring” (bringing production closer to home or to nearby regions) becoming a prominent topic. Jovanović et al. (2021) suggest that the Western Balkan economies could potentially benefit from this reconfiguration of production networks, provided they leverage their competitive strengths and address their weaknesses. These countries might position themselves as attractive nearshore locations for EU firms looking to diversify supply chains. However, as Horváth et al. (2023) argue, relying solely on low labour costs - a traditional advantage of the region - will not be sufficient to attract higher FDI in the post-pandemic era. Rather, emphasising skilled labour, investing in education and training, and modernising the educational framework would prove advantageous in attracting potential investors. Ganić and Novalić (2023) integrated CEFTA into their study (alongside three other trade blocs) and noted that membership in the trade bloc enhances capital mobility within the entire group, albeit with a relatively modest impact on the CEFTA region. The legal safeguards for investors do not yield a positive influence on capital mobility.

Despite various initiatives, there remains considerable heterogeneity in how deeply individual CEFTA countries are integrated into GVCs. Vujanović (2024) shows that less-developed economies in the region tend to rely more on intra-CEFTA value chains for their exports, whereas the more industrialised CEFTA countries are more tightly linked into EU-centred value chains. Moreover, the CEFTA countries have not yet achieved a major breakthrough in global export competitiveness: only a small part of their domestic value added ends up in the exports of EU countries. This indicates limited forward participation in high-value segments of GVCs. Bonomi and Uvalić (2023) find divergent outcomes among CEFTA members, noting that those economies most oriented toward the EU market (through trade and investment ties) achieve better export performance and deeper GVC integration, whereas others lag behind in these aspects. Table 1 summarises the selected studies about the participation of the CEFTA countries in the GVCs.

Table 1. Articles about backward and forward participation in GVCs for CEFTA countries

Authors	Methodology and sources	Results
Vujanović (2024)	Input-output tables, WIIW, WIOD	Forward linkages - very small shares of domestic value added are contained in EU manufacturing exports (from on average 7% in Albania and Montenegro to about 14% in Kosovo) or in CEFTA manufacturing exports (ranges from 4% in Montenegro to 12% in Albania). Backward linkages – heterogeneity of countries - some CEFTA members rely more on the EU market and just Bosnia and Herzegovina and Albania rely more on the CEFTA market. The EU value added represents from 13% (Albania) to 40% (North Macedonia) in their manufacturing exports. CEFTA represents between 17% (Montenegro) and 33% (Albania) of CEFTA value added. North Macedonia uses about 40% from the EU and 35% of value added from the CEFTA.
Krasniqi et al. (2019)	Qualitative research	SEZs are relevant for attracting FDI; different levels of economic development within CEFTA could potentially be mitigated by developing regional value chains to supply inputs to multinational companies based in SEZs.
Mandras and Salotti (2020)	Input-output tables, UNCTAD-Eora	North Macedonia reached the highest values among the Western Balkans economies (73%) in 2018, which is above the EU average; Montenegro has the second-highest GVC participation rate in the region. Bosnia and Herzegovina has not changed its position in GVC between 2000 and 2018.
CEFTA (2017)	WIIW European Integration Input-Output Database	In 2014 Bosnia and Herzegovina had the highest GVC participation index, followed by Macedonia. In the period 2010-2014 GVC participation has increased for all (Western Balkan) economies. Forward participation prevails in comparison with backward participation that indicates the position of economies at the starting point of GVC participation. Linkages with CEFTA partners are the most important for Bosnia and Herzegovina, Macedonia and Montenegro (for backward participation) and for Serbia (for forward linkages)

Source: CEFTA (2017); Mandras and Salotti (2020); Krasniqi et al. (2019); Vujanović (2024)

3. RESEARCH

3.1. DATA AND METHODOLOGY

Researches about countries of CEFTA participation in GVCs are scarce. Participation in GVCs is highly related and dependent on the production and trade structure. The composition of exports in CEFTA members has shifted from primary and resource-based products to medium-technology products

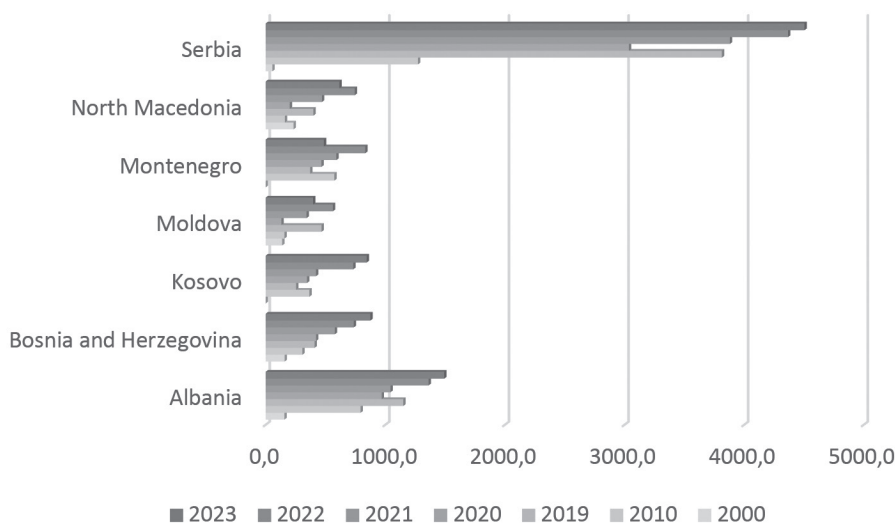
like electrical equipment, machinery, and transport vehicles, which are more fragmented and internationally integrated.

The analysis will include CEFTA2006 signatories, and the covered period is 2000 to 2023. Because the input-output tables are not available for the post-COVID-19 periods¹, the analysis will be specially focused on the FDI flows and inward stock changes during the period 2019-2023. The source of data is the WIIW FDI database. The data was analysed by applying statistical analysis of secondary data and by comparison of the post-COVID-19 data with the situation before the pandemic.

3.2. RESULTS

Even the COVID-19 pandemic has impacted the drop of global FDI flows, and the region of South-East Europe was also affected by the reduced FDI inflows in 2020 and 2021; the recovery of FDI flows was noted in 2022 and 2023. FDI inflows in the period 2019-2023 have increased in all CEFTA signatories except Moldova (average increase was 66%) where the growth varies from 18% in North Macedonia to 231% in Kosovo. Still, the highest values of FDI inflows go to Serbia (4.5 EUR bn. in 2023).

Figure 1. FDI inflows in the CEFTA region from 2000-2023 in EUR m

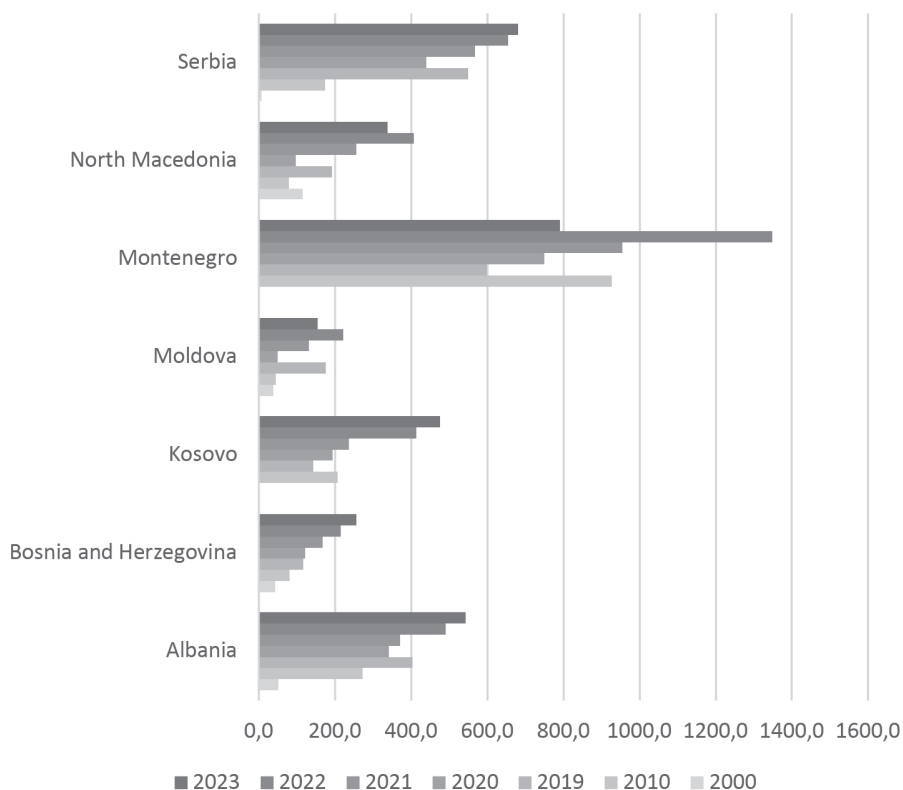


Source: WIIW. 2024. FDI database [online]. Available at:
<https://data.wiiw.ac.at/fdi-database.html#>

¹ The latest data is available for 2018 (Vujanović, 2024)

Regarding the FDI inflows p.c. in 2023, Montenegro and Serbia attracted the highest values (above 790 EUR and 680 EUR respectively).

Figure 2. FDI inflows p.c. in CEFTA region from 2000-2023 in EUR



Source: WIIW.2024. FDI database [online]. Available at:
<https://data.wiiw.ac.at/fdi-database.html#>

Table 2. FDI inward stock in EUR m

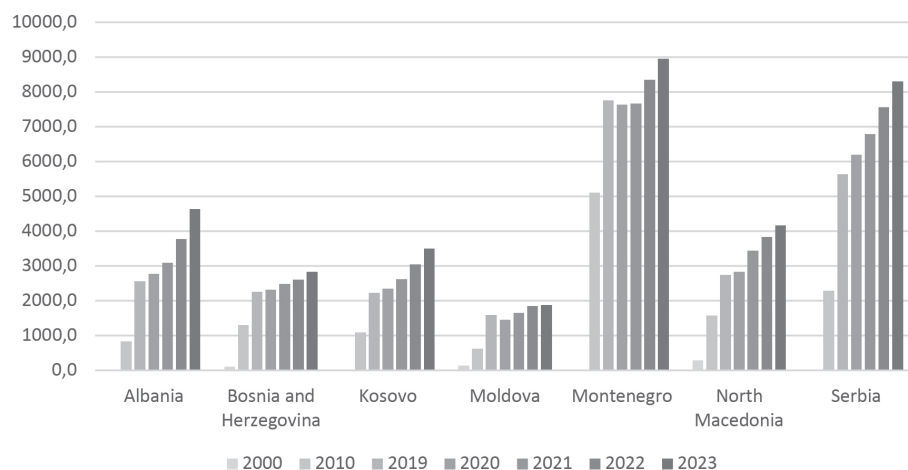
	2000	2010	2019	2020	2021	2022	2023
Albania	.	2436.0	7288.6	7830.0	8640.5	10410.3	12655.8
Bosnia and Herzegovina	384.0	5020.9	7844.2	8017.1	8568.0	8920.7	9653.2
Kosovo	.	1960.9	3968.8	4229.4	4648.4	5358.8	6250.4
Moldova	483.4	2237.2	4206.5	3837.5	4217.6	4637.1	4973.7
Montenegro	.	3166.8	4819.6	4742.1	4732.3	5151.4	5489.4
North Macedonia	580.1	3256.0	5704.1	5851.7	6298.1	7012.9	7621.0
Serbia	56.2	16688.6	39012.1	42555.7	46108.6	50158.2	54714.4

Source: WIIW. 2024. FDI database [online]. Available at:
<https://data.wiiw.ac.at/fdi-database.html#>

FDI inward stock varies from 4,973 million EUR in Kosovo to 54,714 million EUR in Serbia in 2023, indicating an average growth of 40% in the period 2019-2023.

It resulted also in different values of inward stock per capita that vary from 1,876 EUR in Moldova to 8,900 EUR in Montenegro. The highest increase in the period 2019-2023 was in Albania 81%, followed by Kosovo 57%.

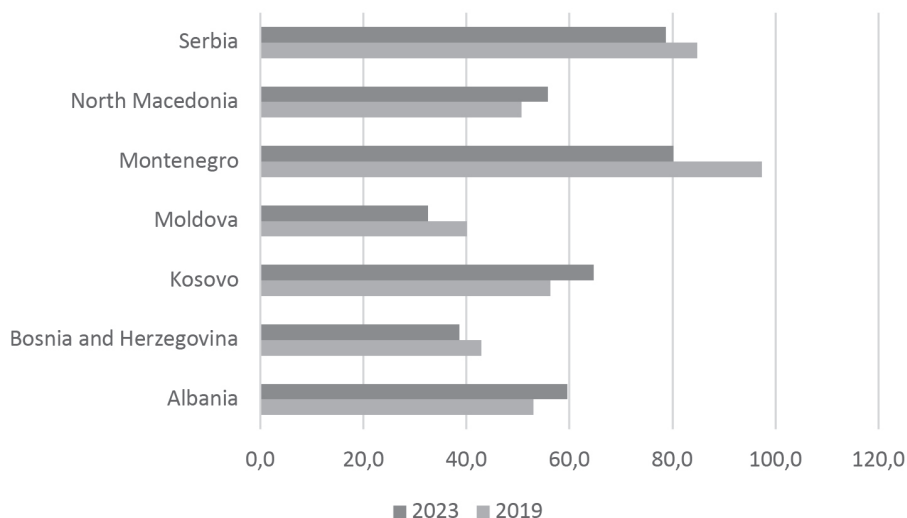
Figure 3. FDI inward stock p.c. in EUR



Source: WIIW. 2024. FDI database [online]. Available at:
<https://data.wiiw.ac.at/fdi-database.html#>

Even though the data shows a big increase in FDI inflows and FDI inward stock, the share of FDI inward stock in GDP has increased just for Albania (6.5 pp), Kosovo (8.5 pp), and North Macedonia (5.2 pp) in 2023 in comparison with pre-pandemic 2019. The rest of the CEFTA signatories faced a decrease of FDI inward stock in GDP which was the highest in Montenegro (17.2 pp).

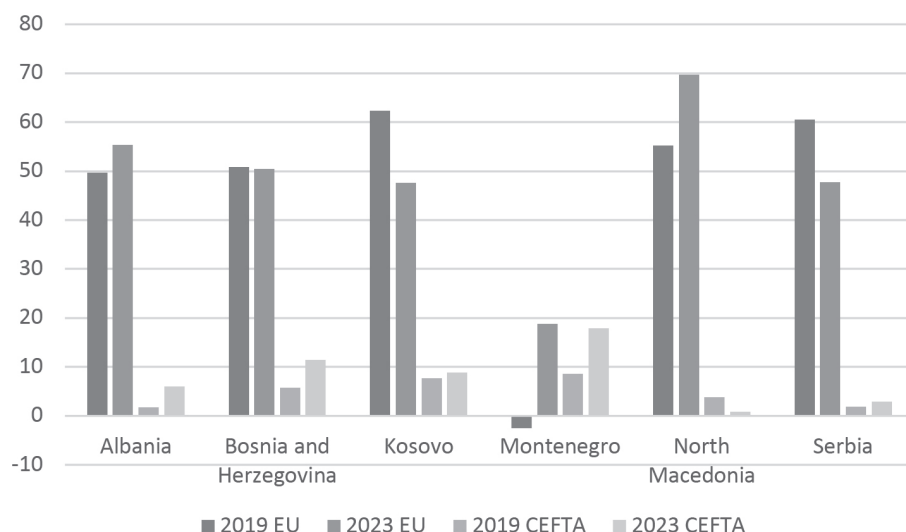
Figure 4. FDI inward stock as % of GDP in 2019 and 2023



Source: WIIW. 2024. *FDI database [online]*. Available at:
<https://data.wiwi.ac.at/fdi-database.html#>

All FDI indicators show that the attractiveness of the CEFTA region is still growing but the total data does not tell much about the potential for stronger inclusion in GVCs.

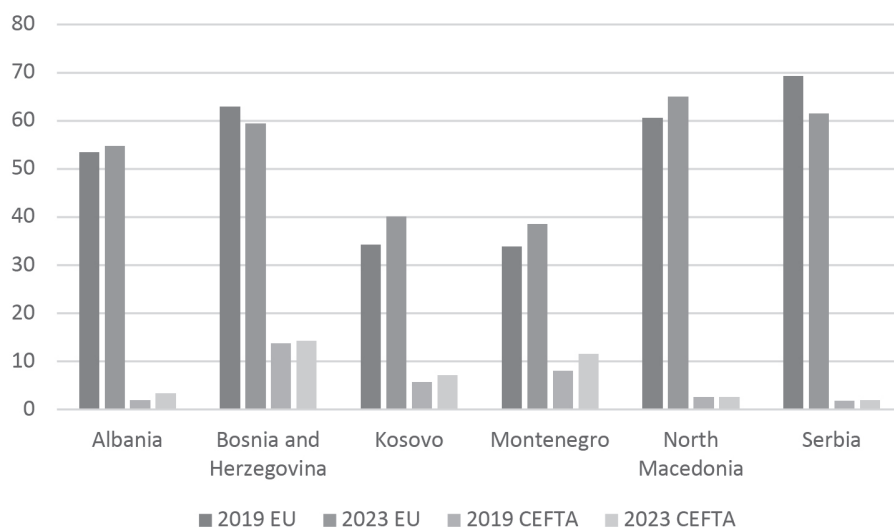
Figure 5. FDI inflows from EU27 and CEFTA in 2019 and 2023



Source: WIIW. 2024. FDI database [online]. Available at:
<https://data.wiwi.ac.at/fdi-database.html#>

Inflows of FDI mainly originated from the EU27 member states, but the share of EU27 inflows in 2023 was lower than in 2019 in Kosovo and Serbia, stable in Bosnia and Herzegovina, while Albania, Montenegro, and North Macedonia increased the FDI inflows from the EU27. Higher trade integration with the EU market is a precondition for higher involvement in global production chains (Bonomi and Uvalić, 2023). The share of FDI inflows in Montenegro from CEFTA partners increased from 8.6% to 17.9%, and also Bosnia and Herzegovina had a high rise from 5.7% to 11.5% of total inflows. The results are not following our expectations since countries made some progress in their relationship with the EU, which should result in stronger growth of the FDI from the EU. It also indicates some internal weaknesses connected with institutional development, characteristics of labour skills, technology development, etc.

Regarding the FDI inward stock, the EU27 represents above 50% of Serbia, North Macedonia, Bosnia and Herzegovina, and Albania, while in Kosovo and Montenegro, the EU share is below 40% (Figure 6). The highest shares of CEFTA signatories in FDI inward stock are in Bosnia and Herzegovina, Montenegro (above 10%), and Kosovo.

Figure 6. FDI inward stock from the EU27 and CEFTA in 2019 and 2023

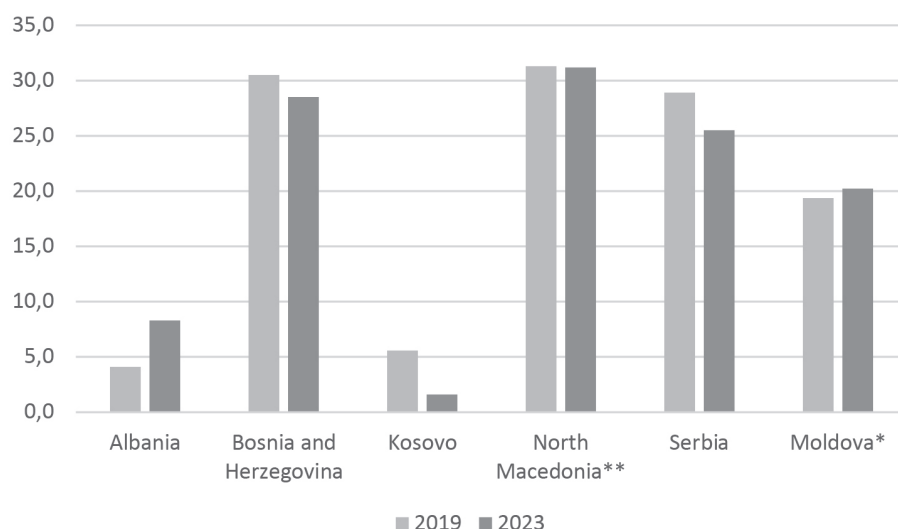
Source: WIIW.2024. FDI database [online]. Available at:
<https://data.wiiw.ac.at/fdi-database.html#>

Figures 5 and 6 show a higher importance of EU27 investors and markets than the regional (CEFTA) investors. The highest increase in the significance of CEFTA in FDI inward stock was in Montenegro (from 8.1% to 11.5%).

The Common Regional Market was an initiative from 2020 that covers four freedoms (free movements of goods, services, capital, and people) but also it includes digital, investment, innovation, and industry policy in the Western Balkan region. It represents the stepping-stone to integrate the region more closely with the EU Single Market (CEFTA, 2024). The contemporary data unfortunately does not prove the increase of market integrations.

Generally, manufacturing industries are highly integrated in GVCs (Cigna et al., 2022) and, because of this, Figure 7 analyses the FDI inflows in that sector. Reiter and Stehrer (2021) found that countries with developed manufacturing industries reach a higher level of integration in the GVCs.

Figure 7. FDI in manufacturing in CEFTA in 2019 and 2023



Note: Data for Montenegro is not available.

Source: WIIW. 2024. FDI database [online]. Available at: <https://data.wiiw.ac.at/fdi-database.html#>

One-third of FDI inflows were directed to manufacturing only in Bosnia and Herzegovina, Serbia, and North Macedonia (Figure 7). For the rest of the countries, manufacturing represents less than 10% of FDI inflows in the last four years. In all CEFTA members, the services sector attracted significant investments from abroad (finance and insurance activities, real estate activities, wholesale, retail trade, repair of motor vehicles, etc.) but these kinds of investments have a small impact on the inclusion in the global production chain due to the specificities of the services. For higher participation in the global value chain, it is very important to know how much foreign investments are focused on advanced industries² as they are considered to be highly integrated in GVCs. Among CEFTA signatories only Serbia and North Macedonia attracted a big portion of FDI inflows in the transport equipment sector and, in that way, they are more integrated in the global production chains in comparison with the rest of the CEFTA.

2 Advanced industries include high technology or medium-high-technology according to Eurostat (2022) hightech classification: Manufacture of pharmaceutical products and preparations, Manufacture of computers, electronic and optical products, Manufacture of electrical equipment, Manufacture of machinery and equipment, Manufacture of motor vehicles, trailers and semi-trailers and Manufacture of other transport equipment.

The analysis reveals significant heterogeneity in FDI performance across CEFTA countries, both in terms of absolute inflows and per capita values. While most countries experienced a recovery in FDI after the initial COVID-19 shock, this rebound has not translated into a substantial shift in manufacturing-related investments, which are crucial for deeper integration into global value chains. The persistent concentration of FDI in non-tradable service sectors raises concerns about the long-term structural transformation of CEFTA economies. Moreover, the limited increase in FDI originating from EU member states, despite progress in EU-CEFTA relations, highlights institutional and capacity-related barriers that hinder more robust integration. These findings suggest that, although the region remains attractive for investment, particularly Serbia and Montenegro, the nature and sectoral orientation of FDI are not yet aligned with the goal of upgrading CEFTA's role within global production networks.

4. CONCLUSION

Countries of the Western Balkan region are lagging in economic development in comparison with the EU member states. The MNCs from the Western hemisphere are encountering two significant obstacles during this decade: the COVID-19 pandemic and the Russian aggression towards Ukraine. These events have had a detrimental impact on their operations, particularly affecting the flow of goods between companies. The manufacturing process faced vulnerabilities due to its reliance on importing intermediate goods from various countries. The production process was threatened due to its dependence on the import of intermediate products from different countries. One of the biggest challenges for GVCs is the identification of new production locations in nearby countries, known as nearshoring. CEFTA member countries could potentially serve as attractive sites for producing certain components (intermediates) for MNCs from developed nations. Our study demonstrates that, despite the resilience of GVCs, nearshoring, and regionalisation (recognised as the primary challenges for GVCs due to the COVID-19 pandemic), this reallocation has not occurred in recent years.

The most effective method for identifying changes in production chains is by analysing backward and forward GVC linkages. Unfortunately, complete data on input-output tables is only available as of 2018, with no data covering the pandemic and subsequent unstable periods. Consequently, we have presented the latest trends in FDI flows and stocks in CEFTA signatories. Changes in these flows can serve as indicators of varying levels of participation in GVCs. Our analysis reveals a continued increase in FDI inflows in the CEFTA

region (excluding Moldova). There exists significant heterogeneity among CEFTA signatories concerning FDI inward stock, as well as in per capita terms, with Montenegro attracting 4.7 times more investments per capita than Moldova. While FDI sources mainly originate from the EU, there has been no substantial increase in the EU's overall share of investments. CEFTA is poorly represented as a source of investment in the participating countries. Higher levels and shares of FDI from the EU will lay the foundation for stronger interconnections in production processes. As investments typically originate from highly developed countries, and CEFTA nations lack surplus capital due to domestic requirements, it is anticipated that the share of FDI from CEFTA countries will remain low. The stagnation in FDI in the manufacturing sector (except in Albania) poses a limitation to deeper integration into GVCs, as manufacturing is the most interconnected sector.

A key constraint of this study lies in the availability of data, as post-COVID input-output tables have not been released, and further value could be derived from analysing the interconnections between domestic and foreign firms at a micro level.

The integration of CEFTA countries into GVCs has the potential to drive their economic transformation by facilitating increased FDI, encouraging technological transfers, and fostering the growth of local industries. Participation in GVCs also motivates these countries to enhance their infrastructure, elevate labour skills, and adhere to international standards and practices, thus boosting their overall competitiveness. GVCs have played a critical role in the economic advancement and structural evolution of the CEFTA through the promotion of export-oriented expansion and inflow of foreign direct investment (FDI). Nevertheless, the path towards achieving deeper integration within GVCs is laden with obstacles. The nations within the CEFTA region must effectively navigate challenges such as political instability, economic inequalities, insufficient infrastructure, and regulatory hindrances. Overcoming these hurdles necessitates comprehensive policy adjustments, collaborative efforts at the regional level, and purposeful investments directed at establishing a conducive business environment. The proposition of a Regional Investment Area as an integral component of a holistic Regional Market Plan holds significant promise in enhancing intra-CEFTA investments and optimising the negotiation dynamics with the European Union.

Acknowledgment

This paper was prepared with the assistance of AI tools for language refinement and organisational improvements. All conceptual development, data analysis, and interpretation remain the sole responsibility of the authors.

5. BIBLIOGRAPHY

1. Alfaro, L. and Charlton, A. 2009. Intra-Industry foreign direct investment. *American Economic Review*, 99 (5), pp. 2096–2119.
2. Amador, J and Cabral, S. 2014. Global value chains surveying drivers and measures. *ECB Working Paper Series* 1739 [online]. Available at: <https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1739.en.pdf>
3. Arriola, C., et al. 2020. Efficiency and risks in global value chains in the context of COVID-19. *OECD Economics Department Working Papers*, No. 1637 [online]. Available at: <https://doi.org/10.1787/3e4b7ecf-en>
4. Bartlett, W., Krasniqi, B. and Ahmetbasić, J. 2017. *Study of Special Economic Zones (SEZs) in the Western Balkans*, European Commission, Technical Report, [online]. Available at: <https://doi.org/10.13140/RG.2.2.17283.20003/1>
5. Bjelić, P.; Popović Petrović, I. and Kastratović, R. 2020. Foreign Direct Investment Patterns in CEFTA 2006: Perspectives and Impact of COVID-19 Pandemic. *Conference Proceedings of 10th SCF International Conference on "The Institutional, Economic and the Social Impacts of Globalization and Liberalization"*, Antalya, Turkey, 45–61.
6. Bonomi, M., Uvalić, M. 2023. Antithetic Perceptions of Regional Cooperation in the Western Balkans. In: Uvalić, M. (eds) *Integrating the Western Balkans into the EU. New Perspectives on South-East Europe*. Palgrave Macmillan, Cham. [online]. Available at: https://doi.org/10.1007/978-3-031-32205-1_11.
7. Carril-Caccia, F, Pavlova, E. 2020. Mergers and acquisitions & trade: A global value chain analysis. *World Econ.*; 43: pp. 586– 614. [online]. Available at: <https://doi.org/10.1111/twec.12882>.
8. CEFTA 2017. *CEFTA Investment Report*, [online]. Available at: <https://cefta.int/wp-content/uploads/2016/05/CEFTA-Investment-Report-2017.pdf>
9. CEFTA 2024. *Common Regional Market Action Plan* [online]. Available at: <https://cefta.int/news/cefta-and-common-regional-market-instruments-for-the-accelerated-integration-of-the-western-balkans-into-the-eu-single-market>.
10. CEFTA Secretariat 2025. *About CEFTA* [online]. Available at: <https://cefta.int/about/>
11. Cigna, S.; Gunnella, V. and Quaglietti, L. 2022. Global Value Chains: Measurement, Trends and Drivers. *ECB Occasional Paper*, No. 289, [online]. Available at: <http://dx.doi.org/10.2139/ssrn.4007756>
12. De Backer, K. and Miroudot, S. 2013. Mapping global value chains. *OECD Trade Policy Papers*, No. 159. OECD [online]. Available at: <https://doi.org/10.1787/5k3vitrgrnbt4-en>
13. Damijan, J, Kostevc, C and Rojec, M. 2013. Global supply chains at work in central and eastern European countries: Impact of FDI on export restructuring and productivity growth. *LICOS. Discussion Paper* 332/2013.
14. Dragutinović-Mitrović, R. and Bjelić, P. 2015. Trade regimes and bilateral trade in the EU enlargement process: Focus on the Western Balkans, *Acta Oeconomica*, vol. 65(2), pp. 249–270.

15. European Commission 2020. Foreign direct investment, global value chains and regional economic development in Europe, [online]. Available at: https://ec.europa.eu/regional_policy/en/information/publications/studies/2020/foreign-direct-investment-global-value-chains-and-regional-economic-development-in-europe
16. Eurostat. 2022. Database. [online]. Available at: <https://ec.europa.eu/eurostat>
17. Ganić, M. and Novalić, A. 2023. Does regional trade integration reinforce or weaken capital mobility? New evidence from four free trade areas. *Economics and Business Review*, 9(3), pp. 239–264. [online]. Available at: <https://doi.org/10.18559/eb.2023.3-795>
18. Grieseson, R., Holzner, M., and Vukšić, G. 2021. Regional economic cooperation in the Western Balkans: The role of stabilization and association agreements, bilateral investment treaties and free trade agreements in regional investment and trade flows. *Eastern European Economics*, 59(1), pp. 3–24.
19. Horváth 2023. Horváth Study: Personnel costs to rise by 7.5 percent in 2023 [online]. Available at: <https://www.horvath-partners.com/en/press/detail/horvath-study-personnel-costs-to-rise-by-75-percent-in-2023>
20. Hunya, G. 2017. CEFTA Investment Report 2017 [online]. Available at: <https://cefta.int/wp-content/uploads/2016/05/CEFTA-Investment-Report-2017.pdf>
21. Javorcik, B. 2020. Global supply chains will not be the same in the post-COVID-19 world. In Baldwin, R. E. and Evenett, S. J. (Eds.), *COVID-19 and trade policy: Why turning inward won't work*. A VoxEU.org Book, CEPR.
22. Jirasavetakul, L-B. F. and Rahman, J. 2018. Foreign Direct Investment in New Member State of the EU and Western Balkans: Taking Stock and Assessing Prospects, *IMF Working Papers* 187, International Monetary Fund.
23. Jovanović, B.; Ghodsi, M.; van Zijverden, O.; Kluge, S.; Gaber, M.; Mima, R.; Hasić, B.; Lalović, O.; Ibrahim, M.; Manova Stavreska, A.; Nikolova, S.; Čulafić, B.; Vasić, J. and Mandić, M. 2021. “Getting Stronger After COVID-19: Nearshoring Potential in the Western Balkans,” *wiiw Research Reports* 453, The Vienna Institute for International Economic Studies, wiiw.
24. Kaminsky, B and Ng, F. 2005. Production disintegration and integration of central Europe into global markets. *International Review of Economics and Finance*, 14: pp. 377–390.
25. Kersan-Škabić, I. 2022. The COVID-19 pandemic and the internationalization of production: A review of the literature. *Development Policy Review*, 40, e12560. [online]. Available at: <https://doi.org/10.1111/dpr.12560>
26. Koopman, R., Powers, W., Wang, Z., and Wei, S.-J. 2010. Give credit where credit is due: Tracing value added in global production chains. *NBER Working Paper*, No. 16426. [online]. Available at: <https://doi.org/10.3386/w16426>.
27. Krasniqi, B., Ahmetbasić, J., and Bartlett, W. 2022. Foreign Direct Investment and Backward Spillovers in the Western Balkans: The Context, Opportunities and Barriers to the Development of Regional Supply Chains. *Southeastern Europe*, 46(1), pp. 1–22. [online]. Available at: <https://doi.org/10.30965/18763332-46010001>

28. Krasniqi, B.; Ahmetbasić, J. and Bartlett, W. 2019. Barriers to cross-border trade in intermediate goods within regional value chains in the CEFTA region, *LSE Research Online Documents on Economics* 117484, London School of Economics and Political Science, LSE Library. [online]. Available at: <https://ideas.repec.org/p/ehl/lserod/117484.html>.
29. Lubeniqi, G. 2023. Foreign Direct Investments in Western Balkans: Are the Western Balkans countries different? *Quality - Access to Success*. 24. pp. 372-384. [online]. Available at: <https://doi.org/10.47750/QAS/24.195.44>.
30. Mandras G, Salotti S. 2020. An Input–Output Analysis of Sectoral Specialization and Trade Integration of the Western Balkans Economies. *Economies*. 2020; 8(4). [online]. Available at: <https://doi.org/10.3390/economies8040093>
31. Nikolovova, P. 2013. Sourcing patterns of FDI activity and their impact on the domestic economy. *Czech Journal of Economics and Finance*, 63, pp. 288–302.
32. OECD. 2020. Shocks, risks and global value chains: insights from the OECD METRO model [online]. Available at: <http://www.oecd.org/trade/documents/shocks-risks-gvc-insights-oecd-metro-model.pdf>.
33. Pistikou, V. 2020. The Impact of CEFTA on Exports, Economic Growth and Development. *International Journal of Business and Economic Sciences Applied Research*, 13(3), pp.15–31
34. Reiter, O. and Stehrer, R. 2021. Value Chain Integration of the Western Balkan Countries and Policy Options for the Post-COVID-19 Period. [online]. *wiiw Policy Notes* 48, The Vienna Institute for International Economic Studies.
35. Trpeski, P., Cvetanoska, M. and Kozheski, K. 2021. The impact of Foreign direct investments on economic growth and trade: a panel approach of selected Western Balkan countries. *Management Research and Practice*. 13 (3). pp.23-31.
36. Vakhal, P. 2023. The evolution of downstream global value chains in Eastern Europe. *Society and Economy*. 45 (3). pp. 270–292. [online]. Available at: <https://doi.org/10.1556/204.2023.00006>.
37. Vujanovic, N. 2024. Can SEE economies grow stronger together? Empirical evidence from the CEFTA region. *Post-Communist Economies*, 36(6), pp. 695-722, [online]. Available at: <https://doi.org/10.1080/14631377.2024.2327875>.
38. Wang Y. and Chen S. 2020. Heterogeneous Spillover Effects of Outward FDI on Global Value Chain Participation. *Panoeconomicus*, 67(5), pp. 607-626. [online]. Available at: <https://doi.org/10.2298/PAN171024009W>
39. WIIW. 2024. *FDI database*. [online]. Available at: <http://wiiw.ac.at/fdi-database.html>
40. WTO/IDE-JETRO. 2011. *Trade Patterns and Global Value Chains in East Asia: from trade in goods to trade in tasks* [online]. Available at: <http://www.wto.org>.

**CONTEMPORARY
TOURISM
CHALLENGES**

MANAGING WORLD HERITAGE SITES IN CROATIA: CHALLENGES AND PERSPECTIVES FOR SUSTAINABLE TOURISM DEVELOPMENT

NATAŠA UROŠEVIĆ

Juraj Dobrila University of Pula
Faculty of Economics and Tourism »Dr. Mijo Mirković«
Pula, Croatia
natasa.urosevic@unipu.hr

MATTEO LEGOVIĆ

Juraj Dobrila University of Pula
Faculty of Economics and Tourism »Dr. Mijo Mirković«
Pula, Croatia
legovic.matteo7@gmail.com

Paper Category: Original scientific paper

ABSTRACT

The main goal of this paper is to present key challenges and perspectives of sustainable tourism development in World Heritage Sites in Croatia. Due to its important geopolitical position and turbulent multicultural history at the crossroads of European cultures, Croatia is characterised by a rich diversity and unique cultural heritage, with 10 UNESCO World Heritage Sites (WHS) and 19 cultural goods inscribed on the UNESCO Intangible Cultural Heritage Lists. Most of Croatian WHS are located on the Adriatic coast, in destinations characterised by overtourism, extreme seasonality and pressure on unique natural and cultural resources. To analyse the most important challenges and perspectives of sustainable tourism development in Croatian WHS, the authors combined qualitative and quantitative methodology, available statistics and indicators, with comparative analysis and interviews with key stakeholders and experts. After the theoretical framework and literature review, the authors present the results of the empirical research, which included analysis of the key available data and indicators related to the selected World Heritage Sites in Croatia obtained through interviews conducted with representatives of the institutions responsible for the management of the selected WHS. The results of the quantitative analysis have been supplemented by semi-structured interviews with national experts in the fields of culture, tourism and UNESCO WH. The research results indicate that Croatian WHS face implementation of management plan problems, lack of cooperation with management bodies, excessive numbers of visitors, lack of implementation of sustainability indicators, misunderstanding of the local community and overtourism in the destinations in which they are located. By solving the key management challenges, it would be possible to establish quality standards and sustainable management of WHS, implementing models of participatory management and development and raising the awareness of the local community and visitors, as well as encouraging the development of sustainable tourism of the WHS destinations.

Keywords: UNESCO, World Heritage Sites, management, sustainable tourism, Croatia

1. INTRODUCTION

World Heritage Sites are important travel destinations which, if managed properly, have great potential impact for local economic development and long-term sustainability (UNESCO, 2014a). 45 years ago, in 1979, the first three Croatian sites, the Historical Complex of Split with the Palace of Diocletian, the Old City of Dubrovnik, and Plitvice Lakes National Park, were among the first to be inscribed on the World Heritage List. Today all these destinations struggle with sustainability challenges related to the current excessive tourism model. Overtourism brought rapid economic development to many tourist destinations but endangered the sensitive and unique local, natural and cultural heritage. A responsible approach based on the principles of sustainability presupposes the tourism development realised within the framework and capacities of the natural and cultural environment, because responsible tourism, in addition to aspects of environmental sustainability, recognises and preserves the local community's customs and way of life that add value to the tourist experience. The impulse for tourism growth and development, especially in developing markets, has led to an increase in the number of natural and cultural sites for inclusion on the UNESCO World Heritage List. The rapid growth of cultural tourism has also put a strain on sensitive cultural and natural sites, some of which were unknown and unvisited, highlighting the need for more effective and comprehensive site management. Thus, one of the main challenges facing the cultural tourism sector is finding a balance between tourism and cultural heritage management, between the consumption of extrinsic values by tourists and conservation of the intrinsic values by cultural heritage managers (McKercher and Du Cros, 2002; Ryan and Silvanto, 2009; Segarić, 2014).

Due to its important geopolitical position and turbulent multicultural history, situated at the crossroads of Central Europe, the Mediterranean, and Southeast Europe, Croatia is characterised by a rich diversity and unique cultural heritage. The United Nations Educational, Scientific and Cultural Organization (UNESCO) has designated 10 sites within Croatia as World Heritage Sites, acknowledging their outstanding universal value. These sites showcase Croatia's diverse history, architecture, natural beauty, and cultural significance. Most of the Croatian WHS are located on the Adriatic coast, in destinations characterised by overtourism, extreme seasonality and pressure on unique natural and cultural resources. The impact of overtourism in Croatia's WHS destinations is a growing concern that poses significant challenges to the preservation and management of these culturally and historically significant sites.

In the search for an optimal model of cultural heritage management and sustainable tourism development of Croatian WHS destinations, this paper aims to analyse and enlight key current challenges and long-term development perspectives of selected destinations. Addressing the challenges of managing Croatia's WHS requires a holistic approach that balances the preservation of cultural and natural heritage with sustainable tourism development. Strategies may include implementing visitor management measures, promoting off-peak travel seasons, diversifying tourism offerings, investing in sustainable infrastructure, and engaging local communities in decision-making processes.

2. CONTEPTUAL FRAMEWORK AND LITERATURE REVIEW

2.1. MANAGEMENT OF WORLD HERITAGE SITES AND SUSTAINABLE TOURISM DEVELOPMENT

The management of World Heritage Sites (WHS) and the promotion of sustainable tourism development are interrelated processes that play a crucial role in preserving and promoting the cultural and natural heritage of a destination. This conceptual framework provides a theoretical basis for understanding the complex dynamics and key principles underlying the management of WHS and sustainable tourism development.

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2024a), heritage is our legacy from the past, what we live with today, and what we pass on to future generations. UNESCO seeks to encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity. This is embodied in the Convention concerning the Protection of the World Cultural and Natural Heritage, adopted in 1972 which, in 5 strategic objectives (credibility, conservation, capacity-building, communication and communities), strongly emphasises the role of local communities, serving as an effective tool in addressing climate change, rapid urbanisation, mass tourism, sustainable socio-economic development, natural disasters and other contemporary challenges.

Cultural heritage management is defined as the systematic care taken to maintain the values of cultural heritage assets for the enjoyment of present and future generations. According to McKercher and du Cros (2009), the main goal of heritage management is conservation of a representative sample of the tangible and intangible heritage for future generations, but also proper

presentation and interpretation of its specific cultural value to present generations, using popular methods to transmit the message about the value of heritage through general educational or awareness building. Recognition of the uniqueness and universal significance of cultural heritage sites could transform them very quickly into attractive tourist destinations, allowing effectively greater levels of engagement with the past, collective memories, identity and its meanings outside of the purely national, and sometimes nationalistic, context (Robinson and Picard, 2006). As indicated by Afrić Rakitovac and Urošević (2017), cultural heritage management coherent with the sustainable tourism concept is a demanding and challenging process. Cautious valorisation and revitalisation of cultural heritage contribute to its protection, stimulate economic development, and strengthen social capital and environmental protection.

Sustainable tourism, defined by the UNWTO (2013) as “tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities”, has gained considerable attention in the last decades, due to the growing recognition of the need to balance economic growth, social wellbeing, and environmental protection in the tourism industry. Through attempts to reduce any negative impact on the environment, society and the economy, while maximising advantages for regional communities and ecosystems, sustainable heritage tourism has a long history of contributing to sustainable development (especially to SDGs 8, 11, 12 and 14). According to Kordej-De Villa and Šulc (2021), since the principles of sustainable tourism proved to be inadequate to address severe problems caused by tourism, the concept of regenerative tourism was introduced, based on regenerative practices and restoring the harm already done to the natural world, which assume transparency, local control, everyday practices, and democratic negotiations, contributing to the wellbeing and balancing sometimes conflicting demands of development, growth and conservation of heritage. Exploring relations between tourism, local communities and WHS, and trying to answer the question who benefits from tourism at WHS, Bordeau, Gravari-Barbas and Robinson (2017) emphasise that tourism can have a role of a disruptive or destructive phenomenon or can be used as an instrument for sustainable development and intercultural engagement.

The dynamic growth of tourism at World Heritage Sites, often unplanned and uncontrolled, presents increasingly significant challenges in their management and the preservation of the outstanding universal value for which they were inscribed on the World Heritage List. Their integrity and authenticity must be protected and preserved to ensure that their

values can be presented to present and future generations (World Tourism Organization, 2009). Key elements of managing WHS were introduced by Pedersen (2002), emphasising the need for sustainable tourism, community involvement, and effective policy frameworks. He highlights the importance of balancing conservation efforts with economic and social benefits to ensure the long-term protection of these sites. The basic principles of managing WHS are elaborated in the *Handbook for the World Heritage - Management of the World Cultural Heritage* (UNESCO, 2013). An integrated approach to heritage management includes: placing heritage concerns in a broader framework, recognising their role in sustainable development, protection and management based on values and participation of all key stakeholders. According to the Manual, there are nine key elements common to all management systems: elements (legislation, institutions and resources), processes (planning, implementation and monitoring) and results (outcomes, outputs and improvements to the management system) (UNESCO, 2013). De Ascaniis, Gravari-Barbas and Cantoni (2018, 2021) elaborated on the tourism management at UNESCO World Heritage Sites, with special emphasis on the place that cities occupy in the WHL, following transition of concepts, from historic centres to historic urban landscapes. A new approach based on dialogue and stakeholder cooperation, where planning for tourism and heritage management is integrated at a destination level, the natural and cultural assets are valued and protected, and appropriate tourism development is represented by the UNESCO World Heritage and Sustainable Tourism Programme (UNESCO, 2014b). In the framework of UNESCO's World Heritage and Sustainable Tourism Programme (WH+ST) a series of “How to” guides have been published, showcasing best practices in sustainable tourism. These guides offer practical recommendations for WHS managers and other stakeholders, helping them to develop effective strategies tailored to their local circumstances. They are particularly valuable for site managers who often lack the necessary tools and expertise to maximise tourism benefits while minimising negative impacts (UNESCO, 2024b).

As indicated by Gravari-Barbas (2020), the multiple and dynamic interrelations between heritage and tourism evolved in the process of the globalisation and massification of tourism, including hypermobility, multi-territoriality and urbanisation, societal changes, the hybridisation of lifestyles and practices, environmental and climate-related risks, micro- and macro-economic changes, digital technology evolutions, which have dramatically accelerated the tourism heritagisation process. These global societal evolutions have contributed to a new “heritage regime” which

includes blurring of heritage categories, plurality and complexity in heritage production, new heritage “producers” and heritage values constantly and dynamically reinterpreted, placing cultural heritage at the very centre of current social, economic and cultural considerations. In that way heritage tourism also becomes a means to achieve sustainable goals and social justice and to guarantee empowerment of local communities.

Since cultural heritage, besides its intrinsic values, also presents as a significant sustainable development resource, bearing in mind various aspects of sustainability (economic, environmental, socio-cultural, political) it is important to monitor and measure the success of cultural heritage sustainability through a special system of sustainability indicators (Jelinčić et al., 2022). The multidimensional role of cultural heritage in sustainable development, as highlighted by Urošević and Afrić Rakitovac (2015), Nocca (2017), and Jelinčić (2021), emphasises that cultural heritage is not only vital for preserving local identity and traditions, but also for fostering economic growth through tourism and creative industries. Furthermore, heritage can promote social cohesion by bringing communities together, while also contributing to environmental sustainability through the preservation of landscapes and historical sites. The conceptual framework and indicator sets, proposed by Ren and Han (2018) and Jelinčić (2021), could serve as a critical tool in facilitating monitoring, ensuring that heritage management activities align with policy priorities and project goals. The further development of sustainability indicators is essential for providing a more holistic and measurable appraisal method to assess the management of cultural heritage. By adopting sustainability indicators, heritage management becomes more effective, ensuring that heritage contributes positively to long-term societal goals, fostering resilience, and supporting sustainable development across all sectors. In this paper, the authors will propose and test a set of indicators which could help in monitoring and measuring the sustainability of management for World Heritages Sites in Croatia.

2.2. UNESCO WORLD HERITAGE SITES IN CROATIA

Croatia, located at the crossroads of Central and Southeast Europe on the Adriatic Sea, boasts a rich and diverse cultural history that spans millennia, which is a testament to the various influences and civilizations that have shaped it over the centuries, including the ancient Illyrians, Romans, Byzantines, Venetians, Austro-Hungarians and Ottomans. Croatia is characterised by a rich diversity of cultural landscapes and historic towns, marked by distinctive historical cores and unique natural and cultural

heritage, faced with both the advantages and disadvantages of overtourism and its impact on sustainable development (Urošević et al., 2023).

The United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites are places of importance to cultural or natural heritage as described in the UNESCO World Heritage Convention, established in 1972. At the 3rd UNESCO session in 1979 the first three Croatian sites were inscribed on the list: the Historical Complex of Split with the Palace of Diocletian, the Old City of Dubrovnik, and Plitvice Lakes National Park. Currently, there are ten sites inscribed on the WHL and 15 sites on the tentative list (*Figure 1.*) Croatia also stands out for its intangible heritage. The Ministry of Culture of the Republic of Croatia has inscribed over 200 intangible cultural goods in the Cultural Property Register of the Republic of Croatia, out of which 19 have been inscribed on three UNESCO lists of the Intangible Cultural Heritage of Humanity: the Representative List of the Intangible Heritage of Humanity (15 goods), the List of Intangible Heritage in Need of Urgent Safeguarding (1 good) and the Register of the Intangible Heritage Best Safeguarding Practices (1 good). These impressive figures are a result of the successful cooperation of the Ministry of Culture, its professional services within the Directorate for the Protection of Cultural Heritage and the Service for UNESCO, with the Croatian Commission for UNESCO, the Commission for Intangible Heritage, experts from various scientific institutions and holders of these traditions (Ministry of Culture and Media of the Republic of Croatia, 2024).

Since 1979 the following sites in Croatia have been inscribed on the UNESCO World Heritage List: Plitvice Lakes National Park (1979), the Historical Complex of Split with the Palace of Diocletian (1979), the Old City of Dubrovnik (1979), the Episcopal Complex of the Euphrasian Basilica in the Historic Centre of Poreč (1997), the Historic city of Trogir (1997), Šibenik Cathedral of St. James (2000), Stari Grad Plain (2008), the Stećci Medieval Tombstones Graveyards (2016), the Venetian Works of defence between the 15th and 17th centuries (2017) and the Primeval Beech Forests of the Carpathians and Other Regions of Europe (2017). UNESCO WHS in Croatia are managed through various methods, reflecting significant differences in their functions and visitor levels. National and nature parks are overseen by their own public institutions, while other WHS, with the exception of the Stećci, are situated within cities and are therefore managed by local administrative units, cultural institutions or competent conservation departments (Kordej-De Villa and Šulc, 2021).

Figure 1. Croatian World Heritage Sites



Source: Kordej-De Villa and Šulc, 2021 (UNESCO, 2020)

Today, tourism is a vital part of Croatia's economic landscape. According to ETC (2024) in 2019, before the COVID-19 pandemic, the tourism sector accounted for approximately 25% of Croatia's GDP, highlighting its substantial contribution, making Croatia one of the most tourism-dependent countries in Europe. The income generated from tourism helps support a range of industries, including hospitality, transportation, retail and food services, fostering economic growth and development across the country. Tourism promotes regional development in Croatia by stimulating infrastructure improvements and investments in less developed areas. On the other hand, the accelerated development of tourism in Croatia has resulted in the development of overtourism destinations with high seasonality, which has

led to disruption of the daily life of local communities and strain on sensitive cultural and natural resources, especially in sites of Outstanding Universal Value inscribed on the UNESCO WHL.

Only a few authors have researched various aspects of tourism development and management of Croatian WHS (Krajnović, Vrdoljak Raguz and Gortan-Carlin, 2020; Kordej-De Villa and Šulc, 2021), focusing primarily on the example of the Old City of Dubrovnik and its recent fame from media exposure like *Game of Thrones* (Pavlić et al., 2017; Tkalec et al., 2017; Pavlić et al., 2020). While tourism has significantly boosted the economy, it has also brought numerous challenges, including environmental degradation, overcrowding, rising property prices, and a growing disconnect between locals and their communities. These issues not only threaten Croatia's natural and cultural heritage but also impact the quality of life for residents.

The most popular tourist destinations in Croatia, bearing the title of WHS, like Dubrovnik, Split and Poreč, experience large crowds, especially during the high tourist season. Overcrowding causes problems for both locals and tourists, who face long queues and congested attractions. Additionally, traffic congestion becomes a significant issue as roads and streets, designed for fewer users, struggle to handle the influx of tourist vehicles. There is also a lack of adequate parking on the outskirts of historic centres, exacerbating the problem of overtourism. The high demand for tourism has gradually turned historical cores into tourism enclaves, diminishing the quality of life of local communities. These areas, driven by rising real estate prices, often see locals selling or renting their properties and moving away. Consequently, these properties are converted into hotels and other tourist accommodations. Historical city centres lose their residential and working functions, becoming open-air museums with businesses catering exclusively to tourists. Additionally, the Croatian coast faces problems with illegal and inappropriate construction of tourist accommodations, often out of sync with local architecture and landscape. While UNESCO sites are well-maintained, their surrounding areas, particularly in places like Poreč, Šibenik, Split, Hvar, and Plitvice Lakes, suffer from poor urban planning and transport organisation, leading to natural and urban degradation (Kordej-De Villa and Šulc, 2021).

3. RESEARCH METHODOLOGY

To provide a comprehensive understanding of current challenges and perspectives of sustainable tourism development in Croatian WHS, the authors combined qualitative and quantitative methodology. In cultural tourism research, as in most other social research, the use of both

qualitative and quantitative approaches may be complementary, with each adding insights to the overall picture (Melkert and Vos, 2010). The authors formulated the following research questions:

RQ1: What are the key challenges faced in managing UNESCO World Heritage Sites in Croatia, particularly in terms of sustainable tourism development?

RQ2: What development perspectives and strategies can be identified for addressing these challenges and promoting sustainable tourism at Croatia's World Heritage Sites?

In the first part of the paper the authors conceptualised the theoretical framework and analysed literature, linking the management of WHS and sustainable tourism development, as well as elaborating rich and unique UNESCO WHS in Croatia. The empirical research is based on the analysis of secondary statistical data and primary data obtained through conducted interviews and a questionnaire.

Analysing the indicators of sustainable management of UNESCO WHS requires a comprehensive methodology that considers various aspects of environmental, social, economic, and cultural sustainability. There are an extremely large number of papers that use different indicators for measuring and monitoring the sustainability of tourism (European Commission, 2016; Trigo et al., 2022; Font et al., 2023), but only a few papers dealing with the sustainability of WHS destinations and sustainable management of WHS are available. WHS, due to their Outstanding Universal Value, require a specialised and distinctive approach to the measurement and monitoring of sustainability. This is especially important in the context of sustainable management, which entails a comprehensive framework incorporating a specific set of elements designed to address the unique challenges and preservation requirements of these sites.

Kordej-De Villa and Šulc (2021) point out that measures for the sustainable use of cultural heritage and WHS in Croatia are insufficient and, if they exist, they are sectoral and fragmented. In this paper the authors combine theoretical and methodological tools and methods proposed by different authors, researches and studies such as UNWTO (2011), UNESCO (2014a; 2019; 2023), Bourdeau, Gravari-Barbas and Robinson (2017), Krajnović, Vrdoljak Raguz and Gortan-Carlin (2020), Kordej-De Villa and Šulc (2021) and Fresneda Fuentes, Fuentes Ruiz and Lobo Gallardo (2022) in order to create a methodological framework in which they analysed the collected indicators and data in structured tables.

The first part of the research focuses on analysing key statistical data for selected destinations, available on the official websites of the tourist boards of

the chosen destinations. The statistical data includes the town area, population size, and the number of arrivals and overnight stays for 2022 and 2023.

For the purposes of the research, the authors created a questionnaire with key indicators of sustainable management of WHS. The questionnaire consisted of a combination of YES/NO questions and questions with a Likert scale so that representatives of competent institutions responsible for managing WHS could confirm the monitoring of the presented indicators, as well as evaluate the level of their implementation, on a scale from 1 to 5. In this research different experts in seven selected Croatian WHS destinations participated, and the obtained results indicate the current state of management of Croatian WHS. The seven selected WHS included in the research represent the most frequented destinations in Croatia that face challenges related to overtourism. While statistical data for the WHS Stari Grad Plain was included in the first part of the research, the site was not included in the questionnaire used to analyse the indicators of sustainable management.

The results of the quantitative analysis are supplemented by semi-structured interviews with national experts in the fields of culture, tourism and UNESCO World Heritage. The interviews were conducted live, by phone and online, and the results represent the answers to the 10 questions formulated in the framework of the interview. More than 20 experts in the field of culture, tourism, UNESCO WHS, as well as representatives of various institutions and organisations responsible for management of selected WHS were contacted. Ten experts participated in the research and answered the questions. The experts' attitudes confirmed the evidence of the current state of management of Croatian WHS, as well as the challenges and development perspectives of sustainable tourism development of Croatian WHS destinations.

All the results of the empirical research; analysed literature, statistical data and the results of conducted interviews, served as input data for the SWOT matrix which analyses weaknesses, opportunities and threats in managing Croatian WHS.

4. DATA ANALYSIS AND INTERPRETATION

4.1. ANALYSIS OF KEY STATISTICAL DATA AND INDICATORS OF SELECTED WHS DESTINATIONS IN CROATIA

The results of the conducted research represent numerous touristic and cultural statistical data and indicators. *Table 1* provides statistical data for selected WHS destinations in Croatia, including their respective town areas,

population as of 2021, tourist arrivals and overnight stays for the years 2022 and 2023.

Table 1. Tourist data and indicators of selected WHS destinations in Croatia

WHS Destination	Town Area	Population (2021)	Tourist Arrivals 2022	Tourist Arrivals 2023	Tourist Overnights 2022	Tourist Overnights 2023	Ratio of Population/ Tourist Arrivals
Split	79.4 km ²	160,577	793,384	956,402	2,697,985	3,050,386	5.95
Dubrovnik	142.6 km ²	41,562	1,036,618	1,246,178	3,557,339	3,889,475	29.98
Poreč	111.7 km ²	16,607	613,140	642,528	3,428,305	3,457,063	38.69
Trogir	39.3 km ²	12,393	129,555	147,606	586,708	614,548	11.91
Šibenik	399.5 km ²	42,599	268,417	283,588	1,341,761	1,303,994	6.65
Stari Grad Plain	52.8 km ²	2,772	167,516	191,357	673,969	687,020	69.03
Zadar	192.4 km ²	70,779	535,170	628,513	2,173,541	2,342,471	8.87

Source: Calculated by the authors according to available data of tourist boards of selected destinations

Statistical results highlight the varying levels of tourism activity among the WHS destinations in Croatia, with some experiencing steady growth in tourist arrivals and overnights, while others show fluctuations or missing data. The results of the analysis indicate that the destinations on the Croatian Adriatic face challenges of overtourism, primarily the cities of Dubrovnik and Poreč, taking into account their number of inhabitants compared to the number of tourist arrivals and overnight stays. Dubrovnik has faced substantial issues related to overtourism, especially since gaining international fame as a filming location for the popular TV series “Game of Thrones”. The historic Old Town, with its well-preserved medieval walls and picturesque streets, has become a magnet for tourists from around the world. However, the city’s narrow alleys and ancient infrastructure struggle to cope with the massive influx of visitors during peak seasons. One of the primary concerns in Dubrovnik is the degradation of the city’s cultural and architectural heritage. The constant foot traffic and overcrowding have led to

wear and tear on historical monuments and buildings. Additionally, the high volume of tourists has put a strain on local resources, such as water and waste management systems, leading to environmental degradation. To address these issues, local authorities in Dubrovnik have implemented measures to manage tourism flows, such as limiting the number of cruise ships that can dock in the city and introducing entrance fees for certain parts of the Old Town. Furthermore, efforts have been made to promote sustainable tourism practices and encourage visitors to explore lesser-known attractions outside the city centre. Poreč, situated along the Istrian Peninsula has experienced significant tourism growth in recent years, particularly during the peak summer season. The city's old town with the UNESCO-listed Euphrasian Basilica, and pristine beaches, attract a large influx of visitors seeking sun, sea, and sand experiences. The surge in tourism has led to overcrowding, especially in the city centre and along the coastline. During peak season, narrow streets become congested with tourists, and popular beaches can become crowded, detracting from the overall visitor experience. Additionally, the strain on infrastructure, such as transportation, waste management, and water supply, has raised concerns about environmental sustainability and quality of life for local residents.

From tracking visitor numbers to assessing the effectiveness of management plans and the performance of governing bodies, statistical data serves as an indispensable tool in understanding, managing, and preserving WHS. Statistical data and indicators enable authorities to monitor the progress of these management plans, assess their effectiveness, and make informed decisions to address emerging challenges or opportunities. Data in the cultural sector in Croatia is very scarce; there is no consistency or standardisation of data, or any precisely defined methodologies, which Urošević et al. (2023) confirmed in their research on the cultural statistics of selected Croatian cities. This analysis also confirms that most WHS do not have publicly available reports and data as key prerequisites and elements of sustainable management of the sites.

The following section presents an analysis of the results obtained through the conducted questionnaire in the selected WHS in Croatia. The findings, summarised in *Table 2*, include data on the number of visitors from 2019 to 2023, the existence of a management plan, and whether a formally established management body is in place to oversee the site's management and preservation.

Table 2. Data and indicators of WHS in Croatia

WHS in Croatia	No. of Visitors 2019	No. of Visitors 2020	No. of Visitors 2021	No. of Visitors 2022	No. of Visitors 2023	Management body	Management plan
Plitvice Lakes National Park	1,771,523	445,841	804,800	1,160,884	1,450,467	Yes	Yes
Historical Complex of Split with the Palace of Diocletian*	952,471	211,480	490,361	803,842	969,502	Yes	Yes
Old City of Dubrovnik	1,448,115	225,087	523,198	1,039,511	1,249,557	Yes	Yes
Episcopal Complex of the Euphrasian Basilica in the Historic Centre of Poreč*	294,837	101,976	215,281	306,570	321,264	No	Yes
Historic City of Trogir*	149,515	48,163	92,030	129,687	149,929	Yes	Yes
St. Nicholas Fortress (Šibenik)	8,407	2,801	7,341	10,842	11,223	Yes	Yes
Stari Grad Plain	/	/	/	/	/	Yes	Yes
Venetian Works of defence between 15th and 17th centuries (Zadar)*	631,336	/	379,473	535,170	628,513	Yes	Yes

* estimation of the number of visitors to the WHS based on data of the total number of visitors

Source: Authors' research

The conducted research first of all highlights the lack of monitoring of statistical data of Croatian WHS, primarily the number of visitors. This is reflected in the issue of the management of sites and their management bodies/management institutions. At certain WHS, such as the Euphrasian Basilica in Poreč, the number of visitors is not available, while at other WHS

it is difficult to measure the exact number of visitors. As an example, the old town centre of Trogir stands out, which as a whole is registered on the UNESCO WHL, where it is impossible to determine the exact number of visitors, because all tourists are also visitors to the site itself. The analysis of the collected data also shows that there has been a constant growth of visitors in Croatian WHS for the last five years. The largest number of visitors is present in the Plitvice National Park. The selected WHS and the analysis of their number of visitors also indicate the need for a more comprehensive management of visitors, which is one of the key elements of their management plans. Visitor management is a critical component in the sustainable preservation and enhancement of WHS in Croatia and it ensures that tourism supports local communities and conserves the integrity and value of the sites. With over a million visitors annually, Plitvice Lakes National Park has a stringent visitor management plan that includes timed ticketing, designated pathways, and visitor education programmes to minimise the environmental impact and enhance the visitor experience. Known for its medieval architecture and historic walls, Dubrovnik employs measures such as limiting the number of cruise ships and implementing an entry ticket system for the city walls to control visitor numbers and reduce overcrowding.

Sustainable management indicators for WHS serve as critical tools for assessing, monitoring, and enhancing the sustainability of these precious cultural and natural heritage sites. A checklist has been devised to establish a sustainable management framework aimed at preserving and overseeing both cultural and natural heritage, as well as practices, knowledge, and movable historical artifacts. Indicators provide an overview of the effectiveness of public efforts in ensuring the sustainability of heritage through the evaluation of three main aspects: national and international registers and inventories; efforts directed towards the protection, preservation, and management of heritage involving all stakeholders and promoting sustainability; the extent of resources mobilised to safeguard and revitalise heritage sites (UNESCO, 2019). The UNESCO Culture 2030 Indicators (2019) were published with the aim of providing a robust framework for assessing and monitoring progress towards the integration of culture into sustainable development agendas, introducing a novel methodology aimed at illustrating, through empirical data, the dual role of culture as both a driver and facilitator of sustainable development processes. CDIS comprise a comprehensive collection of 22 quantitative and qualitative indicators categorised into 7 dimensions (UNESCO, 2014).

According to UNESCO Culture for Development Indicators (2014a) and UNESCO Culture 2030 Indicators (2019), the authors elaborated key sustainable management indicators which were tested on selected Croatian WHS, as shown in *Table 3*.

Table 3. Sustainable management indicators of WHS in Croatia

Sustainable Management Indicators	Description	Yes/No	Level of Indicator Implementation (Arithmetic Mean)
Comprehensive Management Plan	Existence of a detailed management plan addressing conservation, development, and visitor management aspects.	Yes 100%	4.00
Stakeholder Engagement	Engagement of local communities, government agencies, NGOs, and other stakeholders in decision-making processes related to the site's management.	Yes 90% No 10 %	4.42
Monitoring and Evaluation	Regular monitoring and evaluation of the site's condition, visitor numbers, environmental impacts, and effectiveness of management strategies.	Yes 90% No 10%	3.42
Sustainable Tourism Development	Promotion of tourism activities that respect the site's cultural and natural values, minimise environmental impacts, and benefit local communities economically.	Yes 90% No 10%	3.57
Financial Sustainability	Diversified and sustainable funding mechanisms to support ongoing conservation, maintenance, and management activities at the site.	Yes 90% No 10%	3.85
Climate Change Adaptation	Integration of climate change considerations into management plans, including measures to mitigate impacts such as sea-level rise, extreme weather events, and habitat shifts.	Yes 80% No 20%	3.00
Cultural and Natural Heritage Conservation	Implementation of measures to safeguard and preserve the site's cultural and natural heritage values, including restoration, conservation, and risk preparedness.	Yes 100%	4.28

Source: Created by the authors according to authors' research, UNESCO (2014a) and UNESCO (2019)

The sustainable management indicators of World Heritage Sites (WHS) in Croatia indicate a strong commitment to effective conservation and

management practices, although there are areas where improvements can be made. The indicators cover various aspects of site management, including comprehensive planning, stakeholder engagement, monitoring and evaluation, sustainable tourism development, financial sustainability, climate change adaptation, and cultural and natural heritage conservation. All WHS in Croatia have a comprehensive management plan, achieving a full 100% implementation rate. This plan addresses critical aspects such as conservation, development, and visitor management. The high level of implementation, with a mean score of 4.00 out of 5, indicates that these plans are well-structured and effectively executed, laying a solid foundation for sustainable site management. Engagement of stakeholders is vital for inclusive and participatory management models of WHS. In Croatia, 90% of sites actively involve local communities, government agencies, NGOs, and other stakeholders in decision-making processes. This high rate of engagement, combined with a mean implementation score of 4.42, demonstrates that most sites recognise the importance of collaborative governance, although there is a small percentage (10%) where stakeholder engagement could be improved. Regular monitoring and evaluation are essential for assessing the condition of the sites, visitor impacts, and the effectiveness of management strategies. Croatia's WHS perform well in this area, with 90% conducting regular monitoring. The mean score of 3.42 suggests that, while most sites are proactive in this regard, there is still some room for enhancing these practices to ensure they are consistently thorough and effective. Sustainable tourism is promoted in 90% of the sites, reflecting a commitment to tourism that respects cultural and natural values, minimises environmental impacts, and benefits local communities. However, with a mean implementation score of 3.57, it is evident that efforts to develop sustainable tourism could be further strengthened to maximise its positive impacts. Financial sustainability is crucial for the ongoing conservation and maintenance of WHS. In Croatia, 90% of sites have diversified and have sustainable funding mechanisms in place. The mean score of 3.85 indicates robust financial strategies, ensuring that these sites have the necessary resources to support their conservation and management activities. Climate change adaptation is the area with the lowest implementation rate. Only 80% of sites have integrated climate change considerations into their management plans, and the mean score of 3.00 reflects that this is a relatively underdeveloped area. The commitment to preserving the cultural and natural heritage values of WHS in Croatia is exemplary, with all sites implementing conservation measures. This area has the highest mean implementation score of 4.28, indicating that sites are not

only adhering to conservation principles but are also excelling in their efforts to safeguard these invaluable resources.

4.2. ANALYSIS OF THE EXPERTS' ATTITUDES

Besides the analysed questionnaire, the research included interviews with experts and representatives of selected UNESCO WHS. Contacted experts from the fields of heritage protection, responsible city departments, ministries and institutes elaborated the most important sustainability issues and provided the authors with plenty of information and documents related to protection, the current situation and future plans. The questions included key challenges of sustainable management of WHS, implementation of management plans, application of participatory management models and monitoring of WHS, strategic planning of sustainable tourism in WHS, financial sustainability and climate change adaptation measures, as well as measures to preserve cultural and natural heritage, including restoration and conservation.

Answering the first question related to the **key challenges of sustainable management of WHS** in Croatia, Dubrovnik WHS managers mentioned the importance of balance between tourist development and sustainable valorisation of the WHS, which includes the consensus of numerous stakeholders (local government, heritage institutions, local community, business sector). Overtourism, overloaded communal infrastructure and great pressure on the historic core, as well as the quality of life of the local community, are the main challenges for managers of the Historical Complex of Split with the Diocletian Palace. The biggest challenge for Šibenik and Zadar WHS is restoration and maintenance of the Renaissance fortification architecture, mass tourism and related economic changes (emigration of the population from the cultural-historical complex, a large number of catering facilities, etc.), the pressure of new construction and climate change. For the Plitvice Lakes, the biggest challenge is to find a balance between nature protection and tourism, as well as a response to climate risks, i.e. adaptation to climate change. Among the key challenges, conservators responsible for the Euphrasian Basilica in Poreč emphasise the very low level of staff training for managing such localities, mass tourism and great overcrowding of the locality in the peak months of the season. There is no effective way of controlling the number of visitors per day and week or reducing them in moments of overload. This hinders the regular restoration of the monument because the owner/manager requests that all works be completed by the beginning of the tourist season. The third

significant problem is climate change, primarily torrential rains that bring a large amount of precipitation in a short time that the locality cannot absorb, and the constant rise in sea level, which causes more and more frequent flooding of the locality. Sea level rise throughout the Mediterranean has been observed as one of the main problems and a pattern of deterioration of monuments on the World Heritage List. Studies show that sea level rise accelerated significantly after the year 2000, which can also be observed in Poreč.

Regarding **implementation of the management plan**, Dubrovnik is thus the first city in Croatia and one of the few in the world that has already adopted and started implementing an action plan for the management of a WHS in March 2021, not even a year since the introduction of the term “management plan of cultural assets” in the Act on the Protection and Preservation of Cultural Assets. Split has been implementing a Management Plan of the Historic Complex for a year, with the dynamic interaction of key stakeholders involved in the work of the partnership and coordination council. Plitvice Lakes National Park has a Management Plan, valid from 2019-2028 with the possibility of revision. The plan includes an extensive number of activities in the scientific-research part, condition monitoring, active conservation related to habitats such as water, forests, grasslands, karst, and in addition numerous activities related to cultural heritage, interpretation and education, visitor management, sustainable local community development and capacity development and management of a public institution. The only WHS in Istria, the Euphrasian Basilica in Poreč, has a management plan from 2014, but it is poorly implemented. There is no body in charge of monitoring the implementation of the management plan, and there is not even an operational plan. The monument is managed by the owner. The WHS “Zadar Defence System” has a Local Management Plan. This strategic document was created through a participatory process over two years and was completed and adopted in the autumn of 2023. When all other localities of this transnational registration adopt their Local Management Plans, then, based on them, an umbrella and general Management Plan is created for the entire locality and all six individual elements. Given that the fortress of St. Nicholas in Šibenik was also entered on the UNESCO World Heritage List as a transnational cultural asset, the governing body actively participates in the work of the International Coordination Committee of the three partner countries (Italy, Croatia, Montenegro), i.e. in the execution of joint obligations towards the World Heritage Committee and joint projects, activities and promotion of the network “Defence systems of the Republic of Venice in the 16th and 17th centuries”.

All the interviewed WHS managers answered positively the question related to **application of participatory management model**, except experts responsible for Euphrasiana in Poreč. The plan of Dubrovnik WHS was adopted and is being implemented in an extensive participatory process with the cooperation of key stakeholders in which the vision, goals and action plan were formed. Split also insists on inclusion of all interested stakeholders through management bodies. Awareness-raising campaigns, with continued investment, have helped to strengthen awareness of the value of heritage and increase international visibility. Šibenik and Zadar coordinate both local, national and international stakeholders in the framework of their transnational network. The Plitvice Lakes National Park is connected with numerous stakeholders who participated in the process of creating and implementing the Management Plan, from the responsible Ministry, scientific institutions and NGOs, local community, schools and tourist agencies.

Regular **monitoring of the WHS** is carried out by numerous heritage institutions that operate in the Dubrovnik City area but also manage certain parts of the locality - such as cultural institutions, the Society of Friends of Dubrovnik Antiquities, which manages the walls of Dubrovnik, the Institute for the Reconstruction of Dubrovnik, as well as the conservation division of the Ministry of Culture. The data on the exact number of visitors is still not exact, and a management centre for collected data is currently being developed in cooperation with the University of Dubrovnik. Monitoring of the condition of habitats and plant and animal species, Natura 2000 species and habitat types, and of course monitoring of the freshwater ecosystem related to physio-chemical and microbiological indicators are carried out regularly in the Plitvice National Park area. The number of visitors is monitored and reported (part of the Report on the implementation of the Management Plan and the annual programme), while efforts are made to minimise the impact on the environment through many sustainable practices that are introduced into business, especially hotel and catering.

Asked **whether strategic sustainable management of tourism at UNESCO sites** is planned, the responsible expert from the Department for Culture answers that, since 2017, the City of Dubrovnik has been implementing a multidisciplinary project of strategic destination management with an action plan called "Respect the City" (RTC). It consists of a set of short-term, medium-term and long-term measures and activities in which the focus is on sustainable and responsible tourism. Thanks to this project and cooperation with a wide range of stakeholders, the City was able to extend the tourist season in a short time, disperse visitors, free

public spaces from excessive tables, chairs and stands, and finally reduce traffic congestion, as well as congestion in the old city centre. In general, the tourism sector follows the Development Strategy of sustainable tourism by 2030 with, among other things, a vision of resource conservation, which certainly includes natural heritage in Plitvice national Park. The National Park strives to find a balance between visiting and protecting nature; first of all, because visiting generates a unique income from which the entire public institution operates, with an emphasis on sustainable practices, which are a priority for most visitors.

The **assessment of the reception capacity** of UNESCO sites was made by the University of Dubrovnik and estimates of the reception capacity of the most important (and most touristically attractive) monuments within the historic centre were also prepared, and a system for booking visits to these facilities based on this data is currently being developed (application from January 1, 2025). Numerous additional activities, as well as Smart City tools, are planned in the coming period - such as a special traffic regime in the contact zone of the UNESCO site with the aim of optimising traffic and reducing the negative effects of CO₂ emissions (implementation from January 1, 2025), and energy and a completely independent Park'n'Ride system on the outskirts of the city.

Regarding **financial sustainability**, one of the Smart City solutions of the City of Dubrovnik is a unique digital ticket to the most important cultural and monumental buildings of the City, which also includes free public transport as well as a whole range of discounts and benefits. In addition to enabling the management of visitor flows thanks to data on purchases and usage in real time, the Dubrovnik Pass also generates significant revenues from which the entire cultural sector of the City of Dubrovnik is financed, including the restoration of heritage and the implementation of Management Plan activities. Last year, this project generated over 12 million euros, while this year it is expected to increase further. Plitvice Lakes NP strive to evaluate positive sustainability practices through the harmonisation of the criteria for the Green Destinations certificate, received in the autumn of 2023. The Procurement Plan, and the Financial Plan, provided the financial framework for all activities related to the Management Plan. Likewise, the National Park publishes a call for donations, which facilitates the work of many associations and other entities that can carry out part of their activities in this way.

Regarding the **climate change adaptation measures**, the Action Plan for Energy Sustainable Development and Adaptation to Climate Change (SECAP) of the City of Dubrovnik was adopted, while the Preparedness and Risk Management Plan for the World Good Old City of Dubrovnik is currently

being developed. No climate change adaptation measures have been defined for the Plitvice Lakes National Park for now but, as an associated partner in the Italy-Croatia Interreg project called CAMPUS - Climate Adaptation Plans for UNESCO Sites, they will be involved in the development of a climate change adaptation plan.

Regarding **measures to preserve cultural and natural heritage, including restoration and conservation**, managers of Dubrovnik WHS answer that, thanks to the significant income from heritage generated by the Dubrovnik Pass project, as well as by the Society of Friends of Dubrovnik Antiquity through the collection of tickets for the city walls (this is dedicated income for the restoration of cultural heritage), conservation and restoration of heritage in Dubrovnik is carried out systematically and successfully. Since 1979, the Institute for the Reconstruction of Dubrovnik has been continuously organising and implementing a programme for the restoration of the monumental complex and other immovable cultural assets in the area of the IX seismic zone. The programme of Aseismic rehabilitation of blocks of buildings in the historic centre of Dubrovnik, which has been implemented since 2000, is particularly significant here. The restoration is carried out in coordination with the Dubrovnik Conservation Department, and the Ministry of Culture of the Republic of Croatia occasionally participates in co-financing the costs of restoration and conservation of certain cultural assets. Measures to preserve cultural and natural heritage for the Plitvice Lakes National Park are being successfully implemented, trying to conserve heritage sites and save them from deterioration, such as the research of Krčingrad, which should be further conserved and made possible for visiting, and the restoration of the hydroelectric power station from the 1930s. After a multi-year hiatus, work on the restoration of the Euphrasian Basilica monument started again in 2019 and has been carried out regularly since then. The works include several segments of the assembly, with the cooperation of professional employees and external experts. Despite the lack of data on the number of visitors and the lack of monitoring, the cooperation between the Croatian Restaurant Institute and the Conservation Department in Pula, as a legally competent state administration body, is excellent.

The experts' attitudes confirmed the evidence of the current state of management of Croatian WHS, as well as the challenges and development perspectives of sustainable tourism development of Croatian WHS destinations.

4.3. SWOT ANALYSIS

The results of the empirical research: analysis of literature, statistical data and indicators and the results of interviews, served as input data for the SWOT analysis, which elaborates strengths, weaknesses, opportunities and threats related to management of Croatian WHS.

Table 4. SWOT analysis

Strengths	Weaknesses
1. Rich cultural and natural heritage: Croatia boasts numerous WHS, including historic cities, national parks, and archaeological sites, which attract tourists from around the world. 2. Tourism infrastructure: Croatia has developed tourism infrastructure, including transportation networks, accommodation options, and visitor facilities, which can support sustainable tourism development 3. Government support: There is governmental support for heritage conservation and sustainable tourism initiatives, with policies and regulations in place to protect WHS. 4. Local expertise and community engagement: Local communities possess valuable knowledge and are engaged in heritage management activities, providing opportunities for community-based tourism and sustainable development.	1. Insufficient infrastructure: Many WHS lack tourism-related infrastructure, including parking areas, waste management systems, and interpretation centres, which hinders sustainable tourism development. 2. Limited financial resources: Funding constraints may limit investment in heritage conservation, infrastructure development, and sustainable tourism initiatives. 3. Lack of coordination: There may be a lack of coordination among stakeholders, including government agencies, local communities, and tourism operators, leading to fragmented approaches to heritage management and tourism development. 4. Regulatory challenges: Inadequate enforcement of regulations, weak governance structures, and political instability may undermine efforts to manage WHS sustainably and protect them from threats.
Opportunities	Threats
1. Sustainable tourism development: There is an opportunity to promote sustainable tourism practices, such as ecotourism, cultural tourism, and community-based tourism, which can minimise negative impacts on WHS while providing socio-economic benefits to local communities. 2. Technology integration: Leveraging technology solutions, such as digital mapping, crowd monitoring systems, and online booking platforms, can enhance the management and visitor experience at WHS.	1. Overtourism: The surge in tourist numbers, particularly during peak seasons, leads to overcrowding and strains the infrastructure and resources of WHS. 2. Climate change impacts: Climate change poses a significant threat to WHS in Croatia, including rising sea levels, extreme weather events, and habitat degradation, which can undermine their integrity and resilience.

3. Public-civil-private partnerships: Collaborating with the private sector, NGOs, and international organisations can mobilise additional resources and expertise for heritage conservation and sustainable tourism initiatives.

4. Diversification of tourism offerings: Expanding tourism offerings beyond popular sites can distribute visitor flows more evenly and reduce pressure on sensitive areas, promoting a more sustainable tourism model.

3. Cultural commodification: Uncontrolled tourism development may lead to cultural commodification, loss of authenticity, and degradation of cultural heritage values.

4. Socio-economic inequalities: Tourism development may exacerbate socio-economic inequalities, including income disparities, displacement of local residents, and loss of traditional livelihoods.

Source: Created by the authors

Theoretical analysis, as well as the results of conducted research, indicate that the key challenges of managing Croatian WHS destinations are still overtourism, high seasonality, aggressive exploitation of cultural and natural resources, and inadequate management and financing. Key opportunities are the potentials for development of sustainable special interest tourism and diversification of the tourist offer, participatory models of management and development through the connection of public and private sectors and involvement of the local community, as well as innovation and digitisation of content and offer. Addressing the challenges and capitalising on opportunities will require a coordinated effort among stakeholders, robust policies and regulations, innovative approaches to heritage management, and sustainable tourism practices to ensure the long-term preservation and sustainable development of WHS destinations in Croatia.

5. DISCUSSION

From the results derived from the SWOT analysis we can discuss the challenges faced in the sustainable management of WHS destinations in Croatia and outline long-term development perspectives to address these challenges effectively (*Table 5*). The sustainable management of WHS destinations in Croatia requires a holistic approach that balances tourism development with conservation, community engagement, and innovation. Addressing the challenges of overtourism, infrastructure development, conservation, socio-economic impacts, and climate change is essential for safeguarding these invaluable cultural and natural assets for future generations. By adopting long-term development perspectives focused on stakeholders' engagement, sustainable tourism practices, capacity building, technological integration, and sustainable funding mechanisms, Croatia can

effectively manage its WHS in a manner that ensures their preservation and enhances the overall tourism experience.

Table 5. Challenges and perspectives for sustainable management of WHS destinations in Croatia

Challenges	Long-term Development Perspectives
Overtourism: The surge in tourist numbers, particularly during peak seasons, poses a threat to the sustainability of WHS in Croatia. Overtourism leads to overcrowding, environmental degradation and cultural erosion, diminishing the authenticity of these sites.	Stakeholder engagement and participatory planning: Engaging various stakeholders, including local communities, government agencies, tourism operators, and conservation organisations, is critical for developing sustainable management strategies for WHS.
Infrastructure and carrying capacity: Many WHS in Croatia lack adequate infrastructure to support the influx of tourists. Insufficient facilities such as parking areas, waste management systems and visitor centres contribute to environmental degradation and detract the visitor experience. Determining and maintaining a sustainable carrying capacity is crucial to prevent overcrowding and preserve the integrity of WHS.	Sustainable tourism development: Adopting sustainable tourism practices is essential for balancing economic development with environmental and cultural preservation. This includes promoting responsible visitor behaviour, diversifying tourism offerings to reduce pressure on popular sites, and investing in eco-friendly infrastructure and services.
Conservation and preservation: Balancing tourism development with the conservation and preservation of cultural and natural heritage is a delicate task. Inappropriate tourism activities, such as unregulated construction, souvenir vending, or lack of respect for cultural norms, can jeopardise the integrity of WHS and undermine their significance over time.	Capacity building and education: Enhancing the capacity of local communities, tourism professionals, and government officials is crucial for effective heritage management. Providing training and educational programmes on sustainable tourism practices, heritage conservation, and environmental stewardship empowers stakeholders to take an active role in preserving WHS for future generations.
Socio-economic impacts: While tourism brings economic benefits to local communities, it also generates socio-economic challenges. Issues such as income inequality, displacement of local residents, and cultural commodification need to be addressed to ensure that tourism benefits are equitably distributed and contribute to the long-term well-being of host communities.	Integration of technology: Leveraging technology solutions such as digital mapping, crowd monitoring systems, and online booking platforms can help manage visitor flows, monitor environmental impacts, and improve the overall visitor experience at WHS. Embracing innovative technologies can enhance the efficiency and sustainability of heritage management practices.

Climate change and environmental sustainability: Climate change poses a significant threat to the sustainability of WHS in Croatia. Rising sea levels, extreme weather events, and habitat degradation can have detrimental effects on both cultural and natural heritage. Implementing measures to mitigate climate change impacts and promoting sustainable practices such as renewable energy adoption and waste reduction are essential for the long-term preservation of these sites.	Sustainable funding mechanisms: Establishing sustainable funding mechanisms, such as entrance fees, heritage taxes, or public-private partnerships, can provide the financial resources needed for the conservation and management of WHS. Ensuring that revenue generated from tourism activities is reinvested back into heritage preservation initiatives is essential for long-term sustainability.

Source: Created by the authors according to authors' research, Pedersen (2002) and Bourdeau, Gravari-Barbas and Robinson (2017)

Regardless of the elaborated challenges and development perspectives presented by the authors, the conducted research first of all confirmed the following limitations of the current state of management of WHS destinations in Croatia:

1. lack of unique methodology for monitoring key statistical data;
2. lack of measurement of management sustainability indicators;
3. lack of coordination of the competent institutions/management bodies and;
4. lack of sensitivity towards the extremely important role of heritage of Outstanding Universal Value inscribed on the UNESCO World Heritage List.

Kordej-De Villa and Šulc (2021:355), analysing the quality of managing cultural heritage sites in Croatia, stated that “although some progress in balancing protection of cultural heritage and economic valuation is visible, it can be concluded that appropriate models for tourist valuation of cultural heritage are still missing. Lack of knowledge in the field of cultural management is recognised; therefore more research is still needed”. Petrevska, Mihalič and Andreški (2023:13) conducted research on a tourism sustainability model for WHS destinations on the case of Ohrid (North Macedonia) emphasising that “due to the negative impact on natural and socio-cultural resources, Ohrid tourism destination needs to strengthen its responsibility for sustainable development”, which highlights similar management challenges as in the case of Croatian WHS destinations. Fresneda Fuentes, Fuentes Ruiz and Lobo Gallardo (2022:13), in their research on the sustainable management of UNESCO WHS Royal Alcazar

of Seville (Spain), make an evaluation of the dimensions of management sustainability, concluding that: “Royal Alcazar has striven to establish an appropriate balance between all four dimensions to guarantee its long-term sustainability” as well as that “the Royal Alcazar’s managers have expressed their concern about the effort to better balance the current reporting system through a detailed analysis of the Key Performance Indicators, not only to create future reports that include management indicators of all the aspects of sustainable management in their organisation, but also to establish cause-effect relations”. The authors of this paper agree that management bodies of Croatian WHS and local/regional DMO`s could apply the proposed methods of evaluating all dimensions of sustainability (Table 6), thus re-examining the level of sustainability (or non-sustainability) of the management and development of Croatian WHS destinations.

Table 6. Dimensions of sustainability

Sociocultural	Financial
Cultural employment Cultural activities Economic revitalisation of the local community and industry Wellbeing Links to education and learning in the community Visit heritage websites Active participation of stakeholders	Ability to generate resources for operating and restoration expenses Autonomy Revenue identification Expenditure analysis Administration and reporting Strategic planning Performance evaluation Alignment and support of mission.
Environmental	Heritage
Eco-buildings Recycling of waste Energy efficiency Renewable energy Availability of public transport	Preservation of heritage Heritage restoration Heritage access Management of visitor flow Memory/identity Cultural skills and knowledge Integral plan

Source: Created by the authors according to Fresneda Fuentes, Fuentes Ruiz and Lobo Gallardo (2022)

6. CONCLUSION

Managing WHS in Croatia presents a multifaceted challenge intertwined with opportunities for sustainable tourism development. Throughout this paper, the authors tested the theoretical framework and through empirical research provided answers to the research questions (RQ1, RQ2) defining various challenges faced in managing Croatian WHS, including balancing preservation with visitation, ensuring the involvement of local communities, addressing infrastructure needs, and navigating regulatory frameworks. Despite these challenges, Croatia's WHS offer immense potential for sustainable tourism development, providing unique cultural and natural experiences while fostering economic growth and community well-being. To overcome these challenges and harness the full potential of WHS for sustainable tourism, concerted efforts are needed from multiple stakeholders, including government authorities, heritage conservation organisations, local communities, and tourism operators. Collaboration and partnership are essential to develop and implement effective management strategies that prioritise conservation, respect local cultures, and enhance visitor experiences. Moreover, a forward-looking approach is necessary to adapt to changing environmental, social, and economic conditions. This includes embracing innovative technologies for visitor management, promoting education and awareness programmes, and integrating sustainability principles into tourism planning and development.

The conducted research indicates that the majority of selected Croatian WHS destinations are successfully facing the challenges of sustainable management, implementing different management models and strategies and establishing regulatory measures, all with the aim of sustainable development and reducing negative consequences imposed by overtourism, as one of the key challenges present in all Croatian WHS destinations.

The scientific contribution of this research consists of a proposal for monitoring WHS management with an innovative system of sustainability indicators. The limitations of this research are the small sample size and lack of available data. Recommendations for future research include a proposal of implementing a similar sustainability indicator system (*Table 6*) in Croatian WHS.

BIBLIOGRAPHY

1. Afrić Rakitovac, K. and Urošević, N., 2017. Valorisation of Cultural Heritage in Sustainable Tourism. *Management*, 12(3); pp- 199-215. Available at: [10.26493/1854-4231.12.199-215](https://doi.org/10.26493/1854-4231.12.199-215).
2. Bourdeau, L.; Gravari-Barbas, M.; Robinson, M., 2017. *World Heritage Sites and Tourism: Global and Local Relations*. London, New York: Routledge.
3. De Ascaniis S., Gravari-Barbas M., Cantoni L., 2018. *Tourism Management at UNESCO World Heritage Sites*. De Ascaniis S., Gravari-Barbas M., Cantoni L., Lugano: USI – Università della Svizzera italiana.
4. De Ascaniis S., Gravari-Barbas M., Cantoni L., 2021. *Tourism management at UNESCO World Heritage Sites: Vol. 2*. Lugano: USI – Università della Svizzera italiana.
5. European Commission, 2016. *The European Tourism Indicator System – ETIS toolkit for sustainable destination management*. Available at: <https://data.europa.eu/doi/10.2873/983087>.
6. European Travel Commission, 2024. *Share of the GDP of the tourism sector in Croatia from 2013 to 2028*. Available at: <https://www.statista.com/forecasts/1153595/tourism-sector-gdp-share-forecast-in-croatia>.
7. EX.PO AUS, 2016. *Final Report: Joint cross-border approach to sustainable management of the UNESCO World Heritage Sites on the Adriatic*. Montenegro: Centre for Conservation and Archaeology of Montenegro. Available at: <https://www.expoaus.org/final-report-joint-cross-border-approach-to-sustainable-management-of-the-unesco-whs-on-adriatic-no37>.
8. Font, X.; Torres-Delgado, A.; Crabolu, G.; Palomo Martinez, J.; Kantanbacher, J.; Miller, G., 2023. The impact of sustainable tourism indicators on destination competitiveness: The European Tourism Indicator System. *Journal of Sustainable Tourism*, 31(7), pp. 1608-1630. Available at: <https://doi.org/10.1080/09669582.2021.1910281>.
9. Fresneda Fuentes, M.S.; Fuentes Ruiz, P.d.; Lobo Gallardo, A., 2022. Sustainability dimensions and World Heritage Site management: the case of the Royal Alcazar of Seville, Spain. *European Journal of Tourism Research*, 32, pp. 1-21. Available at: <https://doi.org/10.54055/ejtr.v32i.2619>.
10. Gravari-Barbas, M., 2020. Heritage and tourism: from opposition to coproduction. In: *A Research Agenda for Heritage Tourism*. Cheltenham, UK: Edward Elgar Publishing. Available at: <https://doi.org/10.4337/9781789903522.00007>.
11. Jelinčić, D. A., 2021. Indicators for Cultural and Creative Industries' Impact Assessment on Cultural Heritage and Tourism. *Sustainability*, 13, pp. 7732. Available at: <https://doi.org/10.3390/su13147732>.
12. Jelinčić, D. A.; Glivetić, D.; Tišma, S., 2022. *Priručnik za održivost kulturne baštine*. Zagreb: Jesenski i Turk.

13. Kordej-De Villa, Ž. and Šulc, I., 2021. Cultural Heritage, Tourism and the UN Sustainable Development Goals: The Case of Croatia. In: Andreucci, M.B.; Marvuglia, A.; Baltov, M.; Hansen, P. (eds). *Rethinking Sustainability Towards a Regenerative Economy*. Future City, vol 15. Springer: Cham, pp. 341-358. Available at: https://doi.org/10.1007/978-3-030-71819-0_19.
14. Krajnović, A.; Vrdoljak Raguz, I.; Gortan-Carlin, I. P., 2020. Strategic management and demarketing in UNESCO WHSs: a comparative analysis of two Croatian tourist destinations. *Bulletin of Geography. Socio-economic Series, Sciendo*, 48(48), pp. 113-128. Available at: [10.2478/bog-2020-0016](https://doi.org/10.2478/bog-2020-0016).
15. McKercher, B. and Du Cros, H., 2009. *Cultural Tourism: The Partnership Between Tourism and Cultural Heritage Management*. New York: Routledge.
16. Melkert, M. and Vos, K., 2010. A Comparison of Quantitative and Qualitative Approaches: Complementarities and Trade-offs. In: Richards, G. and Munsteres, W. (eds). *Cultural Tourism Research Methods*. Oxfordshire, Cambridge: CABI, pp. 33-40.
17. Ministry of Culture and Media of the Republic of Croatia, 2024. *Cultural heritage on UNESCO lists*. Available at: <https://min-kulture.gov.hr/eu-kultura/kulturna-bastina/kulturna-bastina-na-unesco-ovim-popisima/17251>.
18. Nocca, F., 2017. The Role of Cultural Heritage in Sustainable Development: Multidimensional Indicators as Decision-Making Tool. *Sustainability*, 9, pp. 1882. Available at: <https://doi.org/10.3390/su9101882>.
19. Pavlič, I.; Portolan, A.; Puh, B., 2017. (Un)supported Current Tourism Development in UNESCO Protected Site: The Case of Old City of Dubrovnik. *Economies*, 5(9). Available at: <https://doi.org/10.3390/economies5010009>.
20. Pavlič, I.; Puh, B.; Mišković, Lj., 2020. The perception of travellers and the World Heritage Site image. *Tourism: An International Interdisciplinary Journal*, 68(2), pp. 181-194. Available at: <https://doi.org/10.37741/t.68.2.6>.
21. Pedersen, A., 2002. *Managing Tourism at World Heritage Sites: a Practical Manual for World Heritage Site Managers*. Paris: UNESCO World Heritage Centre.
22. Petrevska, B.; Mihalić, T.; Andreeski, C. , 2023. Tourism sustainability model for a world heritage destination: the case of residents' perception of Ohrid. *European Journal of Tourism Research*, 34, pp. 1-22. Available at: <https://doi.org/10.54055/ejtr.v34i.2783>.
23. Ren, W. and Han, F., 2018. Indicators for Assessing the Sustainability of Built Heritage Attractions: An Anglo-Chinese Study. *Sustainability*, 10, pp. 2504. Available at: <https://doi.org/10.3390/su10072504>.
24. Robinson, M., and Picard, D., 2006. *Tourism, Culture and Sustainable Development*. Paris: UNESCO.
25. Ryan, J. and Silvano, S., 2009. The World Heritage List: The making and management of a brand. *Place Branding and Public Diplomacy*, 5, pp. 290-300. Available at: [10.1057/PB.2009.21](https://doi.org/10.1057/PB.2009.21).
26. Segarić, N., 2014. Baština kao temelj razvoja održivog turizma: iskustvo turističkih djelatnika u Starigradu-Paklenici. *Godišnjak Titius*, 6-7(6-7), pp. 119-134. Available at: <https://hrcak.srce.hr/149673>.

27. Tkalec, M.; Zilic, I.; Recher, V., 2017. The effect of film industry on tourism: Game of Thrones and Dubrovnik. *International Journal of Tourism Research*, 19(6), pp. 705-714. Available at: <https://doi.org/10.1002/jtr.2142>.
28. Trigo, A.; Marta-Costa, A.; Fragoso, R., 2022. Sustainability Assessment: A Tool to Build Resilience in the Face of Future Crisis. In: Vrontis, D.; Thrassou, A.; Weber, Y.; Shams, S.M.R.; Tsoukatos, E.; Efthymiou, L. (eds). *Business Under Crisis, Volume III. Palgrave Studies in Cross-disciplinary Business Research, In Association with EuroMed Academy of Business*. Palgrave Macmillan: Cham.
29. UN, 2015. *Transforming our world: the 2030 Agenda for Sustainable Development*. Available at: <https://sdgs.un.org/2030agenda>.
30. UNESCO, 2014a. *The UNESCO Culture for Development Indicators: Methodology Manual*. Paris: UNESCO. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000229608>.
31. UNESCO, 2014b. *World Heritage and Sustainable Tourism Programme*. Available at: <https://whc.unesco.org/en/tourism/>
32. UNESCO, 2019. *Culture 2030 Indicators*. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000371562>.
33. UNESCO, 2023. *Operational Guidelines for the Implementation of the World Heritage Convention*. Paris: UNESCO World Heritage Centre. Available at: whc.unesco.org/en/guidelines/.
34. UNESCO, 2024a. *UNESCO World heritage list – Croatia*. Available at: <https://whc.unesco.org/en/statesparties/hr>
35. UNESCO, 2024b. *UNESCO World Heritage and Sustainable Tourism Programme*. Available at: <https://whc.unesco.org/en/tourism/>.
36. UNWTO, 2013. *Sustainable Tourism for Development Guidebook*. Madrid: UNWTO. Available at: <https://www.e-unwto.org/doi/book/10.18111/9789284415496>.
37. Urošević, N. and Afrić Rakitovac, K., 2015. Measuring the Multidimensional Role of Culture in Sustainable Development. In: Rabar, D.; Černe, K.; Zenzerović, R. (eds.). *EU Perspectives: Innovation, Entrepreneurship and Economic Policy*. Pula: Juraj Dobrila University of Pula, pp. 373–388.
38. Urošević, N. and Afrić Rakitovac, K., 2017. *Models of Valorisation of Cultural Heritage in Sustainable Tourism*. Pula: Juraj Dobrila University of Pula.
39. Urošević, N.; Grubišić, D.; Krivošić, L.; Legović, M., 2023. Heritage and Sustainable Urban Development: Croatian Case Studies. In: Wąsowska-Pawlik, A. and Purchla, J. (eds). *Heritage and Development*. Krakow: International Cultural Centre., pp. 407-429. Available at: <https://ksiegarniamck.pl/en/produkt/heritage-and-development/>.
40. World Tourism Organization, 2009. *Sustainable Tourism Management at World Heritage Sites – Enhancing Inter-agency and Stakeholder Coordination for Joint Action*. Madrid: UNWTO. Available at: <https://doi.org/10.18111/9789284413010>.

EXAMINING ENVIRONMENTAL AWARENESS OF GENERATION Z: A STUDY FROM CROATIA

VANJA KRAJINOVIĆ

University of Zagreb

Faculty of Economics and Business

Zagreb, Croatia

vkrajinovic@efzg.hr

Paper category: Preliminary scientific paper

ABSTRACT

There is little doubt that Generation Z has brought about numerous changes in the tourism market. Zoomers seem to differ significantly in the way they express their points of view, share values, seek and interpret information or consume products and/or services. However, despite their socially progressive views, they tend to be less socially responsible in their purchases. Such cautious behaviour will also have an impact on the tourism market, as this particular tourist segment will predominate in the coming years. Tourists are to a certain level constrained in their sustainable choices by various factors and the aim of this paper is to analyse the factors that influence the decision-making process of Gen Z. The aim is to determine the extent to which Zoomers are consistent in their pro-environmental behaviour and how this behaviour is reflected in their travel habits. The research focuses on determining the impact of love of nature, green consumption, altruism and sustainable behaviour on Gen Z's travel behaviour. As part of this study, a questionnaire-based survey was conducted and distributed online among Zoomers in Croatia. The results contribute to the understanding of Gen Z's behaviour in terms of their environmental awareness, their tendency to adapt their travel patterns to sustainable measures, and their willingness to make such choices when faced with less sustainable alternatives. This study adds to the knowledge of what motivates Zoomers in Croatia to engage in environmentally friendly behaviour in tourism, but also what discourages them from such behaviour.

Keywords: pro-environmental behaviour, Generation Z, sustainable tourism, values, travel patterns

1. INTRODUCTION

Generation Z has certainly brought about a number of changes and dynamics in the tourism market. One of the first characteristics that distinguishes this generation from all previous ones is the fact that its members have not lived in a world where there was no instant internet connection and fast and free access to information and means of communication (Entina et al., 2021, 132). In other words, their growing up is heavily connected to different devices such as smartphones and screens, and they are used to accessing different sources of information (Haddouche and Salomone, 2018, 70). As the oldest members of this generation are now 28 years old, this brings many demographic changes to the market, such as a direct impact on the volume and structure of demand, but also an impact on the labour market (number and skills of workers) or an indirect impact on jobs in the tourism industry and tourism services (Mueke Robinson and Schänzel, 2019, 128). In general, a typical Gen Z member is empathetic, wants to be part of a diverse community, participates in society, is not keen on accepting hierarchical leadership, values flexibility and authenticity, and is aware of environmental issues, especially climate change, by adopting behaviours to reduce negative environmental impacts (Stanford Report, 2022, np).

On the other hand, there is little doubt that environmentally friendly behaviour is of great importance in today's tourism, as tourism as a whole is responsible for about 8% of global carbon emissions (Sustainable Travel International, n.d.). To fully understand the characteristics of environmentally sustainable tourists and their intended behaviour, it is important to emphasise that such behaviour requires that individuals make a holiday-related choice or behave differently at the destination than they otherwise would have chosen or done for environmental sustainability reasons (Juvan and Dolnicar, 2016, 34). One of the most efficient ways to pursue sustainable tourism development is to target communication to tourists who are aware of the importance of environmental protection and advocate pro-environmental tourism behaviour (Han et al., 2018, 600). However, Budeanu claims that tourists are much less interested in adopting sustainable behaviour or endorsing responsible services and products if we relate these actions to different companies and governments (2007, 499). Furthermore, there is a somewhat confusing relationship between Generation Z and eco-friendly behaviour. As D'Arco, Marino and Resciniti (2023, 1) claim, while Zoomers occasionally report that they are interested in environmental issues, this is only because they believe that the quality

of their own tourism experiences may be declining (due to issues such as overtourism or sea pollution). Lavuri, Jusuf and Gunardi, on the other hand, claim that members of Generation Z have a more exemplary behaviour towards green goods and a firm attitude towards the environment (2021, 12). Overall, Pinho and Gomes conclude that despite the increasing interest and global opinion that Zoomers will have a positive impact on environmental protection, there is still some doubt as to whether this generation is really committed to such positive behaviour to this extent (2023, 3).

As different authors propose different characteristics of Generation Z, it has become clear that members of this generation share a common characteristic with other tourists who engage in pro-environmental behaviours - each of these behaviours has distinctly different drivers (Juvan and Dolnicar, 2017). Furthermore, Schönherr and Pikkemaat claim that Zoomers ought to get a stronger foundation because of their contribution to supporting and understanding more sustainable lifestyles and enhancing social awareness (2024, 943). The main objective of this paper is therefore to determine the extent to which Zoomers are consistent in their pro-environmental behaviour and how this behaviour is reflected in their travel habits. Based on the results of the primary research, conclusions are drawn, and policy recommendations are proposed.

2. THEORETICAL BACKGROUND

This study focuses on pro-environmental tourism behaviour as part of the sustainability concept. However, it is important to point out that environmental problems are exclusively a matter of social action. It is in the nature of environmental problems that, once they arise, they require collective rather than individual participation (Li and Wu, 2020, 1372). While there is a consensus that individual action is required to achieve solutions at a societal level, these actions are often analysed individually rather than in a holistic sense. The amount of general research on pro-environmental behaviour varies and often focuses on a single type of pro-environmental behaviour, such as organic produce, seafood, or recycling (Miller, Merrilees, and Coghlan, 2015, 29). A study by Juma-Michilena et al. (2024) highlights the importance of individual beliefs, attitudes, motivations, commitment and past involvement in pro-environmental behaviour and contribution to climate change mitigation. Another aspect of pro-environmental behaviour is that the higher likelihood of pro-environmental behavioural intentions in the hospitality industry compared to tourism is partly due to the lower cost

and effort required to facilitate more responsible behavioural change in the hospitality industry (Filimonau et al., 2018, 1807).

Juvan and Dolnicar (2016, 32) emphasise three assumptions to define environmentally sustainable tourist behaviour: 1) a person's pro-environmental values and beliefs are sufficient to classify them (and their behaviour) as environmentally sustainable; 2) their intention to protect the environment is sufficient; 3) the latter two constructs are insufficient and only behaviour is important, regardless of values, beliefs and intentions. Based on these conclusions, the same authors suggest that "values and beliefs are antecedents of actual behaviour and are not sufficient to define the behaviour of environmentally sustainable tourists or to be an environmentally sustainable tourist" (Juvan and Dolnicar, 2016, 32). Furthermore, based on Li and Wu's research findings, it can be concluded that even though emotional attachment had a coherent impact on low-effort tourists' pro-environmental behavioural intentions, group norm and interpersonal trust are more easily predictable when it comes to the high-effort tourists' pro-environmental behavioural intentions (2020, 1384). Tölkes claims that people with expressed altruistic values have a tendency towards ensuring the well-being of other people, while the care for the ecosystem is related to a person's biospheric values (2020, 118).

One of the ways to analyse pro-environmental behaviour is through the prism of the value-belief-norm model, which emerged from the convergence of two theoretical traditions. It postulates a causal chain of environmental cognitions that underpin the propensity for pro-environmental behaviour. Values form the basis for these cognitive structures (Landon, Woosnam and Bynum Boley, 2018, 959). Lee et al. claim that according to this model, pro-environmental behaviour can be determined as an aftermath of a pro-social norm, this being a consequence of particular principles (2021, 366).

Due to the growing importance of Generation Z in general and its significance for tourism in particular, this generation was selected for the present study, which deals with the pro-environmental behaviour of the members of this cohort. Unlike previous generations, Zoomers seem to be more aware of the depletion of natural resources and more concerned about the fact that there is no Planet B (Pinho and Gomes, 2023, 2). They differ from all previous generations, especially in terms of the absorption and production of knowledge, information and communication. The members of Generation Z have grown up during the global digital revolution, characterised by the rapid development of the Internet. The younger Generation Z is quite inclined towards green values, resource conservation and reducing consumption (Kubíková and Rudý, 2024, 1117). Li and Wu

(2020) emphasised the importance of collaborative participation with regard to solving environmental issues, which might come as a challenge compared to the individualism of Gen Z's members. It is thus the focus of problem solving that their collaboration is functional in implementation of different practices and solutions (Çalışkan, 2021, 111). Members of this generation have a strong sense that it is necessary to help society and the environment by implementing environmentally friendly practices and exchanging good practices with other members of their generation (Krstinić Nižić and Butković, 2023, 234). A study by Mandić, Walia and Rasoolimanesh (2023) found that promoting love and respect for nature as well as promoting environmental awareness and concerns are crucial for successful sustainable tourism initiatives among Generation Z. Another study by Van Ngo and Khanh Ha found that Generation Z's decision to use ecotourism services is positively correlated with two factors – attitude and perceived behavioural control (2023, 12).

In general, members of Generation Z plan a trip because they want to experience new adventures, learn about a new culture or have a good time (D'Arco, Marino and Resciniti, 2023, 3). Self-determination theory provides a useful framework for understanding the relationships between Generation Z's environmental awareness, attitudes, green travel practices, and green self-efficacy (Khan, 2024, 2224). The author claims that this theory states that environmental consciousness can satisfy Generation Z's need for autonomy in terms of their involvement in green travel practices. Since one of the key behaviours of this generation is that they tend to be much more focused on common causes when it comes to environmental protection, this should be actively incorporated into the process of educating and increasing their global awareness of environmental issues. Their willingness to focus on environmental issues is evident through, for instance, Greta Thunberg's activism and her ability to engage her peers on these issues on a global scale.

If Zoomers are socialising among themselves, it can help in building specific generational injunctive social norms which are linked to the right or wrong behaviour in the sphere of tourism (D'Arco, Marino and Resciniti, 2023, 4). Such behaviour would assume that Zoomers are showcasing sustainable intelligence, which will be of the utmost importance in the upcoming period. Such intelligence assumes that people can use their background and knowledge while travelling, meaning that they can pursue sustainable behaviour and practices, both from the consumption and production points of view (López-Sánchez and Pulido-Fernández, 2016, 61). This generation could be very intelligent when it comes to sustainable issues. Compared to the previous generations, this generation's consumption

patterns and lifestyles are still evolving, providing a unique opportunity to cultivate pro-environmental behaviours that could persist throughout their lives (Jiang, Lyu and Lu, 2024, 2). Another study conducted by Orea-Ginger and Fusté-Forné focused on sustainable consumption and concluded that Generation Z is environmentally conscious and committed to sustainable food consumption (2023, 336). Generation Z's boycott behaviour is driven by prosocial motives such as altruism, trust, and the pursuit of social justice (Seyfi et al., 2023, 14). However, the same study found that, regardless of the fact that Zoomers are highly sensitive and aware of sustainability issues, there is not sufficient empirical confirmation of the existence of elements that support boycotting in tourism (Seyfi et al., 2023, 14).

Building on these findings, two research questions are posed in this study: (1) How do members of Gen Z in Croatia behave when it comes to their pro-environmental tourism behaviour? and (2) How do they rate three value bases of environmental awareness?

3. METHODOLOGY AND SAMPLE

The aim of this paper is to examine attitudes and habits of Generation Z with regard to sustainable travel and to examine the behaviour of this generation with regard to sustainable tourism behaviour. The primary research was conducted in May 2024 using a Google form, among the students of the University of Zagreb in Croatia. A simple random sample was used to ensure representativeness, snow-ball method was used for collecting the responses, while participation was voluntary. A total of 178 questionnaires were collected and the responses were analysed using descriptive statistical methods. The questionnaire contained nine questions divided into two parts – demographic characteristics and attitudes about pro-environmental tourism behaviour. All questionnaires were valid and were analysed for the purposes of this study. The sample consisted of 60.1% women and 39.9% men. The average age of the respondents was 20.9 years, i.e. they were predominantly students.

4. RESULTS AND DISCUSSION

When asked about awareness of the ecological footprint of tourist travel, respondents indicated a rather positive attitude and a high level of awareness of their ecological footprint (51.7%). On the other hand, 26.4% of respondents do not even think about their ecological footprint, a result

that suggests that people's attitudes may or may not change for the better through education.

Table 1. Awareness of Gen Z about the ecological footprint during tourist travel

Response	Share (%)
I am aware of my footprint.	51.7
I am not aware of my footprint.	14.6
I do not find it important.	7.3
I do not think about it.	26.4

Source: primary research data

The following question was designed to determine the extent to which respondents consider it important that their behaviour has a positive impact on the environmental sustainability in their home environment.

Table 2. Importance of positive impact on ecological sustainability in home environment

Response	Share (%)
I find it important.	56.2
I find it is important, provided that such behaviour does not cause additional costs.	19.7
I find it very important, and I will adhere to ecological practice even if such a decision entails additional cost.	12.4
I do not find it important.	10.1
Other.	1.6

Source: primary research data

The majority of respondents have a positive attitude towards their behaviour in the home and its impact on environmental sustainability. Hence, 56.2% of respondents consider such behaviour to be important, while the smallest proportion of 10.1% do not consider such behaviour to be important, resulting in an overall predominantly positive attitude towards environmentally friendly behaviour in the home environment. When discussing certain limitations that could accompany the positive attitude if such behaviour did not incur additional costs (egoistic values), a further 19.7% of respondents would join the majority in their positive behaviour, while 12.4% of respondents would pursue environmentally friendly practises regardless of potential additional costs. Building on this, respondents were

further asked about their opinion on the importance of the impact of tourism on the environmental sustainability of destinations. As Salinero et al. (2022, 1) claim, “Gen Z travellers can show concern for environmental issues that impact their way of travel” and therefore the objective was to examine to what extent this related to the research sample.

Table 3. Importance of tourism impact on destination’s environmental sustainability

Response	Share (%)
I do not think about tourism in that sense.	20.8
I find the responsibility lies with the destinations rather than the tourists.	11.3
I try to maintain environmentally friendly behaviour on my travels.	51.1
I find it very important that my behaviour during the travel does not have a negative impact on the environment.	15.7
During a tourist travel I do not worry about the problem of environmental protection.	1.1

Source: primary research data

More than half of the respondents have a moderate attitude towards the impacts of tourism on a destination’s environmental sustainability, stating that they *try to maintain environmentally friendly behaviour on their travels*. There is also a significant share (20.8) of respondents who have declared that they *do not think about tourism in that sense*. Although this is a significant share of respondents that do not consider the impacts of tourism on environmental sustainability, it is also possible that through education and sharing of information it will become possible to raise awareness about this issue among those who are still uninformed about this topic. Altruistic values are reflected in the statement *I find it very important that my behaviour during the travel does not have a negative impact on the environment* (15.7%), but not a large share of respondents agree with such standpoint.

The following sets of questions required answers on a Likert scale with values 1-5, with 1 meaning I strongly disagree and 5 being I completely agree.

Table 4. Respondents’ environmental awareness

Statement	Mode	Variance	Standard deviation
My knowledge of the ecological impact of tourism is at a satisfactory level.	4	0.86	0.93
The ecological impact of tourist flows significantly impairs the quality of life of the local population in the destination areas.	4	0.84	0.92
My behaviour during tourist trips affects the ecological impact of tourism in the destination areas.	4	0.84	0.92
My behaviour can influence the quality of the environment in destinations.	4	0.67	0.82
My level of knowledge about environmental issues is high.	4	1.00	1.00

Source: primary research data

Overall, the respondents have a rather positive attitude towards pro-environmental behaviour and state that their knowledge of the environmental impact of tourism is at a satisfactory level and relatively high. They are also aware that their behaviour can affect the quality of the environment in the destinations and that such behaviour has an impact on the quality of life of the local population in the destinations they visit. Although respondents differ in their assessment of their behaviour and the environmental impact of their trips, these differences are not very large, indicating that there is moderate agreement among respondents in this regard. The variance of each statement suggests that most respondents have a shared understanding that their tourist behaviour impacts the environment in destinations. There is moderate diversity in the intensity of respondents’ beliefs and understandings but, overall, they provided small variations in their responses, i.e. the results are uniform for all statements.

Table 5. Gen Z's perceptions about their tourist travels

Statement	Mode	Variance	Standard deviation
When I go on a tourist trip, I make sure that the natural resources of the destination are preserved.	4	0.93	0.97
The ecological preservation of destinations is an important element in the selection of the destinations I visit.	4	1.05	1.02
I am willing to spend more money to travel to a place where more attention is paid to the conservation of natural resources.	4	1.23	1.11
If I have the opportunity, I visit destinations that use sustainable practices during a vacation trip.	4	0.97	0.99
When travelling for tourism, I choose environmentally friendly means of transport (if available).	4	1.32	1.15
I am prepared to forego a tourist trip if my decision affects the better preservation of the destination I want to visit.	3	1.51	1.23
I am willing to postpone the decision to go on a tourist trip if my decision will affect the better preservation of the destination I want to visit.	3	1.40	1.19
I am prepared to change my travel habits if it does not cost me anything extra and has a positive impact on the environment.	4	1.10	1.05

Source: primary research data

When it comes to their tourist trips, respondents gave a more varied answer. For example, the statement *I am prepared to forego a tourist trip if my decision affects the better preservation of the destination I want to visit* has a mode 3, variance of 1.51 and an SD of 1.23, indicating that respondents have different opinions regarding their willingness to cancel a trip for environmental reasons. There is no clear consensus among respondents, reflecting a wide range of attitudes and beliefs about foregoing personal travel in favour of environmental protection. In other words, while some respondents are willing to make such a sacrifice to improve the conservation of the destination they wish to visit, others are not so inclined, highlighting the complexity and diversity of opinion on this particular issue. Similar results are found for the statement *I am willing to postpone the decision to go on a tourist trip if my decision will affect the better preservation of the destination I want to visit*, with a mode of 3, variance of 1.40 and SD of 1.19. It appears that respondents are reluctant to fully engage in pro-environmental behaviour, and there are significant differences between those who are willing to fully engage in such behaviour and those who are not for some reason. However,

no conclusions can be drawn from these responses about the factors that would affect behaviour change. For the other statements, apart from the statement that *When travelling for tourism, I choose environmentally friendly means of transport (if available)*, which leads to slight variations in responses, all other statements show moderate diversity in the intensity of respondents' attitudes and offer little variation in responses. This set of statements is related to biospheric values of respondents and reveals how they judge this phenomenon on the basis of costs or benefits to ecosystems or the biosphere.

The results of this study confirm the findings of Juvan and Dolnicar (2016, 32), as respondents expressed their high awareness of environmental issues, but this can only be perceived as a precursor to actual behaviour, as they also expressed a reluctance to unconditionally commit to pro-environmental behaviour during their travels. In addition, their travel decisions are constrained to some extent by additional costs that could be incurred by such behaviour. They are not fully willing to sacrifice their disposable income to achieve environmental sustainability, although they show considerable willingness to behave in a pro-environmental way and are fairly united in this regard. This is also the main limitation of this study, as the results show quite low variance and the respondents gave rather similar answers, which could be due to the fact that they were all students and therefore reflect a similar current state of mind. In future studies, it would be necessary to expand the sample in this sense. Another limitation that prevents more accurate and irrefutable conclusions in this preliminary study arises from the fact that only descriptive statistics was used to analyse the results. In addition, the knowledge about pro-environmental tourism behaviour of Gen Z in Croatia should be expanded with information about factors that influence their travel decisions.

5. CONCLUSION

We live in a world where issues of sustainability can no longer be ignored, nor can sustainable development be seen as more complex or more valuable than other models of development. Sustainability is a core value of every individual and every society, reflecting a commitment to making the world a better place in which to live, regardless of the aspect being analysed. As part of the sustainability agenda, pro-environmental behaviour in tourism is of great importance when it comes to balancing the criteria. At the same time, today's society is highly dependent on the attitude and behaviour of Zoomers, as they are the next generation to participate in leadership and decision-making processes. Zoomers are more environmentally aware and

sensitive, which is why it makes sense to address this important topic via this generation.

Based on the research results of this study, it can be concluded that members of Generation Z in Croatia are aware of environmental issues and their beliefs support pro-environmental behaviour. To answer the first research question – How do members of Generation Z in Croatia behave when it comes to their pro-environmental tourism behaviour? – it can be stated that they are mostly aware of their ecological footprint when travelling, but at the same time there is a considerable proportion of those who do not think about this issue at all. As it is not possible to say with certainty whether or not they would be more aware of their ecological footprint if they were better informed about this topic, it would be necessary to include this variable in the following study. To a large extent, they take various aspects of environmental protection into account when travelling, but they are also subject to certain constraints when making decisions.

The second research question – How do they rate the three value bases of environmental awareness? – provided in-depth reflections on their motivators, i.e. egoistic, altruistic and biospheric values. Egoistic values were found in one-fifth of respondents who stated that their environmental behaviour at home depends on the additional cost, i.e. they will not implement it if it is an additional cost to them. Altruistic values are not so important for the respondents included in the research, as only 15% of them stated that it is very important for them that their behaviour during the trip does not have a negative impact on the environment. Finally, the questions on biospheric values showed that they are less inclined to behave in an environmentally friendly way, even if their choices could contribute to the overall protection of the environment at the destinations they visit.

The results of this study could be useful for stakeholders involved in the process of developing sustainable products and services in tourism, as this study adds to the knowledge of what motivates Zoomers in Croatia to engage in pro-environmental behaviour in tourism, but also what discourages them from such behaviour. In terms of educational processes, these findings offer many areas where additional educational efforts could encourage Zoomers to take pro-environmental behaviour more seriously and think about these practises beyond their egoistic values and focus more on achieving a common good for society as a whole.

6. BIBLIOGRAPHY

1. Budeanu, A., 2007. Sustainable tourist behaviour – a discussion of opportunities for change. *International Journal of Consumer Studies*, 31, 499-508. <https://doi.org/10.1111/j.1470-6431.2007.00606.x>
2. Çalışkan, C., 2021. Sustainable tourism: Gen Z? *Journal of multidisciplinary academic tourism*, 6(2), 107-115. <https://doi.org/10.31822/jomat.2021-6-2-107>
3. Carneiro, M. J., Eusébio, C., Rodrigues, V., Margarita, R., Mara, M., Gama, C. and Monteiro, A., 2022. Pro-environmental Behaviors at Home and During a Tourism Trip: A Generational Perspective. In: Abreu, A., Liberato, D., Garcia Ojeda, J. C. (eds) *Advances in Tourism, Technology and Systems. Smart Innovation, Systems and Technologies*, 293. Springer, Singapore. https://doi.org/10.1007/978-981-19-1040-1_5
4. Casalegno, C., Candelo, E. and Santoro, G., 2022. Exploring the antecedents of green and sustainable purchase behaviour: A comparison among different generations. *Psychology & Marketing*, 39, 1007-1021. <https://doi.org/10.1002/mar.21637>
5. Chaturvedi, P., Kalushreshtha, K. and Tripathi, V., 2020. Investigating the determinants of behavioral intentions of generation Z for recycled clothing: and evidence from a developing economy. *Young Consumers*, 21(4), 403-417. <https://doi.org/10.1108/YC-03-2020-1110>
6. D’Arco, M., Marino, V. and Resciniti, R., 2023. Exploring the pro-environmental intention of Generation Z in the tourism context: the role of injunctive social norms and personal norms. *Journal of Sustainable Tourism*, 1-22. <https://doi.org/10.1080/09669582.2023.2171049>
7. Djafarova, E. and Fouts, S., 2022. Exploring ethical consumption of generation Z: theory of planned behaviour. *Young Consumers*, 23(3), 413-431. <https://doi.org/10.1108/YC-10-2021-1405>
8. Entina, T., Karabulatova, I., Kormishoca, A., Ekaterinovskaya, M. and Troyanskaya, M., 2021. Tourism industry management in the global transformation: Meeting the needs of Generation Z. *Polish Journal of Management Studies*, 23(2), 130-148. <https://doi.org/10.17512/pjms.2021.23.2.08>
9. Filimonau, V., Matute, J., Mika, M. and Faracik, R., 2018. National culture as a driver of pro-environmental attitudes and behavioural intention in tourism. *Journal of Sustainable Tourism*, 26(10), 1804-1825. <https://doi.org/10.1080/09669582.2018.1511722>
10. Haddouche, H. and Salomone, C., 2018. Generation Z and the tourist experience: tourist stories and use of social networks. *Journal of Tourism Futures*, 4(1), 69-79. <https://doi.org/10.1108/JTF-12-2017-0059>
11. Han, W., McCabe, S., Wang, Y. and Chong, A. Y. L., 2018. Evaluating user-generated content in social media: an effective approach to encourage greater pro-environmental behaviour in tourism? *Journal of Sustainable Tourism*, 26(4), 600-614. <https://doi.org/10.1080/09669582.2017.1372442>
12. Jiang, Y., Lyu, C. and Lu, S., 2024. Embracing green: antecedents of Generation Z tourists’ pro-environmental behaviour in national parks. *Journal of Ecotourism*, 1-10. <https://doi.org/10.1080/14724049.2024.2354729>

13. Juma-Michilena, I.-J., Ruiz-Molina, M.-E., Gil-Saura, I. and Belda-Miquel, S., 2024. Pro-environmental behaviours of generation Z: A cross-cultural approach. *International Review on Public and Nonprofit Marketing*. <https://doi.org/10.1007/s12208-024-00395-9>
14. Juvan, E. and Dolnicar, S., 2016. Measuring environmentally sustainable tourist behaviour. *Annals of Tourism Research*, 59, 30-44. <https://dx.doi.org/10.1016/j.annals.2016.03.006>
15. Juvan, E. and Dolnicar, S., 2017. Drivers of pro-environmental tourist behaviours are not universal. *Journal of Cleaner Production*, 166, 879-890. <https://doi.org/10.1016/j.clepro.2017.08.087>
16. Khan, A. N., 2024. Elucidating the effects of environmental consciousness and environmental attitude on green travel behaviour: Moderating role of green self-efficacy. *Sustainable Development*, 32, 2223-2232. <https://doi.org/10.1002/sd.2771>
17. Krstinić Nižić, M. and Butković, I., 2023. Can Generation Z implement sustainable development in tourism? *ToSEE – Tourism in Southern and Eastern Europe*, 7, 231-248. <https://doi.org/10.20867/tosee.07.16>
18. Kubíková, L. and Rudý, S., 2024. Attitudes of Generation Z Towards Sustainable Behaviour in Tourism. *TEM Journal*, 13(2), 1116-1125. <https://doi.org/10.18421/TEM132-24>
19. Landon, A. C., Woosnam, K. M. and Boley, B. B., 2018. Modelling the psychological antecedents to tourists' pro-sustainable behaviour: an application of the value-belief-norm model. *Journal of Sustainable Tourism*, 26(6), 957-972. <https://doi.org/10.1080/09669582.2017.1423320>
20. Lavuri, R., Jusuf, E. and Gunardi, A., 2021. Green sustainability: Factors fostering and behavioural difference between Millennial and Gen Z: Mediating role of green purchase intention. *Ekonomia i Środowisko*, 1(76), 8-38. <https://doi.org/10.34659/2021/1/1>
21. Lee, C., Olya, H., Shakil Ahmad, M., Kim, K. H. and Oh, M., 2021. Sustainable intelligence, destination social responsibility, and pro-environmental behaviour of visitors: Evidence from and eco-tourism stie. *Journal of Hospitality and Tourism Management*, 47, 365-376. <https://doi.org/10.1016/j.jhtm.2021.04.010>
22. Li, Q. and Wu, M., 2020. Tourists' pro-environmental behaviour in travel destinations: benchmarking the power of social interaction and individual attitude. *Journal of Sustainable Tourism*, 28(9), 1371-1389. <https://doi.org/10.1080/09669582.2020.1737091>
23. López-Sánchez, Y. and Pulido-Fernández, J. I., 2016. In search of the pro-sustainable tourist: A segmentation based on the tourist "sustainable intelligence". *Tourism Management Perspectives*, 17, 59-71. <https://doi.org/10.1016/j.tmp.2015.12.003>
24. Mandić, A., Walia, S. K. and Rasoolimanesh, S. M., 2023. Gen Z and the shame movement: examining the intersection of emotions, biospheric values, and environmental travel behaviour in an Eastern society. *Journal of Sustainable Tourism*, 1-23. <https://doi.org/10.1080/09669582.2023.2254950>
25. Miller, D., Merrilees, B. and Coghlan, A., 2015. Sustainable urban tourism: understanding and developing visitor pro-environmental behaviours. *Journal of Sustainable Tourism*, 23(1), 26-46. <https://doi.org/10.1080/09669582.2014.912219>

26. Mueke Robinson, V. and Schänzel, H. A., 2019. A tourism inflex: Generation Z travel experiences. *Journal of Tourism Futures*, 5(2), 127-141. <https://doi.org/10.1108/JTF-01-2019-0014>
27. Orea-Giner, A. and Fusté- Forné, F., 2023. The way we live, the way we travel: generation Z and sustainable consumption in food tourism experiences. *British Food Journal*, 125(13), 330-351 <https://doi.org/10.1108/BJFJ-11-2022-0962>
28. Pinho, M. And Gomes, S., 2023. Generation Z as a critical question mark for sustainable tourism – An exploratory study in Portugal. *Journal of Tourism Futures*. <https://doi.org/10.1108/JTF-07-2022-0171>
29. Prayag, G., Aquino, R. S., Hall, C. M., Chen, N. C. and Fieger, P., 2022. Is Gen Z really that different? Environmental attitudes, travel behaviours and sustainability practices of international tourists to Canterbury, New Zealand. *Journal of Sustainable Tourism*, 1-21. <https://doi.org/10.1080/09669582.2022.2131795>
30. Ribeiro, M. A., Seyfi, S., Elhoushy, S., Woosnam, K. M. and Patwardhan, V., 2023. Determinants of generation Z pro-environmental travel behaviour: the moderating role of green consumption values. *Journal of Sustainable Tourism*, 1-21. <https://doi.org/10.1080/09669582.2023.2230389>
31. Salinero, Y., Prayag, G., Gómez-Rico, M. and Molina-Collado, A., 2022. Generation Z and pro-sustainable tourism behaviours: internal and external drivers. *Journal of Sustainable Tourism*, 1-20. <https://doi.org/10.1080/09669582.2022.2134400>
32. Schönherr, S. and Pikkemaat, B., 2024. Young peoples’ environmentally sustainable tourism attitude and responsible behavioural intention. *Tourism Review*, 79(4), 939-952. <https://doi.org/10.1108/TR-01-2023-0022>
33. Seyfi, S., Sharifi-Tehrani, M., Hall, M. C, and Vo-Thanh, T., 2023. Exploring the drivers of Gen Z tourists’ buycott behaviour: a lifestyle politics perspective. *Journal of Sustainable Tourism*, 1-19. <https://doi.org/10.1080/09669582.2023.2166517>
34. Shen, S., Yang, F. and Sotiridaïs, M. D., 2024. Experiential consumption dimensions and pro-environment behaviour by Gen Z in nature-based tourism: a Chinese perspective. *Tourism Review*, 79(4), 877-902. <https://doi.org/10.1108/TR-04-2023-0207>
35. Stanford Report, 2022. What to know about Gen Z [online]. Available at <https://news.stanford.edu/stories/2022/01/know-gen-z>
36. Stern, P. C. and Dietz, T., 1994. The Value Basis of Environmental Concern. *Journal of Social Issues*, 50(3), 65-84. <https://doi.org/10.1111/j.1540-4560.1994.tb02420.x>
37. Sustainable Travel International, nd. Carbon Footprint of Tourism [online]. Available at <https://sustainabletravel.org/issues/carbon-footprint-tourism/>
38. Tölkes, C., 2020. The role of sustainability communication in the attitude-behaviour gap of sustainable tourism. *Tourism and Hospitality Research*, 20(1), 117-128. <https://doi.org/10.1177/1467358418820085>
39. Van Ngo, Q. and Khanh Ha, V., 2023. Research on the behaviour of Gen Z on using of green tourism: The role of knowledge sharing. *International Journal of Professional Business Review*, 8(8), 1-16. <https://doi.org/10.26668/businessreview/2023.v8i8.3172>

TRIGGERS OF MEMORABLE DARK TOURISM EXPERIENCES: A PRELIMINARY CONCEPTUALISATION

SANJA DOLENEC

Juraj Dobrila University of Pula

Faculty of Economics and Tourism "Dr. Mijo Mirković"

Pula, Croatia

sdolenec@unipu.hr

Paper category: Scientific review

ABSTRACT

The presented theoretical framework showed that dark tourism, based on the communities' memories of (mostly) violent and tragic events, should also remind tourists of tragedies and promote future peace. Whether tourists visiting those sites memorise their visit and behave in the post-visit phase to encourage a better future remains under-researched. Furthermore, triggers of memorable experiences in the general dark tourism context are relatively unknown and represent this study's research problem. The overview of recent theoretical frameworks of memorable tourism experiences showed their potential application in the specific dark tourism context. Therefore, this study merged relatively disconnected academic discourses of memorable experiences and dark tourism by conducting a systematic and primarily integrative literature review. This study (1) shows that memorable dark tourism experiences are multilayered, co-created by tourists and sites, and very individualistic and case-specific, and (2) directs us to conclude that memorable dark tourism experiences generally could be triggered by a general atmosphere of the dark tourism sites, tourists emotionally, educationally, and spiritually experiencing dark tourism sites, sharing their experiences with others, having specific personalities, and being actively involved. These insights allow for a basic understanding of the triggers of memorable dark tourism experiences and show that they differ from memorable experiences in a general tourism context. Furthermore, this study contributes to the literature on (1) dark tourism experiences and dark tourism marketing and (2) memorable tourism experiences. Also, the results may help dark tourism managers promote a culture of peace. This study's limitations are also provided as suggestions for further research, which should focus on deepening the insights gained and shedding light on the failure to achieve memorable experiences. The latter could add to the criticism of this nascent research concept, namely memorable dark tourism experiences.

Keywords: dark tourism, memorable tourism experience, integrative literature review

1. INTRODUCTION

Visits to sites related to war events and tragedies, such as those witnessing clashes and casualties of WWII, the Vietnam War, and wars in the Balkans and Cambodia (Šuligoj, 2017), differ from visits to other sites. War-related sites, which are probably the most significant and known tourist attractions (see Smith, 1998; Sharpley, 2022), are characterised by constant growth in tourist demand, with the further perspective of this growth (Stojanović, 2022). Visits to these sites are not motivated by recreation and pleasure but primarily by understanding history (Light, 2017; Miletić *et al.*, 2023) and local communities sharing a tragic past (Dolenec and Vodeb, 2021). Experiences at these sites are often (1) spiritual (Zheng *et al.*, 2019), include questioning tourist mortality and the purpose of life (Stone, 2012), and are (2) deeply emotional (Light, 2017) and memorable (Chen and Tsai, 2021; Hosseini *et al.*, 2023). As an outcome of their memorability, these visits can evoke a profound sense of the significance of peace (Hosseini *et al.*, 2023; Carbone, 2024) and the necessity to practice tolerance and empathy (see Magee and Gilmore, 2015). These outcomes are exemplified by experiences of several tourists and ancestors of nations involved in the Kinmen War who visited sites related to this war (Chen and Tsai, 2021). On the other hand, several tourists experienced confusion about the necessity of memorising whether they should support militarisation or pacifism after visiting the Peaceful Park of Okinawa, which thematises the Battle of Okinawa (see Hashimoto and Telfer, 2019). The complexity of memorability of visiting war-related sites becomes even more prominent as sometimes memorability can only be achieved when several aspects of tragic pasts are not presented to tourists to free them from difficult emotions (Carbone, 2024). Thus, the presented tragedies are banalised, and the promotion of the culture of peace fails (Carbone, 2024).

Experiences of visits to war-related sites are most often explained through the dark tourism construct (Dolenec and Vodeb, 2021; Dolenec, 2024). Dark tourism is predominately defined as a type of tourism that encompasses the presentation of real and commodified death and disaster zones and their consumption by visitors (Foley and Lennon, 1996, p. 198). More recently (see Zheng *et al.*, 2019; Nandasena *et al.*, 2022; Boršić and Šuligoj, 2023), it has been understood through Seaton's (2018, p. 13) view, according to which dark tourism represents tourist encounters with memories of communities of death and the dead. The author of this paper adopts this definition. The mentioned aspects of the uniqueness of (outcomes of) dark tourism (experiences) should not be explained by the knowledge

already available within the corpus of literature on tourism in a general sense but by applying the already formed tourism theories to the context of dark tourism (see Light, 2017; Dolenec and Vodeb, 2021; Dolenec, 2024). Therefore, memorable tourism experiences defined by Kim *et al.* (2012, p. 13) as experiences selectively recalled by the visitor when describing a special travel experience, a definition later adopted by, for example, Hosseini *et al.* (2023) and Wang *et al.* (2023), should be explained in the dark tourism and other context precisely (Hosseini *et al.*, 2023; Hosseini *et al.*, 2024; Carbone, 2024).

The literature on memorable tourism experiences is very progressive but still nascent, and it recognises different contexts that allow these experiences. Triggers of these experiences differ according to the context itself, while the context of dark tourism has not been acknowledged (see Hosany *et al.*, 2022; Hosseini *et al.*, 2023). Due to the mediating potential of dark tourism to a better society (Maggie and Gilmore, 2015; Stojanović, 2020) and memorable experiences that can encourage the realisation of this potential (Chen and Tsai, 2021; Hosseini *et al.*, 2023), it is urgent to understand how to realise it (Hosseini *et al.*, 2023), why some tourists fail to realise it (Hosseini *et al.*, 2023) or memorise visits in the way that does not trigger them to practice tolerance towards others (Carbone, 2024).

The author of this paper has recognised that two academic discourses, namely dark tourism and memorable tourism experiences, are rather disconnected and that a few available studies that bridge the mentioned academic discourses do not explain the failure of memorability of dark tourism experiences or outcomes related to (lack of) practising tolerance but deal with triggers of site-specific memorable dark tourism experiences (MDTE) using different scientific approaches. Their insights are unjoined; however, they offer the possibility to join these insights and apply the relevant and broader theoretical framework to bridge the two academic discourses and thus form a preliminary conceptualisation of triggers of MDTE. This conceptualisation is allowed by an integrative literature review (see instructions of Dolenec, 2024). This way, we define the research problem (and the literature gap this study strives to fill) and the dominant methodology of this study. By filling this gap, that is, providing a preliminary and early conceptualisation of triggers of MDTE, we explicitly respond to the call of the scholars to (further) clarify (1) experiences in the dark tourism context (Iliev, 2021; Martini and Sharma, 2022; Oren *et al.*, 2022) and their memorability (such as Cakar, 2020; Stojanović, 2020; Hosseini *et al.*, 2024; Carbone, 2024), (2) the potential promotion of a caring world, which strives to prevent the reappearance of war events (such as Stojanović, 2022;

Banaszewicz, 2022; Soulard, 2023), (3) loyalty to (dark) tourism destinations (see Hosseini *et al.*, 2023), and (4) the context suitable to achieve memorable tourism experiences (see Hosseini *et al.*, 2023). The structure of this paper includes the introduction, the theoretical framework, the methodology, the analysis and synthesis of triggers of MDTE, the discussion and the conclusion and future direction.

2. THEORETICAL FRAMEWORK

It has been almost 30 years since Foley and Lennon (1996) defined dark tourism, paving the way for academic discourse (Stone, 2006). War-related attractions are often the focus of this discourse (Cakar, 2020; Dolenec and Vodeb, 2020), but the spectrum of dark tourism attractions extends beyond these themes (see, for example, the spectrum developed by Stone, 2006). However, there is a lack of theoretical frameworks that explicitly separate experiences related to different spectrums (Iliev, 2021). As a result, the presentation of this spectrum and the breakdown of triggers of memorable tourism experiences in dark tourism according to different site spectrums will not be discussed further. It is important to note that other types of tourism also involve war attractions and tourist encounters with communities' memories of tragedies and death (Dolenec, 2024). However, the relationship among them will not be systematically presented due to the blurry separation of similar forms of tourism in the literature (Šuligoj, 2022). Dark tourism scholars are more scientifically productive, especially in topics related to the complexity of tourism motives and experiences (Martini and Sharma, 2022) and have proved that tourists' emotional experiences when encountering memories of tragedies distinguish dark tourism experiences from experiences in general tourism contexts and other contexts (see Dolenec, 2024).

Tourism experiences generally include everything travellers do at a destination (Oh *et al.*, 2007). However, individuals can only transform the selected parts of their tourism experiences into memories (Kim *et al.*, 2010). These experiences are also frequently explained as unusual, selectively recollected from tourist experiences, recalled after the trip, and retrieved more distinctly than regular experiences (Hosseini *et al.*, 2023). Obtaining memorable experiences has recently been considered a core tourist motive for travel (Bai *et al.*, 2023). Destinations tend to encourage these experiences for tourists (Kim *et al.*, 2010) due to increased destination loyalty (Wang *et al.*, 2023; Bai *et al.*, 2023), competitive advantage (Hosseini *et al.*, 2023), word-of-mouth intention (Kim, 2018), and other benefits. According to the

insights provided by a recent literature review conducted by Hosany *et al.* (2022), memorable tourism experiences (1) are subjective and individualistic, (2) are primarily understood as positive outcomes, while memorability of negative experiences is somewhat ignored, and (3) may act as a mediator of behavioural intention. Although several scales allow the measurement of the memorability of experiences, the one that is applicable to all tourism contexts still needs to be developed (see Hosany *et al.*, 2022; Bai *et al.*, 2023; Hosseini *et al.*, 2024). Furthermore, the discussion on triggers of memorable tourism experiences started only recently, in 2018 (see Hosany *et al.*, 2022), and they are defined as critical factors in determining the overall memorability of the tourist experience (see Semrad and Rivera, 2018). According to this definition, within this paper triggers are also considered antecedents, components, dimensions, and factors (as defined by, for example, Wang *et al.*, 2023; Hosseini *et al.*, 2023) and other constructs that form or support memorable experiences. Since some triggers of memorability work already during visits and in the post-visit phase (such as emotions, see Wang *et al.*, 2023), it will not be further discussed whether these triggers support memorability or are already the memorability output (see Wang *et al.*, 2023). However, it is clearly documented that triggers are context-specific (see Hosany *et al.*, 2022; Hosseini *et al.*, 2023) and, in general, according to Hosany *et al.* (2022), depend on tourists themselves (such as personal development and emotions, perceived values, novelty seeking) and destination settings (such as servicescape, smart tourism technology, object-based authenticity). In other words, these experiences are triggered and co-created by tourists and destinations (Hosseini *et al.*, 2023). Due to a lack of a clear theoretical framework under which context-specific triggers of memorable experiences should be systemised (Hosany *et al.*, 2022; Hosseini *et al.*, 2023), their categorisation goes beyond this study's purpose. Instead, this paper will be led by insights from the sources that deal primarily with MDTE, and their discussion/interpretation by (only) available theoretical frameworks on (1) dark tourism experiences and (2) memorable experiences.

The MDTE hold transformative potential in terms of tourists' (1) understanding the dark past (Wyatt *et al.*, 2024), (2) contemplating own mortality (Wyatt *et al.*, 2024), (3) strengthening patriotism when war fought in the name of the nation-state is presented to tourists (Carbone, 2024; Hosseini *et al.*, 2024), (4) encouraging critical thinking on the dark past and, thus, acting towards developing tolerance to do something for a better future (Lundin *et al.*, 2023; Soulard *et al.*, 2023; Nandasena *et al.*, 2023; Hosseini *et al.*, 2024). The mentioned potential benefits underscore the necessity of research that brings one closer to understanding the complexity

of achievability or lack of achievability of MDTE and, consequently, positive societal changes (see Stojanović, 2022; Soulard *et al.*, 2023). The systematic assessment of (level) of positive social changes caused by MDTE goes beyond this study's purpose, as the theoretical framework that allows this assessment (within the dark tourism context) is still unavailable (see Nandanasana *et al.*, 2022; Amaro *et al.*, 2023).

3. METHODOLOGY

The integrative¹ literature review methodology has been primarily selected to solve the research problem. It allows for recognising, analysing, synthesising, and criticising the relevant insights on new and emerging topics (Biloslovo and Rusjan, 2018; Dolenec, 2024), often covered by a few sources (see Connolly *et al.*, 2012). It is especially relevant for (1) transforming individual findings formed by different methodological approaches into new conceptualisations and interpretations (Seraphin *et al.*, 2018; Dolenec and Vodeb, 2021) under the topics for which contradictory evidence appears (Torraco, 2005) and (2) bridging two concepts, thus forming and presenting new knowledge integratively into a cohesive whole (see Cho, 2022). Its conduction demands a rigorous approach in choosing studies that will be reviewed (Teoh *et al.*, 2021) and setting a rigorous, broader, and comprehensive background in the form of a theoretical framework (see Zhao and Agyeiwaah, 2023). As a result, according to Dolenec and Vodeb (2021), this form of the literature review should include primary sources (studies that deal with the topic under investigation) and secondary sources (that form a theoretical and methodological framework, recognise the research problem and the necessity for its clarification). They are all intended to form new and credible knowledge (Dolenec and Vodeb, 2021) with qualitative interpretative richness (see Teoh *et al.*, 2021). The systematic literature review methodology in this paper is additionally partially used to discuss the novelty of the research topic (for instructions, see Zhao and Agyeiwaah, 2023), as this novelty is suggested, for example, by Hosseini *et al.* (2024).

The first steps in an integrative literature review included recognising the literature gap, assessing its importance in terms of fitting within the narrow and broader corpus of literature, choosing and justifying the appropriate method to fill it, and identifying the relevant (primary) studies for review (see instructions by Torraco, 2016). This study restricted the research of the data on bibliographical records on the (primary) studies

1 Integrative literature review is also called narrative literature review (Zhao and Agyeiwaah, 2023).

dealing with memorable tourism experiences in the dark tourism context to the renamed citation bases Web of Knowledge (Web of Science-WOS), which informs the leading scientific journal in all scientific fields, and SCOPUS, the largest citation database. The research was based on the keywords defined in the English language, namely a combination of dark tourism, experience, and memorable². No period was applied since both academic discourses, dark tourism (see Dolenec and Vodeb, 2021) and memorable tourism experience (see Hosseini *et al.*, 2024), are relatively new. The research was carried out on February 24, 2024, and included all the studies published by this date.

The search results included a total of 22 sources. First to be removed were (1) duplicate sources, (2) sources in which the full text was not available in English, (3) those whose content did not provide case-specific insights on triggers of MDTE. As a result, only eight sources were (1) deemed primary and suitable to assess the current state of knowledge about triggers of MDTE, thus achieving the research purpose, and (2) taken from the collections of electronic journals and reviewed (according to instructions by Dolenec and Vodeb, 2021). Additionally, 44 secondary sources were used. In total, 52 sources were employed for this integrative literature review.

The analysis of the primary sources is presented in the form of a table (Table 1). This table includes categories of the studies' author(s), dark tourism site/attraction, country or region where the site is located, and memorable experience trigger. To these categories, the study's unique ID is attached to make the synthesis and discussion more transparent. The synthesis of the analysed primary studies employed the thematic integrative form (as instructed by Torraco, 2016), as it shows how the main themes (triggers of memorable experience) come together as a unified idea.

4. ANALYSIS AND SYNTHESIS OF TRIGGERS OF MDTE

The presented theoretical frameworks lead one to conclude that the unique dark tourism context may create memorable experiences with different triggers than those in general tourism. The analysis provided in the following table summarises what triggers MDTE and how these triggers relate to specific dark tourism sites or attractions (Table 1).

2 Hosany *et al.* (2022) used the keywords “memorable” and “experience” to review the literature on memorable tourist experiences. In this paper, “dark tourism” served as a keyword to narrow the literature to this specific context.

Table 1. Summary of findings about triggers of MDTE

ID	Author: Dark tourism site/attraction (country or region), dark past	Memorable experience trigger
ID1	Oren and Shani (2012): The Yad Vashem Holocaust Museum (Israel), holocaust	Educational and emotional experience, reminding of the necessity to preserve peace
ID2	Cheal and Griffin (2013): Gallipoli Peninsula Historical National Park (Türkiye), battlefield tragedies	Sacred place, educational and emotional experience for Australians, belonging to the community, sharing their experiences
ID3	Grinfelde and Veliverronena (2018): Museum of Communist regime victims (Latvia), communist crimes	Authentic space, educational and emotional experience
ID4	Cakar (2020): Gallipoli Peninsula (Türkiye), battlefield tragedies	A sense of pilgrimage, emotional and educational experience for tourists from Australia, New Zealand, and Türkiye
ID5	Gibson, Yai, and Pratt (2022): Battle of Guadalcanal (Solomon Islands), battlefield tragedies	Emotional and educational experience
ID6	Stojanović (2022): Holocaust-related sites (n.d.), holocaust	Auratic space, educational and emotional experience, tourist sharing experiences
ID7	Wyatt, Leask, and Barron (2024): Tourist tours The Real Mary King's Close (Scotland), Gravedigger Ghost tour (Ireland), Sick to Death (England), various tragic human conflicts and diseases	The illusion of stepping back in time, tourist involvement, educational experience
ID8	Hosseini, Cortes-Macías, and Almeida-García (2024), various war zones (Iran), war tragedies	Intensive and mixed emotions, educational and spiritual experience

According to Table 1, most of the attractions that triggered MDTE were dedicated to social conflicts and war-related tragedies (ID1-ID6, ID8)³. More specifically, MDTE are recorded among some tourists in the cases of holocaust tourism in general (ID6) and the Yad Vashem Holocaust Museum in Israel in particular (ID1), Gallipoli Peninsula Historical National Park in Turkey that thematises battlefield tragedies (ID2; ID4), Museum of Communist regime victims in Latvia (ID3), battlefield tragedies in the Battle of Guadalcanal that took place on the Solomon Islands (ID5), and war zones tragedies in Iran (ID8). Only one case reported memorability of experiencing dark tourism sites that go beyond war-related attractions. This attraction is dedicated to various tragic individual conflicts and diseases and is presented

3 The dash indicates that the codes are in sequence, i.e., ID1; ID2; ID3; ID4; ID5; ID6.

by guided tours in Ireland, Scotland, and England (ID7). Most studies have been published since 2020; only a few were published before that period.

What makes the mentioned experiences memorable, according to several studies, is the general atmosphere at the dark tourism sites (ID2-ID4; ID6; ID7). This atmosphere is created by (1) using different techniques to engage tourists' senses in the re-enacted tours that strive to create an illusion of stepping back in time (ID7), (2) tourists encountering the aura at the sites, namely specific feelings that separate experiences from other everyday experiences and are characterised by sacred aspects within a world (ID2; ID4; ID6), (3) tourists' perceptions of the site's authenticity, e.g., the place that presents original objects, victims testimonies, and maintains the exterior and interior as it used to be in the (dark) past (ID3). The mentioned atmosphere was described by tourists with spiritual attributes, considering dark tourism attractions and pilgrimages (ID2; ID4; ID6; ID8) and thus memorably experiencing them.

Some tourists who feel a greater connection to the sites due to sharing the nationality of their ancestors, who were involved in the dark past events, expressed that the dark tourism experience fosters their national identity and triggers memorability (ID4; ID5). Memorability is further triggered by informal educational experiences of tourists visiting dark tourism sites, who strive to (1) comprehend the dark past and its consequences (ID1-ID8), (2) understand local communities and their need to keep and share their memories of the tragedies (ID5; ID6), and (3) become witnesses to the tragedies (ID6). The educational experience at dark tourism sites is provided by informative and educational means, also understood as interpretation techniques, such as interpretation panels (ID2), audio-visual presentations (ID1), tour guides (ID2; ID3; ID8), museums (ID1; ID2), presentations of personal objects and testimonies of the victims (ID1; ID2) and other interpretative techniques. However, analyses revealed that tourist guides are the most effective educational tool at dark tourism sites, enhancing the memorability of the experience (ID2; ID3; ID8). Symbols of suffering embedded within the architecture of the sites, such as enclosing visitors to follow the evolving narrative in a chronicle order with limited official exit points symbolising “trapped” historical victims (ID12), are also effective means of forming the memorability of dark tourism experience, as it fosters interpretation and understanding of the dark past. Several studies recorded that tourists' active involvement at the sites further triggers memorability since it includes other educational aspects such as rethinking ideological conflicts and contemporary wars (ID1; ID5; ID6; ID8), posing questions

to tour guides (ID1), and raising awareness that humanity should prevent recurring tragedies such as the Holocaust (ID1; ID6).

The emotional journey at dark tourism sites is profound, intricate (ID1 – ID6; ID8), and sometimes conflicting, further intensifying the memorability of these visits (ID5). Negative emotions, such as shock, fright, rage, grief (ID3-ID6; ID8), and numbness (ID6), are often experienced when confronting a dark past. Conversely, positive emotions, such as optimism, love, and serenity, are also felt when tourists realise that they can lead better lives, unlike the victims of these tragedies (ID5). However, the predominant emotion that triggers MDTE is overall emotional empathy while connecting with victims (ID1-ID6; ID8), underscoring the profound memorability of these experiences.

In a few instances, the memorability of the experience is personal and communal, amplified by sharing tourists' experiences with others (ID2; ID6; ID8). The emotions experienced at the sites and expressed in the presence of other tourists (ID2; ID8) and home communities (ID2; ID6) serve as potent MDTE triggers. Sharing experiences at war-related sites enhances the feeling of belonging to the national community, particularly when the war is fought in the name of nations and global humanity, as other nations have also suffered, and some continue to suffer in wars (ID2). This underscores the importance of collective memory and its role in shaping one's understanding and experience of dark tourism.

5. DISCUSSION

The literature on dark tourism primarily focuses on war-related sites and attractions (Cakar, 2020; Dolenec and Vodeb, 2020), as this body of work addresses the memorability of experiences in the same dark tourism cases (ID1-ID6; ID8). However, MDTE are not a one-size-fits-all phenomenon. Memorable experiences are highly multilayered, subjective, and individualistic, meaning that not all visitors in the dark tourism context achieved (the same level of) memorability (ID1-ID8). They are co-created between tourists and dark tourism sites/attractions (see ID1-ID8), as synergy of tourists and sites/attractions is also observed in memorable tourism experiences in general (see Hosseini *et al.*, 2023).

According to the originally conducted primarily integrative literature review, visitors who managed to achieve MDTE were triggered by the novelty of the atmosphere at the dark tourism sites (ID2-ID4; ID6-ID8). This novelty was suggested by the literature dedicated to the memorability of experiences in a general tourism context (Hosseini *et al.*, 2023), and in

the dark tourism context, it is often described as an unusual and auratic atmosphere, namely the arousal of specific feelings that separate tourist experiences from other everyday experiences (ID2; ID4; ID6). MDTE are further triggered by questioning the purpose and meaningfulness of life, an experience already recognised in the dark tourism context as spiritual (Zheng *et al.*, 2019) but not linked to memorability (see Hosany *et al.*, 2022). In other words, this questioning makes the memorability of dark tourism experiences unique compared to the memorability of tourism experiences in general. The emotional engagement of tourists at dark sites (Light, 2017; Dolenec, 2024) was intense among tourists, who deemed their experiences memorable (ID1-ID6; ID8). Emotional empathy (while relating with victims) is a prevailing emotion (ID1-ID6; ID8). Since empathy was not considered a trigger within the literature of memorable tourism experiences in the general tourism context (see Hossany *et al.*, 2022; Hosseini *et al.*, 2023), it was once again initially confirmed that MDTE triggers are distinctive. Different interpretation techniques at dark tourism sites allow (informal) education experiences (see Dolenec and Vodeb, 2021), and the conducted literature review initially confirmed that this education further triggers tourists' memorability (ID1-ID8). Sharing experiences at sites with others and in the post-visit phase with the surrounding community helps tourists to memorise the experiences (ID2; ID6; ID8), which is also recorded under the construct of worth-of-mouth in the literature that thematises tourism marketing and memorable experiences in the general tourism context (Kim *et al.*, 2018). Only a few studies have shown that a specific profile of tourists, namely being of the nationality that was engaged in a past tragic event, especially triggers MDTE (ID4; ID2). Compared to general tourism, the distinctiveness of triggers for MDTE supports Light's (2017) and Dolenec's (2024) calls to integrate tourism theories with the unique aspects of dark tourism to develop new explanations for these experiences.

6. CONCLUSION AND FUTURE DIRECTIONS

Unique experiences of tourists when encountering memories of the deceased of different communities' tragic events have sparked an extensive academic debate (Iliev *et al.*, 2021; Oren *et al.*, 2022; Hosseini *et al.*, 2024), particularly within the context of dark tourism (Martini and Sharma, 2022). However, the question of whether these experiences are memorable or forgettable, in the sense of being deeply ingrained in the individual's memory and having a lasting impact, remains under-researched, with existing insights often limited to specific cases. Understanding their

memorability can significantly contribute to developing a theoretical framework that enhances one's understanding of dark tourism's pivotal role in shaping a compassionate world that seeks to prevent the recurrence of war events (Carbone, 2024). However, the relationship between memorable experiences in dark tourism and social changes is still a relatively unexplored area, requiring the development of a theoretical framework. This is where the present study stepped in, with a unique approach that focuses only on exploring triggers of memorability in the dark tourism context and offering their preliminary conceptualisations.

This study initially indicated that dark tourism triggers memorable experiences through its atmosphere, prompting emotional, educational, and spiritual engagement from tourists who actively share their experiences and have unique personalities. By developing the insights presented, we have identified similarities and differences between the triggers of memorable dark tourism experiences (MDTE) and memorable experiences in the broader tourism context. This research solved the identified problem and filled a gap in the literature on this emerging topic, namely on factors of memorable tourism experiences in dark tourism. Consequently, we have fulfilled the purpose of this study. In other words, and more specifically, we provided a direct response to the call of other dark tourism scholars who have been advocating for further clarification of the dark tourism experiences (Iliev, 2021), their memorability triggers (see, for example, Hosseini *et al.*, 2024) and memorable tourist experiences scholars who have been urging for research in different tourism contexts (Hosany *et al.*, 2022; Hosseini *et al.*, 2023). The study's insights hold the potential to assist dark tourism marketing experts in designing experiences that trigger memorability, which is a form of experience with growing demand (Bai *et al.*, 2023) and offers benefits to destinations such as competitive advantage (Hosseini *et al.*, 2023) and word-of-mouth (Kim, 2018).

The study's limitations regarding its methodology are evident, as the insights were formed only by reviewing and interpreting the sources available in English that deal with MDTE recommended by the WOS and SCOPUS databases. Therefore, the knowledge available in other databases and languages was excluded. Theoretical limitations of this study were inevitable and are the result of the undeveloped theoretical framework that allows (1) explicit separations of triggers and outputs of memorable experiences in the general tourism context (see Wang *et al.*, 2023), which is somewhat blurred among the reviewed primary studies and, accordingly, (2) outputs of MDTE, especially in the form of behaviour towards positive societal changes (Hosseini *et al.*, 2024), (3) triggers of forgettable experiences

(see Hosseini *et al.*, 2023), and (4) the role of negative experiences in overall tourist memorability (see Hosany *et al.*, 2022). Although a lack of these frameworks hinders critics of MDTE and their triggers, it did not hinder fulfilling the study's purpose and allowed us to form suggestions for future research. Therefore, we join the other authors who call for research to form the mentioned theoretical frameworks (see Hosany *et al.*, 2022; Wang *et al.*, 2023; Hosseini *et al.*, 2023; Hosseini *et al.*, 2024). Furthermore, since this study's insights are provided only by a small number of studies that primarily dealt with MDTE and helped to form preliminary conceptualisation, we recommend future studies in the specific context that will possibly recognise new and deepen the understanding of the mentioned triggers.

BIBLIOGRAPHY

1. Amaro, D., Caldeira, A.M. and Seabra, C., 2023. Transformative experiences in tourism: A conceptual and critical analysis integrating consumer and managerial perspectives. *Tourism and Hospitality Research*, p. 14673584231182971.
2. Bai, W., Lai, I.K.W. and Wong, J.W.C., 2023. Memorable Tourism Experience Research: A Systematic Citation Review (2009–2021). *SAGE Open*, 13(4), p. 21582440231218902.
3. Banaszkiewicz, M., 2022. The Transgressive Approach to the Dark Tourism Experience: Stalkerism in the Chernobyl Exclusion Zone. *Polish Sociological Review*, 219(3), pp. 367-384.
4. Biloslavo, R. and Rusjan, R., 2018. *Strateške dualnosti v teoriji in praksi managementa*. Založba Univerze na Primorskem.
5. Boršič, L. and Šuligoj, M., 2023. Competitive lieux de memoire in a post-socialist dark tourism context: an explorative study of a Slovenian case. *Journal of Tourism and Cultural Change*, 21(3), pp. 290-307.
6. Çakar, K., 2020. Investigation of the motivations and experiences of tourists visiting the Gallipoli Peninsula as a dark tourism destination. *European Journal of Tourism Research*, 24, pp. 2405-2405.
7. Carbone, F., 2024. War-related attractions: 'the good, the bad, or the ugly'? War museums between peace, national identity and war porn. *Current Issues in Tourism*, 27(5), pp. 679-688.
8. Cheal, F. and Griffin, T., 2013. Pilgrims and patriots: Australian tourist experiences at Gallipoli. *International Journal of Culture, Tourism and Hospitality Research*, 7(3), pp. 227-241.
9. Chen, C.M. and Tsai, T.H., 2021. Tourist motivations in relation to a battlefield: a case study of Kinmen. In *Tourism Places in Asia* (pp. 78-101). Routledge.
10. Cho, Y., 2022. Comparing integrative and systematic literature reviews. *Human Resource Development Review*, 21(2), pp. 147-151.
11. Connolly, B., Denehy, L., Brett, S., Elliott, D. and Hart, N., 2012. Exercise rehabilitation following hospital discharge in survivors of critical illness: an integrative review. *Critical Care*, 16, pp. 1-10.
12. Dolenec, S., 2024. *Attitudes of local stakeholders towards the development of dark tourism: an example of the heritage of antifascism of Istria County* (Doctoral dissertation, Univerza na Primorskem, Fakulteta za turistične študije-Turistica).
13. Dolenec, S. and Vodeb, K., 2020. State of Art: Održivo upravljanje mračnim turizmom prema teoriji dionika. *Notitia-časopis za ekonomske, poslovne i društvene teme*, 6(1), pp. 25-38.
14. Dolenec, S. and Vodeb, K., 2021. The relationship of the local community and dark tourism development. *Društvena istraživanja: časopis za opća društvena pitanja*, 30(4), pp. 699-719.
15. Foley, M. and Lennon, J.J., 1996. JFK and dark tourism: A fascination with assassination. *International Journal of Heritage Studies*, 2(4), pp. 198-211.

16. Gibson, D., Yai, E. and Pratt, S., 2022. Journeying into the past to discover the potential for WWII dark tourism in the Solomon Islands. *Current Issues in Tourism*, 25(14), pp. 2285-2302.
17. Grinfelde, I. and Veliverronena, L., 2018. The limits of creative approach: conducting an orchestra of emotions in the darkness. *Creativity Studies*, 11(2), pp. 362-376.
18. Hashimoto, A. and Telfer, D.J., 2019, Contested geopolitical messages for tourists at the Okinawa Peace Park and memorials. *Japan Forum*, 31(3), pp. 378-407.
19. Hosany, S., Sthapit, E. and Björk, P., 2022. Memorable tourism experience: A review and research agenda. *Psychology & Marketing*, 39(8), pp. 1467-1486.
20. Hosseini, S., Cortes Macias, R. and Almeida Garcia, F., 2023. Memorable tourism experience research: a systematic review of the literature. *Tourism Recreation Research*, 48(3), pp. 465-479.
21. Hosseini, S., Cortes-Macías, R. and Almeida-García, F., 2024. Extending the memorable tourism experience construct: An investigation of tourists' memorable dark experiences. *Journal of Vacation Marketing*, 30(1), pp. 21-44.
22. Iliev, D., 2021. Consumption, motivation and experience in dark tourism: A conceptual and critical analysis. *Tourism Geographies*, 23(5-6), pp. 963-984.
23. Kim, J.H., 2018. The impact of memorable tourism experiences on loyalty behaviors: The mediating effects of destination image and satisfaction. *Journal of travel research*, 57(7), pp. 856-870.
24. Kim, J.H., Ritchie, J.B. and McCormick, B., 2012. Development of a scale to measure memorable tourism experiences. *Journal of Travel Research*, 51(1), pp. 12-25.
25. Kim, J.H., Ritchie, J.R. and Tung, V.W.S., 2010. The effect of memorable experience on behavioral intentions in tourism: A structural equation modeling approach. *Tourism Analysis*, 15(6), pp. 637-648.
26. Light, D., 2017. Progress in dark tourism and thanatourism research: An uneasy relationship with heritage tourism. *Tourism management*, 61, pp. 275-301.
27. Lundin, E., Soulard, J. and Stewart, W., 2023. A broaden-and-build theoretical perspective on Dark Tourism visitors' transformative emotional journeys. *Leisure Sciences*, pp. 1-25.
28. Magee, R. and Gilmore, A., 2015. Heritage site management: From dark tourism to transformative service experience? *The Service Industries Journal*, 35(15-16), pp. 898-917.
29. Martini, A. and Sharma, N., 2022. Framing the sublime as affect in post-disaster tourism. *Annals of Tourism Research*, 97, p. 103473.
30. Miletic, R., Pantović, D., and Veliverronena, L., 2023. Dark tourism in Serbia: Case study of the Kragujevački oktobar Memorial Park. *Hotel and Tourism Management*, 11(1), pp. 127-144.
31. Nandasena, R., Morrison, A.M. and Coca-Stefaniak, J.A., 2022. Transformational tourism—a systematic literature review and research agenda. *Journal of Tourism Futures*, 8(3), pp. 282-297.
32. Oh, H., Fiore, A.M. and Jeoung, M., 2007. Measuring experience economy concepts: Tourism applications. *Journal of travel research*, 46(2), pp. 119-132.

33. Oren, G. and Shani, A., 2012. *The Yad Vashem Holocaust Museum: Educational dark tourism in a futuristic form*. *Journal of Heritage Tourism*, 7(3), pp. 255-270.
34. Oren, G., Poria, Y. and Reichel, A., 2022. *The positive role of negative emotions in heritage-site visits: the case of Auschwitz Death Camp*. *Journal of Heritage Tourism*, 17(2), pp. 158-173.
35. Seaton, T., 2018. Encountering engineered and orchestrated remembrance: a situational model of dark tourism and its history. *The Palgrave Handbook of Dark Tourism Studies*, pp. 9-31.
36. Semrad, K.J. and Rivera, M., 2018. Advancing the 5E's in festival experience for the Gen Y framework in the context of eWOM. *Journal of destination marketing & management*, 7, pp. 58-67.
37. Seraphin, H., Yallop, A.C., Capatîna, A. and Gowreesunkar, V.G., 2018. Heritage in tourism organisations' branding strategy: The case of a post-colonial, post-conflict and post-disaster destination. *International Journal of Culture, Tourism and Hospitality Research*, 12(1), pp. 89-105.
38. Sharpley, R., 2022. Borders as Dark Tourism Spaces. In *Routledge Handbook of Borders and Tourism* (pp. 205-218). Routledge.
39. Smith, V.L., 1998. War and tourism: An American ethnography. *Annals of tourism research*, 25(1), pp. 202-227.
40. Soulard, J., Stewart, W., Larson, M. and Samson, E., 2023. Dark tourism and social mobilization: transforming travelers after visiting a holocaust museum. *Journal of Travel Research*, 62(4), pp. 820-840.
41. Stojanović, D., 2022. Holocaust and the ethics of tourism: Memorial places in narrations of responsibility. *Filozofija i društvo*, 33(3), pp. 551-566.
42. Stone, P.R., 2006. A dark tourism spectrum: Towards a typology of death and macabre related tourist sites, attractions and exhibitions. *Tourism: An International Interdisciplinary Journal*, 54(2), pp. 145-160.
43. Stone, P.R., 2012. Dark tourism and significant other death: Towards a model of mortality mediation. *Annals of tourism research*, 39(3), pp. 1565-1587.
44. Šuligoj, M., 2017. Warfare tourism: An opportunity for Croatia? *Economic research-Ekonomska istraživanja*, 30(1), pp. 439-452.
45. Šuligoj, M., 2022. *Damnatio memoriae: istarska sjećanja u kontekstu mračnog turizma* (Doctoral dissertation, Catholic University of Croatia).
46. Teoh, M.W., Wang, Y. and Kwek, A., 2021. Conceptualising co-created transformative tourism experiences: A systematic narrative review. *Journal of Hospitality and Tourism Management*, 47, pp. 176-189.
47. Torraco, R.J., 2005. Writing integrative literature reviews: Guidelines and examples. *Human resource development review*, 4(3), pp. 356-367.
48. Torraco, R.J., 2016. Writing integrative literature reviews: Using the past and present to explore the future. *Human resource development review*, 15(4), pp. 404-428.

49. Wang, D., Liu, A.T. and Cheung, C., 2023. Understanding Memorable Tourism Experience: Long-Term Memory System and Revisit Intention. *European Journal of Tourism, Hospitality and Recreation*, 13(2), pp. 125-141.
50. Wyatt, B., Leask, A. and Barron, P., 2024. Re-enactment in lighter dark tourism: An exploration of re-enactor tour guides and their perspectives on creating visitor experiences. *Journal of Travel Research*, 63(2), pp. 496-516.
51. Zhao, Y. and Agyeiwaah, E., 2023. Understanding tourists' transformative experience: A systematic literature review. *Journal of Hospitality and Tourism Management*, 54, pp. 188-199.
52. Zheng, C., Zhang, J., Qiu, M., Guo, Y. and Zhang, H., 2019. From mixed emotional experience to spiritual meaning: Learning in dark tourism places. *Tourism Geographies*, 22(1), pp. 105-126.

EXAMINING STUDENTS' PERSPECTIVES ON SMART TOURISM DEVELOPMENT: THE CASE OF CROATIA

DANIJELA FERJANIĆ HODAK

University of Zagreb

Faculty of Economics and Business

Zagreb, Croatia

dferjanic@efzg.hr

Paper Category: Scientific review

ABSTRACT

Smart tourism has derived from the smart city concept which involves the integration of information and communication technology (ICT) in order to improve living standards and raise the quality of life of local residents. When it comes to the smart tourism destinations concept, usage of ICT represents the core for creating accessible and creative tourism products which will provide seamless and enjoyable experiences for tourists and assure economic, social and environmental sustainability for the destination. Many destinations worldwide strive to become “smart”, aware of the fact that it will take much time and effort of numerous stakeholders in the destination to reach the goal. The main purpose of the paper is to explore the potentials for transformation and smart development of the chosen tourism destinations in Croatia from the students’ perspective. The focus is on examining the attitudes and perceptions of students related to the emerging smart tourism destination concept and the possibilities of the concept implementation in Croatian destinations with respect to the local peculiarities. In this research, both secondary and primary data sources were used. The desk research method was used to analyse relevant literature with the aim of developing a theoretical background and creating variables for the primary research. For the purpose of the primary research a highly structured online questionnaire was created and distributed among students of the Faculty of Economics and Business, University of Zagreb. Adequate descriptive statistic methods were used for the quantitative data analyses. Research findings provide an insight into the attitudes and perceptions of respondents on the key aspects of smart tourism destinations, such as: IoT and Sensor integration, smart transportation, usage of AR and VR, smart accommodation, collaboration and stakeholder engagement, cyber security, social networks, creativity in tourism product development, accessibility, etc.

Keywords: Croatia, smart tourism, smart tourism destinations, technology in tourism

1. INTRODUCTION

The concept of smart tourism goes back to the concept of the smart city, which involves the integration of information and communication technology (ICT) to improve the standard of living and quality of life of residents. According to Gretzel (2021), the concept of smart tourism has only been around for about a decade, while the theory and practice of smart city development has been under development for 30 years. Consequently, smart tourism is less advanced compared to smart city development (Gajdošik, 2022). However, this is not a small market and has a large potential for fast growth. Due to the FMI report (2023), the global smart travel sector market valuation in 2022 was 25,121.3 million US\$, while the estimated Global Market Share in 2023 was 28,763.8 million US\$, which is almost 15% more than in the previous year. The same source forecasted that Global Market Size by 2033 will be 126,889.6 million US\$. North America is anticipated to be one of the most attractive smart tourism markets, aligning with the global trend in developing smart tourist destinations. Looking at the importance of the smart travel sector, many cities in Europe are opting for new technology to attract tourists. The COSME Programme is now funding the EU programme known as the European Capital of Smart Tourism. When it comes to other regions, the smart travel sector is expected to boost in East Asia in the next few years. Aware of the size and the importance of the smart tourism market, many destinations worldwide strive to become "smart", aware of the fact that it will take much time and effort of numerous stakeholders in the destination to reach the goal.

The importance of the paper topic arises from the growing interest of science (increase in the number of scientific papers) and practice (more and more destinations are trying to implement the concept) for the smart tourism concept. Accordingly, this paper can contribute to both theory and practice. The academic contribution arises primarily from the paper's approach to the concept of smart tourism. Most of the existing literature in the field of smart tourism focuses on the technology, whereas this paper treats the other three components of smart tourism equally and considers the technology as supporting their development. Practical implications arise from the fact that more and more destinations are becoming aware of the concept of smart tourism and want to fully understand and implement the concept. The results of this research can help destination stakeholders to decide how to implement certain parts of the concept, such as choosing a certain type of technology or creating an offer, which can ultimately improve the destination's competitiveness and sustainability.

The main purpose of the paper is to explore the potentials for transformation and smart development of the chosen tourism destinations in Croatia from the students' perspective. The main focus is on examining the attitudes and perceptions of students related to the emerging smart tourism destination concept and the possibilities of the concept implementation in Croatian destinations with respect to the local peculiarities. The research findings provide an insight into attitudes and perceptions of respondents on the key aspects of smart tourism destinations such as: IoT and Sensor integration, smart transportation, usage of AR and VR, smart accommodation, collaboration and stakeholder engagement, cyber security, social networks, creativity in tourism product development, accessibility, etc. Principal components responsible for smart tourism development are smart tourism destinations defined by UNWTO as one with a strategy for technology, innovation, sustainability, accessibility and inclusivity along the entire tourism cycle before, during and after the trip. These destinations utilise advanced technology to enhance the efficiency and sustainability of tourism operations, aiming to provide a seamless and enriched experience for visitors. A full use of ICT tools can enable 24/7 access to the tourist products, services, spaces and experiences, thus providing tourists with the opportunity to gather information about a destination, make reservations or engage with it whenever they wish.

2. THEORETICAL FRAMEWORK

Smart tourism makes use of intricate systems, surroundings, connections and ICT foundation to effectively run tourist destinations like smart governments, environments and transport systems. Knowing the travellers' needs before, during and after their trip thus increase the competitiveness of destinations as they connect it with information technologies. Development in technology has changed all tourism resources into smart resources relying on smart communications and data (Sigala 2018). Smart tourism links the digital and physical worlds during and after travel, while e-tourism handles communications before and after travel (Gretzel et al., 2015). It supports predicting user needs, improving traveller experiences with quality information and interactive services, and empowering travellers to share experiences (Gretzel et al., 2015).

For destinations, smart tourism involves process automation, productivity boosts, new product development, demand forecasting, crisis management, and value creation (Xiang and Fesenmaier, 2016). In business, smart tourism enables better management of tourist flows, service

improvements, modern advertising, and new transactions based on cloud services and big data (Gretzel et al., 2016). Establishing a sustainable and smart tourism platform enables destinations to be more competitive by focusing not only on natural resources but also on management efforts and optimal resource allocation (Wang, Li and Li, 2013).

The key to a successful tourism destination is to attract visitors and tourists while maintaining the unique quality of the region (Shafiee et al., 2019). A starting point for analysing the current state and development potential of smart tourism is therefore the tourist-consumer, which is considered in the context of current trends. Tourists are no longer passive consumers, but active participants in shaping their travel experiences. They are looking for unique, customised experiences that cater to their specific interests and preferences. Today's tourist is experienced, well informed and demanding – a globalist who dictates trends in the tourism market. Therefore, in order to meet the expectations of smart tourists, destinations must continue to evolve by involving leveraging technology, adopting sustainable practices to protect the environment, and continuously innovating to offer unique and personalised travel options. By focusing on the tourist-consumer, destinations can ensure sustainable growth and remain competitive in the global market.

2.1. SMART TOURISTS AS DRIVERS OF SMART TOURISM DEVELOPMENT

The tourism industry is being reshaped by the idea of “smart” tourists who are increasingly using and accessing technology (Buhalis, 2022). Among the main causes of this trend, one may consider ubiquitous technology usage by travellers. Access to smartphone, applications and digital platforms, for example, has made it easy for a traveller to plan, navigate and enhance their travel experiences in a seamless manner. This therefore implies that tourists today have become active participants rather than mere consumers of tourism services due to such technological engagements. In other words, they no longer content themselves with just watching; instead, they become part of what is going on around them culturally as well as environmentally, while pretending to be “temporary citizens.” This transition is enabled by diverse digital tools that allow tourists to interact with locals, discover offbeat attractions and tailor their trips as they go along. The engagement in these activities makes travelling richer and strengthens links with the tourist destination.

The modern “smart” tourist, a separate and influential category within the tourism industry, is different from the traditional travellers on several key traits and behaviours. Firstly, smart tourists rely heavily on Information and Communication Technology (ICT) (Ghaderi et al., 2018). They use various digital devices for travel planning, booking, and enhancement. Their travel journey begins with researching destinations using GPS apps as well as comparing prices through ICT. Consequently, their trips are more efficient due to this reliance on technology, thereby meeting their preferences. In addition, smart tourists are informed and demanding due to the availability of ICT infrastructure (Buhalis, 2022). They have access to a wide range of information via the internet and social media, which helps them to make well-informed decisions. They have high expectations of service because they strive for excellence in everything they do; if their expectations are not met, they express this immediately. This intelligent discerning nature forces providers continuously to update their services and ensure quality experiences for customers’ satisfaction. Smart tourists expect personalised offers (Buhalis and Sinarta 2019). Instead of generic travel packages, they want experiences tailored specifically for them individually (Buhalis, 2022). This demand for personalisation has led to the development of bespoke travel services and tailor-made itineraries that offer unique and memorable experiences.

Authenticity is another key characteristic of smart tourists (Buhalis and Sinarta, 2019). They are looking for genuine and unique travel experiences that reflect the true essence of the destinations they visit. Whether it is local cuisine, cultural festivals, or historical sites, they want to immerse themselves in the local culture and avoid tourist traps. Within the authentic experience, smart tourists expect *interaction with the destination* (Femenia-Serra et al., 2019). They seek opportunities to engage with local communities and learn about their way of life. This interaction often includes participating in local activities, learning the language, or even volunteering. Such immersive experiences provide deeper connections and more meaningful travel experiences.

Sustainability is a significant concern for smart tourists (Buhalis et al., 2022). They are interested in the environmental and social impact of their travels and prefer destinations that promote sustainable practices. This includes staying in eco-friendly accommodations, supporting local businesses, and engaging in responsible tourism activities that minimise their carbon footprint. By choosing to spend their money on local businesses, such as family-owned restaurants, local markets, and handmade goods, they

ensure that their spending directly benefits the community. This economic support helps sustain local livelihoods and promotes economic resilience.

Social media activity is a prominent trait of smart tourists. They are very active on platforms like Instagram, Facebook, and Twitter, where they share their travel experiences in real-time. This not only influences their peers but also serves as a form of free advertising for the destinations they visit. Their social media presence can significantly impact the reputation and popularity of a destination. Through their social media posts, reviews, and recommendations, they play a crucial role in shaping the perceptions of potential travellers. In summary, smart tourists are reshaping the tourism industry with their reliance on technology, demand for personalisation, desire for authenticity, concern for sustainability, and active social media presence. Their behaviour and preferences are driving innovation and higher standards within the industry, ensuring that travel experiences are more tailored, meaningful, and responsible.

2.2. KEY COMPONENTS OF SMART TOURISM DESTINATIONS

Given the demand in tourism, the so-called smart destinations are characterised by several specific features, which include the use of technology, sustainability, accessibility and innovative means to enrich the tourist experience. These principles ensure that everyone involved in building the smart destination system, including businesses, tourists and locals, will benefit.

One of the most important components of smart destinations is the use of high *technology* by all stakeholders. Buhalis wrote almost 30 years ago that information technologies (IT) bring a number of new opportunities and challenges to the tourism sector. Organisations and destinations that want to remain competitive will be forced to change in line with technological developments, as the same author still writes today. Today, ICT has an even deeper impact on the travel industry worldwide. Businesses, governments, tourists as well as service providers, are the ones embracing newer forms of technology to improve their services and operations. The most prominent and routinely used technologies in smart destinations are big data, blockchain technology, recognition technology, the Internet of Things, virtual and augmented reality and artificial intelligence, say the most renowned authors worldwide (Boucher, 2017; Buhalis, 2020; Buhalis and Moldavska, 2022; Chaouchi, 2013; Dragović, Stankov and Vasiljević, 2018; Iansiti and Lakhani, 2017; Jung and Dieck, 2017; Pizam et al., 2022; Tussyadiah et al., 2018). Advanced mobile technologies and the Internet of Things are central to big

data. If the most basic element of these technologies is a system-on-chip such as Arduino, the addition of sensors and actuators will transform the systems into a cyber-physical system (CPS) consisting of a combination of hardware and software. With technology developing at such a rapid pace, it is not up to the stakeholders to decide whether they want to use the technology, but only to decide which technology and to what extent it is best suited to their business.

Sustainability is the second component that determines the development of smart destinations. Sustainable tourism development issues are closely linked to competitiveness by promoting innovation in all aspects of business operations (Streimikiene et al., 2021). Sustainable development is essentially based on the protection and enhancement of natural, social and cultural resources. These resources must also be managed in such a way that they meet the needs of future generations. Therefore, sustainable tourism values, beside the preservation of the environment, should take into account cultural integrity, ecological processes, biodiversity and transportation capacity (Sharma, 2019). When it comes to ecological goals, the main aim of sustainable development is to avoid environmentally harmful practises and reduce ecological costs. These programmes use CO₂-reduced transportation, clean waste disposal systems, the protection and management of natural resources and responsible tourist behaviour as methods for greener tourism. The focus should be on tourism development that is not only environmentally friendly but also beneficial for the local community. Within the sociocultural sustainability, smart destinations focus on creating opportunities for meaningful interactions between tourists and the local population. This interaction is facilitated through cultural exchanges, local events, and community-based tourism initiatives. By fostering such connections, tourists gain a deeper understanding of the local culture, and local residents benefit economically and socially from tourism.

The third component of smart destinations thrives on *creativity and innovation*. On the one hand, creative tourism is driven by travellers looking for active and engaging cultural experiences that allow them to use and develop their own creativity. On the other hand, creative tourism offers communities the opportunity to highlight their uniqueness and create new value-added initiatives that benefit local people (Duxbury, 2021). Creative tourism encourages businesses and service providers to develop innovative solutions and creative offerings that differentiate the destination from others. This includes unique attractions, interactive experiences, and cutting-edge technologies that attract tourists and provide memorable

experiences. Innovation is key to staying competitive and meeting the evolving expectations of modern travellers.

The fourth component of smart destinations is *accessibility*. This component should ensure that all services and attractions are accessible to everyone, including people with disabilities, the elderly, and families with young children. This includes providing accessible transportation, accommodations, and attractions that cater to diverse needs, ensuring that everyone can enjoy their visit without barriers.

In summary, smart destinations are characterised by the integration of technology, a commitment to sustainability, fostering interactions between tourists and locals, ensuring accessibility for all, developing a robust digital environment, and promoting creativity and innovation. These characteristics collectively enhance the tourist experience, support sustainable development, and benefit all stakeholders involved.

3. RESEARCH OF STUDENTS' PERSPECTIVES ON SMART TOURISM DEVELOPMENT IN CROATIA

The research sample comprised 3rd, 4th and 5th year students of business economy. The reason for choosing the student population is that their opinion can be analysed from two aspects: as tourists and as potential future experts in tourism. Furthermore, they are a generation that has grown up with technology and destinations need to adapt their offer to the needs of this generation if they want to meet their needs and enable them to function with the technology they are used to.

3.1. RESEARCH METHODOLOGY

In this research, both secondary and primary data sources were used. The desk research method was used to analyse relevant literature with the aim of developing a theoretical background and creating variables for the primary research. Primary quantitative research was conducted in order to explore the students' perspective on potentials for transformation and smart development of the chosen tourism destinations in Croatia. The empirical research was based on a highly structured online questionnaire which was created and distributed among students.

The questionnaire was organised into five sections. The aim of the first section was to analyse the importance of the listed element for the development and operation of smart tourist destinations (each of ten elements belongs to one of smart tourism destination components). The

second section aimed to answer the question which a stakeholder should initiate and manage in smart tourism destination development. The third section was about the importance of different technologies for smart tourism destination development. The fourth section aimed to gain the opinions of the examinees on their travel habits and expectations connected with smart destinations. In the last section, the examinees listed Croatian destinations which could, in their opinion, become smart destinations in the near future. A total of 304 answers were collected.

3.2. RESEARCH RESULTS

Due to the previously described components, the first section aimed to discover the perception of their importance for the development and operation of smart tourism destinations. Each component was described with certain elements and the examinees graded their importance on Likert scale (1 – very unimportant, 5 – very important). The results are shown in Table 1.

Table 1. The importance of key elements for the development and operation of smart tourism destinations

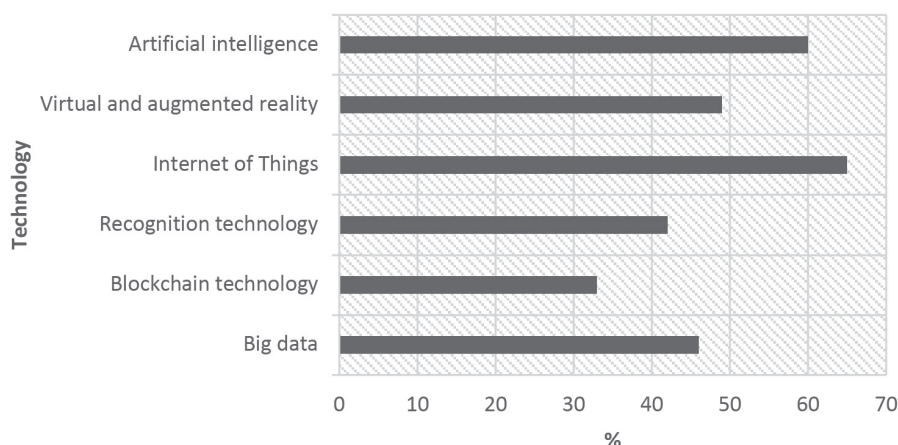
Elements	Average grade
Technology	
Usage of new technologies in traffic	4.21
Usage of new technologies in accommodation facilities	4.21
Usage of new technologies at tourist attractions	4.15
Sustainability	
Ecological sustainability of the tourism destination	4.32
Economic sustainability of the tourism destination	4.38
Socio-cultural sustainability of the tourism destination	4.34
Creativity	
The inclusion of creative industries in the development of the tourism supply	4.07
Active participation of tourists (not just passive observation)	3.86
Accessibility	
Accessibility of the destination to all people (regardless of their limitations)	4.31

Source: Survey data

The component that received the highest average score (4.34) was *sustainability*. Within sustainability, the elements derived from the three main principles of sustainable development were assessed. Respondents consider all three elements equally important and gave the highest score to the economic sustainability of the destination (although the difference in the average score is 0.02). Socio-cultural sustainability came second and environmental sustainability third. *Accessibility* was rated with an average score of 4.31, which shows awareness of the importance of the term "tourism for all". Due to the complexity of this component and possible misunderstandings of its individual elements (appropriate adaptation and universal design), this component was not divided into different elements. Looking at the average score, the third component is *technology* with an average score of 4.19. This component was divided into three elements depending on the services they offer (transportation, accommodation, attractions). Transportation and accommodation were given an average score of 4.21, while the importance of technology in tourist attractions was given an average score of 4.15. The average rating of *creativity* by the respondents was 3.97. Two elements are distinguished here. The element that respondents consider more important is the involvement of the creative industries in the design of the tourism offer (4.07), while the active participation of tourists was rated with an average score of 3.86. The average rating of all elements is 4.21, and the differences between the individual elements and components are minimal, from which it can be concluded that the respondents are aware of the importance of all components for the development of smart destinations.

Due to the fact that technology affects all other components, and that there are many different types of technology that can be used by all stakeholders (including tourists), the aim of the second section was to examine which technology has the largest impact (and the most widespread usage) in smart tourism destination development. The results are shown in Figure 1.

Figure 1. The importance of technology for smart tourism destination development (in %)

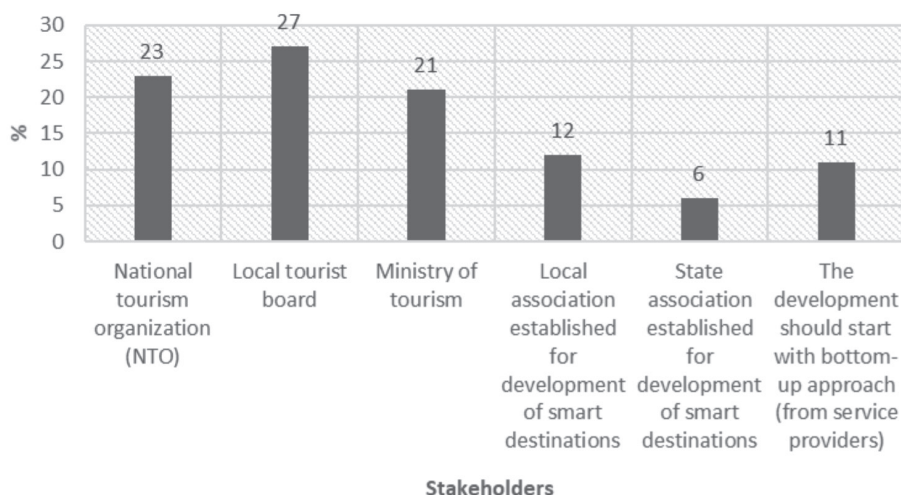


Source: Survey data

In line with expectations, the Internet of Things (64.8%) and artificial intelligence (60.2%) have the largest share, i.e. respondents believe they are the most important for the development of smart destinations. These technologies are followed by virtual and augmented reality (49.3%), big data (46%) and recognition technology (42.4%). Only 32.6% of respondents believe that blockchain technology is important for the development of smart destinations.

Although the development of smart tourism destinations is planned and comprehensive in some destinations, a large number of destinations are undergoing this change spontaneously and most of the time not all stakeholders or all components are involved. Considering that more and more destinations will enter the transformation process, respondents gave their opinion on which entity should lead the development of a smart destination.

Figure 2. Entities in charge of development and management of smart tourism destination (in %)



Source: Survey data

Before analysing the entities that should be responsible for the development and management of smart destinations, it is important to emphasise that two basic approaches are possible. The first approach implies a bottom-up development, i.e. the initiative of the service providers, while the second approach implies a top-down development. No less than 88.8% of respondents believe that a top-down approach is the right approach, while only 11.2% of respondents believe that a bottom-up approach is better for the development of smart destinations. Almost 27% of respondents believe that the local tourist board should be responsible for developing smart destinations, 23% of respondents believe that it should be the NTO, while 21% of respondents believe that the Ministry of Tourism should be responsible for development. A part of the respondents (18%) believe that a special association should be set up to develop smart destinations.

When it comes to the opinion of the examinees on their travel habits and expectations connected with smart destinations, the vast majority of the respondents use technology both in planning the holiday and during their trip. Furthermore, during the trip, they are willing to use technology that they have not had the opportunity to use before, which is not the case with older generations.

One of the research goals was to gain an insight into the respondents' opinions on the status and possibilities of developing smart destinations

in Croatia. Therefore, respondents were asked to rate the statement “Croatia is not lagging behind the competition in the development of smart destinations” from 1 to 5. This statement was given an average score of 2.81, from which it can be concluded that the majority of respondents disagree with the statement. Respondents were also asked to list Croatian destinations which could, in their opinion, become smart destinations in the near future.

Cities that received more than 100 votes are Zagreb (159), Split (131), Dubrovnik (112) and Zadar (104). Other cities on the list of potential smart destinations include: Pula, Osijek, Rijeka, Rovinj, Varaždin, Šibenik, Poreč, Opatija and Hvar. The majority of cities from the list are located on the coast, while only a few are inland. Also, some of the cities have already started the transformation process, although these are mainly individual initiatives funded by projects, which is why the systematic development of all components of smart destinations is unfortunately lacking.

4. DISCUSSION AND CONCLUSION

The research findings show that younger generations consider the development of smart tourism destinations (and each component within that development) to be extremely important. In their opinion, development should be planned and comprehensive and not the result of individual initiatives. Unfortunately, Croatia is lagging behind the competition in the development of smart destinations but, in their opinion, some cities have the potential to become smart destinations. Although this process is neither quick nor easy, it brings numerous benefits to destinations. First of all, it is attractive to be called a smart destination, especially among tourists who are curious about new things. The use of technologies such as AI or VR enables smart destinations to provide intelligent, valuable and immersive insights into the subject matter to stimulate visitors' interest and understanding. Furthermore, with the help of smart technology, these places can also offer specially tailored services and experiences, increasing overall visitor satisfaction. In terms of sustainability, smart destinations can use IoT solutions to monitor the use of resources such as energy, water and waste within the site, helping to preserve the environment. Moreover, a smart destination attracts more tourists and investments as it increases visibility in the global market. So, this reputation shows that this resort is open-minded and creative, which increases its competitiveness with other tourism businesses in the world. In addition, decision-making processes can be improved through real-time data insights from big data analytics or

cloud computing, which supports efficient management practices. However, when developing smart destinations, stakeholders must also consider the challenges that such destinations may face. First, smart solutions may not be suitable in some regions of the world due to infrastructural limitations and/or technological readiness. The second important issue is privacy, as smart technologies are characterised by massive data collection and analytics, some of which come with ethical or legal concerns. Thirdly, the cost of research and development to establish robust system controls is another financial challenge for most destinations. To ensure that the information provided by smart systems is relevant and accurate, close monitoring and continuous and systematic collection of system data is required. In this respect, smart destinations are not feasible for all segments of the population, especially those who do not have or use an IT culture. Smart destinations would thus exclude a market segment that is considered potentially interesting for tourism. Finally, younger generations such as Y and Z increasingly expect all smart solutions to be seamlessly integrated into every inch of the destination's infrastructure and services; this creates huge expectations that can be difficult to meet, as this study confirms. In summary, smart destinations bring many benefits: from enhancing experiences and sustainability, but also many challenges like privacy, cost, technology readiness, data management, integration and meeting increasingly demanding expectations. All of these elements need to be very well planned and organised in destinations to be successful.

The main limitation of the study arises from the fact that it was conducted on a sample of students from one faculty. In addition, some of the students were familiarised with the concept of intelligent goals in class, which partly influenced their perception of the concept. Future research should be conducted on a sample of students from different faculties from different parts of Croatia, which would make the results more objective. It would also be advisable to examine the perspective of other stakeholders in the field of tourism in addition to the students' perspective. In the future, such research should be conducted several years in a row in order to see progress in the understanding and application of the concept.

BIBLIOGRAPHY

1. Boucher, P., 2017. *How blockchain technology could change our lives: In-depth analysis*, European Parliament
2. Buhalis, D. and Moldavska, I., 2022. Voice assistants in hospitality: using artificial intelligence for customer service. *Journal of Hospitality and Tourism Technology*, 13(3), 386-403.
3. Buhalis, D., 2022. *Smart Cities and Tourism: Co-creating experiences, challenges and opportunities*. Goodfellow Publishers.
4. Buhalis, D., 2020. Technology in tourism - from information communication technologies to eTourism and smart tourism towards ambient intelligence tourism: a perspective article. *Tourism Review*, 75(1), 267-272.
5. Buhalis, D. and Sinarta, Y., 2019. Real-time co-creation and nowness service: lessons from tourism and hospitality. *Journal of Travel & Tourism Marketing*. 36(5), pp. 563-582.
6. Chaouchi, H., 2013. *The Internet of Things: Connecting Objects to the Web*, Wiley
7. Dragović, N., Stankov, U. and Vasiljević, Đ., 2018. Contactless technology as a factor of tourism industry development-a review of current practices and future directions. *Economic Themes*, 56(2), 179-202.
8. Duxbury, N, Albino, S. and Pato de Carvalho, C., 2021. *Creative Tourism*. CAB International.
9. Femenia-Serra, F., Neuhofer, B. and Ivars-Baidal, J. A., 2019. Towards a conceptualisation of smart tourists and their role within the smart destination scenario. *The Service Industries Journal*, 39(2), pp. 109-133.
10. FMI, 2023. Smart Travel Sector Market Outlook (2023 to 2033). Available at: <https://www.futuremarketinsights.com/reports/smart-travel-sector-analysis-and-forecast>
11. Gajdošík, T., 2022. *Smart Tourism Destination Governance*. Routledge.
12. Ghaderi, Z., Hatamifar, P. and Henderson, J. C., 2018. Destination selection by smart tourists: the case of Isfahan, Iran. *Asia Pacific Journal of Tourism Research*, 23 (4), pp. 385-394.
13. Gretzel, U., 2021. Smart tourism development. In: Dieke, P., King, B. and Sharpley, R. (eds.). *Tourism in development*. Oxford: CABI, 159-168.
14. Gretzel, U., Sigala, M., Xiang, Z. and Koo, C., 2015. Smart tourism: Foundations and developments. *Electronic Markets*, 25(3), 179-188.
15. Gretzel, U., Zhong, L., Koo, C., Morrison, A. and Morrison, A., 2016. Application of smart
16. Iansiti, M. and Lakhani, K. R., 2017. The truth about blockchain. *Harvard Business Review*, (January-February 2017), 118-127.
17. Jung, T.H. and Dieck, M.C., 2017. Augmented reality, virtual reality and 3D printing for the co-creation of value for the visitor experience at cultural heritage places. *Journal of Place Management and Development*, 10(2), 140-151.
18. Pizam, A., Ozturk, A. B., Balderas-Cejudo, A., Buhalis, D., Fuchs, G., Hara, T., Meira, J., Revillae, M., Sethi, D., Sheng, Y., State, O., Hacikaraa, A. and Chaulagain, S., 2022. Factors

- affecting hotel managers' intentions to adopt robotic technologies: A global study. *International Journal of Hospitality Management*, 102, 103-139.
19. Shafiee, S., Rajabzadeh Ghatari, A., Hasanzadeh, A. and Jahanyan, S., 2019. Developing a model for sustainable smart tourism destinations: A systematic review. *Tourism Management Perspectives*, 31, 287-300.
 20. Sharma, A. (ed.), 2019. *Sustainable Tourism Development*. Apple Academic Press.
 21. Sigala, M., 2018. New technologies in tourism: From multi-disciplinary to anti-disciplinary advances and trajectories. *Tourism Management Perspectives*, 25, 151-155.
 22. Smartphone. *International Journal of Internet, Broadcasting and Communication*, 8(4), 39-47.
 23. Streimikiene D., Svagzdiene B., Jasinskas E. and Simanavicius A., 2021, Sustainable tourism development and competitiveness: The systematic literature review. *Sustainable Development*. 29, 259-271.
 24. Tussyadiah, I. P., Wang, D., Jung, T. H. and Dieck, M. C., 2018. Virtual reality, presence, and attitude change: Empirical evidence from tourism. *Tourism Management*, 66, 140-154.
 25. Wang, D., Li, X. R. and Li, Y., 2013. China's "smart tourism destination" initiative: A taste of the service-dominant logic. *Journal of Destination Marketing & Management*, 2(2), 59-61.
 26. Xiang, Z., & Fesenmaier, D. R. (2016). *Analytics in Smart Tourism Design*. Springer
 27. Xu, F., Nash, N. and Whitmarsh, L., 2020. Big data or small data? A method-logical review of sustainable tourism. *Journal of Sustainable Tourism*, 28(2) 144-163.

A METHODOLOGICAL FRAMEWORK FOR RESEARCHING AND PRESERVING SOUTH AFRICAN CULINARY HERITAGE

HENNIE FISHER

University of Pretoria
Faculty of Natural and Agricultural Science
Department of Consumer Science
Pretoria, South Africa
hennie.fisher@up.ac.za

GERRIE DU RAND

University of Pretoria
Faculty of Natural and Agricultural Science
Department of Consumer Science
Pretoria, South Africa
Gerrie.DuRand@up.ac.za

Paper Category: Scientific review

ABSTRACT

South Africa (SA) consists of a melting pot of cultures, including cultures from other African countries, and cultures that have been around for the past few hundred years. It is a complex society of many ethnic races who converse in 12 official languages (including sign language), along with demographic differences such as religion, politics, and other cultural diversities. These diverse cultures, with their unique food traditions, have contributed to what is understood to be the everyday food culture of South Africans, the Rainbow Cuisine. Although this inclusive term is used informally to describe the country's cuisine, no formal National Culinary Identity has been developed. Therefore, the purpose of this research was to present the methodological elimination steps to find a suitable framework that could be applied in future research for the compilation and formulation of a Culinary Identity. The six-framework development and refinement steps, developed by Ritchie and Spencer in 1994, were used to identify one framework from 27 eliminated unsuitable frameworks. The Sackett and Haynes Food Culture and Cuisine Model, used in their book *American Regional Cuisines: Food Culture and Cooking*, to determine the regional cuisines of North America, was deemed appropriate in a South African context. The suitability of the Sackett and Haynes model, applying the element of Foundation Foods, namely Starch, Protein and Principal Produce items, is discussed. Apart from advantages such as education, national pride, and economic applications (e.g., product development and the protection of indigenous practices and heritage), National Culinary Identity could be used to promote and market the country as a unique and sustainable gastronomic travel destination, particularly to increase heritage tourism. Other uses are application in agricultural activity, branding identity and empowerment. Applying this model will also have a theoretical contribution in identifying other national cuisine identities that still have to be developed.

Keywords: Cuisine; Culinary Identity; Framework Development; Food Heritage; Indigenous Foods; South Africa.

1. INTRODUCTION

A Culinary Identity reflects the shared food habits of people in a specific region (Moreno and Malone, 2021, Murcott, Belasco and Jackson, 2013). Cuisines begin regionally, highlighting the common ingredients and tastes of local groups (Sackett and Haynes, 2012). Over time, these regional cuisines help shape national identities, showcasing a nation's culture through its food. UNESCO's intangible cultural heritage list recognises the importance of preserving culinary traditions, as this knowledge is vital to a nation's heritage (Santucci Oliveira, Torres Tricárico, Lisboa Sohn and Pontes, 2020).

South Africa lacks a formal National Culinary Identity, making it essential to develop a framework to capture and safeguard its diverse food heritage. This framework can boost gastronomic tourism, protect specialty foods, promote internal education, and generate national pride (Du Rand, 2007). It will also help preserve indigenous knowledge and cultural heritage, by indirectly contributing to strengthening heritage tourism. Heritage tourism describes the process whereby visitors want to learn something new or enhance their lives in some way, such as through experiencing national foods (Timothy, 2011). In the developing world, such as South Africa, the indications are that heritage tourism is growing much faster than any other type of tourism (Timothy and Nyaupane, 2009).

In 2023, 8.48 million tourists visited South Africa, significantly impacting employment and sustainability. The country's "Rainbow Cuisine" reflects its diverse population, blending flavours and cooking methods from various cultures (Snyman and Sawa, 2001). The Rainbow Cuisine of South Africa is a colloquial word for an amalgamation of cuisines, "not only from all the nationalities that make up our rainbow nation, but from many other nations as well" (Snyman, 2004:93). Preserving this culinary heritage is crucial to maintaining South Africa's cultural identity amid changing food practices (Fernandes and Richards, 2023).

This research aims to create a framework to document and map South Africa's Culinary Identity by examining cultural, racial, and linguistic groups, and analysing regional differences. This will help ensure the conservation and innovation of South African cuisine for future generations. A National Culinary Identity will contribute to cementing cultural heritage and tourism potential, which will, of course, strengthen economic potential. Furthermore, role-players in a country such as South Africa, with a large culturally diverse population, could find popularity in a National Culinary Identity through differentiation from other African Cuisines, benefitting through tourism, cultural heritage and national identity advantages.

2. LITERATURE REVIEW

This paper presents the methodological research and justification for the identification and selection (or development) of either 1) a new framework, or 2) an amendment of an existing framework, or 3) the application of a previously validated framework that would be suitable in future research to conceptualise a Culinary Identity for South Africa. Methodological research indicates that theoretical models or frameworks provide structure to the research process in the form of a plan for the approach and conduct of a specific enquiry. The literature review therefore presents the identification/selection (or development) and suitable justification of an appropriate integrative theoretical framework that may be applied to determine a South African Culinary Identity. However, a nation's Culinary Identity cannot be determined without consideration of the national cuisine, which follows the section on frameworks.

2.1. THEORIES, MODELS, THEORETICAL FRAMEWORKS, AND CONCEPTUAL FRAMEWORKS

2.1.1. INTERCHANGED TERMS – SUBTLE DIFFERENCES

A theory in literature is a set of “analytical principles or statements designed to structure our observation, understanding, and explanation of the world” (Nilsen, 2020). It predicts and explains relationships that influence outcomes, providing a “clear explanation of how and why specific relationships lead to specific events” (Nilsen, 2020). The distinction between a theory and a model is often blurred. Theories are both descriptive and explanatory, while models are primarily descriptive and have a narrower scope. Models describe, but do not explain, the translation of research into practice. Frameworks and models are sometimes used interchangeably but differ, in that frameworks offer a “big picture” view, outlining various descriptive categories and their relationships without providing explanations. Frameworks consist of concepts, constructs, or variables and the relationships that account for a phenomenon. They are used in research to explore choices and decisions, relating concepts to variables that influence behaviour. Theoretical frameworks, based on specific theories' predictions, guide the research structure and lead to conceptual frameworks. These frameworks provide ways to think about problems and illustrate expected relationships between variables to draw coherent conclusions (Crockett,

2017, Luft, Jeong, Idsardi and Gardner, 2022, Nilsen, 2020, Van der Waladt, 2024, Weible and Sabatier, 2018).

2.1.2. APPLYING FRAMEWORKS

Even though terms for theories, frameworks and models are sometimes mistakenly used interchangeably because specific definitions are often loose, inconsistent and contradictory (Ngulube, 2018), theoretically sound research can inform appropriate practical application through sound practice guidelines. Frameworks in food-related research cover a range of aspects including food systems (Zou, Dawodu, Mangi and Cheshmehzangi, 2022), organic food (Wang, Feng, Lian, Sun, Wang and Sun, 2023), supply chains (Vu, Ghadge and Bourlakis, 2023) and many more. However, frameworks specifically developed in the context of cultural or national cuisines seem scant. Examples of such frameworks were used to identify Setswana cuisine in Botswana (Chatibura, 2015), how migration forms relationships between food cultural practices and sustainability (Terry, 2020), and how the relationship between culture and teaching food as culture may assist in building cultural awareness and intelligence (Asif, M'Begniga, Ali and Usman, 2022). In a local South African context, a Theoretical Framework was developed by Coughlan and Hattingh (2020) to determine the authentic local food identity of specifically Basotho and Afrikaner families in the Free State Province.

2.2. CULINARY IDENTITY

Social identities like culture, race, and ethnicity are closely connected through food practices, especially in multicultural societies such as South Africa, where food helps preserve ethnic identities. Developing a National Culinary Identity requires recognising and studying the diverse regional cuisines within a country, as this knowledge is crucial for understanding national cuisine and modern culinary practices (Reddy and van Dam, 2020, Rodyna, 2023).

Heritage, which includes tangible objects and intangible aspects like oral traditions and culinary practices, is what is inherited from the past and deemed worth preserving. UNESCO defines intangible cultural heritage as practices, representations, expressions, knowledge, and skills recognised as part of cultural heritage by communities. Cultural heritage includes what is considered heritage, who manages it, and the values defining it (Harrison, 2010, Konsa, 2013, UNESCO, 2003).

Gastronomic identity is influenced by environmental conditions, culture, history, ethnic influences, and economic prosperity. Factors such as geography, climate, religion, traditions, and innovations also play roles. Culture encompasses a group's beliefs and habits, including language, art, and traditions, manifesting the inherited past in the present (Harrington, 2005, Ondieki, Kotut, Gatobu and Wambari, 2017). Cuisine is defined as specific cooking practices and traditions connected to a culture or historical period. National cuisine involves meals and their characteristics, symbolising social identity through home practices, recipes, and communal eating. Ethnic food, though ambiguous, originates from the heritage of an ethnic group and is culturally and socially accepted by others (Hastorf, 2017, Kocevski and Risteski, 2020, Kwon, 2015). National cuisines can be identified by specific flavours achieved through ingredient combinations and cooking methods, including spice use. Traditional cuisine refers to inherited food practices, while national cuisine includes current and newly accepted foodways. Some argue that the concept of a national cuisine is contradictory and that only regional cuisines exist (Buccini, 2015, Mintz, 1996, Rozin, 1992).

Culinary Identity reflects the unique characteristics of a community's food practices, cultural, social, and historical aspects, and is shaped by local traditions and global influences (Becuț and Puerto, 2017). It is part of cultural heritage, encapsulating a community's history, traditions, and social values, influenced by historical events, cultural exchange, and regional diversity. In a South African context, the authors of this research utilised components of a National Cuisine in research pertaining to indigenous ingredients used in eateries, as well as the role of cuisine in practice and research (Fisher and du Rand, 2023, Fisher and Du Rand, 2024).

2.3. FACTORS CREATING FOOD CULTURE AND CUISINE, INCLUDING GEOGRAPHY, HISTORY, AND CULTURE

A food culture develops based on where people originate from, whether they still live there or not, and is most influenced by its place of origin. It is shaped by various factors: the climate and land (including soil and water), and the community's beliefs (such as religion, education, literacy, and communication abilities). Ethnicity, whether indigenous or immigrant, and historical aspects like colonisation and globalisation also play roles. Additionally, technological abilities, such as hunting, fishing, gathering practices, agriculture, horticulture, food transportation, storage, processing, and cooking methods, contribute to forming a food culture (Wahlqvist, 2007).

3. METHODOLOGY

This methodological study followed a mixed-method approach. Although part of a larger research project, this part of the work aims to identify, select, develop and/or amend an existing Culinary Identity Framework for the South African Rainbow Cuisine. This paper reports on the initial phase, where different frameworks in culinary studies were compared, investigated, and analysed to conceptualise a suitable framework to develop a Culinary Identity for South Africa, to be applied in future phases of the research project (Mbuagbaw, Lawson, Puljak, Allison and Thabane, 2020).

To identify or develop a Culinary Identity Framework, a selection of frameworks in culinary studies was analysed. This was necessary to identify the main elements of a Culinary Identity that could be applied to a country as demographically varied as South Africa. It was imperative to represent the body of knowledge encapsulating the various dimensions of a Culinary Identity and Heritage Framework. A multifaceted approach of framework analysis integrating various steps as identified in studies by de Camargo, Botelho, Dean and Fiates (2022), and Srivastava and Thomson (2021), was followed. Framework analysis, a qualitative method widely used in other disciplines, has been applied to culinary research (de Camargo *et al.*, 2022). It was developed by Ritchie and Spencer (2002) to describe and interpret what is happening in a specific setting. It provides a step-by-step approach and is primarily used for applied research. This technique is suitable for this study as it creates a matrix that enables the researchers to analyse data according to themes and key constructs. This allowed the researchers to label, classify and organise data contextually and compare and contrast data across the various themes (Delve, Not dated, Ritchie, Spencer and O'Connor, 2003).

3.1. DEVELOPING A METHODOLOGICAL APPROACH

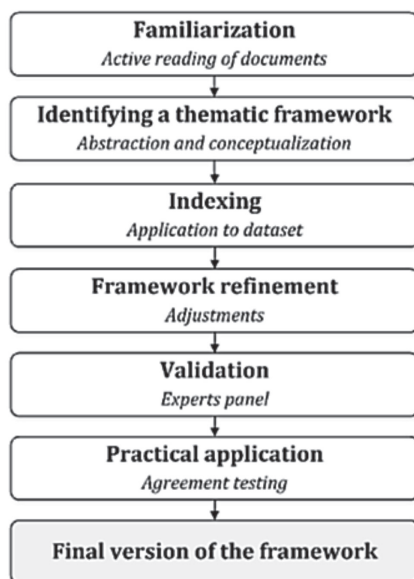
To meet the aim of the study it was necessary to conceptualise and develop an appropriate framework based on fundamental food study concepts (such as culinary heritage) to document the analysis of the cuisines of the specific human groups according to cultural, race, or language groups. Thereafter, geographical and regional cuisine maps noting similarities and differences, determined by the environment (land/region), the people (heritage, culture, race, or language) and their cuisine (ingredients, preparation methods, and flavouring), were developed. Finally, these maps depicting the human and physical cuisine groups were overlaid to determine final groupings within the larger South African Culinary Identity. This will facilitate the Culinary

Identity development of the country and explicitly identify the regional differences and similarities, a requirement of a National Culinary Identity as indicated by Sackett and Haynes (2012). The framework will be applied as an evaluation device based on the factors contributing to the development of a cuisine. This will provide a tool to understand and evaluate the development of a regional cuisine based on the land and its products, its past and present inhabitants, and economic viability. These factors are the key requirements necessary to provide a framework that can compare one region with another and contribute to the development of a Culinary Identity for the country.

3.2. FRAMEWORK DEVELOPMENT STEPS

Figure 1 provides a flowchart of the steps that were followed in the development and refinement of a framework as suggested by Ritchie and Spencer (2002) and as applied in a culinary study by de Camargo *et al.* (2022). Only the first four steps of the framework development are reported in this paper. The proposed framework that is presented is only a tentative framework and will be assessed for validation and agreement testing in future phases of the larger research study. The mapping, interpretation and final version of the framework will not be reported in this paper and are part of the future phases of the study.

Figure 1. Framework development steps overview (Ritchie and Spencer, 2002)



Familiarisation – active reading of documents refers to the process where the researchers familiarised themselves with the range and diversity of the body of knowledge in culinary studies reporting and discussing framework development or application. The traditional keyword search method was applied to identify and select papers that referred to framework development or application. Google Scholar and academic networking platforms ResearchGate, Academia.edu and SCISPACE were used to search for papers that reported on frameworks in culinary studies. These search engines and platforms were selected as they provided a wide range of scholarly literature across various disciplines. Selected papers had to:

- report on the development or application of a framework (the keyword ‘framework’ had to appear in the abstract or the title of the paper),
- refer to additional keywords relating to culinary studies – culinary identity; culinary heritage; national /regional cuisine,
- be published in academic peer-reviewed journals,
- be available to read the full text (the full article was essential to enable the analysis of the framework, and the methodology used),
- be written in English,
- include framework development and/or analysis focused on Culinary Identity development.

The framework elimination table, Table 1, contained information regarding the various models, field of application, why they were unsuitable for Culinary Identity development, and the reference. The forming of the table is based on the interpretation the authors made when following the steps required of identifying thematic frameworks as outlined in the steps for framework development below. The categories included in the table provided the essential information necessary for abstraction and conceptualisation, thus providing essential details that focused on forming a clear and structured concept of culinary identity to be understood and communicated effectively. The reasons for unsuitability were based on the reviewed frameworks’ main focus not being on culinary identity dimensions, but rather on related issues that could possibly impact a region’s culinary identity such as politics, logistics, health and tourism. This step allowed the researchers to gain an overview of collected secondary data, both present and past.

Identifying a thematic framework – abstraction and conceptualisation, the second step is a continuation of the familiarisation process. During this step, the researchers returned to the selected, tabulated

documents, and identified key issues and themes that could be used to assess the data set. These key issues, concepts and dimensions of Culinary Identity now form the basis of a draft thematic framework to filter and classify the data (Ritchie and Spencer, 2002). The development and refinement of the thematic framework required making judgements regarding the meaning, relevance and importance of various Culinary Identity dimensions, and the integration of factors that capture the essence of a region's cuisine, such as geography, agricultural products, culinary heritage, and language and cultural groups.

Indexing – application to the dataset, the next step requires the initial draft structure to be indexed to data using a systematic process (Ritchie and Spencer, 2002). The researchers applied the framework categories and descriptions to preliminary Culinary Identity data, an iterative process of comparing data to the framework and vice versa, using the framework as a tool. Data was organised in a spreadsheet with the Culinary Identity factors of each region's cuisine, corresponding to the identified factors such as geography, agricultural products, culinary heritage, cultural heritage, language, and cultural groups. This process was applied to all the textual data gathered and referenced. During this stage, improvements required in the description of the categories were noted and gaps in the data were identified.

Framework refinement – adjustments, is the fourth stage where the framework is refined by double checking all categories and arranging the specific data that has been indexed in the previous stage into charts according to the factors identified. This process moves the data from its textual context into charts with headings and subheadings created during the development of the thematic framework.

These steps provided a tentative framework that can be applied in the determination of a Culinary Identity for South Africa. Further steps of validation and application, not reported in this paper, will contribute to the final version of the Culinary Identity Framework as a tool to capture the culinary dimensions of the South African Rainbow Cuisine. The process of validation and application will require a range of data collection techniques, both qualitative and quantitative, and will include physical evidence, focus group discussions, in-depth interviews, and archival research to understand all the dimensions and interconnections of a Culinary Identity and measure the validity and applicability of the final framework's categories.

4. RESULTS AND DISCUSSIONS

The data obtained for the in-depth identification of potential frameworks is sorted in Table 1. Twenty-eight papers that complied with the criteria mentioned in the methodology section were selected and tabulated according to their application field.

4.1. FRAMEWORK SELECTION AND JUSTIFICATION FOR THE SELECTION OF THE SACKETT AND HAYNES MODEL

Table 1. Framework elimination – finding the right framework for Culinary Identity development (source: author’s own)

	Model name	Application field	Reason for unsuitability for Culinary Identity development	Reference
1	Culinary heritage on regional levels	Food heritage	Analysis of food as a tool for understanding politics and international relations	Assmann (2024)
2	Cultural preservation: ensuring our legacy endures	Cultural heritage	Cultural heritage and the influence of urbanisation and globalisation	Insights (2024)
3	Gastro-identity scale	Food tourism	Tourism development application	Kalenjuk Pivarski, Paunić, Šarenac, Šmugović, Mlinarević, Ivanović, Marjanović, Pavlović, Tekić and Đerčan (2024)
4	Combination of Food and Culture Theory, Cultural Intelligence (CQ) Theory and Active and Experiential Learning Theory	Food heritage	Understanding Chinese Food Culture in Pakistan - a framework about teaching food as culture to build cultural awareness and intelligence	Asif, M’Begniga, Hashim and Ali (2023)
5	Ethno-gastronomy to retaining culinary tradition	Food heritage	How to conserve intangible gastronomic heritage, including food cultures, customs, recipes, and preparation techniques	Fernandes and Richards (2023)

6	High, mid, and low-level frameworks	Food communication	Exploring the logic behind the creation and deconstructing practices of sharing Chinese food overseas	Zhang (2023)
7	Framework to assess culinary recipes' healthiness	Culinary recipes' healthiness	Health promotion framework	de Camargo <i>et al.</i> (2022)
8	A conceptual framework of online food delivery	Food practices	Framework development of food delivery	Shankar, Jebarajakirthy, Nayal, Maseeh, Kumar and Sivapalan (2022)
9	Framework of heritage food and related risk factors of authenticity and safety	Food heritage	Safety risk factors in heritage food production	Almansouri, Verkerk, Fogliano and Luning (2021)
10	A repertory grid and thematic network analysis of culinary heritage and traditions	Food heritage	Methods focus on ingredients, preparation methods, and culinary tradition but not on the other variables that can determine the Culinary Identity	Cadiogan, Dy, Opaco, Rodriguez, Tan, Villanueva and Mercado (2021)
11	A knowledge representation framework representation and presentation of the tangible and intangible dimensions of culinary tradition as cultural heritage	Cultural heritage	Focus is on cultural heritage and the links to culinary tradition	Partarakis, Kaplanidi, Doulgeraki, Karuzaki, Petraki, Metilli, Bartalesi, Adami, Meghini and Zabulis (2021)
12	Heritagisation of food	Food heritage	Food heritagisation and how to improve the socio-cultural sustainability of the food system	Zocchi, Fontefrancesco, Corvo and Pieroni (2021)
13	Typology of cuisines	Culinary systems	The loss of specific foods and foodways, and the consequent wholesale demise of traditional culinary systems	Buccini and Dahlstrom (2020)
14	Tapestries of Practice	Food practices	Migration to trace relationships between food cultural practices and sustainability investigated	Terry (2020)

15	Model for the identification and documentation of gastronomic cultural resources	Gastronomic cultural resources	Foundations of awareness and knowledge that can be used to construct a promotion project able to give food its true value.	Porporato, Grimaldi and Fassino (2019)
16	Understanding traditional and modern eating: the TEP10 Framework	Food practices	A framework for traditional and modern food consumption	Sproesser, Ruby, Arbit, Akotia, Alvarenga, Bhangaokar, Furumitsu, Hu, Imada and Kaptan (2019)
17	Attribute-based Framework of Projected and Perceived Destination Food Image	Food tourism	Model integrates food image and food neophobia theories	Lai (2018)
18	Cuisine image attributes	Food tourism	Food image and tourism focus	Lai, Khoo-Lattimore and Wang (2018)
19	Food as intangible cultural heritage (ICH)	Cultural heritage	Can food regulation help safeguard Intangible Cultural Heritage in international law?	Lixinski (2018)
20	Conservation frameworks of UNESCO, ICOMOS and GCI heritage charters and conventions	Food heritage	Proposed culinary safeguarding plan	Mercado and Zerrudo (2018)
21	Framework of "gastronomic systems research" (GSR) to understand culture-specific consumer food choice	Food practices	Determining consumption patterns, their drivers, and possible areas for interventions	Cuevas, de Guia and Demont (2017)
22	Modified version of the Theory of Interpersonal Behaviour	Food heritage	Identification of Setswana cuisine in Botswana – however, no new framework was developed	Chatibura (2015)
23	Strategic framework for the promotion of local cuisine in Botswana	Food tourism	Tourism focus and understanding of tourists' experiences and consumption behaviour of local cuisine	Chatibura (2015)

24	Travelling Cuisines: Toward a Framework for Studying Culinary Globalisation	Culinary globalisation	Globalisation of food relevant, but the framework not about a national food identity	Farrer (2015)
25	Theoretical framework for the development of sustainable culinary places	Food practices	Theoretical framework to explain the development of sustainable culinary places and restaurant clusters	Omholt (2015)
26*	Model of American regional cuisines	Regional cuisines, Food Culture, and cuisine	Book contains a built-in set of tools that consists of the basic five factors that apply to analyse regional cuisines	Sackett and Haynes (2012)
27	Traditional foods: a science and society perspective	Food heritage	Traditional food and composition and population dietary intake	Trichopoulou, Soukara and Vasilopoulou (2007)
28	Gastronomic identity	Food tourism	A framework as a tool for defining a region's gastronomic identity, but focuses on food and wine tourism	Harrington (2005)

* Elements of Food Culture and Cuisine Model identified in this research (Sackett and Haynes, 2012)

Firstly the 28 models or frameworks presented in Table 1 were read – **Familiarisation**. This step allowed the researchers to become familiar with the body of knowledge and enabled them to categorise and tabulate the 28 selected papers according to the application field. The fields of application included: culinary globalisation, food security, food practices, food heritage, food tourism, food communication, gastronomic cultural resources, cultural heritage, culinary recipes, healthiness, and culinary systems.

Identification of a thematic framework comprised subjecting the selected papers to abstraction and conceptualisation. The selected papers were scrutinised for framework development and/or analysis and had to present constructs and abstractions of concepts required for Culinary Identity such as cuisine, culinary heritage, cultural heritage, Culinary Identity, and indigenous foods. Of the 28 papers included in Table 1, all identified a thematic framework, but not all were suitable for the Culinary Identity Framework development. Only three suitable frameworks (Fernandes and Richards, 2023, Harrington, 2005, Sackett and Haynes, 2012) met the criteria and referred to the relevant key concepts required for developing a Culinary Identity Framework.

The third step of **Indexing**, where the data was applied to the dataset reflecting the concepts and dimensions of a Culinary Identity, eliminated two of the three frameworks that did not meet the conceptual requirements of a national cuisine in terms of food culture, geography, and culinary products and dishes from regional areas. Their application field deviated from the required Culinary Identity focus requirement.

Insights from the documents captured in **Table 1: Framework elimination – finding the right framework for Culinary Identity development** informed the selection and development of the framework's first draft, which captured the main themes and key constructs that could be applied to Culinary Identity. Only one framework complied to all these requirements after being subjected to the first four steps of the framework development process.

4.2. THE SACKETT AND HAYNES ELEMENTS OF FOOD CULTURE AND CUISINE MODEL

The Sackett and Haynes (2012) Food Culture and Cuisine model met the requirements and criteria of a Culinary Identity Framework that outlines the key components of regional cuisines contributing to the Culinary Identity of a country. The Sackett and Haynes (2012) model is relevant as it contains the concepts relevant to research in food studies; it is clear and concise and includes the themes and key concepts required to develop a Culinary Identity Framework for South Africa. Regional differences and similarities, a requirement of a National Culinary Identity, could be identified. It allowed the generation of geographical and regional cuisine maps that could capture data regarding the environment (land/region), the people (heritage, culture, race, or language) and their cuisine (ingredients, preparation methods, and flavouring). Using specific markers such as trade and tourism, it finally establishes the economic viability of a country's culinary heritage and food tourism potential. This is achieved by combining the various key components contributing to culinary identity of a country into a unified, distinctive and recognised cuisine.

The frameworks used in the other culinary studies did not meet all these specific requirements. Table 1 reflects the reasons why these frameworks were not suitable and therefore not considered. The Sackett and Haynes (2012) framework could be applied with minimal amendments and was selected as the initial methodological choice for the development of a Culinary Identity Framework for South Africa.

4.3. CONSTRUCTION AND DEVELOPMENT OF THE PROPOSED CULINARY IDENTITY FRAMEWORK

The proposed Culinary Identity Framework for South Africa will be informed by an amended version of the Sackett and Haynes (2012) Elements of Food Culture and Cuisine Model. This paper outlines the key components of the Culinary Identity Framework, based on the Sackett and Haynes (2012) Food Culture and Cuisine Model. This model was chosen for its suitability in meeting the requirements of a national cuisine, showcasing the nation's food culture and culinary products, portraying cultural and culinary standards, and defining regions with shared foods and culinary ideas. A regional cuisine needs to meet three essential criteria according to Sackett and Haynes (2012), namely, geography, food culture, and defining dishes.

The land, the people and their cooking are the elements used to identify the cuisines of the various regions within South Africa. This information will be used to map the Culinary Identity of South Africa and contribute to the Culinary Identity Framework. Apart from identifying various regional cuisines, information should highlight areas where ingredients and cooking methods are shared whilst having different climates and topographies. Each region has a culturally distinct population with its own unique history and foodways, resulting in different dishes. Capturing the Culinary Identity of South Africa is imperative to recognise each region independently. Therefore, the framework must be used as a tool to capture each region's Culinary Identity, and should allow overlaps between the regions, where people have integrated various ingredients into their cultural identity, to be identified. The economic viability of a region is finally determined by the combination of its various culinary elements and portrayed as a characteristic, recognised and unified regional cuisine.

4.3.1. IDENTIFICATION OF THE FACTORS

Elements of a Regional Cuisine

The food

The Sackett and Haynes (2012) Elements of Food Culture and Cuisine Model proposes three main elements, namely ingredients, cooking methods and attitudes about food and eating. Further lower-order divisions detail aspects such as “Ingredients” into Foundation Foods, Seasonings and Cooking Media (also called Flavour). To understand any cuisine the ingredients and

background information, such as preparation methods, storage, and seasonal availability, need to be known.

- Foundation Foods
 - Principal Starches
 - Principal Proteins
 - Principal Produce
- Favoured Seasonings
- Principal Cooking Media
- Primary Cooking Methods

The Land

Mapping regional cuisine - to understand the cuisine of a specific region it is necessary to be acquainted with the geography of the region. Geographical and regional maps will be generated to illustrate topographical features, climatic conditions, settlement patterns, agricultural usage, and other key concepts. The maps will depict the human and physical cuisine groups and eventually determine the final groupings within the larger South African Culinary Identity Framework.

The People

A region's history determines its cuisine because of the historical events and diverse groups of people living in an area. Knowing the history of a region facilitates an understanding of the people and their food culture. Food culture includes various elements such as taste preferences, cooking technology, and beliefs and attitudes about food, aspects facilitating an understanding of the food culture of a group of people in a region or country (Sackett and Haynes, 2012).

Regional cuisines usually have a culinary history and a collection of traditional dishes as well as newly chef-invented dishes that represent specific ingredients or have particular flavour profiles of the region and its people's cuisine. Sackett and Haynes (2012) refer to these as 'defining dishes', representing prepared foods of a particular cuisine in a specific region or country. The development of this regional cuisine based on its culinary history determines the economic viability of the culinary identity. Markers of a culinary identity's economic viability include the development of successful trade and tourism products such as food and tourist experiences.

4.4. APPLYING THE SACKETT AND HAYNES FOOD CULTURE AND CUISINE MODEL

Finally, a discussion of the Sackett and Haynes (2012) Food Culture and Cuisine Model in the context of South African cuisine examples, follows. For example, Foundation Foods under the Ingredients element is divided into Starch, Protein and Principal Produce items, which are the vegetables and fruits of that cuisine. In the South African context, the Principal Starches include maize, sorghum and millets (pearl and finger) (AgriSETA, 2019). South Africans older than 15 eat well below the recommended 400 g of vegetables and fruit per day (226 g per day for females and 235 g per day for males). Fruits considered part of the South African cuisine include oranges, mangoes, and avocados, while low-income urban households regularly purchase bananas, apples, grapes, peaches, and pears. Vegetables most often purchased by South African families include sweet potato, spinach, green mealies, cabbage, green beans, tomatoes, onions, potatoes, pumpkin, carrots, and others.

The remaining parts of the Food Culture and Cuisine Framework as applied to South African cuisine will not be discussed here. Discussion of all the elements of the Food Culture and Cuisine Model can only occur once the framework is applied in the development of a South African Culinary Identity and will take place in further independent research as previously mentioned.

5. CONCLUSIONS

In this work, the researchers present only the first part of various future research projects, namely the determination of the South African Culinary Identity. However, to conceptualise a Culinary Identity, the researchers had to first identify or develop a new Culinary Identity Framework, which may be applied in future research to formalise the South African Culinary Identity. Meta-study research by Loulanski and Loulanski (2011) has shown that if the economic value of heritage can be raised through tourism, the cultural value is also increased. Furthermore, these authors suggest that heritage should be re-established in order to fully recognise its capacity. This may not only be valuable as a tourism resource, but as “an important and largely irreplaceable complex form of capital (cultural, social, environmental and economic).”

5.1. RECOMMENDATIONS FOR FUTURE RESEARCH

To safeguard the South African culinary heritage as defined by UNESCO, the following three steps should be followed in constructing a food heritage: a) describing gastronomic heritage, b) challenging the feasibility of heritagisation of gastronomy and associated social practices, and c), reflecting on the importance of interest in food heritage (Romagnoli, 2019). The Culinary Identity Framework of Sackett and Haynes (2012), identified as most suitable for this study, will be applied in future research as follows:

- to identify cuisine examples for each of the previously determined cultural/regional groups, as possible case studies, through an extensive literature search online and in printed texts such as cookbooks, recipe books, food and tourism blogs, food websites and promotional material,
- to conduct a three-step RMA (rapid market assessment), consisting of product, recipe and food dishes counts and dot surveys in food and retail establishments, followed by Constructive Comments and Observations (CCO) obtained from restaurateurs, retailers, and other relevant food experts.
- to conduct qualitative interviews with selected cultural food role-players for triangulation.
- to finally determine the achievement of economic viability of the South African culinary identity by reviewing economic markers that establish the development of a characteristic, unified cuisine that contributes cultural heritage and tourism

Future research on this topic would contribute to the body of academic knowledge, justifying the importance of future work regarding the development of a Culinary Identity for South Africa. This paper, therefore, presents the methodological steps in the elimination selection process to identify the existence and appropriateness of a suitable framework to determine the South African Culinary Identity. Ritchie and Spencer's (2002) six framework development and refinement steps were applied to determine the existence of a suitable framework and how it could be applied in the South African context. The Food Culture and Cuisine Model of Sackett and Haynes (2012) developed for their work on American Regional Cuisines: Food Culture and Cooking, was identified as most suitable for application in a South African context. It is recommended that the model is trialled in a

South African context, and then applied over different geographical regions, overlaid by the country's various cultural groups to determine the collective South African Culinary Identity. The framework development contributes theoretically in the sense that it would not only be used in a South African context, but globally to develop other national cuisines.

BIBLIOGRAPHY

1. AgriSETA. 2019. *GRAINS AND CEREALS*. [Online] Available from.
2. Almansouri, M., Verkerk, R., Fogliano, V. and Luning, P.A. 2021. Exploration of heritage food concept. *Trends in Food Science and Technology*, 111:790-797.
3. Asif, M., M'Begniga, A., Ali, M. and Usman, M. 2022. Chinese Food Culture in Pakistan: Analysis of Chinese Food Culture within the Framework of the CPEC Project. *East Asian Journal of Multidisciplinary Research*, 1(2):97-128.
4. Asif, M., M'Begniga, A., Hashim, M. and Ali, M. 2023. Chinese Food Culture in Pakistan: Analysis of Chinese Food culture within the Framework of the CPEC Project. *International Journal of Instructional Technology and Educational Studies*, 4(1):16-57.
5. Assmann, S. 2024. Culinary heritage in Asia: National and regional identities–Reflections from the field. *Routledge Open Research*, 3(6):6.
6. Becuț, A.G. and Puerto, K.L. 2017. Introduction. Food history and identity: Food and eating practices as elements of cultural heritage, identity and social creativity. *International Review of Social Research*, 7(1):1-4.
7. Buccini, A.F. 2015. Defining 'Cuisine': Communication, Culinary Grammar, and the Typology of Cuisine. 105-121.
8. Buccini, A.F. and Dahlstrom, A. 2020. Culinary Change, Disruption, and Death: Do Traditional Cuisines Have a Future?
9. Cadiogan, D.J., Dy, S.C.H., Opaco, C.J.L.T., Rodriguez, R.D., Tan, J.T.T., Villanueva, K.A. and Mercado, J.M.T. 2021. Manyisig: the culinary heritage significance of sisig in Angeles City, Pampanga, Philippines. *International Journal of Gastronomy and Food Science*, 24:100347.
10. Chatibura, D. 2015. *The development of a strategic framework for the promotion of local cuisine in Botswana*.
11. Coughlan, L.-M. and Hattingh, J. 2020. Local is lekker! The search for an appropriate food identity for the Free State Province, South Africa.
12. Crockett, L. 2017. *Unpacking KT Theories, Models and Frameworks*. [Online] Available from: <https://medium.com/knowledgenudge/unpacking-kt-theories-models-frameworks-bc816de36a97#:~:text=A%20theory%20should%20help%20you,believed%20to%20influence%20an%20outcome>. [Accessed: May 2024].
13. Cuevas, R.P., de Guia, A. and Demont, M. 2017. Developing a framework of gastronomic systems research to unravel drivers of food choice. *International Journal of Gastronomy and Food Science*, 9:88-99.
14. de Camargo, A.M., Botelho, A.M., Dean, M. and Fiates, G.M.R. 2022. A qualitative framework for the assessment of culinary recipes' healthiness. *International Journal of Gastronomy and Food Science*, 28:100391.
15. Delve. Not dated. *Understanding Framework Analysis: An Introductory Guide*. [Online] Available from: <https://delvetool.com/blog/frameworkanalysis> [Accessed: May].
16. Du Rand, G.E. 2007. *The role of local food in destination marketing: A South African situational analysis*. University of Pretoria.

17. Farrer, J. 2015. Introduction: traveling cuisines in and out of Asia: toward a framework for studying culinary globalization. *The Globalization of Asian Cuisines: Transnational Networks and Culinary Contact Zones*: Springer.
18. Fernandes, C. and Richards, G. 2023. A methodological framework for innovation of gastronomic heritage. *Evolving the perspectives on the value of gastronomy for Mediterranean destination development*.: McGraw Hill Publishing.
19. Fisher, H. and du Rand, G. 2023. The Double-Edged Role of Cuisine in Both Research and Practice. *Contemporary Advances in Food Tourism Management and Marketing*:212-227.
20. Fisher, H. and Du Rand, G. 2024. A Western Cape Food Tour: Examining Indigenous Foods in Eateries Through the Lived Experience Model.100-111.
21. Harrington, R.J. 2005. Defining gastronomic identity: The impact of environment and culture on prevailing components, texture and flavors in wine and food. *Journal of culinary science and technology*, 4(2-3):129-152.
22. Harrison, R. 2010. What is heritage. *Understanding the politics of heritage*, 9.
23. Hastorf, C.A. 2017. *The social archaeology of food: Thinking about eating from prehistory to the present*. Cambridge University Press.
24. Insights, G. 2024. *Cultural Preservation: Ensuring Our Legacy Endures*. [Online] Available from: <https://www.graygroupintl.com/blog/cultural-preservation> [Accessed: May].
25. Kalenjuk Pivarski, B., Paunić, M., Šarenac, N., Šmugović, S., Mlinarević, P., Ivanović, V., Marjanović, J., Pavlović, S., Tekić, D. and Đerčan, B. 2024. The influence of gastronomic identity factors on food tourism development in the Republic of Serbia and Bosnia and Herzegovina. *Frontiers in Nutrition*, 10:1335943.
26. Kocevski, J. and Risteski, M. 2020. Defining cuisine and types of cuisine. *Horizons International Scientific Journal Series A Social Sciences and Humanities*, 26:291-302.
27. Konsa, K. 2013. Heritage as a socio-cultural construct: Problems of definition. *Baltic Journal of Art History*, 6:125-151.
28. Kwon, D.Y. 2015. What is ethnic food? *Journal of ethnic foods*, 2(1):1.
29. Lai, M.Y. 2018. *Conceptualising an Attribute-based Framework of Projected and Perceived Destination Food Image: The Case of Australia and its Chinese Market*. Griffith University.
30. Lai, M.Y., Khoo-Lattimore, C. and Wang, Y. 2018. A perception gap investigation into food and cuisine image attributes for destination branding from the host perspective: The case of Australia. *Tourism Management*, 69:579-595.
31. Lixinski, L. 2018. Food as heritage and multi-level international legal governance. *International Journal of Cultural Property*, 25(4):469-490.
32. Loulanski, T. and Loulanski, V. 2011. The sustainable integration of cultural heritage and tourism: A meta-study. *Journal of sustainable tourism*, 19(7):837-862.
33. Luft, J.A., Jeong, S., Idsardi, R. and Gardner, G. 2022. Literature reviews, theoretical frameworks, and conceptual frameworks: An introduction for new biology education researchers. *CBE—Life Sciences Education*, 21(3):rm33.

34. Mbuagbaw, L., Lawson, D.O., Puljak, L., Allison, D.B. and Thabane, L. 2020. A tutorial on methodological studies: the what, when, how and why. *BMC Medical Research Methodology*, 20:1-12.
35. Mercado, J.M.T. and Zerrudo, E.B. 2018. Pamanang Kulinarya: Developing a safeguarding plan for culinary heritage using the statement of significance–The case of Lomi in Lipa City, Batangas, Philippines. *SPAFA Journal*, 2.
36. Mintz, S.W. 1996. *Tasting Food, Tasting Freedom: Excursions Into Eating, Culture, and the Past*. Beacon Press.
37. Moreno, F. and Malone, T. 2021. The role of collective food identity in local food demand. *Agricultural and Resource Economics Review*, 50(1):22-42.
38. Murcott, A., Belasco, W. and Jackson, P. 2013. *The Handbook of Food Research*. Bloomsbury Academic.
39. Ngulube, P. 2018. Overcoming the difficulties associated with using conceptual and theoretical frameworks in heritage studies. *Handbook of research on heritage management and preservation*: IGI Global.
40. Nilsen, P. 2020. Making sense of implementation theories, models, and frameworks. *Implementation Science* 3,0:53-79.
41. Omholt, T. 2015. Developing a theoretical framework to analyze an urban culinary culture and explain restaurant cluster developments. *Journal of Place Management and Development*, 8(3):233-253.
42. Ondieki, E.B., Kotut, E.J., Gatobu, C.K. and Wambari, E.M. 2017. Gastronomic identity: Role of the environment and culture on culinary tourism. *African Journal of Tourism, Hospitality and Leisure Studies*, 3(1):17-21.
43. Partarakis, N., Kaplanidi, D., Doulgeraki, P., Karuzaki, E., Petraki, A., Metilli, D., Bartalesi, V., Adami, I., Meghini, C. and Zabulis, X. 2021. Representation and presentation of culinary tradition as cultural heritage. *Heritage*, 4(2):612-640.
44. Porporato, D., Grimaldi, P. and Fassino, G. 2019. *Culture, Heritage, Identity and Food. A Methodological Approach*. Franco Angeli.
45. Reddy, G. and van Dam, R.M. 2020. Food, culture, and identity in multicultural societies: Insights from Singapore. *Appetite*, 149:104633.
46. Ritchie, J. and Spencer, L. 2002. Qualitative data analysis for applied policy research. *Analyzing qualitative data*: Routledge.
47. Ritchie, J., Spencer, L. and O'Connor, W. 2003. Carrying out qualitative analysis. *Qualitative research practice: A guide for social science students and researchers*, 2003:219-262.
48. Rodyna, S.N. 2023. "We are very proud and very tempted and determined to make this food". *The Arbutus Review (TAR)*, 14(1):81-96-81-96.
49. Romagnoli, M. 2019. Gastronomic heritage elements at UNESCO: Problems, reflections on and interpretations of a new heritage category. *International Journal of Intangible Heritage*, 14:158-171.
50. Rozin, E. 1992. *Ethnic Cuisine: How to Create the Authentic Flavors of 30 International Cuisines*. Penguin Books.

51. Sackett, L. and Haynes, D. 2012. *American Regional Cuisines: Food Culture and Cooking*. Pearson.
52. Santucci Oliveira, B., Torres Tricárico, L., Lisboa Sohn, A. and Pontes, N. 2020. The culinary intangible cultural heritage of UNESCO: A review of journal articles in EBSCO platform. *Journal of Culinary Science and Technology*, 18(2).
53. Shankar, A., Jebarajakirthy, C., Nayal, P., Maseeh, H.I., Kumar, A. and Sivapalan, A. 2022. Online food delivery: A systematic synthesis of literature and a framework development. *International Journal of Hospitality Management*, 104:103240.
54. Snyman, L. 2004. South Africa's rainbow cuisine. *Gastronomica*, 4(1):91-93.
55. Snyman, L. and Sawa, A. 2001. *Rainbow Cuisine*. Könnemann.
56. Sproesser, G., Ruby, M.B., Arbit, N., Akotia, C.S., Alvarenga, M.d.S., Bhangaokar, R., Furumitsu, I., Hu, X., Imada, S. and Kaptan, G. 2019. Understanding traditional and modern eating: the TEP10 framework. *BMC Public Health*, 19:1-14.
57. Srivastava, A. and Thomson, S. 2021. Framework analysis: a qualitative methodology for applied policy research. 2009. *JOAAG*, 4(2).
58. Terry, N. 2020. *The “Tapestries of Practice” conceptual framework: Taking a lens of migration to trace relationships between food cultural practices and sustainability*. [Online] Available from.
59. Timothy, D.J. 2011. *Cultural heritage and tourism: An introduction*. Channel View Publications.
60. Timothy, D.J. and Nyaupane, G.P. 2009. *Cultural heritage and tourism in the developing world*. Routledge New York.
61. Trichopoulou, A., Soukara, S. and Vasilopoulou, E. 2007. Traditional foods: a science and society perspective. *Trends in Food Science and Technology*, 18(8):420-427.
62. UNESCO. 2003. *Definition: Intangible cultural heritage*. [Online] Available from: <https://uis.unesco.org/en/glossary-term/intangible-cultural-heritage> [Accessed: May].
63. Van der Waltd, G. 2024. Towards a Conceptual Framework for the Social Dimensions of Sustainable Development. *African Journal of Governance and Development*, 13(2):113-134.
64. Vu, N., Ghadge, A. and Bourlakis, M. 2023. Blockchain adoption in food supply chains: A review and implementation framework. *Production Planning and Control*, 34(6):506-523.
65. Wahlqvist, M.L. 2007. Regional food culture and development. *Asia Pacific journal of clinical nutrition*, 16:2.
66. Wang, J., Feng, J., Lian, Y., Sun, X., Wang, M. and Sun, M. 2023. Advances of the functionalized covalent organic frameworks for sample preparation in food field. *Food Chemistry*, 405:134818.
67. Weible, C.M. and Sabatier, P.A. 2018. *Theories of the Policy Process*. Taylor and Francis.
68. Zhang, K. 2023. Food as a medium: The framework and cross-culture implications of short videos of overseas Chinese sharing Chinese food in foreign countries. 02017.

69. Zocchi, D.M., Fontefrancesco, M.F., Corvo, P. and Pieroni, A. 2021. Recognising, safeguarding, and promoting food heritage: challenges and prospects for the future of sustainable food systems. *Sustainability*, 13(17):9510.
70. Zou, T., Dawodu, A., Mangi, E. and Cheshmehzangi, A. 2022. General limitations of the current approach in developing sustainable food system frameworks. *Global Food Security*, 33:100624.

**REGULATORY
ISSUES IN A
(DIGITAL)
BUSINESS
ENVIRONMENT**

THE PERSONALITY RIGHT OF A LEGAL PERSON AND THE RIGHT TO COMPENSATION FOR NON-PROPRIETARY DAMAGE DUE TO BREACH OF CONTRACT

OLIVER RADOLOVIĆ

Juraj Dobrila University of Pula

Faculty of Economics and Tourism »Dr. Mijo Mirković«

Pula, Croatia

oradol@unipu.hr

Paper Category: Original scientific paper

ABSTRACT

The right of personality of a legal person and the right to compensation for non-proprietary damage due to breach of contract are two important innovations brought into Croatian law by the Civil Obligations Act (ZOO) from 2005.

Although these two legal institutes are regulated in different places in the Act (the first - in article 19 and the second - in article 346 par 1 of the ZOO), they have the same legal origin in the matter of civil and commercial law - right on personality - which aims to protect the dignity and personality of human and legal persons.

The development of these institutes in Croatian law was significantly influenced by: 1) the general “expansion” of the non-proprietary part of civil law (personality rights), 2) progress in the law of personality in relation to legal persons and 3) a modern understanding of the subjective cause of legal transactions (as causa finalis).

The mentioned institutes may be “ahead of their time” in Croatia, but they have their own future. For now, Croatian (court) practice is modest, but with the first indications that it is about issues that are of great interest to Croatian society, citizens and legal entities.

Keywords: breach of contract, legal person, liability for damage, non-proprietary damage, personality right

1. INTRODUCTION

Two significant innovations (and two very important institutes of obligatory law) were introduced into Croatian law by the (new) Civil Obligations Act from 2005 (hereinafter: ZOO 2005): 1. the personality right of a legal person (article 19 of the ZOO) and 2. the right to compensation for non-proprietary damage due to breach of contract (article 346, paragraph 1 of the ZOO). Both of these rights are very closely related, which is why they are covered by the common title of this paper.

In article 19 of the ZOO 2005 ("Personality rights") it is stated that: "(1) Every natural and legal person has the right to the protection of his personality rights under the assumptions established by law, (2) Personality rights in the sense of this Act mean the rights to life, physical and mental health, reputation, honour, dignity, name, privacy of personal and family life, freedom, etc. and (3) A legal person has all the above-mentioned personality rights, except for those related to the biological essence of a natural person, and especially the right to reputation and good name, honour, name, firm, business secret, freedom of business, etc."

In article 346, paragraph 1 of the ZOO 2005 ("Volume of compensation") it is stated that: "The creditor has the right to compensation for ordinary damages and lost profits, as well as fair compensation for non-proprietary damages, which the debtor had to foresee at the time of concluding the contract as possible consequences of the breach of contract and considering the facts that were known or must have been known to him at the time."

Before 1990, these two institutes were hard to imagine in Croatian legislation. Legal entities, especially commercial companies (so-called social economic enterprises), did not have a corresponding social significance; in social ownership (according to the Constitution of the SFRJ from 1974, the Act on Joint Labour from 1976, etc.) everything was "ours", which means "everyone's" and "nobody's". From such "market unrecognisability", the idea that a legal person could also be the holder of personality rights and that there would be a right to compensation for non-proprietary damage due to breach of contract (breach of contract was limited to contractual penalty and liability for proprietary damage) was unimaginable. Of course, these are not the only reasons for not knowing the personality rights of legal persons in Croatian law. Even in countries that did not know the concept of social ownership, the right to compensation for non-proprietary damage of legal entities was not known. Until the 1990's, the concept of non-proprietary damage everywhere in the world was at such a stage of development that it

was associated exclusively with natural persons. The situation changed only in the late 1990's and early 2000's.

Although the introduction of these two institutes into the ZOO 2005 is a very significant innovation, the response of the general, professional and scientific public was, apart from the rare exceptions mentioned in this paper, quite indifferent. There was no major praise or criticism, which is the result of several factors. First, the non-proprietary part of civil law (where this matter belongs) was never particularly developed in our region; in fact it was significantly behind other important European countries (especially before 1978). Second, neither practice nor domestic legal theory (including the Yugoslav one) showed much interest in the above-mentioned issues; a few authors who dealt with it (Klarić, Gavella, Radolović) only managed to touch on the matter of one or both institutes in the legal theory. Thirdly, the development of Croatian society in the historical circumstances of frequent wars and unrest did not create the necessary “peacetime” framework (general state in society) for the development of such a subtle matter of law.

Even before the adoption of the ZOO 2005, the Croatian legislation recognised contractual liability for damage. In fact, most of the provisions on contractual liability from the former Yugoslav Civil Obligations Act from 1978 (adopted in the Republic of Croatia in 1991 and valid until December 31, 2005; hereinafter: old ZOO 1978) were copied into the new ZOO. The flaw of the old ZOO 1978 was the lack of knowledge of contractual liability for non-proprietary damage; it was a very clear provision (article 266, paragraph 1) according to which the debtor was liable to the creditor only for proprietary damage. Old ZOO 1978 (in articles 199-205) regulated only non-contractual (tort) “compensation for non-material damage”.

In Croatian law, there has long been a well-established understanding that the introduction of the institute of contractual liability for non-proprietary damage, in legal doctrine and in business practice, would create a number of difficulties (reduction of legal security of the contractor, uncertainty in the market, payment of high fees). It was considered that by breach of contract (harmful action that violates an existing contractual obligation and modifies the obligatory relationship and, based on it, the debtor can request the fulfilment of the obligation (if possible) and/or compensation for damages), the creditor suffers only material damage and by no means (Napijalo, D, 1995) “moral” or “non-material” damage (the terms “material and non-material” damage from the old Croatian legal theory and the old ZOO 1978 were replaced in the new ZOO 2005 by the way better terms “proprietary and non-proprietary” damage). The reasons for the delay in the introduction of the institute of contractual liability for non-proprietary damage in the

Croatian law were (**Radolović, A, 2005**): dogma about the exclusively proprietary character of the ZOO (1), delay in the classification of damage (2) and restrictive views on the concept of non-proprietary damage (3).

After its legal independence, Croatia “neglected” the non-proprietary matter of civil law, and it took almost 15 years since independence and 30 years since the adoption of the old ZOO 1978 for the institutes in question to “appear” in Croatian law. From today’s point of view, it remains incomprehensible how the Croatian legislator in a relatively long period (1978-2005) did not see the reasons for the protection of the non-proprietary rights of contractors (especially in some important spheres of life for the country, such as tourism: for example, the hotel-keeper can cause a hotel guest minor proprietary damage and significant non-proprietary damage violating the hotel-keeper’s contract (**Radolović, O, 2009; Radolović, O, 2010**) by: 1) ruining the annual vacation, 2) guest’s dissatisfaction with the services provided, 3) restlessness, discomfort and/or frustration due to the actions of the hotel-keeper’s staff, 4) in the form of physical and mental pain, etc.

The editors of the ZOO 2005, somewhat *ex sua sponte* but also on the basis of an extensive public scientific and/or legislative discussion (which preceded the adoption of the new ZOO), added the provisions on a legal person as to the holder of personality rights as well as the provisions on the right to compensation for non-proprietary damages due to breach of contract (**Klarić, P, 2003**).

It is also worth mentioning more advanced understandings of our legal theory according to which Croatian courts could award compensation for non-proprietary damage due to breach of contract even before the ZOO from 2005, interpreting the norms on contractual liability from the old ZOO 1978, which norms on non-contractual liability were subsidiarily applied, in a slightly more extensive manner (**Slakoper, Z, 2002**). In that case, the “total” damage would include a non-proprietary part as well, but only in the case of fraud, intent and gross negligence.

Despite such interesting theories, by the provision from article 346, paragraph 1 of the ZOO 2005, the institute of contractual liability for non-proprietary damage was introduced into the Croatian legislation for the first time (in the event of a breach of contract, the creditor now has the right to compensation for ordinary damages, lost profits “and fair compensation for non-proprietary damage”). With this solution, Croatian law achieved great (legislative) progress in respecting the rights of personality and dignity (**Larenz, K, 1976**) of contracting parties (natural and legal persons).

However, even after almost 20 years of application of the provisions of the new ZOO 2005 (and the institute of personality rights of legal entities and of the provisions on the right to compensation for non-proprietary damages due to breach of contract) no relevant social changes in practice have been brought. The “assessment” was the same even 10 years ago: although the legislator set a good framework (an objective concept of non-proprietary damage), it did not significantly affect the concept of non-proprietary damage and the repair of such damage in practice (**Bukovac Puvača, M, 2015**).

It is a well-known problem in the Republic of Croatia that court decisions (primarily decisions of the Supreme Court of the Republic of Croatia) are somewhat reluctant to be made public (this does not mean the mere informative publication of decisions on the websites of the USRH, VSRH and in other relevant databases (e.g. IUS info.), but their public comment which would cause a “stronger” public debate). The alleged problem is the so-called “anonymisation” of court decisions (i.e. deletion of private data about litigants), and a real problem is also possible in the fact that courts want to avoid seeing what and how they decided (this especially applies to important decisions or different decisions in “similar things”). In the matter considered here, it is certainly also about the fact that there are not many disputes and decisions about it, as well as that the “essence” of the new institutes has not been realised. In addition, the “few” court decisions that Croatian court practice has (or that have been publicly announced) confirm that there will be no progress while the amount of claims and court decisions (for example: judgments of the Regional Court in Zagreb, Gž 1709/2022 of September 13, 2022 and Gž 5673/2015 dated October 02, 2015; judgment of the District Court in Kutina, Pn 40/2021 of September 21, 2022; judgment of the Regional Court in Split, Gž 1218/2022 of February 13, 2023; judgment of the Regional Court in Čakovec, P 47/2016 from January 10, 2017) are still “miserably” low and do not enter into the essence of the institute.

In addition to all of the above, the substantive legal protection of the right to personality is hampered by the fact that there are still no special procedural legal provisions for its protection (**Radolović, A, 2013**). Finally, one should ask whether the level of legal (and judicial) knowledge in the Republic of Croatia is high enough in these matters, because Croatian judges, for example, apart from the principled legal regulation (Acts on Courts, Act on the State Judicial Council) and their own conscience, little else truly obliges one to follow the development of the science of law (theory of personality law). This paper aims, therefore, to point out two very “living” institutes of civil and commercial law in the ZOO 2005, the factors that

influenced their justified introduction into Croatian law and the possibility of their development through theory and practice. The paper is structured in six chapters and uses the methodology of analysis of theoretical and practical problems mentioned in the introduction chapter, review of current legal solutions in the Croatian law and synthesis of (future) answers to the challenges of those institutes.

2. ESSENTIAL LEGAL AND SOCIOLOGICAL FACTORS IN THE CREATION OF MENTIONED LEGAL INSTITUTES

When the editors of the ZOO in 2005 introduced the relevant institutes into the draft legal text, they did not, of course, do so without their own and good knowledge of personality rights (rights of personality, personal rights). The term “personality right” follows the terminology from ZOO 2005, but it is difficult to talk about any “established” name in Croatian theory.

Namely, our doctrine cannot agree on the name of the institute. Some authors believe that the most adequate term is “right to personality”, because the right to personality (right of the person) is only one of the personality rights, so it is not appropriate to name an entire legal area after one right (**Radolović, A, 2006**). Others, on the other hand, pluralistically call it “personal rights”, considering that in Croatian law (then legislation) there are no solid theoretical foundations for calling it this (**Gavella, N, 2000**).

In the history of law, these type of rights developed over a long period and slowly, and it “exploded” after the atrocities of World War II (and the need for stronger protection of the rights of persons). Before that, the development of personality rights was conditioned by the general state of human society, which gradually recognised certain parts of it.

Generally speaking, it can be said that the right of personality has begun to develop and is most understood in societies based on the concept of the citizen-individual as the main bearer of overall development. In this sense, liberal civil society is certainly the most favourable environment for the true development of personality rights; contemporary private law is based, or at least should be based, on the worldviews of individualism and liberalism, and especially on their teachings on the freedom and equality of all people (**Gavella, N, 2019**).

Totalitarian societies are the opposite of that. Not only extreme totalitarianism such as fascism, Nazism or Stalinist communism, but also any collectivism, leads to stagnation and backwardness. Yet, in 1923, there was an explained theory that any collectivism, even when it seems idyllic (e.g. home cooperatives), leads to backwardness because it creates economic

anarchy, produces only for itself and not for market surpluses, there are no innovations, no new technology, etc. (**Mirković, M, 2008**). There, the individual citizen is literally, legally and politically “trampled”, but too great a historical price has been paid for it: a big backlog in the development (of these rights).

It is also a lesson for today's Croatian time, which has: a) neglected agricultural areas and agriculture in general and b) excessive public ownership (public enterprises) which, according to some estimates, makes up to 60% of the national capital and is an “ideal” soil for corruption, nepotism and crime of all kinds. This, in turn, brings with it the dangers of falling behind and not developing the citizen's rights at all and particularly the right of personality.

The right of personality (and its development in practice) is therefore particularly favoured by certain sociological factors: high level of economic development of society (1), clear, solid and stable legal system (2), mild social conflicts (3), high level of development of the social sphere of life: culture, science, art (4) and continuity (not discontinuity) in general development (5).

Seen from these “sociological” positions, Croatia's (general and historical) position is not exactly the “most favourable” one, and this means that in the development of the institute of personality rights, in practice, Croatia must start either from the foundation or from the low level already achieved. At the same time, we can use general European and world experiences (principles) in the fields of personality rights for faster progress in the development of the institute (**Proso and Štambuk-Šunjić, 2008**).

It should also be noted that, according to all the mentioned (sociological) factors essential for the development of personality rights, the world today is in crisis (wars, political crises, terrorism, the problem of loss of privacy on social networks). The right of personality includes the right to respect the personality of every natural (and legal) person. In the modern world where, especially in the younger population, a large part of their time is spent on the so-called social networks, the possibility of violation of personality rights and the consequent decline in individual self-esteem is increasing (**Jerončić Tomić, Mulić and Milišić Jadrić, 2020**).

In such conditions, human and civil rights always suffer first, and to a greater extent the right to personality, which *ex rerum natura* seeks peace, democracy, freedom and development. Less rich countries suffer to a greater extent from the stagnation in the development of personality rights.

However, from such a global political situation in Croatia as well, it is necessary to draw a rule that only builds the right of personality in its development: progress and overcoming the crisis situation is possible

only by fully using the potential and protecting the rights of each individual.

In addition to these sociological points of view, when the issue of the development of the institutes that are the subject of this work is viewed from a narrower perspective of civil and commercial law, it should be pointed out that some significant legal factors also contributed to the development of personality rights:

- general “expansion” of the non-proprietary part of civil law (personality rights),
- progress in the rights of personality in relation to legal persons,
- a new (modern) understanding of the cause of legal affairs.

Therefore, the analysis of the same legal factors through the development of the two titular institutes (in Croatian and comparative law) provides answers to the significance of their introduction and forms the main topic of the paper.

3. GENERAL “EXPANSION” OF THE NON-PROPRIETARY PART OF CIVIL AND COMMERCIAL LAW (PERSONALITY RIGHTS)

The “personality right” is the same as the “non-proprietary part” of civil and commercial law. In the Croatian law, the terms “personality rights” and “non-proprietary damages” are effectively equated: non-proprietary damage is a violation of personality rights, and violation of personality rights is the basis of liability for such damage. In fact, it would be most correct to replace the negative definition of the term “non-proprietary damage” from the ZOO with the expression: “repair of damage caused by violation of personality rights”.

The right of personality (the non-proprietary part of civil law) experienced its full development in the late 1940’s and early 1950’s. Special credit for this belongs to the very inventive legal theory (science), as well as to the creative judicial practice.

Interestingly, legislators (both in Croatia and in the world) were most often “sleeping” and did not create new or supplement old regulations, so science and practice found a special “way out”; they invoked the provisions of the Constitution and so came to the regulation of personality rights. The question remains: is there one (and general) personality right (1st monistic

conception) or should we talk about several individual personality rights (2nd pluralistic conception)?

The first solution (concept: one general right of personality) which prevails in the German legal field (**Hubmann, H, 1967**) has the advantage that it enables the “expansion of the space” of the right of personality more easily, but also carries the risk that something unnecessary is omitted from the right of personality.

The second solution (concept: more individual personality rights), on the other hand, does not allow any dilemmas, but potentially hinders development and expansion (**Gavella, N, 2000**).

The old ZOO 1978 did not offer any solution in this sense. It only stated (in article 157) that anyone can request that a court or other authority “... order the cessation of an action that violates the right of his personality.” There was nothing in the old ZOO 1978 about what personal rights are and what personality rights exist; only rare legal literature in Croatia dealt with this issue at all in the period from 1978-1991 (**Radolović, A, 1985**).

The new ZOO 2005 (by provision of the article 19, paragraph 2) not only corrects such a deficiency, but also adopts both conceptions of personality rights: 1) individual personality rights are listed - life, physical and mental health, reputation, honour, dignity, name (**Dropulić, J, 2006**), privacy of personal and family life (**Gavella, 2006**) and freedom, etc. 2) but the term “etc” leaves the possibility for the adoption of new individual personality rights and its “expansion”. Without that addition - “etc” - also for the possible adopting of the “other personality rights”, it would be difficult to construct this kind of responsibility.

This satisfies both solutions in Croatian law: first, individual personality rights are listed individually (2nd conception), and the word “etc.” enables further progress and shaping of new personality rights (1st conception). ZOO, therefore, correctly resolved the dilemma regarding the existence of only one (and general) personality right or several individual rights, adopting both concepts (a list of individual personality rights, but with the possibility of recognizing others as well). The latter is of particular importance for the compensation of non-proprietary damage due to breach of contract, because the question is which personality right is being violated (**Klarić and Vedriš, 2006**).

In parallel with the “expansion” of the institute through progress in legislation (or sometimes even the previous “influence” on the adoption of the new ZOO in 2005), Croatian personality law, very interestingly, also “expanded” in its doctrine, at least in three directions, that is, attempts to answer three essential questions: 1. What are all the “groups of rights” that

make up the concept of personality rights? 2. From which “legal affairs” does the right of personality arise? and 3. What are the “new” special personality rights created by “expansion” in contemporary practice?

To the first question, what belongs to the right of personality, the best answer (classification) was given by Gavella (**Gavella, 2000**) - later in 2005, the ZOO was very broad and flexible in defining the right of personality, opening the door wide to the expansion of this list of “what falls under the right of personality” - systematising the same rights by listing seven types of personal rights (the rights of personality):

1. right to physical integrity,
2. right to freedom,
3. right to honour and reputation,
4. right to privacy,
5. right to personal identity,
6. right to mental integrity and
7. right to protection of other non-proprietary personal assets.

In the context of more recent theoretical understandings, the only drawback of such a “taxatively closed” systematisation, which is certainly necessary for determining the framework of personality rights, is that some personality rights that cannot be classified in any way (e.g. the right to information) and may remain outside of it, could also hinder the “expansion” of personality rights.

To the second question, regarding legal matters that protect the right to personality, the most precise answer in Croatian literature is given by Radolović (**Radolović, A, 2014**), highlighting four groups of such legal matters:

1. group of legal affairs related to the right to life, physical and mental integrity (e.g. contracts related to work in difficult conditions, euthanasia, abortion regulation, organ transplantation and similar),
2. group of affairs related to human treatment,
3. group of affairs related to the so-called artificial insemination and
4. other legal matters (e.g. related to one’s image, appearance, voice).

Both Gavella and Radolović use the terms “others” (the right to protect “other” non-proprietary personal assets, “other” legal matters of personality rights) and, in fact, even 10 and 20 years ago, they were removing the flaws of their “systematisations” leaving the possibility of a new expansion of

personality rights to new personal rights and to new legal affairs that protect them.

Finally, Croatian legal (but also economic and other social) literature also dealt with the third issue related to the expansion of personality rights - the “new” special personality rights that arose from the modern way of life (actually, the special personality rights created by the “expansion” concept of the institute itself) as a confirmation of the thesis that the ZOO from 2005 really set a broad framework for the additional “expansion” of the same. Some of the “new” special personality rights discussed in the more recent Croatian literature are, for example:

1. the right to a sports image (**Balcarczyk, J, 2010**),
2. the right to publicity in sports (**Proso, M, 2015**),
3. the right to the personality of hotel managers as part of the protection of their autonomous decision-making rights (**Stone and Ineson, 1998**),
4. the hotel guest’s right to privacy protection (**Radolović, O, 2010**),
5. the right to privacy and access to information in the digital world (**Boban, M, 2012**),
6. the right to protect the dignity of workers (**Šokčević, S, 2016**) and
7. the right to correct or respond to published information (**Prančić, V, 2008**).

At the end of the chapter, it is worth mentioning two possible problems related to the current and future “expansion” of the right to personality in Croatian law: 1) the fact that the right to personality is often on the “border” between law and morality and 2) the issue of legislative regulation of the content of certain personality rights.

From the stylisation of the provision of article 19, paragraph 3, of the ZOO 2005 (“...right to reputation and good name, honour, name or company, trade secret, freedom of business, etc.”) it follows that these terms traditionally fall more into the realm of morality than into the realm of law. This, of course, also applies to everything mentioned in paragraph 2 of the same article, where the personality rights of natural persons are mentioned. The right to personality is also, to a very strong extent, a “sign” of the rule of morality. This, however, does not “remove” the right to personality from (civil non-proprietary) law because even in the proprietary part of civil law there are references to the rules of morality (e.g. article 271, article 298, paragraph 1 or Article 322, paragraph 1 of the ZOO).

However, the provisions of paragraphs 2 and 3 of article 19 of the ZOO have another shortcoming: they do not state (neither in this nor in any other place in the Act) the content of individual personality rights. In the case of legal persons, this objection does not refer only to the concept of the company's name (article 11. of the Croatian Company Act), but everything else is "in the zone" in which interpretation is still needed. In the area of the proprietary law, it would be as if, for example, the Act on Property and other real rights mentions the right of ownership as the most important real right, but does not specify anything else about the content of that right.

It is quite certain that the same (both for natural persons and for legal persons) complicates the proper construction and even more so the application of personality rights in practice. In some perspective of the development of personality rights, it will be possible to eliminate this, but at the current stage when personality rights are still developing the existing legal regulation can help significantly.

4. PROGRESS IN THE PERSONALITY RIGHTS IN RELATION TO LEGAL PERSONS

The sociological basis of learning about the right of personality is the free citizen-individual. He is given the opportunity and freedom to realize his creative potential and thereby contribute to himself and society as a whole. These or similar "words" are not in the ZOO (nor in other special regulations that, to a greater or lesser extent, affect the right of personality, such as the Croatian Media Act, the Croatian Copyright and Related Rights Act, etc.) but they are "written" in the complete, modern, domestic and world teaching about the personality right.

Mutatis mutandis, everything of this also applies to the legal persons (companies, institutions). Numerous and varied theories about what a legal person is are known (created since Roman times). Here, however, we will not enter into the theory of law and discuss the status of a legal person (as a social creation to which the system has recognized the status of a legal subject).

Let us start only from the fundamental (and almost indisputable) thesis that every legal entity is a unity of people (persons), capital (property) and goal (purpose). The purpose for which the legal entity was established provides the framework for the protection of its right to personality (**Klarić, P, 1995**).

Based on this, the question arises: Does such a legal creation have personality rights and what are those rights? In the history of learning about

the right of personality, in this respect, there have been and still are radical divisions (and consequently different teachings).

One direction of learning about personality rights (especially Italian legal theory) positively answers the question posed in this way. Perlingieri (**Perlingieri, P, 1972**) claims that in the being of every legal person there is a certain relationship between people and that therefore a legal person always represents an “interpersonal”, even a “superpersonal”, legal phenomenon. Perlingieri also claims that, in the life of a person (natural person), there are only two essential areas of legal regulation: to have (*habere, haben, avere*) and to be (*esse, sein, essere*).

This kind of philosophical-legal foundation enabled the principled construction of personality rights. There is no doubt that legal entities also have their “to have” and their “to be”. They act not only to earn some property (this only exists in the case of commercial companies) but also to spread certain cultural, educational, scientific and other values. A similar position in the Italian doctrine was later continued by De Cupis (**De Cupis, A, 1982**), with a note or supplement in the teaching that a legal person, however, cannot have all the (individual) personality rights that a natural person (by its nature) has.

The opposite side (and negative answer to the question) is led by German legal literature. Almost 60 years ago, Nass (**Nass, G, 1964**) published 22 theses and explained with them that a legal person cannot be the holder of personality rights (in them he also explains his conclusions, which basically boil down to the fact that a legal person does not have the qualities of emotional communication like a human being and therefore must be outside the teaching of the right of personality). Such a point of view is still “in force” in German legal theory today, even though there are some signs of “giving in”.

It is possible, however, to combine (join) these two opposing conceptions regarding the view on the personality rights of the legal person. Namely, in every legal person, there is a more or less present and determined personal element, the basis for the construction of the personality rights of the legal person. A joint-stock company is the most well-known commercial company, and it is a capital company, but it also has people: owners, board members and employees. Together they form one personal and emotional whole, sufficient holders of personality rights and the right to compensation for non-proprietary damages (**Kačer, H, 2012**).

It should also be especially pointed out that the violation of the right to the personality of society can be committed “from outside” (by another subject) but also “from within” - by the people who make up its personal unit

(Babić, S, 2014). This human-emotional element, according to their special legal nature, comes to the fore even more strongly in the society of persons and even more in the case of school, health, cultural or artistic institutions.

Personal rights that, therefore, (certainly) belong to legal entities are: (business) reputation and good name, honour, name or company, business secret and freedom of business (Pichler, D, 2015). Such solutions of the ZOO 2005 represent a logical result of general developments in learning about the right of personality of legal entities in Europe and the world.

In conclusion of the chapter, it should be noted that Croatian rare legal literature that dealt with the topic expressed itself positively with regard to the “new” right of personality of legal entities; the ZOO from 2005 more than consistently followed the provisions of article 19 of the Act in the development of learning about the right of personality of legal persons (except for those rights that do not belong to legal entities, as opposed to natural persons, “by the nature of things”).

5. THE CAUSE OF LEGAL AFFAIRS IN THE PROTECTION OF PERSONALITY RIGHTS AND CONTRACTUAL LIABILITY FOR NON-PROPRIETARY DAMAGE

The institute of cause (*causa*) of legal affairs is generally one of the most complicated concepts (special institutes) in civil and commercial law. This paper, however, does not aim to enter into a discussion of the concept of cause, but only gives a look at some of its aspects that affect both the problem of contractual liability and the right to compensation for non-proprietary damage due to breach of contract (and thus the protection of personality rights).

Basically, there are two (foreign) causes of legal affairs in the legal literature - authors often call them two theories or two conceptions of the cause: a) objective cause (and it is always the same for all cases of the same type of legal affair; for example, in the case of sales, it is acquisition of ownership rights for one party and obtaining money for the other party) and b) subjective cause (which answers the question of what specific goal the contractual parties want to achieve in a certain contractual relationship; for example, in the case of buying and selling a vehicle, it can be the acquisition of ownership of a car that is original and unique to market).

The legislations of individual countries usually decide to accept one or the other conception. However, in addition to the objective and subjective concept of the cause of contractual obligation, in some legal systems (e.g. in Italy) the so-called “mixed” concept of cause, so the concept of cause of

contractual obligation includes both objective and subjective elements (Nikšić, S, 2006).

Here (in the analysis of the subject institutes), the subjective case (concept) is particularly interesting. Namely, every contract always has an initial motive (Cigoj, Blagojević and Krulj, 1983). That is *causa initialis*. In principle, the motive has no significance for the validity of the legal transaction (Nikšić, S, 2006). If it were against it, every deal could be contested and that would then create legal uncertainty. However, when the *causa initialis* is presented to the other contracting party and he agrees to make it an integral part of the contract, then the *causa initialis* takes on a new meaning - it becomes the *causa finalis*.

In order to understand the concept of subjective *causa finalis*, hypothetical and practical examples are given:

1. if, for example, the buyer presented to the real estate seller that he is buying land, but only because he expects that there will be no other buildings within the radius of 10,000 m², and the seller agrees, the subjective cause as a *causa finalis* has become an integral part of the contract;
2. if, for example, in the construction contract, the contractor agreed to complete the client's seaside house by July 1, because the client specifically stated that he wanted to spend the entire annual vacation from July 1 until September 1 at sea, the agreed term is *causa finalis*;
3. if the hotel guest has expressly requested in the (direct) contract for hotel services to be accommodated in a room with a sea view (accommodation in a room with contracted properties), and the caterer agrees, the same becomes *causa finalis*;
4. if the travel organiser agrees to provide the traveller with exceptional sightseeing during his stay in a certain place (Supreme Court of the Croatian Socialist Republic, Rev 985/88 of November 24, 1988) by which, according to the old ZOO 1978, the guest was denied compensation for non-proprietary damage (mental pain) due to being denied a visit to some places that were in the travel plan, the same becomes *causa finalis* (Klarić, P, 2006).

The Croatian ZOO, in principle, follows this logic of thinking (article 273 of the ZOO). The motivations (the same as the motive, *causa initialis*) from which the contract was concluded do not affect its validity (article 273, paragraph 1 of the ZOO). However, if the motive was impermissible (and the other party knew or had to know), the contract is “ineffective” (article 273,

paragraph 2 of the ZOO; theoretically, it is not clear what “no effect” means - does this mean “non-existent” legal affairs or something else?).

In the case of free legal transactions, impermissible motives have the effect that the contract “has no effect” even when the other party did not know or had to know about the impermissibility of the other party’s motives (article 273, paragraph 3 of the ZOO). In any case, without a subjective cause, it is not possible to construct liability for non-proprietary damage due to breach of contract.

In this regard, a particularly interesting thinking comes to us from Italian legal doctrine. Galgano (**Galgano, F, 1972**) claims, according to the provisions of articles 1343 and 1344 of the Italian Civil Code (*Codice Civile*) from 1942, talks about the typical (*causa tipica*) or atypical (*causa atipica*) cause of the contract. For the latter, he especially points out that it is the result of learning and practice about the right of personality (*diritti di personalità*).

In the history of civil and commercial law, there have been many theories according to which non-proprietary damages cannot be claimed for breach of contract. An important objection was that for breach of contract there is general liability for (proprietary) damage and contractual penalty. Learning about personality rights has shown that these two responsibilities are not sufficient for all the legal interests of creditors. Namely, there is no or should not be a difference whether the non-proprietary damage is caused by a tort or a contract, so in both cases there is liability for damages.

Some practical consequences of such an attitude can be seen today in almost all of Europe (e.g. in the case of contractual liability of road, rail and air carriers, where in the event of a delay passengers are recognized as entitled to compensation for non-proprietary damage, regardless of whether there was any proprietary damage).

The cause (either subjective or objective) always answers the question of why the debt is owed (*cur debetur*) and not the question of what is owed (*quid debetur*). The subjective cause can refer to proprietary as well as non-proprietary goals (four possible hypothetical and practical examples mentioned above). It is an open question what kind of answers in Croatian law arose and now arise from the comparison of the decisions of the old ZOO 1978 and the new ZOO 2005.

In Croatian literature, Gorenc and associates (**Gorenc and associates, 2014**) believe that the old ZOO 1978 (in article 51) provided for both causes (both objective and subjective cause) and that the new ZOO 2005 omits the subjective cause. Klarić (**Klarić, P, 2005**), on the other hand, states the complete opposite - that article 273 of the new ZOO 2005 expresses the

subjective cause of legal affairs and that this satisfies the supporters of the theory of the existence of a subjective cause in Croatian (compulsory) law.

It seems, indeed, that the old ZOO 1978 was familiar with both causes (it adhered to the so-called mixed concept of the cause) because then the ruling theory of obligatory law advocated a mixed, therefore both objective and subjective, cause. There is no doubt that the Belgrade school of civil law (Konstantinović, Gams, Perović, Stanković...), French pupils, students and doctoral students who brought the French school of mixed (objective-subjective) causes into ZOO 1978 (**Perović, S, 1976**) influenced this theory also in the Croatian law.

However, the new ZOO 2005 in article 273 only speaks more clearly and basically more accurately about the subjective cause of legal affairs, while the objective cause stems from the basic rule that every legal transaction must have the essential ingredients provided for by law (article 247 of the ZOO). This is the essence of the objective cause.

In other words, both the old ZOO 1978 and the new ZOO 2005 recognize both objective and subjective causes, but the new ZOO defines the subjective cause more precisely and better. Thus, in fact, the ZOO 2005 enables contracting parties to make greater use of the specific goals of a specific legal transaction, including various non-proprietary goals.

In accordance with these conceptions of the cause of legal affairs, the study of personality rights has built an additional principle; that, as a rule, non-proprietary damages are repaired (compensated) with non-proprietary means (apology, publication of judgment, public statement and similar).

Every contract has its own objective cause prescribed by law and it is the same for every legal transaction of a certain type. Each contract, however, does not have to have a subjective cause and it is different for each individual contract. From the aspect of the protection of personal rights and contractual liability for non-proprietary damage, it should therefore be concluded that the subjective cause can also refer to a specific non-proprietary goal, which is an increasingly common case in the modern world. Accordingly, the legal basis for compensation (repair) of non-proprietary damage due to breach of contract is created. The method of repairing this damage is basically the same as for any non-proprietary damage.

At the same time, the following should also be emphasised; that due to the circumstances that the doctrine of the right of personality has created a fairly firm rule in this regard - that non-proprietary damage is usually compensated with non-proprietary means - in theory and practice, the exceptions that would deviate from the same. If, for example, the injured party who has been harmed by the media does not submit a claim or does not

submit it within the prescribed preclusion period and nevertheless initiates a civil proceeding before the court in order to compensate for the damage, the court is obliged to reject the claim by decision (judgment) as unfounded (**Jakovljević, D, 2017**).

The only exceptions would be physical injuries (it would be against "common sense" (a legal standard often used by the European Court of Human Rights in Strasbourg) if, for example, someone who was lying immobile in the hospital for 6 months due to the fault of a third party was offered an apology). However, it is necessary to exceptionally allow and determine monetary compensation in other places where non-proprietary compensation does not make sense and in cases in which non-proprietary compensation would not be fair for natural or legal persons (article 1100, paragraph 3 of the ZOO).

Monetary compensation for non-proprietary damage, therefore, as an exception to the rule (**Baretić, M, 2006**), according to our ZOO, must, as stated, be fair (article 1100, paragraph 1 of the ZOO). Therefore, the provision of paragraph 2 of the same article ("When deciding on the amount of fair monetary compensation, the court will take into account the strength and duration of the damages caused by the violation...") is an unnecessary recurrence of the old ZOO 1978, because in the new conception of non-proprietary damage it can only depend on the degree of violation of personality rights (**Radolović, A, 2007**).

6. CONCLUSION

The paper analysis indicates that the introduction of the right of personality of a legal person (article 19 of the ZOO) and liability for non-proprietary damage due to breach of contract (article 346, paragraph 1 of the ZOO) into the Croatian ZOO 2005 did not occur by chance. The drafters of the ZOO had no domestic social incentive for this, but they obviously acted correctly, knowing contemporary European trends in the field of personality rights.

Admittedly, the same was indirectly influenced by some sociological factors in Croatian society at the beginning of the 21st century (those factors which in the developed world are actually prerequisites for a stronger development of personality rights): the higher level of economic development of Croatian society (1), a clear, stronger and more stable legal system (2), a period of mild social conflicts (3), a higher level of development of the social sphere of life: culture, science, art (4) and continuity (not discontinuity) in the general development of our country (5).

In addition to these indirect sociological factors, some significant legal factors (actually trends in non-proprietary matters of civil law in Europe and the world) contributed much more to the introduction of the subject institutes into Croatian law: 1. the general “expansion” of the non-proprietary part of civil law (personality rights), 2. progress in personality rights of the legal persons and 3. newer (modern) understandings of the cause of legal affairs (especially the subjective *causa finalis*).

The two new institutes in question in ZOO 2005 may be somewhat “ahead of their time” when it comes to the Croatian legal system, but at the same time they indicate the direction of movement (development) of personality rights in the Republic of Croatia. The only, still current and essential, lack of provisions of the ZOO on personality rights is that they do not specify the content of individual personality rights, so it is still “in the zone” where interpretation is needed. The same in theory makes it difficult to properly construct (individual or plural) personality rights and even more difficult to apply personality rights in practice. However, this does not diminish the positive progress of the existing legal regulation in relation to the period before (the adoption of the ZOO) 2005.

On the Croatian legal-economic and legal-political scene, however, more work should be done on the social and market “reorientation” of both physical and legal persons (and ultimately the courts) because this is a key assumption for the general development of personality rights in practice. Only legal entities (especially trading companies, but also others) who live on the market and from the market will have an interest in defending their personal rights as well.

The same applies to non-proprietary damage due to breach of contract. Therefore, the paper particularly emphasizes the issue of the cause of legal affairs. Namely, one must understand the mixed objective-subjective conception of the cause where, without the latter, the construction of liability for damage due to breach of contract is not possible (especially significant in the case of violation of personality rights).

The repair of this damage follows the general rules of the ZOO; it is hereditary in nature (**Matijević, B, 2019; Bukovac Puvača, M, 2007**) and follows the general attitude (developed in parallel by doctrine and practice): in the right of personality as a “non-proprietary part” of civil and commercial law, non-proprietary repair is in principle carried out (publication of the verdict, correction, apology, withdrawal of statement and the like). Only in the case of physical injuries does it make sense to give proprietary (material, monetary) satisfaction and elsewhere (but only there) where non-proprietary satisfaction cannot have a real effect.

The issue of compensation for non-proprietary damage through property satisfaction is still the subject of theoretical discussions in two important segments (**Ćurković, M, 2012**): 1. how "broadly" to recognise the right to compensation for damage and 2. how to determine the criteria for calculating the monetary amount of compensation.

The right to personality as a whole, and also in relation to the two subject institutes, requires, almost as a rule, very often efficient (quick, sometimes urgent) and, at the same time, legal and judicial proceedings. Such an apparently "impossible mission" is still possible, but it requires judges specially trained in the personality law field. Urgent action is very often necessary in the rights of personality, and it always requires special legal caution because an urgent measure often consumes the claim. However, a well-educated judge in personality law will be able to correctly weigh when to determine such a measure.

Of the valid regulations in the Republic of Croatia, this work is "based" mainly on the provisions of the ZOO 2005. This, however, is not the only regulation or source of law relevant for compulsory law, as there are others (which regulate public transport, hotel services, labour relations and the like). These regulations aim to encourage debtors to improve the quality and timeliness of services (this applies especially to road, rail and air transport). There is a tendency to "tariffise" or "flat rate" compensation and even neglect the non-proprietary component (personality rights). The problems of "tariffing" when determining (monetary) compensation for non-proprietary damage were also dealt with in Croatian literature recently (**Crnić, I, 2012; Matic and Baretić, 2021**).

ZOO is not, in the constitutional sense, any "code" and other acts of obligatory law do not have to be in accordance with it. They must, however, be in accordance with the Croatian Constitution from 1990 as the highest regulation which - among other things - determines personality and human dignity as constitutional values (article 22, paragraph 1 and article 35 of the Constitution). These constitutional provisions are the very origin of the right to personality, which was created and develops precisely on that (constitutional) basis.

The right of personality, as was pointed out earlier, is actually a legal doctrine from which the right of personality of a legal person results in responsibility to it for non-proprietary damage due to breach of contract.

Two important objections may be raised to the concept of personality rights of a legal person and the right to compensation for non-proprietary damages due to breach of contract presented here:

1. that the ZOO from 2005, in article 273, paragraph 2, does not provide a definition of the subjective cause that is highlighted in this paper,
2. that the goals of the subjective cause (in the aforementioned hypothetical and practical similar examples) can be set in the contract as a termination condition (article 297, paragraph 2, ZOO).

The first objection probably arises due to the failure of the editors of the ZOO to more clearly present an alternative situation and that a permissible motive (motive, *causa initialis*) of one party which was accepted by the other contracting party forms an integral part of the contract. However, with the correct interpretation of the same provision, it can still be read clearly.

The same applies to the termination condition. Subjective cause is not a termination condition. The authorized contracting party does not even want to terminate the contract in case of non-fulfilment of the subjective cause. He wants compensation for non-proprietary damage. All of the above does not mean that the contracted subjective cause is the only assumption of compensatory liability for non-proprietary damage due to breach of contract. Formulation from article 346, paragraph 1 of the ZOO (“...and fair compensation for non-proprietary damage, which the debtor had to foresee at the time of concluding the contract as possible consequences of breach of contract, and considering the facts that were known to him at the time or must have been known.”) clearly indicates that under these conditions the creditor will have the right to compensation for non-proprietary damages due to breach of contract even if the subjective cause is not contracted.

However, the contracted subjective cause makes it easier and faster to realise the right to compensation for damages, because in that case it is enough for the creditor to simply refer to the contract (and its provisions), since the subjective cause is an integral part of the contract.

Given that, according to the ZOO from 2005, non-proprietary damage is the same as violation of personality rights (article 1046) and it will always be very important to know which personality right has been violated. It is relatively easy for a natural person, but a legal person would not be able to exercise the right to compensation for non-proprietary damage if article 19, paragraph 3 of the ZOO did not recognise the capacity of the holder of personality rights.

In conclusion, despite the great progress in the legislative regulation of the two institutes in question in Croatian law, Croatian courts and judges should apply the norm of article 346, paragraph 1 of the ZOO with a high degree of “caution” and not “lightly” award compensation for non-proprietary damage. Moreover, in cases where, nevertheless, they do award

it - they should represent a great step forward in recognising the right of personality and protecting the dignity of the injured subjects. Until now, when determining the amount of compensation for non-proprietary damage (for both contractual and non-contractual liability for damage), Croatian courts, as a rule, determined only "symbolic" amounts of compensation, which was not the meaning of the new understandings of the subject institutes regulated by the ZOO and analysed here in this work.

Looking at all the conclusions reached in this paper, it should be especially emphasised that in the context of the development of the two institutes mentioned above, it is very important for the reader of this paper, and especially for the lawyers who deal with the matter, to understand the existence of these institutes in Croatian law, their solutions and mutual relationship and ultimately the legal protection they provide to citizens and business entities.

BIBLIOGRAPHY

Books and articles

1. Babić, S., *Odgovornost uprave za štetu prouzročenu trgovačkom društvu*, Hrvatska pravna revija, Inženjerski biro d.d., god. 14, 1/2014, pp. 37-48.
2. Balcarczyk, J., *O pravima na sportski imidž (Sports image rights - a comparative overview)*, Zbornik radova Pravnog fakulteta u Splitu, god. 47, 2/2010, pp. 327-334.
3. Baretić, M., *Pojam i funkcije neimovinske štete prema novom Zakonu o obveznim odnosima*, Zbornik Pravnog fakulteta u Zagrebu, god. 56, posebni broj, 2006, pp. 461-500.
4. Boban, M., *Pravo na privatnost i pravo na pristup informacijama u suvremenom informacijskom društvu*, Zbornik radova Pravnog fakulteta u Splitu, god. 49, 3/2012, pp. 575-598.
5. Bukovac Puvača, M., *Deset godina nove koncepcije neimovinske štete*, Zbornik Pravnog fakulteta Sveučilišta u Rijeci, god. 36, 1/2015, pp. 157-180.
6. Bukovac Puvača, M., *Funkcije pravične novčane naknade u hrvatskom odštetnom pravu*, Zbornik Pravnog fakulteta Sveučilišta u Rijeci, god. 37, 1/2016, pp. 155-173.
7. Bukovac Puvača, M., *Trend proširenja kruga osoba s pravom na novčanu naknadu u poredbenom i našem pravu kao oblik popravljavanja neimovinske štete u slučaju smrti bliske osobe*, Zbornik Pravnog fakulteta Sveučilišta u Rijeci, god. 28, 1/2007, pp. 511-540.
8. Cigoj, S.; Blagojević, B. i Krulj, V., *Komentar Zakona o obligacionim odnosima*, 2. izdanje, Savremena administracija, Beograd, 1983.
9. Crnić, I., *Značenje orijentacijskih kriterija Vrhovnog suda Republike Hrvatske za dosudu pravične novčane naknade neimovinske štete*, Zbornik Pravnog fakulteta u Zagrebu, god. 62, 5-6/2012, pp. 1715-1730.
10. Ćurković, M., *Talijanski sustav naknade neimovinske štete*, Zbornik Pravnog fakulteta u Zagrebu, god. 62, 5-6/2012, pp. 1579-1598.
11. De Cupis, A., *I diritti della personalità*, A. Giuffrè, Milano, 1982.
12. Dropulić, J., *Pravo na osobno ime*, Hrvatska i komparativna javna uprava: časopis za teoriju i praksu javne uprave, god. 6, 3/2006, pp. 121-137.
13. Galgano, F., *Diritto privato*, A. Giuffrè, Milano, 1972.
14. Gavella, N., *Osobna prava I. dio*, Pravni fakultet Sveučilišta u Zagrebu, Zagreb 2000., pp. 27-30.
15. Gavella, N., *Povreda prava na privatnost, posebno na vlastiti lik, glas, osobne zapise i pisma*, poglavlje u knjizi: *Odgovornost za neimovinsku štetu zbog povrede prava osobnosti*, Grubić, V. (ur.), Narodne novine, Zagreb, 2006., pp. 73-134.
16. Gavella, N., *Privatno pravo*, Narodne novine, Zagreb 2019., pp. 6-13.
17. Gorenc, V. i suradnici, *Komentar ZOO*, Narodne novine, Zagreb, 2014.
18. Hubmann, H., *Das Persönlichkeitsrecht*, Böhlau, Köln-Graz, 1967.

19. Jakovljević, D., *Neimovinska šteta prouzročena informacijom objavljenom u medijima*, *Pravnik: časopis za pravna i društvena pitanja*, god. 51, 101/2017, pp. 21-42.
20. Jerončić Tomić, I.; Mulić, R. i Milišić Jadrić, A., *Utjecaj društvenih mreža na samopoštovanje i mentalno zdravlje mladih*, In *medias res*, god. 9, 17/2020, pp. 2649-2654.
21. Kačer, H., *Tri novote iz novog koncepta neimovinske štete po Zakonu o obveznim odnosima iz 2005.*, *Zbornik Pravnog fakulteta u Zagrebu*, god. 62, 5-6/2012, pp. 1491-1511.
22. Klarić, P., *Zakon o obveznim odnosima*. Narodne novine, Zagreb, 2005.
23. Klarić, P. i Vedriš, M., *Građansko pravo*, Narodne novine, Zagreb, 2006., pp. 589-591.
24. Klarić, P., *Nematerijalna šteta pravne osobe*, *Zbornik Pravnog fakulteta u Zagrebu*, god. 45, 4-5/1995, pp. 408.; svrha radi koje je pravna osoba osnovana daje okvire za zaštitu njezina prava osobnosti.
25. Klarić, P., *Odgovornost za neimovinsku štetu zbog povrede ugovora o organiziranju putovanja*, *Zbornik Pravnog fakulteta u Zagrebu*, god. 56, posebni broj, 2006, pp. 381-400.
26. Klarić, P., *Odštetno pravo*, Narodne novine, Zagreb 2003.
27. Larenz, K., *Lehrbuch des Schuldrechts - I (Erster Band)*, 11. Auflage, Allgemeiner Teil, C.H. Beck'sche Verlagsbuchhandlung, München, 1976, pp. 342-346.
28. Matic, Z. i Baretić, M., *Izazovi postavljanja tužbenog zahtjeva u slučaju povrede prava osobnosti tjelesnom ozljedom*, *Zbornik Pravnog fakulteta u Zagrebu*, god. 71, 5/2021, pp. 619-644.
29. Matijević, B., *Nasljeđivanje tražbine naknade neimovinske štete - s osvrtom i na talijansko pravo*, *Hrvatski časopis za osiguranje*, god. 1, 2/2019, pp. 61-76.
30. Mirković, M., *Glavni nosioci gospodarske zaostalosti slavenskih naroda*. Dom i svijet, Zagreb 2008., (doktorska disertacija iz 1923.).
31. Napijalo, D., *Naknada neimovinske štete zbog povrede ugovorne obveze (Rušenje dogme o imovinskom karakteru ugovora)*, *Odvjetnik (časopis HGK)*, Zagreb, god. 68, 3-4/1995, pp. 103-109.
32. Nass, G., *Person, Persönlichkeit und juristische Person*, Duncker & Humblot, Berlin, 1964.
33. Nikšić, S., *Kauza obveze i srodni instituti u poredbenom pravu*, *Zbornik Pravnog fakulteta u Zagrebu*, god. 56, 4/2006, pp. 1057-1102.
34. Nikšić, S., *Utjecaj razloga na preuzimanje obveze na valjanost pravnih poslova*, *Zbornik Pravnog fakulteta u Zagrebu*, god. 56, 6/2006, pp. 1809-1846.
35. Perlingieri, P., *La personalità umana nell'ordinamento giuridico*, Jovene, Camerino, Napoli, 1972.
36. Perović, S., *Obligaciono pravo*, Službeni list SFRJ, Beograd, 1976.
37. Pichler, D., *Problematika opsega naknade neimovinske štete zbog povrede poslovnog ugleda pravne osobe javnog prava*, *Zbornik radova Veleučilišta u Šibeniku*, god. 9, 3-4/2015, pp. 7-23.

38. Prančić, V., *Pravo na ispravak objavljene informacije i pravo na odgovor na objavljenu informaciju prema Zakonu o medijima*, Zbornik Pravnog fakulteta u Zagrebu, god. 58, 5/2008, pp. 1231-1280.
39. Proso, M. i Štambuk-Šunjić, M., *Principi europskog ugovornog prava s osvrtom na ugovornu odgovornost za neimovinsku štetu prema novom ZOO-u*, Zbornik radova Pravnog fakulteta u Splitu, god. 45, 4/2008, pp. 901-914.
40. Proso, M., *Pravo na publicitet u sportu*, Zbornik radova Pravnog fakulteta u Splitu, god. 52, 4/2015, pp. 1069-1086.
41. Radolović, A., *Naknada neimovinske štete zbog povrede ugovora*, Zbornik radova: Naknada štete u primjeni novog Zakona o obveznim odnosima, Narodne Novine, Zagreb, 2005., pp. 73-117.
42. Radolović, A., *Odnos prava osobnosti i medijskog prava*, Zbornik Pravnog fakulteta Sveučilišta u Rijeci, god. 28, 1/2007, pp. 267-315.
43. Radolović, A., *Pravni poslovi prava osobnosti*, Zbornik Pravnog fakulteta Sveučilišta u Rijeci, god. 35, 1/2014, pp. 95-118.
44. Radolović, A., *Pravo ličnosti kao kategorija građanskog prava*, doktorska disertacija, Pravni fakultet Zagreb, 1985.
45. Radolović, A., *Pravo osobnosti u novom Zakonu o obveznim odnosima*, Zbornik Pravnog fakulteta Sveučilišta u Rijeci, god. 27, 1/2006, pp. 129-170.
46. Radolović, A., *Specifični postupnovopravni problemi u zaštiti prava osobnosti*, Zbornik Pravnog fakulteta u Zagrebu, god. 63, 3-4/2013, pp. 695-715.
47. Radolović, O., *Contractual Liability of the Guest for Damage in Direct Hotel-keeper's Contract (Ugovorna odgovornost gosta za štetu u izravnom ugovoru o hotelskim uslugama)*, Ekonomska Istraživanja, Odjel za ekonomiju i turizam Sveučilišta u Puli, god. 23, 1/2010, pp. 97-114.
48. Radolović, O., *Hotel Guest's Privacy Protection in Tourism Business Law*, Interdisciplinary Management Research VI, Osijek, god. 6, 1/2010, pp. 699-708.
49. Radolović, O., *Odgovornost ugostitelja za štetu zbog povrede obveza iz izravnog ugovora o hotelskim uslugama*, Zbornik Pravnog Fakulteta u Rijeci, god. 30, 2/2009., pp. 1034-1080.
50. Slakoper, Z., *Odgovornost dužnika za štetu zbog povrede ugovora*, Zbornik Pravnog Fakulteta u Rijeci, god. 23, 1/2002., pp. 113-143.
51. Stone, G.J. i Ineson, E., *Razvoj osobnosti i management u hotelijerstvu (Personality and hospitality management development)*, Tourism and hospitality management, god. 4, 2/1998, pp. 373-382.
52. Šokčević, S., *Zaštita dostojanstva i zdravlja radnika - zaštita od maltretiranja na radu i u vezi s radom*, Sigurnost: časopis za sigurnost u radnoj i životnoj okolini, god. 58, 1/2016, pp. 1-18.

Legal acts

1. *Codice Civile* - Talijanski građanski zakonik (1942).
2. Ustav Republike Hrvatske, Narodne novine, br. 56/90, 135/97, 08/98, 113/00, 124/00, 28/01, 41/01, 55/01, 76/10, 85/10, 05/14.

3. Ustav Socijalističke Federativne Republike Jugoslavije, Službeni list SFRJ, br. 9/1974.
4. Zakon o autorskom pravu i srodnim pravima, Narodne novine, br. 111/21.
5. Zakon o Državnom sudbenom vijeću, Narodne novine, br. 116/10, 57/11, 130/11, 13/13, 28/13, 82/15, 67/18, 126/19, 80/22, 16/23.
6. Zakon o medijima, Narodne novine, br. 59/04, 84/11, 81/13, 114/22.
7. Zakon o obveznim odnosima, Narodne novine, br. 35/05, 41/08, 125/11, 78/15, 29/18, 126/21, 114/22, 156/22.
8. Zakon o obveznim odnosima, Službeni list SFRJ br. 29/78, 39/85, 57/89, Narodne novine, br. 53/91, 73/91, 111/93, 3/94, 107/95, 7/96, 91/96, 112/99, 88/01, 35/05 (na snazi od 01.10.1978. do 31.12.2005.).
9. Zakon o sudovima, Narodne novine, br. 28/13, 33/15, 82/15, 82/16, 67/18, 126/19, 130/20, 21/22, 60/22, 16/23.
10. Zakon o trgovačkim društvima, Narodne novine, br. 111/93, 34/99, 121/99, 52/00, 118/03, 107/07, 146/08, 137/09, 125/11, 152/11, 111/12, 68/13, 110/15, 40/19, 34/22, 114/22, 18/23.
11. Zakon o udruženom radu, Službeni list SFRJ, br. 53/1976, 57/1983, 85/1987, 6/1988, 77/1988, 40/1989, 60/1989.

Court law

1. Odluka Vrhovnog suda SR Hrvatske, Rev 985/88 od 24.11.1988.
2. Presuda Županijskog suda u Zagrebu, Gž 5673/2015 od 02.10.2015.
3. Presuda Općinskog suda u Čakovcu, P 47/2016 od 10.01.2017.
4. Presuda Županijskog suda u Zagrebu, Gž 1709/2022 od 13.09.2022.
5. Presuda Općinskog suda u Kutini, Pn 40/2021 od 21.09.2022.
6. Presuda Županijskog suda u Splitu, Gž 1218/2022 od 13.02.2023.

IN SEARCH OF A STRATEGY FOR REGULATING DIGITAL TOURISM PLATFORMS: WHAT IS THE ROLE OF PRIVATE ENFORCEMENT MECHANISMS IN FACING CRITICAL ISSUES IN THE SHORT-TERM RENTAL MARKET?

ALESSANDRO PALMIERI

University of Siena

Department of Law

Siena, Italy

alessandro.palmieri@unisi.it

Paper Category: Preliminary scientific paper

ABSTRACT

It is almost unanimously acknowledged that in the last decade, alongside the emergence of the so-called ‘app economy,’ digital tourism platforms have disrupted the traditional tourism industry. The present paper deals with the activities performed by this kind of intermediary, investigating, in particular, the short-term accommodation services offered through electronic platforms intended to connect, for remuneration, potential guests with professional or non-professional hosts. With the spread of this service, critical issues have been identified in terms of residents’ quality of life, working conditions, housing market, and urban structure. Due to the above-mentioned concerns, and also due to the need to preserve the competitiveness of the markets in which these platforms operate, the idea of introducing new regulations specific to them has emerged. In the light of the EU legislative framework, there is not much room for manoeuvre for national authorities if they aspire to regulate the phenomenon relying entirely on tools designed for services of the pre-digital era. Indeed, the CJEU held that the intermediation service for short-term accommodation must be classified as an ‘information society service’, since neither that intermediation service, nor the ancillary services offered by the provider, make it possible to establish the existence of a decisive influence exercised by that company over the accommodation services to which its activity relates, with regard both to determining the rental price and selecting the hosts or accommodation for rent. Notwithstanding the limits set forth in the relevant provisions of EU law, the major tourism European cities have adopted regulations aimed at mitigating the negative effects produced by the platform-mediated ‘overtourism.’ But these efforts would be ineffective in the absence of adequate private enforcement mechanisms which should not be regarded as simple add-ons to the public regulatory regime system. A special emphasis must be put on collective redress actions, which are likely to have strong deterrence effects.

Keywords: Platforms, Regulation, Short-term rental

1. INTRODUCTION

Many voices in the political debate at the global level seem to be in favour of a more rigorous regulation of the platform economy. The excessive power of the largest online platform has raised serious concerns, not only amongst policymakers, but also in the legal scholarly literature. In this scenario, even some fundamental rights are deemed to be at peril. For instance, the people's ability to freely self-determine is seen as capable of being violated by the algorithmic control strategies implemented by digital platforms (Pisani, 2024).

The changes in social and economic dynamics are exemplified by the digital tourism platforms, particularly those which specialise in the sector of short-term rentals, a type of tourist service that produces a significant impact on the everyday life of the community where the properties are rented, affecting its development prospects. Such specialised platforms have grown amazingly fast and in a remarkable way. The tumultuous growth has also led to significant opposition (Koster et al., 2021). Decision-makers all over the world are called to respond to these challenges, but it is not an easy task, due to various motivations. The market for short-term rentals is evolving and progressing. Regulatory efforts could crystallise the situation. Furthermore, although a position of strength can be observed, it has been said that the leader in the provision of short-time rentals plays a significant role in the competitiveness of the overall accommodation sector (Zekan & Gunter, 2022).

It is remarkably interesting to take a look at the European Union, and its peculiar approach towards the phenomenon under scrutiny. Indeed, at the EU level, as well at the national level (and sometimes at the infranational level), contradictions become manifest. The intent is to regulate clashes with opposing interests, which are also taken into account by EU primary and derivative legislation.

2. THE GENERAL FRAMEWORK

In the digital age we are living in, platform-mediated tourism has expanded and developed quickly. Indeed, some commentators speak of 'platformisation of tourism' (Capineri & Romano, 2021; Tuomi & Ascensão, 2023); and this kind of phenomenon is incentivised by the increase in the appeal of urban destinations, "given their demographic and social characteristics and their agglomeration economies"» (Garay Tamajón et al., 2022). Indeed, platformisation is a broad concept, which plays a central

role in the digital economy as a whole, and in its various sectors (Nieborg et al., 2023). In the field of tourist services it has been recently referred to as “the proliferation of digital platforms in tourism operations, starting with distribution but later extending also to other areas of business operations” (Turnšek & Radivojević, 2025).

Focusing on the short-term rental sector in the EU, official statistics have shown that, only in the first half of 2022, guests spent around 199 million nights in such accommodations booked via the most important private ‘collaborative’ economy platforms. This ‘explosion’ created – especially in some locations – critical issues, in terms of residents’ quality of life, working conditions, housing market, and urban structure, yet new forms of social injustice have emerged, and others threaten to materialise in the near future. In this regard, in an article devoted to platform-mediated tourism, it has been observed that “tourism platforms are therefore discussed as drivers of commodification, consumption, and financial speculation over social goods that feed the industry: private homes, public spaces and neighbourhoods” (Minoia & Jokela, 2021).

However, not everything is bad. For instance, some authors have argued that some positive effects are likely to be obtained, for the benefits of hotel managers, and indirectly of consumers; according to this view, “as the offer of short-term rental accommodation increases, so does the technical efficiency of hotels. These hotels seem to make better use of their productive resources to maximise the number of overnight stays by customers. Although many hotels might see short-term rentals as a potential threat to their business model, the results of this study actually reveal the potential complementary effect of short-term rentals”; furthermore, the attraction of international tourists, characterised by “greater purchasing power and higher daily expenditure [...] could positively influence the profitability of local hotels” (Casado-Díaz & Sellers-Rubio, 2021). Moreover, it has to be taken into account that one of the leaders in the provision of these services has also conceived an expansion strategy towards related services based on immersive activities offered by local hosts. This could also favour the rise of new entrepreneurs.

A recent study, carried out in Italy, has focused on the way in which overtourism in some Italian cities is influenced by accommodation platforms which facilitate short-term rentals (Celata & Romano, 2022). The essay has shown that those platforms may be a crucial factor for explaining the excessive growth of tourist in city centres. Overtourism generated by platform has an impact that goes beyond the fact that the streets, and other public spaces, have become incredibly crowded. Probably the main problems

are the following: on the one hand, one can see that a significant number of residential units are being converted into apartments or houses managed only (or for the most part) for touristic purposes; and, on the other hand, cities (mainly historical areas and those with a high density of food and drink facilities) are being 'deprived of their soul'. The figures dramatically show this trend. For instance, in Rome this is happening in several neighbourhoods, such as the iconic Trastevere.

There is a shared feeling that regulation is needed in this field. However a question arises: how, and to what extent, to enforce binding legal rules, avoiding the risk to neutralise the perceived benefits? Moreover, when we come to consider European legal systems, the analysis cannot ignore keeping in mind the European Union basic principles, which include the freedom to provide services, currently set out by Article 56 of the Treaty for the Functioning of European Union (Chalmers et al., 2024).

3. THE EU APPROACH

In the framework of their efforts to promote e-commerce, EU institutions enacted in 2000 a provision – namely Article 3(2) of Directive 2000/31/EC (so-called E-commerce Directive) – that prevented national legislatures from restricting the freedom to provide information society services from another Member State as long as such restrictions are dictated by “reasons falling within the coordinated field”.

In 2018, the Court of Justice of the European Union (CJEU) was requested by a French Regional Court, in a criminal case brought against Airbnb Ireland, to answer the following questions: 1) Do the services provided in France by the said provider, via an electronic platform managed from Ireland, benefit from the freedom to provide services established in Article 3 of Directive 2000/31/EC? 2) Are the restrictive rules relating to the exercise of the profession of a real estate agent in France enforceable against the aforementioned company?

The CJEU, in its judgment delivered on 19 December 2019, held that an intermediation service which, by means of an electronic platform, is intended to connect, for remuneration, potential guests with professional or non-professional hosts offering short-term accommodation services, while also providing a certain number of services ancillary to that intermediation service, must be classified as an ‘information society service’ under Directive 2000/31/EC. The ruling has received a great deal of attention. Many comments have been published in European law journals (Huet, 2020; Tenenbaum, 2020; Grozdanovski, 2020; Douville & Gaudin, 2020; Van Cleynenbreugel,

2020a; Van Cleynenbreugel, 2020b; Van Acker, 2020; Anderl, 2020; Blockx, 2020; Brunessen, 2021; Colombo & Goanta, 2021).

In particular, the Kirchberg judges excluded any similarity with the online platform providing services in the context of urban passenger transport, which in previous decisions (judgments of 20 December 2017, *Asociación Profesional Elite Taxi*, and of 10 April 2018, *Uber France*) they regarded as an integral part of an overall service whose main component is a service coming under another legal classification. Indeed, in respect of that service, it was ascertained that the company which manages the platform exercised decisive influence over the conditions under which transport services were provided by the non-professional drivers using the application made available to them by the said company. On the contrary, according to CJEU, it cannot be said that Airbnb Ireland exercises such a decisive influence over the conditions for the provision of the accommodation services to which its intermediation service relates, particularly since Airbnb Ireland does not determine, directly or indirectly, the rental price charged, and it does not select the hosts, or the accommodation put up for rent on its platform. The judgment we are dealing with observed that it would not be sufficient to prefer a different interpretation; the mere existence of an optional tool capable of being used by the hosts to estimate their rental price having regard to the market averages taken from the same platform, because the final responsibility for setting the rent is left to the host alone.

What is the main outcome of this decision? The first and most important consequence is that, all over the EU, national decision-makers have a limited scope of intervention in regulating the above said service.

What has been said so far does not mean that EU institutions are not interested in the phenomenon. They approached the issue from the transparency perspective, in a rather pragmatic way, since they believe that the significant increase of short-term accommodation rental services, across the Union, pushed by platform operators, is capable of creating many opportunities for guests, hosts and the entire tourism ecosystem.

Bearing in mind the objective of ensuring “the fair, unambiguous and transparent provision of short-term accommodation rental services within the internal market, as part of a balanced tourism ecosystem that provides opportunities for platforms while respecting public policies objectives”, the European Parliament and the Council of the European Union, on 11 April 2024, enacted the Regulation (EU) 2024/1028, on data collection and sharing relating to short-term accommodation rental services. This piece of legislation, published in the Official Journal of the European Union on 29 April 2024, will be applicable from 20 May 2026. Members States are called on

to identify some areas within their territory where a registration procedure shall apply (according to Article 3, point 8, this consists of a “procedure by which hosts must provide specific information and documentation to the competent authorities in order to obtain a registration number enabling them to offer short-term accommodation rental services through online short-term rental platforms”). With respect to such platforms, we find several provisions imposing specific duties. Among others, these firms will be obliged to: (A) design and organise their online interface in a way that requires hosts to self-declare whether the unit offered for short-term accommodation rental services is located in an area where a registration procedure has been established or applies; (B) design and organise their online interface in a way that, when hosts declare that a unit offered for short-term accommodation rental services is located in an area where a registration procedure has been established or applies, users are able to identify the unit through a registration number, and ensure that hosts have provided a registration number prior to allowing the offering of the short-term accommodation rental services in respect of that unit, and that hosts display that registration number clearly as part of their reference published on the platform’s website; (C) make reasonable efforts to randomly check on a regular basis declarations of the hosts concerning the existence or not of a registration procedure; (D) inform, without undue delay, the competent authorities and the hosts of the results of the said random checks, concerning incorrect declarations of hosts, the misuse of a registration number, or invalid registration numbers; (E) inform hosts adequately of the applicability in a given area of registration procedures; (F) when the reference published on the platform’s website concerns a unit located in a ‘sensitive’ area, collect and, on a monthly basis, transmit to the single digital entry point of the Member State where the unit is located, activity data per unit, together with the corresponding registration number as provided by the host, the specific address of the unit and the URL of the reference.

More recently, in four judgments delivered on 30 May 2024 (joined cases C-662/22 and C-667/22, *Airbnb Ireland and Amazon Services Europe*; case C-663/22, *Expedia*; joined cases C-664/22 and C-666/22, *Google Ireland and Eg Vacation Rentals Ireland*; C-665/22, *Amazon Services Europe*), the CJEU reaffirmed the limited scope of Member States’ margins of manoeuvre when confronting the providers of online intermediation services. In these decisions distinct types of platforms were involved, including those which allow travellers to interact with owners and managers with a view to leasing their property. Summarising, the CJEU held that: (a) Article 3 of Directive 2000/31/EC must be interpreted as precluding measures adopted by a

Member State, with the stated aim of ensuring the adequate and effective enforcement of Regulation (EU) 2019/1150 of the European Parliament and of the Council of 20 June 2019 on promoting fairness and transparency for business users of online intermediation services under which, on pain of penalties, providers of online intermediation services established in another Member State are subject, with a view to providing their services in the first Member State, to the obligations: (a1) to be entered in a register maintained by an authority of that Member State; (a2) to communicate to that authority certain detailed information about their organisation; (a3) to send periodically to an authority of that Member State a document relating to their economic situation, in which it is necessary to set out a large amount of information relating, in particular, to the revenues of the service provider; (a4) to pay a financial contribution to that authority; (b) Regulation (EU) 2019/1150 must be interpreted as meaning that it does not justify, with a view to the adequate and effective implementation of that regulation, the adoption of measures by a Member State under which, on pain of penalties, providers of online intermediation services are subject, with a view to providing their services in that Member State, to the obligation to send periodically to an authority of that Member State the aforementioned document.

4. THE MEASURES TAKEN BY LOCAL REGULATORS

There are at least two factors that provide incentives for local authorities (municipal or sometimes regional) to introduce some obligations and limits to the intermediation activities for short-term rental offered in the area subject to their jurisdiction. The first one is the aforesaid poor activism of national regulators, whose possible initiatives are under the magnifying glass of the EU institutions and so tend to remain inert. The second reason is that, by definition, local authorities are closer to the situation in their domain, and in theory are in the best position to set priorities; at the same time, they are subject to pressure from citizens or specific groups of individuals, and from firms which operate in the tourism sector in the relevant area. This last factor is not limited to the EU context; one cannot ignore that many cities in the United States have made their moves, worried by the so-called financialisation of housing (Hoffman & Schmitter Heisler, 2021). There is no doubt that the financialisation of housing – described as “the growing dominance of financial actors in the housing sector which is transforming the primary function of housing from a place to live into a financial asset and tool for investor profits” (August, 2022) – is a global matter, although its

effects are more prominent in the areas affected by the great financial crisis that took place between 2007 and 2009 (Rolnik et al., 2024).

Focusing on Europe, there is no need to say that local authorities also have to abide with the EU rules in place. They are not immune from the provisions of the Treaties and from secondary legislation; they must comply with CJEU rulings (Kramer & Schaub, 2022). Yet, they are not meaningless in the framework of EU policy; in this regard, it has been said that “local government adds input and output legitimacy to European governance, and some local authorities have become proactive international players driving innovative policy agendas” (Guderjan & Verhelst, 2021). The same authors, in a subsequent short entry, attributed considerable importance to the fact that these authorities “are responsible for a wide range of social and economic tasks that are regulated by the EU, including environmental change, energy transition, the integration of refugees, healthcare and other essential public services” (Guderjan & Verhelst, 2023). A disparity of opinion may exist also among local and central authorities. When such a divergence exists, in many national jurisdictions the last word is up to the Constitutional Courts. For instance, in Italy quite recently a dispute involving the Autonomous Region of Valle d’Aosta – created after the Second World War, when the special linguistic and cultural orientation of that part of the country was acknowledged, and its newly enacted rules, has been adjudicated by the Constitutional Court. The judgment in this case (no. 94 of 24 May 2024) declared compatible with the Italian Fundamental Charter the provision of a Regional Act according to which the rental periods shall not exceed 180 days, but only in the case of “home-sharing arrangements”. However, the scope of this provision is not broad; if a host in that region rents a room in the place where he lives for more than 180 days, the contract with the guest is deemed to be valid and enforceable. The statutory provision passed the constitutionality test precisely because it does not affect contract law, since the infringement is relevant only for the purpose of urban planning legislation (Palmieri, 2024).

It is a matter of fact that local regulators are usually compliant, but sometimes they go beyond the limits set for them. State authorities, due to budget constraints, are not able to properly perform the surveillance activity. One of the risks is caused by the mass of local rule makers. It has been pointed out that “differences between cities might lead local authorities to make radically different regulatory choices as regards the short-term rental market” (Kramer & Schaub, 2022). The problem is exacerbated by the fact that, concentrating on Europe, instead of fragmentation, it could be useful to boost “regulatory coordination at the interregional and pan-European

levels” (Mendieta-Aragón et al., 2025). Some municipalities are also inclined to boost the aforesaid market. Another weakness of this approach is that, among the immense variety of local ordinances, only a negligible percentage is binding on online accommodation platforms; on the contrary, the usual targets are the hosts.

5. THE ROLE OF PRIVATE ENFORCEMENT

Even in the absence of the said limitations to the possibility that public enforcement mechanisms are fully deployed, there are several factors – as shown in other contexts – that would not allow adequate correction through such mechanisms of the possible market failures. In the field at stake, public enforcement needs to be complemented by private enforcement, especially when damages are thought to occur for the different players of the market, including those who can be labelled as consumers for the purposes of EU specific protective rules.

A successful class action is the one commenced in 2017, before the Canadian judges, against some companies of the Airbnb group, with the aim of obtaining a remedy for the guests (with exception of the ones reserving an accommodation primarily for business purposes) who booked accommodations that matched the parameters of a previous search they ran on the search results page of the platform, consisting of monetary compensation for the loss suffered due to the fact that they paid a price higher than another price expressed by the said entities (the so-called ‘double ticketing’). This was the notion of the class, as amended by the order of the Federal Court when it certified the action as a class proceeding (order of 5 December 2019). A settlement was reached on 27 August 2021, according to which the class members are eligible to obtain a single redeemable credit of a value of up to CAD \$45 each. The settlement was approved by the Federal Court of Canada with a judgment dated November 19, 2021. Consumers residing inside Quebec had to go through a separate settlement process in order to aspire to the same benefits.

Another non-individual claim, pursued in California against the same entrepreneur, is worth mentioning. Due to its potential repercussions for the San Francisco local community, an even greater impact could have been achieved with it, if successful. In that dispute, which took place from 2014 until 2017 – when the Court of Appeal of the State of California (First Appellate District, Division Five) finally resolved the case in favour of the defendants (*Gamache v. Airbnb, Inc.*, 2017 WL 3431651 (Cal. Ct. App. Aug. 10, 2017)) – the complaint had been filed by the plaintiffs on behalf of apartment tenants

who lived in residential buildings with units rented through Airbnb. The goal of the action was to obtain compensation for the loss suffered in respect of real property interests (diminution of value; deprivation, or limitation, of the use and enjoyment of property). However, in the background, there was also the belief that – as noted by the Court of Appeal – “increased short-term rentals in apartment buildings also “create security problems, increased foot traffic, and far more noise than would otherwise exist”; the short-term guests are “inconsiderate, destructive, violent, smoke in prohibited areas, [and] have more guests than allowed”. Therefore, the legal suit was partly intended to solve a social problem, highly felt in the area of San Francisco.

Many causes of action were alleged against the platform manager. The most relevant of them were ‘public nuisance’ and ‘private nuisance’. They are two traditional common law torts, which are described in the California Civil code as follows: “Anything which is injurious to health [...] or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property [...] . is a nuisance” (§ 3479); “A public nuisance is one which affects at the same time an entire community or neighbourhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal” (§ 3480); “Every nuisance not included in the definition of the last section is private” (§ 3481). However, the Court of Appeals came to the conclusion that the mere “facilitation of some number of short-term rentals in the plaintiffs’ building (which may or may not have involved renters who smoked more or made more noise than long-term tenants, does not render Airbnb a proximate cause of the alleged harms”; and the plaintiffs were not able to demonstrate that “Airbnb operated its online platform in a manner that encouraged the nuisance activity in any way”. Commenting on this decision, as well as others concerning the same geographical area, some authors have pointed out that not only short-term rental platforms generate negative externalities, but since they are not forced to “expend capital on precautions against these negative externalities, nor face the penalties of imposing them”, this results in the possibility of charging “far less for their services than the brick-and mortar companies in the lodging industry” (Carder et al., 2017).

Putting aside the negative outcome of the case just described, actions of this kind are susceptible to interacting with local initiatives, in order to induce the platform managers (fearing large compensation which would be added to heavy fines) to adopt corrective measures. The hope is that this will also be achieved in Europe, despite the cultural resistance to group actions,

in the light of the Directive (EU) 2020/1828, on representative actions for the protection of the collective interests of consumers.

6. CONCLUSION

The exponential growth of the market for the online intermediation services which facilitate short-term rentals of residential places, especially (but not exclusively) for touristic purposes, alongside uncharted opportunities for some of the market players, has generated a lot of problems and, consequently, a great bulk of literature. The attitude of national legislatures towards this phenomenon has been quite flat. The same can be said for supranational legislative bodies. This is true, in particular, for EU institutions, with an ‘aggravating circumstance.’ Yet, EU policies, since the first stages of the Digital Age and until today, reserve preferential treatment for any type of platform, including the ones involved in the business of short-term rentals. The situation is rendered even worse by the fact that regulation is not able to keep pace with technology. The recent EU legislation on data collection and sharing relating to short-term accommodation rental services, although it is an indicator of a possible reversal, is expected to have a quite limited impact.

The regulation gap left by legislatures can be filled only partly by local authorities. Nevertheless, the efforts of municipalities or regions may contribute to mitigate some critical issues. Private enforcement in this sector is still underdeveloped; a change of pace might help, primarily for the benefit of individuals who live in areas where the number of residential units rented for a brief period of time is substantial. Probably a combination of these measures would create a reaction that is not only symbolic. The role of private enforcement collective mechanisms seems very promising, due to the deterrence effect related to them. Such mechanisms should be promoted also in legal systems where they have been refused until the recent past. However, what is really needed is the preparation of new legal devices (or at least the adaptation of traditional devices as long as it is not superficial) to face the new challenges. In the light of the tremendous complexity of current scenarios, dominated by technological advancements, this task requires the establishment of a synergy between experts in multiple areas. It would be desirable for law scholars to begin this dialogue.

BIBLIOGRAPHY

1. Anderl A., 2021. *Zur Anwendung des Herkunftslandprinzips bei Onlineplattformen*. Ecolex, pp. 915-917.
2. August M., 2022. *The Financialization of Housing in Canada: a summary report for the Office of the Federal Housing Advocate*, June, p. 3.
3. Blockx J., 2020. *Het ene platform is het andere niet en de incidentele effecten van de Richtlijn Elektronische Handel*. Droit de la consommation, n° 127, pp.151-162.
4. Brunessen B., 2021. *La rationalisation des catégories juridiques relatives aux services numériques*. Revue trimestrielle de droit européen, n° 1, pp. 188-194.
5. Capineri C. and Romano A., 2021. *The platformization of tourism: from accommodation to Experiences*. Digital Geography and Society, 2, 100012. Available at: <http://dx.doi.org/10.1016/j.diggeo.2021.100012>.
6. Carder C., Chase E. and Burns S., 2017. *Legal Ambiguity as a Competitive Advantage: Airbnb's Use of Technological Novelty to Avoid Liability*. 46 Real Est. L.J. 352.
7. Casado-Díaz A.B. and Sellers-Rubio R., 2021. *The effect of short-term rentals on regional hotel efficiency*. Current Issues in Tourism, vol. 24, n. 21, pp. 2990-2995.
8. Celata F. and Romano A., 2022. *Overtourism and online short-term rental platforms in Italian cities*. Journal of Sustainable Tourism, 30(5), pp. 1020-1039.
9. Chalmers D., Davies G., Monti G. and Heyvaert V., 2024. *European Union Law: Text and Materials*, 5th ed., Cambridge University Press, pp. 704-746
10. Colombo C.M. and Goanta C., 2021. *Airbnb in the European Union: the theory and practice of interpreting elements of algorithmic governance: Case C-390/18 Airbnb Ireland*. European Journal of Risk Regulation, n° 3, pp. 724-734.
11. Douville T. and Gaudin H., 2020. *Service de la société de l'information, Airbnb bénéficie de la libre circulation*. La Semaine Juridique - entreprise et affaires, n° 1, pp. 44-49.
12. Garay Tamajón L.A., Lladós Masllorens J., Meseguer Artola A. and Morales Pérez S., 2022. *Analyzing the influence of short-term rental platforms on housing affordability in global urban destination neighborhoods*. Tourism and Hospitality Research. Available at: <https://doi.org/10.1177/14673584211057568>.
13. Grozdanovski L., 2020. *Les services fournis par les plateformes numériques: quelle qualification juridique pour quels enjeux?* Journal des tribunaux, pp. 449-455.
14. Guderjan M. and Verhelst T., 2021. *Local Government in the European Union. Completing the Integration Cycle*, Palgrave Macmillan.
15. Guderjan M. and Verhelst T., 2023. *Local government in the European Union: Completing the integration cycle*. Available at; <https://blogs.lse.ac.uk/europpblog/2022/02/13/local-government-in-the-european-union-completing-the-integration-cycle/>.
16. Hoffman L.M. and Schmitter Heisler B., 2021. *Airbnb, Short-Term Rentals and the Future of Housing*, Routledge, pp. 7-78.

17. Huet J., 2020. *Deux revirements de jurisprudence regrettables de la Cour européenne de justice: 2) La plateforme électronique d'intermédiation Airbnb rend un service de la société de l'information*. Revue des contrats, n° 2, pp. 50-51.
18. Koster H.R.A., van Ommeren J. and Volkhausen N., 2021. *Short-term rentals and the housing market: Quasi-experimental evidence from Airbnb in Los Angeles*. Journal of Urban Economics, vol. 124, 103356.
19. Kramer D. and Schaub M., 2022. *EU Law and the Public Regulation of the Platform Economy: The Case of the Short-Term Rental Market*. Common Market Law Review, 59(6), pp. 1633-1668.
20. Mendieta-Aragón A., Rodríguez-Fernández L. and Navío-Marco J., 2025. *Tourism usage of digital collaborative economy platforms in Europe: Situation, behaviours, and implications for the digital policies*. Telecommunications Policy, 49(1), 108274.
21. Minoia P. and Jokela S., 2021. *Platform-mediated tourism: social justice and urban governance before and during Covid-19*. Journal of Sustainable Tourism, pp. 1-15.
22. Nieborg D.B., Poell T. and van Dijck J., 2023. *Platforms and Platformisation*, in Flew T., Holt J. and Thomas J. (eds.), *The SAGE Handbook of the Digital Media Economy*, SAGE Publications, pp. 29-49.
23. Palmieri A., 2024. *Circa la fissazione, in Valle d'Aosta, di un tetto massimo alla durata dei periodi di home sharing per finalità turistiche*, ForoNews. Available at: <https://www.foroitaliano.it/news/2768/circa-la-fissazione-in-valle-d-aosta-di-un-tetto-massimo-alla-durata-dei-periodi-di-home-sharing-per-finalita-turistiche/>.
24. Pisani G., 2024. *The right to self-determination in the digital platform economy*. Computer Law & Security Review, vol. 53, 105964.
25. Rolnik R., Marín-Toro A. and Jasonson E., 2024. *The empire strikes back: the financialization of rental housing – a new frontier of accumulation and precarity*. Urban Geography, pp. 1-17.
26. Tenenbaum A., 2020. *La protection des parties faibles et les réglementations nationales professionnelles*. Revue des contrats, n° 3, pp. 121-124.
27. Tuomi A. and Ascensão M.P., 2023. *Deliberative governance for tourism platforms*, in *Annals of Tourism Research*, 103, 103647. Available at: <https://doi.org/10.1016/j.annals.2023.103647>.
28. Turnšek M. and Radivojević V., 2025. *Platformisation in Tourism: Typology of Business Models, Evolution of Market Concentration and European Regulation Responses*. Platforms, 3, 1.
29. Van Acker L., 2020. *The CJEU Finally Clears the Air(bnb) Regarding Information Society Services*. Journal of European Consumer and Market Law, pp. 77-80.
30. Van Cleynenbreugel P., 2020a, *Arrêt «Airbnb Ireland»: quel statut pour les plateformes en ligne en tant que prestataires de services?* Journal de droit européen, n° 3, pp. 110-113.
31. Van Cleynenbreugel P., 2020b, *Accommodating the freedom of online platforms to provide services through the incidental direct effect back door: Airbnb Ireland*. Common Market Law Review, n° 4, pp. 1201-1228.
32. Zekan B. and Gunter U., 2022. *Zooming into Airbnb listings of European cities: Further investigation of the sector's competitiveness*. Tourism Economics, 28(3), pp. 772-794.

REGULATING CRYPTO-ASSETS IN THE EU MiCA VS. MiFID: IS DELINEATION FEASIBLE UNDER ESMA DRAFT GUIDELINES?

IVANA PARAC

Croatian National Bank
Zagreb, Croatia
ivana.parac@hnb.hr

TOMISLAV JAKŠIĆ

University of Zagreb
Faculty of Law
Zagreb, Croatia
tomislav.jaksic@pravo.unizg.hr

Paper Category: Preliminary scientific paper

ABSTRACT

The Markets in Crypto Regulation (MiCA) was adopted in May 2023, with the purpose of regulating crypto-assets in a unified manner in the European Union. To date, EU legislation on crypto-assets has been almost non-existent. Admittedly, some types of crypto-assets have been regulated based on the fact that they fell within the scope of the existing Union legislation, e.g. crypto-assets with the features of financial instruments and certain provisions of the European Anti-Money Laundering legislation have also been applicable to crypto-assets. Facebook's (failed) initiative to inaugurate its stablecoin Libra made European legislators aware of the potential threat such crypto-assets could pose to financial stability. The MiCA Regulation is intended to foster innovation and level the playing field, while ensuring protection of crypto asset holders and keeping remaining technology neutral. The purpose of this paper is twofold; firstly, to clarify the novelties initiated through this regulation and, secondly, to indicate that the boundary between MiCA and MiFid is far from being clear and uncontroversial. To this end, analysis of conditions under which crypto-assets could qualify as shares in a company under MIFID II is given. Since the transposition of MiCA Regulation is still an ongoing process, i.e. implementation of transitional measures may be prolonged to June 2024 (in some cases until July 2026), this paper debates selected contemporary legal matters that will have significant impacts on the elevation of the European financial ecosystem. To that end, special attention is given to the delineation between MiCA and MiFid and its consequences on legal certainty as one of the proclaimed objectives of MiCA.

Key words: EU legislation, crypto-assets, distributed ledger technology, e-money tokens, asset referenced tokens, utility tokens, financial instruments, MiFid, transferrable securities, shares in a company

1. INTRODUCTION

The provision of financial services in the EU, as well as in the rest of the world, changed significantly in the past two decades as a result of digitalisation. New technologies undoubtedly changed the manner in which financial services are provided. Distributed ledger technology (DLT) and blockchain (as its subcategory) are frequently mentioned in that context. Although blockchain could be used for various purposes, crypto-assets remain its most prominent use case. There are many different definitions of crypto-assets, one being that they are digitally transferable representations of a value or a right, which differ from traditional assets in that the transactions are stored on a distributed ledger (van der Linden T. and Shirazi T., 2023).

In Europe crypto-assets have been unregulated at the Union level for a long period of time. As observed by some authors, such regulatory gaps created incentives for several Member States to introduce their own legal regimes for crypto-assets and to consequently open the door to potential regulatory arbitrage (Buttigieg C. and Cuyle S., 2020). Additionally, Facebook's Libra proposal in June 2019 (later renamed to Diem) prompted a vigorous debate about the EU regulation of crypto-assets. Some authors (Read and Schäfer, 2020) see the Libra project as the reason for the emergence of a harmonised framework for crypto-assets, not only in Europe but in other parts of the world as well.

The legal framework for crypto-assets in Europe, i.e. the MiCA Regulation, has been introduced as part of the European Digital Finance Package. On 24 September 2020, the European Commission adopted the said Digital Finance Package (European Commission, 2020), which included the digital finance strategy, retail payments strategy, crypto-assets legislative proposals and digital operational resilience legislative proposals. The MiCA Regulation was published in the Official Journal in June 2023 and came into force in the same month. The part of the MiCA Regulation concerning stablecoins is to be applied as of 30 June 2024 and the rest of the MiCA Regulation as of 30 December 2024.

The aim of the MiCA Regulation is to address some of the concerns raised with regards to the crypto-assets, regulatory gap being one of them. Even the choice of the legal instrument (i.e. regulation over directive) shows the clear intent of EU legislators to uniformly regulate the said subject matter across the EU. Some authors rightly conclude that the intention of the MiCA Regulation is to "fill a major regulatory gap and ensure a harmonised approach to crypto-assets across the EU Single Market" (Zetzsche D.A., Annunziata F., Arner D.W., Buckley R.P., 2020).

Although the comprehensive crypto-assets regulation in the European Union did not exist prior to the MiCA Regulation, sporadic attempts at regulating specific aspects of crypto-assets in the EU existed, most notably in the anti-money laundering legislation. What is more, some types of crypto-assets fell within the scope of the pre-existing EU regulation (first and foremost the regulation of financial instruments).

However, the main idea behind the MiCA Regulation has been to deal with the unregulated part of the crypto-assets markets (Tomczak T., 2022). The inexistence of rules left consumers exposed to risks from which they would otherwise be protected and created space for market abuse. The potential emergence of widely accepted crypto-assets with stable value (such as the already mentioned Libra/Diem) has been recognised as a threat to financial stability, as well as to the monetary sovereignty, monetary transmission and smooth operation of payment systems. Having that in mind, an Explanatory Memorandum for the MiCA Regulation identifies four objectives of the MiCA Regulation (European Commission 2019).

The first objective is the legal certainty. This paper analyses a potential challenge, which might stand in the way of achieving that objective. The second objective is supporting innovation. The third objective is instilling appropriate levels of consumer and investor protection and market integrity, given that crypto-assets not covered by existing financial services legislation present many of the same risks as more familiar financial instruments. The fourth objective is ensuring financial stability.

It is also important to note that the MiCA Regulation is intended to remain technology neutral. However, some authors (Tomczak T., 2022) express their scepticism with regards to MiCA's technical neutrality since MiCA's definition of crypto asset refers to “DLT or similar technology”.

Another principle on which the MiCA Regulation is founded is “same activities, same risks, same rules”. As a consequence, crypto-assets which fall within the scope of other Union regulation remain regulated by such regulation, and the mere fact that they are based on different technology does not suffice to exclude them from the scope of the pre-existing regulation. However, delimitation between crypto-assets which are financial instruments and the ones which are not always clear, especially taking into account that there is no uniform, EU-wide, definition of financial instruments. The definition of financial instrument is part of the MIFID II, which is a directive, and as such it has not been uniformly transposed into the national legislation of all Member States. ESMA previously confirmed the absence of a common definition and shared criteria applicable to all financial instruments (ESMA, 2019 par. 77), which raises legal concerns.

Namely, the concept of a financial instrument in MIFID II is determined through a list of instruments in Annex I section C of MIFID II and there are no specific conditions and criteria which would determine what a financial instrument is. For that reason, ESMA has been mandated to issue guidelines on the criteria for qualification of crypto-assets as financial instruments.

Apart from financial instruments, there are also other types of crypto-assets which remain out of the scope of the MiCA Regulation, for instance, unique and non-fungible crypto-assets (including digital art), crypto-assets issued by the International Monetary Fund or the Bank for International Settlements, as well as central bank digital currencies, including the digital euro. Additionally, and as stated in recital 22 of the MiCA Regulation, if crypto-asset services are provided in a fully decentralised manner without any intermediary, they do not fall within the scope of MiCA. The best example of such crypto-asset is Bitcoin, which still represents “the crypto-asset with the highest capitalisation in the world” (Annunziata F., 2023). However, crypto-asset service providers providing services in respect of such crypto-assets are covered by MiCA.

2. CATEGORIES OF CRYPTO-ASSETS IN MiCA

The description of categories of crypto-assets in MiCA inevitably needs to begin with the general definition of crypto-assets. A definition of crypto-assets is to be found in Article 3(5) of the MiCA Regulation. In accordance with that definition crypto-assets are “a digital representation of a value or of a right that is able to be transferred and stored electronically using distributed ledger technology or similar technology”. However, the definition of crypto-assets appears to be a moving target, since the Commission is empowered to adopt acts in respect of further specifying technical elements of the definitions set out in the MiCA Regulation in order to adjust them to market and technological developments. This means that the definition of crypto-assets could potentially be amended or supplemented in the future.

According to the ECB, the definition of crypto-assets in MiCA is very broad and catch-all and thus not very clear (European Central Bank, 2021, par 1.4.). Needless to say, ambiguity of such an important definition in MiCA adversely affects the legal certainty as one of the proclaimed objectives of MiCA.

It is also important to note that MiCA does not aim to regulate crypto-assets as such, but their markets i.e. the “phenomena comprising their offer, negotiation and exchange, as well as provision of services related to the foregoing” (Annunziata F., 2023). This explains why Bitcoin as such does

not fall within the scope of MiCA, while the crypto-asset service providers providing services in respect of Bitcoin would be covered by MiCA.

Notwithstanding the above, for the purpose of regulating their markets, MiCA Regulation divides crypto-assets into three groups, depending on the envisaged stability of their value and the stabilisation mechanism used. It bears noting that the categorisation envisaged in the MiCA Regulation to an extent reflects the functional approach which divides crypto-assets into three categories: currency/payment tokens, financial/investment/security tokens and utility tokens. The first two groups of crypto-assets in the MiCA Regulation are described as stablecoins, since they purport to have a stable value, but the underlying assets used for stabilisation of their value differ. Therefore, the MiCA Regulation applies to three types of tokens:

1. E-money tokens
2. Asset-referenced tokens
3. Other crypto-assets

The first type of crypto-assets under MiCA Regulation are e-money tokens whose value is stabilised by referencing to one official currency and they are defined as “a type of crypto-asset that purports to maintain a stable value by referencing the value of one official currency”. The recitals of MiCA Regulation state that “such crypto-assets are electronic surrogates for coins and banknotes and are likely to be used for making payments”. Substantially, e-money tokens have a lot in common with the e-money; however the technology used for their issuance differs from the one usually used for the issuance of the “conventional” e-money.

The second type of crypto-assets covered by MiCA Regulation are the asset-referenced tokens defined as “type of crypto-asset that is not an electronic money token and that purports to maintain a stable value by referencing another value or right or a combination thereof, including one or more official currencies”. The previously mentioned Libra/Diem would fall within the category of asset-referenced tokens under the MiCA Regulation.

It is important to note that both e-money tokens as well as asset-referenced tokens only “purport” to maintain a stable value, and they do not actually have to achieve that target. Since the stabilisation mechanism of asset-referenced tokens relies upon referring to other types of rights and assets, including combination of such rights and assets, they might not be as stable as they are often presented. Stability of asset-referenced tokens might however influence their legal nature. Namely, if they consistently achieve a stable value, it is not likely they will be used for investment purposes, due

to the absence of potential profit. In that case, it is more likely for them to be used as a payment instrument. However, if their value fluctuates, it is more likely for them to be used for investment purposes i.e. as a financial instrument.

At first glance, deliberation on the legal nature of asset-referenced tokens might appear to be purely theoretical and academic. However, as rightly observed by some authors (Zetzsche D.A., Annunziata F., Arner D.W. and Buckley RP. 2020) the classification of instruments and transactions determines which body of law will apply, and which supervisory powers a competent authority may exercise. Therefore, determination of their legal nature has very important practical consequences.

MiCA Regulation appears not to be neutral in this respect and it attempts to reduce the risk that asset-referenced tokens are used as a store of value by prohibiting the issuers of asset-referenced tokens and crypto-asset service providers to grant interest to holders of asset-referenced tokens (Article 40). Some authors (Zetzsche D.A., Annunziata F., Arner D.W. and Buckley RP. 2020) conclude that it is “an attempt to ensure ARTs (..) are payment, rather than securities/investment, tokens” and that “the prohibition seeks to avoid a circumvention of EU securities law, given that the promise to pay interest may mix up the criteria for currency and bonds (where only bonds are subject to securities regulation).”

With regards to the third type of crypto-assets under MiCA Regulation it should only briefly be noted that it is actually not a type, but a category created to include the residual i.e. all types of crypto-assets which are neither e-money tokens, nor asset-referenced tokens.

3. DIFFERENTIATION OF CRYPTO-ASSETS AND FINANCIAL INSTRUMENTS

Some authors claim that “while the boundary between MiCAR and MiFid is fundamental it is, at the same time, unclear” and conclude that “the problem of the MiCAR taxonomy constitutes the main fragility of the new regulatory system, which may render its application uncertain with respect to other texts of EU law, in particular MiFid” (Annunziata F., 2023).

In analysing the legal nature of crypto-assets, Article 2(5) of the MiCA Regulation deserves special attention. The said provision authorises ESMA to issue guidelines on conditions and criteria for the qualification of crypto-assets as financial instruments.

On 29 January 2024, ESMA published the Consultation paper on the draft Guidelines on the conditions and criteria for the qualification of

crypto-assets as financial instruments. The reason why the issuance of these guidelines has been necessary is the fact that the MiFid has been transposed differently in different Member States, which led to the inexistence of a uniform definition of the financial instrument in the EU. However, the purpose of the ESMA guidelines is not to provide a universal definition of the financial instrument, but to provide tools for delineation when an instrument seemingly fulfils both the criteria from MiCA and MiFid. The final ESMA Guidelines are expected to be adopted by the end of 2024.

As already stated, MiCA is not to be applied to crypto-assets that qualify as financial instruments under MiFid. Moreover, based on the principle of “same activities, same risks, same rules” and of “technology neutrality”, MiCA applies only to the instruments which are not already covered by the existing EU legislation. If a crypto asset does not fall within the scope of the existing EU legislation, it is very likely for it to fall within the scope of MiCA. However, this must not always be the case. Non-fungible tokens for instance are in principle out of the scope of the MiCA regulation.

When defining the instruments that are within the scope of MiFid, the definition of “transferable securities” needs to be taken into account. MiFid defines “transferable securities” as “those classes of securities which are negotiable on the capital market, with the exception of instruments of payment, such as:

- a. shares in companies and other securities equivalent to shares in companies, partnerships or other entities, and depositary receipts in respect of shares;
- b. bonds or other forms of securitised debt, including depositary receipts in respect of such securities;
- c. any other securities giving the right to acquire or sell any such transferable securities or giving rise to a cash settlement determined by reference to transferable securities, currencies, interest rates or yields, commodities or other indices or measures;”

If the crypto asset meets the criteria to be considered a “transferable security” MiCA regulation will not be applied. In assessing whether the crypto asset qualifies as a financial instrument, ESMA proposes nine guidelines. It remains to be seen whether those guidelines will be adopted in an unaltered form after the public consultation.

To an extent, draft guidelines reiterate the principles of MiCA. For instance, the principle of technological neutrality. Namely, in assessing whether a crypto-asset is to be deemed as a financial instrument, the

technological structure of such a crypto-asset should not be deemed as a prevailing factor.

ESMA guidelines are also based on the assessment of the set of rights that pertain to the holder of the crypto asset. Namely, if crypto-assets grant to their holder rights similar to shares, bonds, or other securities, which may indicate that such crypto-assets qualify as a financial instrument. ESMA supplements this criterion with an additional pre-requisite that the instrument is not used for payments. Namely, the definition of a transferable security in MiFid II explicitly excludes instruments used for payments.

Additional ESMA (draft) guidelines deal with specific conditions and criteria for the classification of crypto-assets as money-market instruments, units in collective investment undertakings, derivative contracts, emission allowances, NFTs and hybrid tokens.

4. ANALYSIS OF DRAFT REQUIREMENTS FOR QUALIFYING CRYPTO-ASSETS AS SHARES IN A COMPANY UNDER MIFID II

As already previously mentioned, according to Article 2 para. 4 MiCA regulation, among others, does not apply to assets that qualify as financial instruments. This also means that MiCA does not apply to the crypto-assets that qualify as transferrable securities, like shares in a company, bonds or other forms of securitised debt or securitised derivative, i.e. a security or an investment token. Security or an investment token is a form of a crypto asset that, like other traditional securities, grants its holder rights to future payments and potentially even co-management rights in the underlying investment (Rennig C., 2020, p. 24). Whether a specific crypto-asset qualifies as a security token poses an important legal question, since such qualification determines whether such an asset falls under the scrutiny of MiCA regulation or MiFid II which includes a different and more onerous set of rules, most notably related to the trading with financial instruments, the publication of prospectus, the provision of related investment services, insider trading, the provision of securities depository and settlement (HANFA Opinion dated 6 April 2020, Rennig C., 2020, p. 24). The European legislator recognised this and, based on Article 2(5) of the MiCA Regulation, imposed upon ESMA a duty to provide clear guidelines to national competent authorities for this purpose by the end of 2024. The recently published first draft of the Guidelines offers some insight into what the possible qualification criteria might look like.

According to Article 2 para. 1 p. 11 of the Pilot Regime, a “DLT financial instrument” means a financial instrument that is issued, recorded, transferred and stored using distributed ledger technology. This means that the definition of a traditional financial instrument is expanded to include financial instruments based on the use of distributed ledger technology. This means that “crypto security” could also qualify as a financial instrument under MiFid II. Therefore, it is not surprising that the ESMA Guidelines conclude that the use of distributed ledger technology in transferrable security should not exclude it from being able to qualify as a financial instrument. In other words, crypto securities that have been tokenised should not be excluded as financial instruments only because they are based on the use of distributed ledger technology. However, ESMA guidelines go even further than the Pilot regime by extending the scope of the technology used to any other technology, without limitation to the distributed ledger technology (ESMA Draft Guidelines, paras. 27-29). In this regard, except in its preamble, it is unfortunate that the Pilot Regime does not emphasise the technological neutrality principle more clearly (Pilot Regime Preamble, paras. 9-10).

In addition, according to ESMA, such a crypto asset (i) must also form part of the “class of securities,” (ii) it must be negotiable and (iii) must not be an instrument of payment (ESMA Draft Guidelines, para. 30). Therefore, if a crypto asset is issued, recorded, transferred and stored using distributed ledger technology and also forms part of the class of securities, it is negotiable and is not an instrument of payment; it qualifies as a financial instrument (Brauneck, 2024, p. 66).

When referring to the class of security ESMA elaborates that a crypto asset should provide similar rights to investors as traditional transferrable securities. In other words, rights conferred to holders of crypto-assets should correspond to the rights granted to traditional securities holders. Namely, shares in a public limited company confer to shareholders a whole scope of various types of rights which can generally be divided into two groups, co-management rights and property rights (Barbić J., 2020, pp. 72-73). For example, co-management rights include the right to be informed, the right to participate in the work of the general assembly, the right to seek annulment of the general assembly’s decisions, and the right to exercise voting rights in the general assembly. On the other hand, property rights include the right to participate in the distribution of the company’s profits, the right to participate in the distribution of the liquidated assets of the company, and the right of priority when registering new shares. Besides such rights regularly associated with a share, a share could also provide its holder with

special preferential rights. Such preferential rights are regularly associated with property rights rather than co-management rights (e.g. a right to a higher participation in the company's distribution of profits than the right normally granted to regular shareholders).

However, it is unclear what scope of rights is required to qualify a specific crypto asset as a share in the company. There is no doubt that if a crypto asset provides the whole scope of rights usually conferred to the holder of traditional shares that such an asset could be qualified as a financial instrument. However, if this is not the case, what would be the threshold for such a qualification? For example, if there is a threshold, is the threshold determined by the number of rights conferred or by the type of rights conferred? Namely, not all shareholder's rights have the same value, i.e. some are considered to be more important than others. According to Article 167 para. 2 of the Companies Act regular shares confer to its shareholders the right to exercise voting rights in the general assembly, the right to participate in the distribution of the company's profits, and the right to participate in the distribution of the liquidated assets of the company. These rights are generally considered to be the most important shareholder rights in the company. Therefore, to avoid potential abuses of the existing MiFid II regulation, a crypto asset should be considered a share in the company and, potentially, a financial instrument as well, if it at least provides these most important (typical) shareholder rights to its holder. However, the problem still exists when other shareholder rights are granted by a crypto asset (e.g. a right to participate at the general assembly or seek annulment of the general assembly decisions before the courts), but not all or even any of the mentioned three typical rights (e.g. a right to exercise voting rights at the general assembly). In a situation where none of the typical rights are granted, a question should be posed whether such crypto asset should be even considered a share in the company, since such rights are not typical rights one normally associates only with shares or are even exclusive to shares. Therefore, one should be more inclined to consider that such a crypto asset is not comparable to a share in the company. However, if a crypto asset provides at least one of the typical rights associated with shares (e.g. a right to exercise voting rights in the company's general assembly), one should be inclined to consider such a crypto asset as a share in the company. On the other hand, one should also consider the underlying economic purpose of such a crypto asset, e.g. whether such purpose is primarily to provide its holder with co-management rights that are similar to rights afforded to the company's shareholders (Haeberli D., Meier U., 2020, p. 62). If that is the case, such a crypto asset should be qualified as a share in the company since it is

comparable to such a traditional security. Notwithstanding, the qualification criteria should be made as clear as possible so that there are no serious doubts as to whether a specific crypto asset granting certain rights will be qualified as a share and financial instrument or not. It should be noted that even if one particular crypto asset is not comparable to a share in a company, which does not mean that such an asset could not be qualified as another financial instrument, e.g. another form of securitised debt or a securitised derivative. In such a situation the same approach should be followed as with shares in the company.

However, besides having similarities with shares and granting access to equal rights as shares in the company, for a crypto asset to form a class of security, it should also be interchangeable and issued by the same issuer (ESMA Draft Guidelines, para. 32). Interchangeability (fungibility) means the ability of a security to be exchanged with another security of the same issuer and the same type concerning rights and obligations granted to its holder. In other words, shares of the same class of shares are generally considered interchangeable when they provide their holders with the same rights. Therefore, it is irrelevant to the acquirer of the share whether it acquires the specific share or any other share of the same class, since all of them grant exactly the same rights (Ebenroth C., T., Boujong K., Joost D., Strohn L., 2009, Rn. VI48). In other words, all shares of the same class of rights express the same value per unit (ESMA Draft Guidelines, para. 33). Such interchangeability is very important for the secondary market since it contributes to the orderly functioning of the regulated market in situations where the acquired security with the specific ISIN (International Securities Identification Number) cannot be transferred to the acquirer because of issues during clearing and settlement (e.g. because the security was already transferred to another acquirer), but can be exchanged for another security within the same class of rights with another ISIN. Generally speaking, crypto-assets are considered to be regularly interchangeable, since they can be issued in greater numbers and can provide the same scope of rights to their holders. Naturally, one could easily imagine the opposite as well as issues of different classes of a crypto asset granting different rights to their holders. This is nothing new and is also observed with traditional securities. In such a situation, the normal rules for traditional securities apply. Therefore, interchangeability should not represent an issue in itself, since crypto-assets are easily interchangeable as are other shares in the company. The same can be concluded in regard to the free transferability of crypto-assets since they can be generally easily and freely transferrable.

The requirement that the same issuer issues the crypto asset that qualifies as a share is closely connected to the previously elaborated interchangeability of the security. This requirement emphasises that the acquisition of a security (investment decision) depends primarily on who the issuer of that security is. The more profitable the issuer is, the more profitable the return investment will be for the shareholder. Therefore, a specific crypto asset of one issuer does not hold the same market value as a crypto asset of another issuer. In other words, crypto-assets from two different issuers are not considered interchangeable in their market value, investment return, or the shareholder rights contained therein. On the other hand, this requirement also ensures that there is a sufficient number of crypto-assets of the same class providing the same rights on the market. In other words, as is with interchangeability, this means that the acquirer can receive, during the clearing and settlement of the transaction, another crypto asset (a crypto security with a different ISIN) of the same class and the same issuer with the same rights as the one acquired on the market. In other words, the acquirer should not receive a crypto asset issued by another issuer during trading, since that is not the crypto asset he wanted to acquire on the regulated market.

For qualifying a crypto asset as a crypto security such an asset must meet the negotiability requirement (ESMA Draft Guidelines, para. 33). Negotiability means that the security is easily and freely transferable and tradeable on the market. The previously mentioned interchangeability is closely connected to the security's ability of such transferability, since such ability is an important requirement for the orderly functioning of the regulated market (Schwark E., Zimmer D., 2010, §5. BörsZuIV, Rn. 1). In other words, the transfer of a crypto asset should not be restricted or severely limited to endanger the orderly functioning of the regulated market. For example, such restriction exists when a transfer of a security is made dependent on the statutory approval of the issuer or any other restriction relating to such transfer affecting every shareholder (i.e. *erga omnes* effect). On the other hand, contractual restrictions should not represent an issue since their effect is limited to the contractual parties (i.e. *inter partes* effect). Therefore, as with interchangeability, this requirement should not represent an issue in itself, since crypto-assets are easily and freely transferrable and negotiable, as are other shares on the regulated market.

The last requirement clearly states that a crypto asset should not qualify as an instrument of payment. Security or investment tokens that qualify as shares in a company do not qualify as financial instruments.

5. CONCLUSION

MiCA Regulation undoubtedly represents an important step towards closing a regulatory gap and ensuring a harmonised approach to crypto-assets in the EU. However, it remains to be seen if the four proclaimed goals of the MiCA Regulation (legal certainty; supporting innovation; appropriate levels of consumer and investor protection; ensuring financial stability) are to be achieved. Even the definition of crypto-assets in MiCA is subject to criticism as “very broad and catch-all and thus not very clear”. Ambiguity of such an important definition in MiCA undoubtedly adversely affects the legal certainty as one of the proclaimed goals of MiCA.

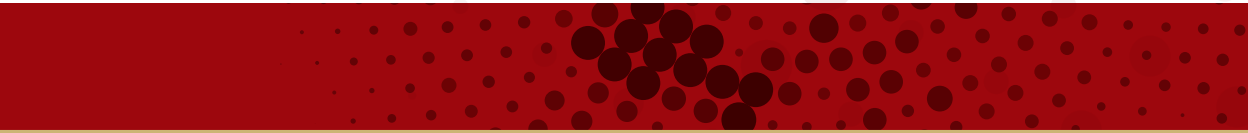
Additionally, and as analysed in this paper, the boundary between MiCA Regulation and MiFid is not completely clear and will inevitably be subject to interpretation. ESMA guidelines on conditions and criteria for the qualification of crypto-assets as financial instruments should provide some tools for delineation; however, it is safe to assume that many relevant aspects will remain controversial and potentially subject to different interpretations in practice.

As to requirements for qualifying specific crypto-assets as shares in a company, and thus financial instruments, the most problematic is the requirement that crypto-assets form part of the same class of securities as shares in a company, namely that a crypto asset grants similar rights to its holders as a traditional company share. What scope of rights is necessary for such qualification is unclear and, considering that such rights may vary from member state to member state, it is likely that there will be no unified approach across the EU in this regard. We are likely going to see somewhat varying practices of member states’ national regulators when deciding whether a specific crypto asset qualifies as a share in a company and thus a financial instrument.

6. BIBLIOGRAPHY

1. Annunziata F., 'An Overview of the Markets in Crypto-assets Regulation (MiCAR)' (2023), European Banking Institute Working Paper Series, No 158, 11.12.2023
2. Barbić J., Pravo društava, Knjiga druga, Društva kapitala, Svezak I., Dioničko društvo, 7th Edition, Zagreb 2020.
3. Brauneck J., MiCA im Zahlungsverkehr – Teil 2 Krypto-Dienstleistungen und Zahlungsdienstleistungen, EuZW 2024.
4. Buttigieg C. and Cuyle S., 'A Comparative Analysis of EU Homegrown Crypto-asset Regulatory Frameworks' (2020) 5 European Law Review 639.
5. Directive (EU) 2018/843 of the European Parliament and of the Council of 30 May 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, and amending Directives 2009/138/EC and 2013/36/EU, OJ L 156/43, 19.6.2018
6. Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU, OJ L 173, 12.6.2014, p. 349–496
7. Ebenroth C. T., Boujong K., Joost D., Strohn L., Handelsgesetzbuch, Band 2, 2nd Edition, München 2009.
8. European Central Bank (2021), Opinion of the European Central Bank of 19 February 2021 on a proposal for a regulation on Markets in Crypto assets, and amending Directive (EU) 2019/1937 OJ C 152/1, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021AB0004>, Accessed 10 May 2024
9. European Commission (2019), Proposal for a Regulation of the European Parliament and of the Council on Markets in Crypto-assets, and amending Directive (EU) 2019/1937, COM(2020) 593 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020PC0593>, accessed 10 May 2024
10. European Commission (2020), Digital Finance Package, https://finance.ec.europa.eu/publications/digital-finance-package_en, accessed on 10 May 2024
11. ESMA (2019), Advice on Initial Coin Offerings and Crypto-assets, ESMA50-157-1391, https://www.esma.europa.eu/sites/default/files/library/esma50-157-1391_crypto_advice.pdf, accessed 12 May 2024
12. ESMA (2024), Consultation paper on the draft Guidelines on the conditions and criteria for the qualification of crypto-assets as financial instruments, ESMA75-453128700-52, dated 29 January 2024
13. Haeberli D., Meier U., DLT and Blockchain Framework Is Set for Change, International Financial Law Review, no. 1, 2020.
14. Mišljenje HANFE vezano za izdavanje digitalne imovine utemeljenoj na Ethereum blockchainu od 6. travnja 2020.
15. Read, Oliver, and Stefan Schäfer. "Libra project: regulators act on global stablecoins." Intereconomics 55 (2020): 392-398.

16. Rennig C., KWG goes Krypto, Die Aufnahme von Kryptowerten und des Kryptoverwahrgeschäfts in das KWG, BKR 2020.
17. Regulation (EU) 2022/858 of the European Parliament and of the Council of 30 May 2022 on a pilot regime for market infrastructures based on distributed ledger technology, and amending Regulations (EU) No 600/2014 and (EU) No 909/2014 and Directive 2014/65/EU (Text with EEA relevance)
18. Regulation (EU) 2023/1114 of the European parliament and of the Council of 31 May 2023 on markets in crypto-assets and amending Regulations (EU) No 1093/2010 and (EU) No 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937, OJ L L 150/40, 9.6.2023.
19. Tomczak T. (2022), Crypto-assets and crypto-assets' subcategories under MiCA Regulation, Capital Markets Law Journal, Vol. 17, No 3, p. 365-382
20. Schwark E., Zimmer D., Kapitalmarktrechts-Kommentar, 4th Edition, München 2010.
21. van der Linden, Tina, and Tina Shirazi. “Markets in crypto-assets regulation: Does it provide legal certainty and increase adoption of crypto-assets?” Financial innovation 9.1 (2023): 22.
22. Zetzsche D.A., Annunziata F., Arner D.W, Buckley R.P. (2021), The Markets in Crypto-Assets Regulation (MICA) and the EU Digital Finance Strategy, Capital Market Law J 16(2): 203-225



ISBN 978-953-377-087-1



9 789533 770871

This publication is not for sale