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CAPITAL STRUCTURE DETERMINANTS OF LISTED PRIVATE AND STATE COMPANIES: EVIDENCE AND LESSONS FROM BOSNIA AND HERZEGOVINA

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ABSTRACT

Purpose. *The purpose of this paper is to determine and analyze the determinants of the capital structure of joint-stock companies in Bosnia and Herzegovina that are listed on the Banja Luka Stock Exchange. This study will answer the question as to which factors determine the capital structure of BiH companies and whether existing financial theories of the capital structure hold true in that context. The main research objective is to estimate the effects of a firm's level determinants on its capital structure measures in different ownership structures. Those findings will certainly advance our understanding of listed companies financing behavior.*

Methodology. *For the research, we took into account firm-specific characteristics and divided joint-stock companies into private and state-owned. The results of the research show that the capital structure of these two groups of enterprises is differently affected by individual determinants.*

Findings and implications. *While state-owned enterprises rely more on borrowed resources to finance both short-term and long-term assets, private enterprises even finance part of their short-term assets with their own capital. However, the most important determinant in both groups of enterprises is the share of inventories in short-term assets, which confirms that short-term liabilities, i.e. free sources of financing in the form of liabilities to suppliers are the determinant that most positively affect the indebtedness of all enterprises. Unlike previous research that observed enterprises according to their size or affiliation to individual industries, the focus of our research is enterprises of different ownership structures. The empirical statistical results provide basis for logical conclusion and appropriate policy implications. The study points to the specifics of the capital structure in private and publicly listed joint-stock companies. The stated opposite influence of certain ratios on the indebtedness of the enterprises is explained by a number of factors.*

Limitations. *This study focuses only on the presentation of the recent indicators of capital structure of listed companies - listed on the Banja Luka Stock Exchange, which is one of its major limitations. The limitation of this search is the sample size which can be considered low. Further research may be conducted by using other capital markets to explore more information regarding the effect of the variables affecting the capital structure. In addition, further research may also be conducted by using other proxies or by adding more variables, sample size, and research period to get a better result.*

Originality. *The study is an original research paper. It has not been published in any other peer-reviewed journal not under consideration for publication by any other journal. The paper adds to the existing literature on Bosnia and Hezegovina by giving an overview of recent developments in the flexi purity concept, pointing out the areas that require policy response.*

1. INTRODUCTION

The decision on how to finance the business is important in maximizing the value of the enterprise. During the last two decades, numerous researches have been made on how enterprises choose the ratio of own and borrowed capital. However, scientists have been dealing with these issues for many years. One of the most frequently asked questions related to capital structure is to identify the factors that crucially influence the choice of one of the two possible sources of financing: debt and capital. Stakeholders will want to reinvest their resources in a company with "clear corporate governance practices, which ensures that the cost of capital is minimal and hence service as a determinant of firm financial performance" (Amole et al., 2001).

Usually, the factors that affect the capital structure of a firm are classified as external factors and internal factors. External factors represent the inflation rate, the average interest rate, and other macroeconomic conditions that are specific to a particular country and that enterprises cannot influence. Internal factors are those that are specific to a particular enterprise, such as profitability, size of the enterprise, asset structure, and others. For enterprises operating in one country, macroeconomic factors are common for them and they affect all enterprises in the same way. For example, statistically significant relationship between four factors (inflation, GDP growth rate, GDP, index of protection of the creditors and debtors rights) and the strength and direction of the impact of internal factors on the capital structure has been found (Jaworski & Czerwonka, 2019). Among the internal factors that have been found to have a positive correlation with the level of debt are: the size of enterprise (Frank and Goyal, 2009, Rajan and Zingales, 1995, Booth et al., 2001) collateral (Harris and Raviv, 1991, Rajan and Zingales, 1995, Kremp, Elma and Gerdesmeier, 1999, Frank and Goyal, 2009) and profitability. Gallegos Mardones and Ruiz Cuneo find a positive relationship between financial performance, growth, and size of the company (Gallegos Mardones & Ruiz Cuneo, 2020). As researches shows, the influence of certain factors also depends on the size of the enterprise, majority ownership, and belonging to certain branches but also on the development of the markets in which they operate. For example, research in developing countries shows a negative correlation between collateral and leverage (Nivorozhin, 2002, Cornelli, Portes, & Schaffer, 1996). Most studies realized in European transition economies consistent with the pecking order theory, find a negative relationship between profitability and capital structure (Nivorozhkin, 2004, Joeveer, 2008, Črnigoj & Mramor, 2009). Research conducted in Serbia during the crisis period from 2008 to 2011 shows a significant negative impact of the quick ratio, the cash gap and the revenue quality on leverage and a positive and statistically significant impact of the free cash flow variable and its volatility on leverage (Denčić-Mihajlov, Malinić, Grabinski, 2015).

The other literature review conducted by Kumar et al. (2020) including 262 articles published in the years 2012-2017 proved that one of the most prevalent topic in the literature concerns determinants of SME capital structure. At the same time, the authors indicated that it would be worth extending this research to other determinants, not covered by studies carried out so far (Kumar, Sureka & Colombage, 2020)

However, many firms experience financial distress and even bankruptcy because they are wrong in taking their capital structure policies, especially debt decisions. The increase in excess debt impacts liquidity because the interest-bearing is higher, thus disrupting the firm's working capital (Santosa, 2020).

The only research, which is similar to our work is a paper by Czerwonka, L. et. al. (2021). Even though they have a comparable approach, our research includes a more updated dataset and more importantly, our research also includes micro enterprises, whereas the research of Czerwonka and contributors excludes microenterprises from the sample. Particularly, Czerwonka et al. state that although previous works show that some capital structure differences can be explained by modern capital structure theory in mature market economies, the capital structure decision in transition markets is still an open question for investigation.

In former socialist countries, such as Bosnia and Herzegovina, joint-stock companies were created by the transformation of socially-owned enterprises by transferring shares in socially-owned enterprises to citizens/employees for nominal compensation to create broad ownership of shares, and insider owners emerged as owners of the socially-owned property. With the emergence of the capital market, the further transformation of joint-stock companies was sought in such a way as to provide owners willing and able to make additional investments in existing companies, but mostly in this way transformed joint-stock companies were bought by a small number of investors, where companies became family businesses, and where joint-stock companies were re-registered from open to closed companies or limited liability companies. At the same time, strategic companies remained in majority state ownership.

The capital structure research studies were highly focussed on developed economies, with time, research studies in developing markets are increasing (Bajaj, Kashiramka & Singh, 2020). Bearing in mind the characteristics of enterprises in Bosnia and Herzegovina, the objectives of this study are to seek and explore the main determinants of capital structure and to identify factors specific to enterprises in developing countries that significantly influence decisions on borrowing, i.e., financing, and to construct an appropriate econometric model.

For the purposes of the research, we have analyzed enterprises listed on one of the two stock exchanges in the BiH - Banja Luka Stock Exchange. This study will answer the question as to which factors determine the capital structure of BiH companies and whether existing financial theories of the capital structure hold true

in that context. The main research objective is to estimate the effects of a firm's level determinants on its capital structure measures in different ownership structures. Therefore, we have answer on a research question: "What internal factors dominantly affect the indebtedness of private and state-owned enterprises listed on the Banja Luka Stock Exchange?" In view of all the above, we formulate the hypothesis according to which, there is no linear relationship between the specific indicators and the debt ratio in listed companies in Bosnia and Herzegovina. Based on the problem analysis above, the study formulated the following main hypothesis of this research: "There is no linear relationship between the specific indicators and the debt ratio in listed companies in Bosnia and Herzegovina."

Similar research has not been done in Bosnia and Herzegovina, and we believe that this paper will provide new insights into the dominant factors that determine the capital structure of joint-stock companies in developing countries, both public and private. To the best of our knowledge, this is one of the first comprehensive studies of capital structure choice in Bosnia and Herzegovina (as a small and open economy) for listed companies.Our study also may have a significant impact on policymaking for the countries in the region. Moreover, our data set allows us to divide the analysis based on ownership structure, and thus, we can find out the important factors that affect the capital structure from the ownership perspective. Overall, we believe that the paper makes a significant contribution to understanding capital structure determinants in the context of listed private and state companies.

We extend this literature by shedding light on several issues related to capital structure in a region characterized by a different institutional environment and that has received little if any, attention in the capital structure literature. Secondly, this research provides a comprehensive study of capital structure choices with the latest dataset and empirical evidence on the determinants of capital structure.

Furthermore, the results of our study complement and strengthen some of the findings to date. Overall, we believe that the paper makes a significant contribution to understanding SME finance in the context of Visegrad Group.

2. LITERATURE REVIEW

The capital structure of companies differs between developed and developing countries (Kuč & Kaličanin, 2021). There are several well-known but different theories of capital structure: Modigliani-Miller's theorem (Modigliani & Miller, 1958), trade-off theory, pecking order theory, agency theory, and market timing theory (Serghiescu & Văidean, 2004, Ahmadimousaabad, Bajuri, Jahanzeb, & Karami, 2013, Czerwonka & Jaworski, 2021). For the SMEs sector, the two main capital structure theories are prevalent in the literature (the trade-off theory and the pecking order theory (Martinez, Scherger & Guercio, 2019). Albart et al. (2020) explained that the capital structure is the amount of short-term debt, both permanent

and non-permanent, long-term debt, preferred stock, and common stock used to finance the firm.

The essence of Modigliani-Miller's theorem is that they make two claims: the first claims that the level of leverage of a company does not affect its market value, which is constant regardless of the proportions of debt and equity chosen in financing the company. The second proposition describes the weighted average cost of an enterprise as being unaffected by the company's leverage (Serghiescu & Văidean, 2004). Tradeoff theory explains that a company strives for a debt that balances tax advantages of additional debt against the cost of possible financial distress (Myers, 2001). As explained by Myers and Mayloof (1984), the key order of pecking order theory argues that because of the information asymmetry between shareholders, managers, and investors, companies prefer to finance their investments first with internal resources, then with borrowed capital, and ultimately using capital provided by shareholders (Myers and Majloof, 1984). The main result of the analysis of the sample comprises 141 of the largest Serbian companies in the period after the global economic crisis in 2008. over the period 2009-2017 indicates that these companies, mostly financed by short-term debt, predominantly belong to the 'pecking order' theory (Kuč & Kaličanin 2021). On the other side, research from Serbia shows that neither of the two competing theories exclusively and completely explain the financing behaviour of the analysed companies, and that inflation and development of the banking sector are important factors that affect the corporate leverage level (Pepur, Ćurak & Poposki, 2016).

Contrary to the theories presented before, agency theory assumes that the interests of managers and shareholders are not perfectly aligned and that managers, although acting as shareholder representatives, will not always act in the best interests of investors, but will pursue their personal benefits (Jensen and Meckling, 1976). Baker and Wurgler (2002) proposed the 'market timing theory' which does not define an optimal capital structure, but shows that some specific capital market conditions and macroeconomic conditions within a country may affect the capital structure of listed companies (Baker & Wurgler, 2002). Kang Li et. al. (2019); Kenourgios et. al. (2019) analyze SME capital structure decisions for European countries and identify differences in the determinants of firms' capital structure across the various countries. Those authors suggest the differences are probably better explained by firm-specific factors than by country-specific factors. In their work Jaworski et.al (2019), they state that there are two factors, namely the size of the enterprise and its growth, has a positive impact on capital structure. The larger the company and/or faster the company grows, the higher the share of debt in the capital structure.

The free cash flow theory says that dangerously high debt levels will increase value, despite the threat of financial distress, when a firm's operating cash flow significantly exceeds its profitable investment opportunities (Myers, 2001). The most important finding of these studies is the determination of factors influencing

capital structure (Graham & Leary, 2011, Parsons & Titman, 2007). The mentioned researches differ according to the number of observed enterprises, their size and the industry to which they belong to, the statistical methods used, the scope in terms that they refer to only one country or cover several countries, and similar. Among the numerous researches, we singled out the following. Czerwonka et. al. (2021) confirmed the dominant role of firm-specific factors. Industry and country variables explain only 4% of the debt variability of the surveyed companies. Using the multiple linear regression model, concluded that the structure of capital (debt-to-asset ratio) is influenced by the following factors: tangible assets, company size, growth and profitability. In addition, they showed that there is a positive relationship between the debt-to-assets ratio and tangible assets, company size and growth, while on other hand, there is a negative relationship between profitability and debt-to-assets. Jõeveer used data collected from companies from nine European countries covering the period from 1995 to 2002 (Jõeveer, 2006). Jõeveer studied the importance of the impact of determinants specific for companies of a certain country and specific for macroeconomic factors on debt-to-asset ratios. In his study, he pointed how factors specific to a country influenced the debt-to-assets ratio of small companies, while factors specific to companies affected the debt-to-assets ratio of large companies.

Nivorozhkin used data on 667 Bulgarian and 596 Czech companies from 1993 to 1997 (Nivorozhkin, 2004). Nivorozhkin used the ratio of total debt to the sum of total debt and shareholders' equity as a dependent variable, while for independent variables he used income variability, profitability, tangible assets, size, trade payables, trade receivables and distance. He separately assessed the dynamic model for Bulgaria and the Czech Republic and came to the conclusion that Bulgarian companies were adapting faster than Czech companies to the desired level of capital structure.

Serghiescu and Vaidean examined the relative importance of five factors on the capital structure of Romanian companies listed on the Bucharest Stock Exchange and operating in the construction sector (Serghiescu & Văidean, 2004). The analysis is based on the estimation of panel data from a sample of 20 companies, observed over three years (2009-2011). The study used traditional explanatory variables, including profitability, company size, assets, liquidity, and asset turnover. Using simple and multiple linear regression, they showed that the profitability and liquidity ratio negatively affect the overall debt ratio of the observed companies. On the other hand, the size of the company and the turnover of assets have a positive correlation with the result.

Honggang et al. observed 127 listed companies in China from 2009 to 2016 using linear regression (Honggang, Chen, & Zhong, 2019). The results show that the capital structure of listed companies has a significant positive correlation with profitability, growth capacity, company size, and cash flow and that the capital structure of companies listed on the Stock Exchange is negatively correlated with

dividend policy. Factors specific to the industry in which the company operates have a great impact on the capital structure. However, De Jong, Kabir & Nguyen showed back in 2008 that the determinants of impact for the same industries, for example for companies in the construction sector, differ by country (De Jong, Kabir, & Nguyen, 2008). Unlike previous authors who observed companies only within one country Rajan and Zingales test for the G7 countries, the theoretical and empirical lessons learned from the US studies (Rajan & Zingales, 1995). These authors find similar levels of leverage across countries, thus refuting the idea that firms in bank-oriented countries are more leveraged than those in market-oriented countries. They find that the determinants of capital structure that have been reported for the USA (size, growth, profitability, and importance of tangible assets) are important in other countries as well.

Among several factors, that most research identifies to determine the capital structure, the share of tangible assets in total assets as the basis for collateral recognized is certainly one. Most empirical studies conclude a positive relation between collaterals and the level of debt (Rajan & Zingales, 1995; Kremp, Elma, & Gerdesmeier, 1999; Frank & Goyal, 2009). Based on the agency problems between managers and shareholders, (Harris & Raviv, 1991) suggests that firms with more tangible assets should take more debt. This is due to the behavior of managers who refuse to liquidate the firm even when the liquidation value is higher than the value of the firm as a going concern. Indeed, by increasing the leverage, the probability of default will increase which is to the benefit of the shareholders. In an agency theory framework, debt can have another disciplinary role: by increasing the debt level, the free cash flow will decrease (Grossman & Hart, 1982, Michael & Jensen, 1986, Stulz, 1988). As opposed to the former, this disciplinary role of debt should mainly occur in firms with few tangible assets, because in such a case it is very difficult to monitor the excessive expenses of managers. From a pecking order theory perspective, firms with few tangible assets are more sensitive to information asymmetries. These firms will thus issue debt rather than equity when they need external financing (Harris & Raviv, 1991) leading to an expected negative relationship between the importance of intangible assets and leverage. The importance of collateral increases in cases where businesses are newly established and have no close ties to creditors. These arguments suggest a positive relationship between tangibility and a firm's leverage. Indeed, the results for developed countries (Titman & Wessels, 1988; Rajan & Zingales, 1995) uniformly confirm this. On the other side, conclusions from developing countries are mixed. Booth et al. (2001) find a negative relationship in the case of developing countries (Booth, Aivazian, Demirguc-Kunt, & Maksimovic, 2001). The findings of Nivorozhkin 2002, Dragotta & Semenescu, 2008, Joeveer, 2006, Booth, Aivazian, Demirguc-Kunt, & Maksimovic, 2001 and Berk, 2006) indicate a negative and statistically relevant correlation between tangibility and leverage in firms operating in European transition countries.Gan, Wei, Zheng, & Wang in a sample of Chinese

companies proved that if the transaction cost is lower, companies showed the tendency to target capital structure adjustment; when the cash flow is not enough to adjust the capital structure deviation part, companies showed deviation from the target capital structure. (Gan, Wei, Zheng, & Wang, 2018).

Other theories complement previous studies that use entrepreneurship management and innovation as drivers of company profitability (Rico & Cabrer-Borrás, 2018). For example, Kyvik (2018) incorporates the business model, creativity, and management and financial control as key variables in his analysis.

Research on the SMEs' capital structure in CEE markets does not have a long tradition and is not as developed as in Western Europe (Belas et al., 2018, Kenourgios et al., 2019).

Comparative analysis regarding capital structure determinants of firms in transition economies located in CEE has been performed in several papers (Cornelli, Portes, & Schaffer, 1996, Nivorozhkin, 2002, Klaper et al., 2002, De Haas & Peeters, 2006, Jõeveer, 2006, Delcoure, 2007, Triandafil & Brezeanu, 2010). Malinić et al (2013) mostly report that, with respect to firm-level characteristics, firms' capital structure in CEE economies follows a different pattern compared to Western European structure (Delcoure, 2007). Although every research has contributed to formulating and testing the determinants of the capital structure all authors caution on the difficulty of finding suitable proxies for the determinants of capital structure. At the same time, the authors indicated that it would be worth extending this research to other determinants, not covered by studies carried out so far (Czerwonka & Jaworski, 2021).

3. THE DATA AND METHODOLOGY

The methodological elements presented in this work concern the measurement of variables, the characteristics of the sample, and the collection of data as well as the statistical tools used.

The firm's capital structure can be determined through several factors. Those observable elements for leverage should be linked to the theories on capital structure since they are the assumed proxy for the forces that underpin theories, such as financial distress and information asymmetry costs. However, this relationship is not always clear, and hence it is important to resolve the elements that are reliable and economically important in order to predict the leverage. Some of the attributes which affect the choice of capital structure are the same for firms within the same industry. However, the effects of some of these attributes, for example, type of output market and type of products, are not testable because these attributes themselves are not easily measurable (Table 1). In this table, TBT refers to the tax-bankruptcy static trade-off theory. POT denotes the pecking order theory. ST refers to the signaling theory. The + (-) sign shows the expected positive (negative) relationship between

the leverage and the designated variable. The (+/-) sign signifies the possibility that plausible arguments could be made for a positive as a negative relationship using a given theory.

Table 1: Summary of the Capital Structure Theories Predictions

No	Variables	Static trade-off theory		Asymmetric information theory	
		TBT	Agency	POT	ST
1	Firm Size	+	+	-	+
2	Profitability	+	+	-	+
3	Growth opportunity	-	-	+	+
4	Asset tangibility	+	+	+/-	
5	Tax shield	-			
6	Risk	-	+	-	
7	Dividend policy	-	+	+/-	
8	Uniqueness of product	-			
9	Managerial equity ownership	-	+	+/-	

Source: Own construction

Fifty years after Modigliani and Miller's (1958) made their ground-breaking analysis, there is yet no unifying theory on the capital structure for corporate finance. Despite this, the applicable theories serve as analytical tools in order to probe the empirical findings. However, none are capable of explaining all the aspects of capital structure choice. Even though some of the stylized facts can be successfully accounted for in each theory, there are incongruities with some of the others. The current reference materials say that the most reliable elements explaining corporate leverage are the market-to-book ratio (-), tangibility (+), profitability (-), company size (+), expected inflation (+), and median industry leverage (+ effect on leverage). Frank and Goyal (2009) refer to these factors as the "core leverage factors" affecting the decisions on the capital structure. Furthermore, those six core factors provide a more powerful explanation of a market-based definition of leverage than a book-based definition of leverage. Empirical findings regarding the relationship between chosen firm-specific characteristics and leverage can be summarized in one table (Table 2).

Table 2: Summary of empirical evidence from selected empirical studies on determinants on capital structure

Author(s)	Firm size	Profitability	Growth opportunity	Asset tangibility	Risk
Rajan and Zingales (1995)	+	-	-	+	-
Fan, Titman and Twite (2012)	+	-	-	+	
Frank and Goyal (2009)	+	-	-	+	
Kremp et. el. (1999)	+	-	-	+	
Titman and Wessels (1988)	+	-	-	+	
Czerwonka et. al. (2021)	+	-	+		
Nivorozhkin (2004)		-			
Serghiescu & Văidean (2004		-			
Honggang et al. (2019)	+	+	+	+	

Source: Own construction

For the dependent variable, we determined the complete liabilities ratio defined as total liabilities divided by the total book value of assets. As Huang & Song (2006) point out, the total liabilities ratio represents appropriate measure for capital structure. As can be seen, we observed the ratio obtained from the information from the balance sheet in order to determine how much the structure of assets affects the sources of financing.

In Bosnia and Herzegovina, joint stock companies are listed on two Stock Exchanges: the Sarajevo Stock Exchange (SASE) and the Banja Luka Stock Exchange (BLSE). The shares of most of these companies are not actively traded on the Stock Exchange; i.e. in most companies one trading was at the moment of their transformation into joint-stock companies. On the Banja Luka Stock Exchange, only one joint-stock company was established by a public offering of shares, while all the others were created by the transformation of socially owned companies. According to data from 2019, 472 joint stock companies are listed on this Stock Exchange, of which 76 are in bankruptcy and 11 are in the process of liquidation. However, only 47 of them were traded for 10 or more days during 2020.

For the purposes of this research, we took into account joint stock companies listed on the Banja Luka Stock Exchange, which have publicly disclosed their financial statements for the period from 2015 to 2019. The empirical analysis focused on five years of data on a sample of public and private nonfinancial companies in order to test the relationship between the capital structure and the leverage determinants, combining all variables affecting the determination of the capital structure.

We divided the listed companies into joint stock companies in majority private ownership and joint stock companies in majority state ownership. By state-owned enterprises we imply those in which the state has a majority ownership of capital, i.e. participation in the share capital above 50%. The total sample of companies that submitted complete balance sheets for the observed period is 237. Of these, 163

are privately owned and 74 are in majority state ownership. There is no lag in the observed variables.

4. RESULTS AND DISCUSSION

The results obtained allow us to make several observations, including their scope and limits to guide future research. The equation of the estimate of our regression model can be as follows: $DR = \alpha + \beta_1 \cdot CL + \beta_2 \cdot FS + \beta_3 \cdot FC + \beta_4 \cdot CFI + \beta_5 \cdot SHC + \beta_6 \cdot CSTA + \beta_7 \cdot ICA + \beta_8 \cdot RETA + \beta_8 \cdot LOGI + \varepsilon$. Descriptive statistics of explanatory variables for private and state companies are presented in Table 3 and Table 4. There is no lag in these variables. The explanatory variables cover the period from 2015 to 2019. Focus of this study is on most the most commonly used indicators: debt ratio (abbreviation DR), liquidity - measured by current ratio (current assets/current liabilities; TL), fianancial stability ratio (long term assets/(capital+long term liabilities; FS), degree of coverage (capital / fixed assets;CFI), share capital / equity (SHC), cash and cash equivalents/ short-term assets (CSTA), inventories / current assets (ICA), real estate / total assets (RETA), log (Total assets) (LOGI).

Table 3: Indicators for state-owned enterprises

Abbreviation	Variable	Mean	Median	Std dev	Minimum	Maximum
DR	Debt ratio	0.28	0.18	0.29	-	1.02
CL	Liquidity is measured by current ratio (current assets/ current liabilities)	2.45	1.54	3.42	-	22.03
FS	Fianancial stability ratio (long term assets/(capital+long term liabilities)	0.79	0.95	0.52	-	1.94
CFI	Degree of coverage = capital / fixed assets	0.80	0.90	0.45	-	1.72
SHC	Share capital / equity	1.29	0.79	2.25	-	11.58
CSTA	Cash and cash equivalents/ short-term assets	0.12	0.04	0.19	-	0.87
ICA	Inventories / current assets	0.14	0.06	0.19	-	0.83
RETA	Real Estate / Total Assets	0.43	0.45	0.29	-	0.97
LOGI	log (Total assets)	6.75	6.91	2.01	-	8.99

Source: calculations made by the authors

For state-owned enterprises, it can be noticed that the largest deviation is observed in the current liquidity ratio, which reaches a maximum of 22.03. The mean of the debt ratio is 0.28 while the maximum value is 1.02 due to the existence of enterprises that have a loss above the amount of capital.

Table 4: Indicators for private-owned enterprises

Abbreviation	Mean	Median	Std dev	Minimum	Maximum
DR	0.20	0.01	0.27	-	0.99
CL	2.82	1.10	6.70	-	69.30
FS	0.57	0.38	0.86	-	8.01
CFI	1.05	0.94	1.11	-	9.43
SHC	2.45	0.90	10.57	-	138.20
CSTA	0.12	0.02	0.21	-	0.98
ICA	0.27	0.13	0.30	-	1.00
RETA	0.36	0.32	0.32	-	0.99
LOGI	6.07	6.49	1.93	-	8.93

Source: calculations made by the authors

In private enterprises, in addition to the current liquidity ratio, the high standard deviation is also expressed in the ratio of share capital to total capital. The mean of debt ratio is 0.20 while the maximum amount is 0.99.

Observing the indebtedness ratio, we notice that state-owned enterprises are financed more from borrowed than from their own capital. There are a correlation matrix with all observed variables (Table 5 and Table 6). Multivariate analysis through the study of correlations indicates that there is no problem of multicollinearity between the independent variables of the model since the correlation coefficients between the explanatory variables are all less than 0.7. Indeed, the presence of the multicollinearity problem is a sign of redundancy of information in the model and deteriorates its quality.

Table 5: Correlation matrix - state-owned enterprises

	DR	CL	FS	CFI	SHC	CSTA	ICA	RETA	LOGI
DR	1,00	-0,27	0,37	-0,53	0,47	-0,25	-0,00	-0,16	0,11
CL	-0,27	1,00	-0,09	0,30	-0,09	0,05	-0,12	0,16	0,27
FS	0,37	-0,09	1,00	-0,08	0,09	-0,17	0,29	0,19	0,49
CFI	-0,53	0,30	-0,08	1,00	-0,30	0,27	0,06	0,22	0,40
SHC	0,47	-0,09	0,09	-0,30	1,00	-0,05	-0,09	-0,04	0,02
CSTA	-0,25	0,05	-0,17	0,27	-0,05	1,00	-0,16	0,00	0,07
ICA	-0,00	-0,12	0,29	0,06	-0,09	-0,16	1,00	0,19	0,36
RETA	-0,16	0,16	0,19	0,22	-0,04	0,00	0,19	1,00	0,41
LOGI	0,11	0,27	0,49	0,40	0,02	0,07	0,36	0,41	1,00

Source: calculations made by the authors

Table 6: Correlation matrix - private-owned enterprises

	DR	CL	FS	CFI	SHC	CSTA	ICA	RETA	LOGI
DR	1,00	-0,19	0,65	-0,22	-0,02	-0,16	0,17	0,01	0,32
CL	-0,19	1,00	-0,14	0,26	-0,04	0,09	-0,04	-0,12	0,12
FS	0,65	-0,14	1,00	-0,22	-0,06	-0,09	-0,00	0,08	0,30
CFI	-0,22	0,26	-0,22	1,00	-0,11	0,23	0,03	-0,11	0,25
SHC	-0,02	-0,04	-0,06	-0,11	1,00	-0,08	0,21	-0,08	-0,00
CSTA	-0,16	0,09	-0,09	0,23	-0,08	1,00	-0,27	0,10	0,17
ICA	0,17	-0,04	-0,00	0,03	0,21	-0,27	1,00	-0,04	0,25
RETA	0,01	-0,12	0,08	-0,11	-0,08	0,10	-0,04	1,00	0,33
LOGI	0,32	0,12	0,30	0,25	-0,00	0,17	0,25	0,33	1,00

Source: calculations made by the authors

The results of the correlation matrix among state-owned enterprises show that FS, CFI, and SHC have a significant (at the conventional level of significance of p=0.05) negative (positive) impact on DR. The results of the correlation matrix among private enterprises show that FS, CFI, and LOGI have a significant (at the conventional level of significance) negative (positive) impact on DR.

Table 7 shows the multiple regression where we notice that the ratio of multiple correlation (R) in state-owned enterprises is 0.72 and in private enterprises 0.73, i.e. that the ratio of determination in state-owned enterprises is 0.51 and in private enterprises 0.54.

The adjusted ratio of multiple determination (less biased estimate of the ratio of multiple determination in the population - Adjusted R Square) shows about what percentage of variability of the criterion variable in the population can be explained on the basis of knowledge of variability in predictor variables. In the case of state-owned enterprises, it amounts to 0.45 and, therefore, suggests that based on the observed indicators (taken together), about 45.1708% of individual differences in terms of the debt ratio can be explained. Similarly, in private enterprises this indicator is equal to 0.51 (51.318%). Std. error of the estimate in the case of state-owned enterprises is about 15.13% and in the case of private enterprises it is 17.79%.

Table 7: Comparative representation of multiple regression

Regression Statistics	State-owned	Private
Multiple R	0.72	0.73
R Square	0.51	0.54
Adjusted R Square	0.45	0.51
Standard Error	0.15	0.18
Observations	74	163
Heteroscedasticity Breusch-Pagan Test	20.74	37.73
Durbin-Watson autocorrelation	1.72	2.22

Source: calculations made by the authors

Critical values are more than 20.09 at level 0.05. For state-owned enterprises, this value is 20.74 and for private-owned it is 37.73. We reject the thesis that heteroscedasticity is not present (Table 7). There is no sufficient evidence to conclude that heteroscedasticity is not present. The result is expected because the samples include companies from different sectors and industries. The Durbin-Watson statistics show that there is no problem with autocorrelation.

In order to verify the correctness of the obtained predictions, ANOVA test was performed (Table 8 and Table 9) in which the null hypothesis is discussed, which in our case states that in the population there is no linear relationship between the observed indicators on the one hand and the indebtedness ratio on the other.

Table 8: ANOVA overview for state-owned enterprises

	df	SS	MS	F	Significance F
Regression	8	1.56	0.20	8.52	0.00
Residual	65	1.49	0.02		
Total	73	3.05			

Source: calculations made by the authors

Table 9: ANOVA overview for private enterprises

	df	SS	MS	F	Significance F
Regression	8	5.66	0.71	22.35	0.00
Residual	154	4.87	0.03		
Total	162	10.53			

Source: calculations made by the authors

In both cases, the value of Significance F is below the value of F and we can conclude that the null hypothesis is wrong, therefore we can say that in the population there is a linear relationship between the observed indicators and the debt ratio and that it makes sense to use a regression model to explain the situation in the population.

Table 10: Ratios for state-owned enterprises

	Ratios	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
DR	-0.37	0.36	-105.07	0.30	-108.35	0.34
CL	0.00	0.00	0.32	0.75	-0.00	0.00
FS	0.26	0.07	3.490.189	0.00	0.11	0.41
CFI	-0.01	0.03	-0.56	0.58	-0.07	0.04
SHC	0.02	0.03	0.50	0.62	-0.05	0.08
CSTA	0.12	0.10	1.141.951	0.26	-0.09	0.33
ICA	0.67	0.09	7.177.215	0.00	0.49	0.86
RETA	0.06	0.08	0.73	0.47	-0.10	0.22
LOGI	0.02	0.04	0.47	0.64	-0.06	0.10

Source: calculations made by the authors

Table 11: Ratios for private enterprises

	Ratios	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
DR	0.66	0.19	3.392.185	0.00	0.27	1.037.467
CL	-0.01	0.00	-449.64	0.00	-0.02	-0.01
FS	-0.04	0.03	-157.68	0.12	-0.10	0.01
CFI	-0.04	0.02	-213.27	0.03	-0.09	-0.00
SHC	0.06	0.02	2.991.081	0.00	0.02	0.09
CSTA	0.03	0.06	0.44	0.66	-0.10	0.15
ICA	0.44	0.05	8.191.704	0.00	0.34	0.55
RETA	-0.30	0.06	-473.98	0.00	-0.42	-0.17
LOGI	-0.03	0.02	-1.00	0.16	-0.08	0.01

Source: calculations made by the authors

The empirical statistical results provide basis for logical conclusion and appropriate policy implications. Such results point to a need for a more detailed analysis of country-specific and macroeconomic variables that potentially cause different financial behavior of observed companies.

5. CONCLUSION

In our study the recent we identified advances and challenges in the literature and suggests some directions for future research. The results obtained allow us to make several observations, including their scope and limits to guide future research. The aim of our study was to research the capital structure of the listed companies in Bosnia and Herzegovina and identify the typical capital structure and its key determinants.

The subject of this study is the capital structure of the listed companies in bosnia And Herzegovina in the period before the global pandemic in 2020. This research on the capital market of a developing country shows that state and private enterprises behave differently when choosing the source of financing. The results of the research on private and state enterprises listed on the Banja Luka Stock Exchange are specific. Unlike previous research that observed enterprises according to their size or affiliation to individual industries, the focus of our research is enterprises of different ownership structures.

We reject the main hypothesis. So, there is a significant linear relationship between the specific indicators and the debt ratio in listed companies in Bosnia and Herzegovina. It can be concluded that there are no symptoms of heteroscedasticity in the regression model.

In general, we can say that both groups of enterprises have a low debt ratio; in state-owned enterprises, total assets are financed on average from borrowed funds of 28%, while this percentage in private enterprises is 20%. The low indebtedness of state-owned enterprises can be explained by the fact that no significant funds have been invested in these enterprises. On the other side, the state is borrowing from most utility companies in order to acquire assets for these companies, giving them the assets for disposal mainly free of charge. Observing the ratio of share capital and total capital, we can see that private enterprises have a higher ratio of share capital to total capital. Furthermore, Bosnia and Herzegovina belongs to the group of common law countries that are traditionally financed from bank loans.

The study points to the specifics of the capital structure in private and publicly listed joint-stock companies. The first thing observed in the regression model of these two groups of enterprises is the opposite sign of intercept; while in private enterprises it is 0.66 in state enterprises it is -0.37. In addition to the intercept, other explanatory variables have different effects on the indebtedness ratio of these enterprises. The growth of the current liquidity ratio and the financial stability ratio leads to an increase in the indebtedness of state-owned enterprises, while in the case of private enterprises the growth of these ratios reduces the indebtedness. The negative relation between leverage and liquidity in cases of Croatia, Hungary and Poland was found by De Jong et al. (De Jong, Kabir, & Nguyen, 2008) and confirmed by Sarlija & Harc (2012) in the Croatian case. With the growth of the ratio of real

estate and total assets, the indebtedness of state-owned enterprises is growing, while that of private companies is declining.

The stated opposite influence of certain ratios on the indebtedness of the enterprises can be explained by a number of factors. State-owned enterprises emerged in the privatization process when social ownership was transformed into state-owned, with no additional capital increase by the state. In the case of borrowing, state-owned enterprises find it easier to obtain borrowed capital due to guarantees are given by the government to banks for loans to these enterprises. The only way in which the capital of these companies increases (apart from withholding profits) is the revaluation of fixed assets, which leads to both an increase in assets and an increase in capital. Through the influence of the ratio of financial stability, we notice that state-owned enterprises finance the growth of long-term assets from borrowed sources, while with private companies the situation is reversed. Also, the higher the share of real estate in total assets with state-owned enterprises, the higher the indebtedness. In the case of private enterprises, the situation is reversed mainly due to the fact that real estate is financed from the owner's own funds, taking into account that the most illiquid part of the assets should be mostly financed from their own sources.

Observing only at state-owned enterprises, we see that the largest impact on indebtedness within the observed variables has the ratio of inventories and current assets (0.67). With the growth of this ratio, i.e. the share of inventories in short-term assets, there is an increase in indebtedness, which mainly refers to short-term liabilities to suppliers. The next is the ratio of financial stability, i.e. financing of fixed assets with long-term sources. On average, 79% of long-term assets are covered by long-term sources while the rest is financed from borrowed sources. Further growth of this ratio leads to an increase in indebtedness since the state does not have the funds for further investments in these companies. The results of our research on the positive correlation between fixed assets and indebtedness are correlated with the results (Ryan & Zingales, 1995, Kremp, Elma, & Gerdesmeier, 1999, Frank & Goyal, 2009, Titman and Wessels, 1988). Consequently, with the growth of capital towards long-term assets, there is a decrease in indebtedness.

The most important explanatory variable of indebtedness in private enterprises as well as in state-owned enterprises is the share of inventories in short-term assets, with the influence of this ratio being less expressed in private enterprises. Enterprises in Bosnia and Herzegovina use spontaneous sources of financing, i.e. financing liabilities to suppliers, as well as other free sources is very expressed as stated in the research of Malinić et al. (2013).

Of the seven variables observed, the growth of four variables has an inverse effect on indebtedness. Thus, the growth of short-term assets in short-term liabilities but also long-term assets in long-term sources leads to a decrease in indebtedness, which implies that private enterprises finance this growth from their own sources.

The same situation is with the share of real estate in total assets; as this share grows — indebtedness falls. The same conclusion was reached in the research of Romanian companies (Nivorozhkin, 2002) as well as Malinić et al. (2013) on Serbian companies. A lower level of indebtedness of private enterprises can be observed by analyzing the ratio of capital coverage of assets, where the average value of this ratio in private enterprises is above one, which indicates that one part of short-term assets is financed from the capital.

The sample used in this research is only the companies listed on the Banja Luka Stock Exchange. The limitation of this search is the sample size which can be considered low. Indeed, although the sample in this study is statically acceptable it is nevertheless limited and heterogeneous. This could affect the accuracy of the results and leave some doubts about the generalization of the study to all shareholders companies. In future studies we intend to investigate which factors determine the capital structure in sectors and industries. Future studies must conduct a comparative analysis of the affected countries to enhance the study's coverage. Further research may be conducted by using other capital markets to explore more information regarding the effect of the variables affecting the capital structure. In addition, further research may also be conducted by using other proxies or adding more variables, sample size, and research period to get a better result. For some future research, a pandemic crisis should be considered as well as its impact on the observed variables. Also, future researchers could overcome the limitations by combining the theoretical and empirical studies in a paper.

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IMPACT OF ENTREPRENEURIAL ACTIVITIES ON ORGANISATIONAL INNOVATIVENESS OF SMALL AND MEDIUM ENTERPRISES (SMEs) IN OSUN STATE, NIGERIA

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ABSTRACT

Purpose. *The entrepreneurial activity has requirements that distinguish it from other professional activities, especially managerial activities and other requirements associated with recognizing business opportunities and engaging in innovative activity. Meanwhile, Entrepreneurial activities have been identified in the literature as drivers of SMEs' growth and development. The study determined the mechanisms by which entrepreneurial activities impact the organisational innovativeness of Small and Medium Enterprises (SMEs) in Osun State, Nigeria.*

Design/Methodology/Approach. *This study adopted a survey research design. The population of this study consisted of three thousand and seven (3007) Owners/Managers of registered SMEs in Osun State, Nigeria. The sample size of three hundred and fifty-three (353) for the study was arrived at using the Taro Yamane formula for sample size. This study employed a simple random sampling technique for the selection of respondents across all the three senatorial districts in Osun State. The primary data used for the analyses were collected from the respondents through the use of a structured questionnaire, and responses were analysed using descriptive and inferential statistics.*

Finding and Implication. *Two hypotheses were proposed and tested. The first hypothesis revealed a significant impact of creativity at (R^2 = 0. 982, β = 0.1.004, t = 90.701, p< 0.05) on SMEs organisational innovativeness and the second hypothesis revealed a significant impact of knowledge transfer at (R^2 = 0.993, β = 0.1.012, t = 144.459, p< 0.05) on organisational innovativeness. Therefore, policymakers may be encouraged to develop and support policies that promote a creative culture and facilitate knowledge-sharing mechanisms among SMEs.*

Limitations. *The study focuses only on entrepreneurs' creativity, without recognizing the employee creativity. The study was also constrained by the cross-sectional and single-respondent nature of the study.*

Originality. *The claim about measuring performance with organisational innovativeness remains unclear to SMEs in Nigeria because most of the researches were carried out among large enterprises.*

1. INTRODUCTION

Organisations conducting business in the global environment are faced with significant competition. The search for competitive advantage has led to the recognition of innovation as a vital ingredient for survival and profitability. Scholars from different continents around the globe acknowledged the role and contribution of Small and Medium Enterprises (SMEs) to the economic development of every country (Ivan, Milica, and Đorđe. 2018), most importantly in the creation of wealth, new jobs and creation of products and services (Olubiyi, Egwakhe, Amos, & Ajayi. 2019), which promoted the interest of nation's stakeholders on the need to provide a lasting solution to their failure.

Entrepreneurship has a wide range of conceptual approaches, including economics, management, sociology, and psychology. The studies in the economic and management domains attempt to describe and explain the characteristics of SMEs, their contribution to national wealth, the logistical and management aspects of running a business, and so on. On the other hand, sociology uncovers the concept of different factors (values, norms, and rules) on entrepreneurial behaviour, the psychological approach, which is relatively new, seeks to identify the personality traits of businessmen as well as the psychosocial correlates of the traits (Luca, 2017).

The development of a business entails complex interactions between individual variables and external variables. The entrepreneurial activity has requirements that distinguish it from other professional activities, especially managerial activities and other requirements associated with recognizing business opportunities and engaging in innovative activity. However, the characteristics of an entrepreneur are easier to measure than other variables involved in the process of creating a profitable business to successfully manage these activities and face other business challenges, the entrepreneur must have personal characteristics that differ from those of a manager, not only in terms of domain-specific competencies but also, most likely, in terms of personality traits.

Organisations thrive where they have competitive advantages based on efficient and strategic ideas and innovation. Securing adequate strategies that give competitive advantages is a continuous process. Achieving efficiency in stable environments depends on standardized routines, division of labour and management control, which are conventional strategies. However, business environments are dynamic with their unpredictable fast-changing internal and external environments. The dynamic environment in which a business operates provides opportunities for it to grow, develop and create value and wealth.

Meanwhile, improving SMEs' performance has become a global agenda because of discussions involving government support and promotion, sociocultural trends, and the injection of economic capital (Liang 2019). Studies by scholars such as Brandstätter (2011); and Liang (2019) found a positive relationship between

entrepreneurship and personality traits, with entrepreneurs being more confident and outgoing while being less insecure and amenable. Meanwhile, studies focusing on the influence of entrepreneurial activities on organisational innovativeness are limited in the literature (Liang 2019; Ivan, Arsić, and Nikolić 2018), specifically on SMEs in developing countries like Nigeria. Secondly, the claim about measuring performance with organisational innovativeness remains unclear to SMEs in Nigeria because most of the researches were carried out among large enterprises and mainly in developed countries and on just product and process innovation (Nawaz & Khatoon, 2015), ignoring the contributory role of creativity and knowledge transfer on one side and organisational innovativeness on the other side to the entrepreneurship growth and sustainability. Therefore, it has become necessary to examine the modalities by which entrepreneurial activities impact organisational innovativeness in Nigeria

The broad objective of this study is to determine the mechanisms by which entrepreneurial activities impact the organisational innovativeness of SMEs in Osun State, Nigeria. Other specific objectives are to:

1 examine the impact of creativity on the organisational innovativeness of SMEs in Osun State, Nigeria
2 investigate the influence of knowledge transfer on organisational innovativeness of SMEs in Osun State, Nigeria.

2. LITERATURE REVIEW

2.1. ENTREPRENEURIAL ACTIVITIES

Entrepreneurship has an important role in the long-term economic development and competitiveness of a nation. Entrepreneurship, according to Rukundo, Cyeze, and Emmanuel (2016), is the process of creating something new and valuable through the act of devoting the required time and effort, with the assumption that the financial, social, and psychic risks are available, coupled with the result of personal satisfaction, independence, and monetary rewards. Meanwhile, Nwite (2016) describes an entrepreneur as a person who is willing to start a new business and is willing to accept complete responsibility for the results. Piirala (2012) defines entrepreneurship activities as "the discovery and exploitation of opportunities that result in the introduction of new goods and services." Weiloon (2016) posits that entrepreneurial activities are the process involving entrepreneurial cognition and actions. Meanwhile, for this study, creativity and knowledge transfer were used to measure entrepreneurial activities based on the study of Jovanović, Arsić, and Nikolić. (2018).

2.2. CREATIVITY

Creativity is the generation of unique ideas that provide tasks with a solution through an innovation process to arrive at a better or new product or process in other to derive a competitive advantage in a targeted sector of the economy. Liu, Ip, and Liang, (2018) opined that creativity has been found to have a positive impact on entrepreneurship intentions, mainly in terms of entrepreneurial originality. However, Ip, Liang, Wu, Yin, and Liu (2018) defined creativity as the business capacity to discover and exploit business opportunities for generating and implementing creative ideas, which help establish new ventures or revive existing organisations. Therefore, creativity serves as a motivator for entrepreneurial activities especially when entrepreneurs display high levels of entrepreneurial desirability.

2.3. KNOWLEDGE TRANSFER

Knowledge transfer is a usual norm and it happens indirectly in an organisation, especially when there is a flow of communication between employees, Zhang and Ng, (2012) asserted that knowledge transfer is created by individuals, not the organisation and it doubles when individuals share it with others in an organisation Knowledge transfer is better and productive when there are no intermediaries in the relationship between units in the organisation, and the result is bound to improve business performance if it's well absorbed, used creatively within the organisation. Zamfir (2020) opined that successful organisations are characterised by their ability to improve elements of organisational performance, as this often results from knowledge processes that reflect the nature of leadership and the values of diversity and continuous development. He further stated that the main purpose of knowledge transfer is to discover explicit knowledge that can be effectively transferred between sources and target tasks as well as the balance between the objectives of improving the performance of learning models. As to Wang et al. (2022), knowledge sharing encompasses the exchange of best practices, lessons learned, project updates, research findings, and training materials. According to Wang et al. (2022), knowledge sharing can take place through different means such as meetings, seminars, mentorship, coaching, social networking, online platforms, and papers.

2.4. ORGANISATIONAL INNOVATIVENESS

Organisational Innovativeness is a major element that enhances business sustainability and success in today's competitive environment, also the key to achieving long-term firm goals and objectives. The changing business environment has prompted business owners, managers and researchers to search for new ways to improve organisational capability, productivity and business performance.

Innovation may take different forms, such as product and process innovation, radical and incremental innovation, and administrative and technological innovation. However, an organisation's ability to create such innovations depends on both the financial and non-financial capabilities of the business. Asad, Shabbir, Salman, Haider, and Ahmad (2018) asserted that organisational innovativeness is a key determinant for survival, critical to enhancing market share, improving performance and providing a competitive edge in a competitive business environment. As per Ganguly, Talukdar, and Chatterjee (2019), information exchange is a crucial managerial element for generating innovation. The primary key to organisational learning, as identified by Belinski et al. (2020), is a significant catalyst for building values that drive business excellence and performance through innovation, as highlighted by Azeem et al. (2021).

According to Schumann (1994), organisational innovation can be viewed from two perspectives: the nature of the change and the extent to which it occurs. He further classified the dimension of the nature of innovation into three categories:

a) Product Innovation encompasses all aspects of functions and forms that can be provided to customers and is concerned with how things interact with one another.

b) Process Innovation refers to any change in the way a product is developed, manufactured, and prepared, such as improving the manufacturing process and distribution system.

c) Innovation Procedures include any method by which products and processes are integrated into an organisation's operations, such as improved marketing and administrative methods.

2.5. ENTREPRENEURIAL ACTIVITIES AND ORGANISATIONAL INNOVATIVENESS

Creativity, knowledge transfer and organisational innovativeness are the foundation of organisations' competitive advantage. Therefore, for an organisation to foster creativity and innovation, conventional wisdom and seminal research advocate eradicating constraints for creative minds to flourish (Amabile & Pratt, 2016). Creativity and innovativeness not only promote the development or enhancement of products and services but also new management techniques and technologies are directed towards other organisational functions in an organisation. Zamfir (2020) stated that the survival of organisations in a particular market is linked to the level of performance and, therefore, the organisations that are particularly interested in the issue of performance will remain focused and active in the use of advanced technology that not only speeds up product and service introduction to the marketplace but also strengthens the competitiveness of an organisation in every business environment (Tsao and Chen, 2012). Almerri (2023) stated that Knowledge dissemination serves as a mediator in the correlation between organisational culture

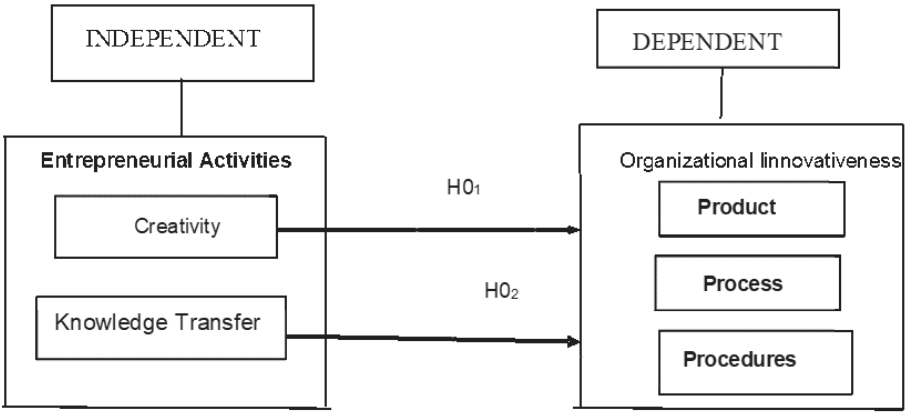
and innovation in small and medium-sized firms (SMEs). It suggests that a society that places importance on sharing knowledge might have a beneficial impact on the ability of small and medium-sized enterprises (SMEs) to innovate. Shahzad et al. (2020) found that fostering a culture in small and medium-sized enterprises (SMEs) that places importance on sharing knowledge can lead to a boost in innovation. Also, there is a need for proper Knowledge management in an organisation to create a sustainable competitive advantage. These initiatives will help to improve business processes simply because they can share best practices through conversations and discussions that can generate valuable knowledge for expected savings and cost reduction.

Meanwhile, existing literature on innovation suggests that creativity is a fundamental driver of innovation. Entrepreneurial activities often involve creative thinking, problem-solving, and the generation of novel ideas. Research in other regions and industries has consistently highlighted the positive relationship between creativity and innovation in organisations. Further, in the contemporary business landscape, the importance of knowledge as a strategic resource cannot be overstated. Knowledge transfer, which involves the sharing and application of knowledge within an organisation, is crucial for adapting to market changes and technological advancements. Therefore, for this study, two hypotheses were formulated;

Ho_1: Creativity does not significantly impact the organisational innovativeness of SMEs in Osun State, Nigeria

Ho_2: Knowledge transfer has no significant influence on the organisational innovativeness of SMEs in Osun State, Nigeria.

Figure 1.: Conceptual Model



Source: Author's Conceptual Framework (2021)

3. THEORETICAL REVIEW

3.1. ENTREPRENEURSHIP INNOVATION THEORY

Joseph Schumpeter (1949) defined entrepreneurs as innovative and creative individuals with foresight in a given economy to help in the process of development of the economy through the creation of goods and services. Schumpeter stated that innovation is the art of introducing a new product new production system, or new market, discovering a new source of raw materials or introducing a new business into a particular industry by the entrepreneur. However, Schumpeter's entrepreneurs are, essentially, large-scale businessmen/women which is common in advanced economies contrary to classes of entrepreneurs common in developing countries who rather imitate than innovate to survive.

3.2. KNOWLEDGE-BASED THEORY (KBT)

Knowledge is a specific and special resource at the heart of the firm. Curado (2006) opined that a firm is a body of knowledge and sees the Knowledge-based theory (KBT) of the firm as an extension of the resource-based theory. The theory states that an organisation exists to create, transfer and transform knowledge into a competitive advantage. Lewin (2000) indicates that knowledge is an intangible heterogeneous and difficult-to-imitate resource made up of different types of different levels of the organisation, and likened to organisational performance. Therefore, the Entrepreneurship Innovation Theory is selected as the anchor theory for this study because its perspectives are tied to the focus of the study and explain when and how creativity and innovation occur to achieve innovativeness and enhance a firm superior performance.

3.3. EMPIRICAL REVIEW

In their study, Almerri (2023) examined how information sharing influences the connection between organisational culture (including values, norms, symbols, rituals and ceremonies, language, and climate) and innovation in small and medium-sized firms (SMEs) in Kuwait. A quantitative methodology was employed to send a questionnaire to a suitable sample of 339 HR managers and executives in small and medium-sized firms in Kuwait. The study revealed that the impact of information sharing on the connection between organisational culture and innovation is based on the degree to which knowledge sharing can influence the level of support for innovative practices within the organisation's culture.

Zamfir (2020) examined and identified the impact of knowledge sharing on organisational performance with a sample size of 100 people working in a certain

shared services centre. The study also analyzed the importance of having a solid base of information to achieve excellent organisational performance. The study revealed that knowledge transfer has an impact on the company's vision, continuous learning and business performance. The study concludes that the way knowledge is managed in a company is crucial to gaining a competitive advantage.

Indriastuti's (2019) empirical study analysis was on entrepreneurial innovativeness, relational capabilities, and value co-creation to enhance the marketing performance of SME (Small and Medium Enterprise) apparel fashion industries in Central Java, Indonesia. Data sampling was adopted using the purposive sampling technique involving 150 respondents, with the use of a questionnaire. The data analysis employed Structural Equation Modelling (SEM) with AMOS program assistance. The result of the study revealed that relational capabilities have a significant effect on value co-creation. The study concludes that value co-creation can mediate the gap between relational capabilities and marketing performance.

The study of Domi, Keco., Capelleras., and Mehmeti (2019) empirically investigate the interplay of innovativeness, innovation behaviour and SMEs' performance indicators. The study used face-to-face techniques and data for 211 valid cases using SEM statistical methodology. The results indicate that innovativeness significantly affects innovation behaviour. While innovativeness does not affect SMEs' performance directly, its significant effects are indirect, through the mediation role of innovation behaviour.

Ayepa, Boohene, and Mensah (2019) examined the effects of innovativeness and firm resources on the growth of small enterprises in the Ga South Municipality in Ghana. The study employed a quantitative approach using a cross-sectional design with a sample size of 188 registered SMEs, selected from a population of 368 using a Simple random sampling technique. The study revealed that innovativeness and firm resources both affected the growth of small enterprises and. concluded that SMEs should be more innovative, and reinforce and maximise the effective use of resources to enhance growth.

4. METHODOLOGY

A survey research design was employed to investigate the impact of entrepreneurial activities on organisational innovativeness among selected SMEs in Osun State, Nigeria. The population consists of small and medium-sized enterprises in Osun State, which comprises 3007 SMEs (SMEDAN, 2017), representing 4.1% of the total of the 73,081 SMEs in Nigeria. The justification for the adoption of SMEDAN (2017) figures was that it is the most current and reliable database for SMEs in Nigeria.

On the determination of the appropriate size that represents the total population, Taro Yamane was used to derive the sample size. This was determined by applying the Taro Yamane formula as is the standard method of randomization and identifying

the limits of errors considered as the most essential items in the survey. This helps the researcher obtain the sample and use the results to make sampling decisions based on the data.

The Yamane formula is commonly used for determining the sample size in a finite population. The formula is given by:

The Yamane formula is commonly used for determining the sample size, and the formula is given by:

$$n = \frac{N}{1 + Ne^2}$$

Where:

n is the sample size.

N is the population size.

e is the desired level of precision (expressed as a proportion).

Let's assume a 95% confidence level, which corresponds to e=0.05, and the population size is N=3007.

$$n = \frac{3007}{1 + 3007 \cdot 0.05^2}$$

$$n = \frac{3007}{1 + 3007 \cdot 0.025}$$

$$n = \frac{3007}{8.5175}$$

$$n \approx 352.85$$

So, according to the Yamane formula, a sample size of approximately 353 would be appropriate for a population of 3007, with a desired precision level of 0.05 (95% confidence level). population.

This study adopted a simple random sampling technique, which belongs to the probability sampling technique, in which every member or element in the population for this study has an equal chance or opportunity of being selected to participate in the study based on random selection. This was the stage of randomly selected and distributed questionnaires to registered SMEs in Osun State, Nigeria.

The researcher adopted the use of primary data with the use of structured questionnaires disseminated to randomly selected Owners/Managers of Small and Medium Enterprises (SMEs) across all the 3 senatorial districts in Osun State, Nigeria during their typical working hours. Questionnaire items were adapted from related past studies with modification and validation to fit into the current research. The devised instrument was constructed utilising a 5-point Likert-type scale

ranging from "strongly agree" to "strongly disagree." The rationale for selecting this particular design is based on its expeditious and efficacious approach to instrument design.

5. MODEL SPECIFICATION

Based on the review of relevant literature, the model for the study is stated to capture the two major variables.

Where:

Dependent variable = Organisational Innovativeness (OI),

Independent variable = Entrepreneurial Activities (EA).

EA and IO variables are operationalized into mathematical equations as

$Y = f(x)$,

y represents the aggregate of dependent variables,

x represents the aggregate of independent variables.

$X = (x_1, x_2)$, x_1= Creativity(CR), x_2 = Knowledge Transfer(KT)

Functional relationships

$Y=f(X)$

$Y=f(x_1)$.....obj. i

$Y=f(x_2)$.....obj. ii

Regression Model

$Y= f(x_1)$

$OI = f(CR)$

$Y= \alpha_o + \beta_1 x_1 + \mu$

$OI= \alpha o + \beta 1 CR + \mu i$ .....equation 1 for obj. i

$Y= f(x_2)$

$OI = f(KT)$

$Y= \alpha_o + \beta_2 x_2 + \mu$

$OI= \alpha o + \beta 2 KT + \mu i$ .....equation 2 for obj. 2

Where α = the constant of the equation

$\beta 1$ = the coefficient of variables in the equations;

μi = the stochastic function that accounts for the errors that may arise in the equation.

6. RESULTS AND DISCUSSION

I. Ho_1: Creativity does not significantly affect the organisational innovativeness of SMEs in Osun State, Nigeria

Table 1: Summary of the regression analysis of the impact of creativity on organisational innovativeness of SMEs in Osun State, Nigeria

	Sum of square	df	MODEL	β	Sig.	T	ANOVA (Sig)	R^2	Adjusted R^2	F
Regression	266.38	1	**Constant**	0.062	0.21	1.26	0	0 .982	0.964	8226.74
Residual	9.81	303	**Creativity**	1.004	0	90.7				
Total	**276.19**	**304**								

Notes: Predictors: (Constant), Creativity; Dependent Variable: Organisational Innovativeness.
Source: Author's Computation (2021).

The model summary in Table 1 gives the results of the analysis with an R^2 value of 0.982. This indicates that creativity explained 98.2% of the changes in organisational Innovativeness of SMEs in Osun State. Therefore, the model met the fitness and robustness criteria for the analysis. The table equally provides the results of the regression analysis of the variance (ANOVA). The results indicate that the overall model was statistically significant. This was supported by an F statistic of 8226.742 and the p-value was 0.000 less than the conventional probability of a 5% level of, significance.

The results also show that creativity has a significant impact on the organisational' Innovativeness of SMEs in Osun State at $\beta = 1.004$, $t = 90.701$, $p<.05$. This implies that a unit change in creativity leads to a 100.4% change in organisational' Innovativeness of SMEs. The t-statistic of 90.701 and p-value of 0.000 shows that at a 5% level of significance, the null hypothesis (H_{01}) was rejected and the alternative hypothesis accepted, implying that creativity has a significant impact on organisational' Innovativeness of SMEs in Osun State, Nigeria. The results are consistent with Jovanović, Arsić, and Nikolić (2018) assertion that creativity and innovation affect the performance of the SMEs sector.

Ho_2. Knowledge transfer has no significant influence on the organisational innovativeness of SMEs in Osun State, Nigeria.

Table 2: Summary of the regression analysis of the impact of Knowledge transfer on organisational innovativeness of SMEs in Osun State, Nigeria

	Sum of Square	df	Mean Square	Model	β	Sig.	T	ANOVA (sig.)	R^2	Adjusted R^2	F
Regression	272.23	1	272.23	**Constant**	.-048	0.129	-1.52	0	0.993	0.986	20868.32
Residual	3.95	303	0.013	**KT**	1.012	0	144.46				
Total	276.19	304									

Notes: Predictors: (Constant), Knowledge transfer; Dependent Variable: Organisational innovativeness.
Source: Author's Computation (2021).

The model summary in Table 2 gives the results of the analysis with an R^2 value of 0.993. This indicates that knowledge transfer explained 99.3% of the changes in the organisational Innovativeness of SMEs in Osun State. Therefore, the model met the fitness and robustness criteria for the analysis. The table equally provides the results of the regression analysis of the variance (ANOVA). The results indicate that the overall model was statistically significant. This was supported by an F statistic of 20868.320 and the p-value was 0.000 less than the conventional probability of 5% level of significance.

The results of the coefficients also revealed that knowledge transfer has a significant impact on the organisational innovativeness of SMEs in Osun State at $\beta = 1.012$, $t = 144.459$, $p<.05$. This implies, that a unit change in knowledge transfer leads to a 101.2% change in organisational' innovativeness of SMEs. The t-statistic of 144.459 and p-value of 0.000 shows that at a 5% level of significance, the null hypothesis (H_{o2}) was rejected and the alternative hypothesis accepted, implying that knowledge transfer has a significant impact on the organisational' innovativeness of SMEs in Osun State, Nigeria. The result also reaffirms the findings of Zamfir (2020) that knowledge transfer has a significant impact on the business performance of an organisation.

7. LIMITATIONS AND FUTURE RESEARCH

This study has two research limitations that suggest directions for future studies.

First, this research focuses only on entrepreneurs' creativity, without recognizing employee creativity. Future studies can build on our findings to investigate how employee creativity influences the organisational innovativeness of SMEs.

Second, the study was constrained by the cross-sectional and single-respondent nature of the study. Future studies should also try multiple respondents from each SMEs business to improve the data validation of the studies.

8. CONCLUSION

The goal of this study was to investigate the impact of entrepreneurial activities on the organisational innovativeness of SMEs in Osun State, Nigeria. An analysis was conducted and the findings from the analysis highlighted the role of entrepreneurial activities in organisational performance. Furthermore, the study concludes how entrepreneurial activities, such as creativity and knowledge transfer, impact organisational innovativeness. Therefore, entrepreneurs must develop a creative mind to achieve organisational innovativeness, since creativity is a personality trait that could be developed and nurtured by the entrepreneur. In addition, entrepreneurs must encourage a greater transfer of knowledge and practices as an organisational rule and procedure by recruiting and developing Managers with a knowledge-transfer mindset to improve business performance.

Policymakers may be encouraged to develop and support policies that promote a creative culture and facilitate knowledge-sharing mechanisms among SMEs. Therefore, funding may be allocated to support the implementation of policies that encourage and facilitate entrepreneurial activities that enhance both creativity and knowledge transfer.

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QUALITY OF LIFE DEPENDENCE ON PUBLIC TRANSPORT ACCESSIBILITY

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ABSTRACT

Purpose. *Article present the survey on dependency of quality-of-life indicators with transport accessibility. Specific focus is on rural areas. There was hypothesis to prove, that inhabitants of low population density rural areas are facing poor quality-of-life.*

Design/Methodology/Approach. *A representative survey of the population was chosen as the research method. The study area was divided into transport districts, and the representativeness of the survey was ensured in each transport district. Transport districts are divided according to the criterion of travel time and public transport supply. The survey included questions that allowed checking whether and which quality of life parameters correlate with the quality of public services.*

Findings and implications. *The research found that public transport accessibility is closely related with such attributes as education, employment rate and closely related to such attributes of life quality as change of clothes more often or having the proper shoes more often as well as having Internet access.*

Limitations. *The study was conducted in just one country with a very high level of car ownership, which is still growing. Another limitation is that the public transport supply in this country is insufficient due to historical reasons. For a long time, public transport was unsubsidized or weakly subsidized in this country.*

Originality. *The originality of the paper is based on a representative survey conducted by the authors, the results of which linked quality of life indicators with public transport availability indicators. The originality of the work is based on a representative survey conducted by the authors, the results of which linked quality of life indicators with public transport availability indicators.*

1. INTRODUCTION

Many of European Countries are facing urbanisation process which leads towards inequalities in quality of life. Largely populated cities with high density suburban areas are growing fast accompanied by development of infrastructure and public services. However, a region and especially rural areas have a serious issue with declining of population. Low density of population is facing a scarce of available public funding due to insufficient number of local tax payers. As an example, is Lithuania, where capital city Vilnius is growing since 2005, since EU access of the country, however the population of rest of the country continuously declining due to domestic and foreign emigration. Foreign emigration is caused by economical reason in many of 2005 EU new commers. However, it is important to emphasize, that majority so called labour emigrants are formerly residents of poor regions, low density regional towns and rural areas. Domestic migration has very similar patterns, when inhabitant of working age are leaving low density towns, villages and rural areas for large cities and suburbs.

The issue of increasing inequality between large cities and their metropolitan areas and regions was on political agenda during 2014-2020. Efforts to reallocate public funds in favour of regions with rural areas and declining population region was taken place in National funding as well as in EU funding in Lithuania. One of the current streams of politicians is to improve the public transport accessibility in regions, as there is the hypothesis, that poor mobility and public transport accessibility and access are causing inhabitants behaviour to leave rural areas for major cities. The aim of the article is to present survey results and to verify mentioned hypothesis. Such comprehensive survey is never was done for Lithuania and shall support politicians' decisions on reorganization of public transport services at National level. Survey was carried out in 2019 with methodological part and finished in 2020, with the gathering answers and operating with results. One of the boundaries of survey was Covid19 possible impact on perceptions of respondents, but it was tackled by formulating question to avoid influence of lock down.

2. LITERATURE REVIEW

Issues with quality of life and public services depending of living area are object of research for many years. Those are coming very similar both in European Union and in United States. Bieri and Dawkins (2016) have proved that US Federal housing subsidies are allocated without regard to spatial differences in the cost of living or quality of life and these subsidies are significantly related to metropolitan quality-of-life differentials. Household transportation expenditures, and this is particularly pronounced for low-income households.

In Gerber et all (2017) is argued in the life-oriented approach that travel behavior affects life choice and vice versa with resulting impacts on quality of life. Authors conducted in depth analysis of interdependences between daily mobility and life event (relocation) and their relationship and show how life events first, encourage travel behavior changes, especially mode choice, and second, improve or decrease people's quality of life.

Insufficient rural area population for profit oriented regular transport services and scarcity of public funding for those services, led over the past decade, considerable decline in rural buses. Between 2010 and 2016, funding for buses in Wales fell by 20% (Joseph, 2016). Cut routes and timetables can disproportionately affect rural areas, where there are few alternative options. Higher levels of car ownership in rural compared to urban Wales (Systra 2018) suggest that most rural dwellers depend on driving. However, both older and younger people are less likely to have access to a car (Powell et al. 2018) Ð and more likely to need to get to distant schools and health services. Research argued that accessibility poses particular challenges, especially for those with physical disabilities.

Correlation between public transport accessibility and indicators of quality of life are also found beyond EU, UK and US. Those are significant in other regions of the world. Transportation is one of the key indicators used to measure the Quality of Life of people especially those living in the urban area is proved by Othman at all (2021). Many aspects of transportation are very significant as they have the power to directly influence our way of life in search for a better Quality of Life is justified by research conducted in Malaysia.

Sipus and Ambramovic (2017) concluded that the population that migrates from the rural area into the urban center has constantly been in decline, with the trend suggesting the increase of emigration with each year. The significantly inadequate mobility in the researched rural area results from the lack of spatial coverage of 70% of the area by public bus transportation services, with railway transport available only to the inhabitants residing in the vicinity of the railway track. The fact that every other working-age inhabitant possesses a vehicle is not by choice but rather due to the impossibility of using adequate public transportation services. Researchers suggest that the availability of public transportation would contribute to the change of the emigration trends of the rural areas, thus improving the quality of life in the analyzed region.

The newest scientific article advocated the transport on demand as possible solution to ensure economically efficient transportations services in low density rural areas. The role of government is highlighted in (Veeneman and Mulley, 2018) by suggesting multi-level governance in public transport and efficient use of public subsidies. White (2016) also figuring the role of transport on demand role in organisation of public transport in situation, when regular transport is not economically sustainable However he indicated as public transport is highly related

to the basic indicators of quality of life. Public transport from one hand is very closely related with the availability of working places. Scarcity of mobility tend even to higher unemployment rates, lower attendance in social and cultural life of residents of rural areas. There is common to have daily job commuting up to 100-kilometer distance in those countries where is public transport access and services are well organized. However, those countries which have not integrated the rural areas by regular job commuting services to the major hubs of working places, are facing poor living standard and emigration in rural areas.

Diana and Daraio (2013) have reviewed among other things the indicators that have been proposed in the transport economics and engineering scientific literature to assess quality aspects in public transport systems in different countries, both in Europe and overseas. As it is mentioned in Jarzemskis and Jarzemskiene (2017) This review only considers variables and indicators related to physical, or instrumental measures, thus not taking into account other methods that are for example based on individual satisfaction levels, subjective or perceived quality. According to their review, the quality indicators available in the published research in these fields can be grouped as time performance and service coverage indicators. On-time performance that is related to the service reliability. This seems the quality aspects being most considered in the above defined research field, and a lot of indicators have been proposed that are related to this aspect. Service coverage and availability, that identifies to which extent the studied system is available both in spatial and in temporal terms. Spatial and temporal availability can typically be measured through the consideration of the service are on one hand, of the hours of operations on the other. This is also useful to assess the importance and the impact of a service within the whole transport system.

The results of the publications of Bansal et all (2021), Huang et al (2019), Kim et all (2019), Ma et all (2019), Noel et all (2019), Song et all (2020), Wu et all (2021) show different willingness to pay more for environmentally friendly car in China, India, South Korea as well as European Nordic countries.

In summarizing the review of literature, it is important to conclude that it well justified fact that public transport accessibility and perception of quality of life are closely related. However, the prove of those correlation by taking sets of very specific accessibility indicators and quality of life indicators was not obtained during analysis of literature. That was for the authors a scientific challenge to define proper methodological approach and tools to use for proving mentioned correlations. In the next chapter methodology is presented.

3. METHODOLOGY

For the representativeness of regions, the whole territory of Lithuania is divided into non-intersecting parts - layers and a stratified sample with a simple random sample in layers is used. The stratification is based on the aspects of peripherality of the territory and accessibility of the territory by public transport.

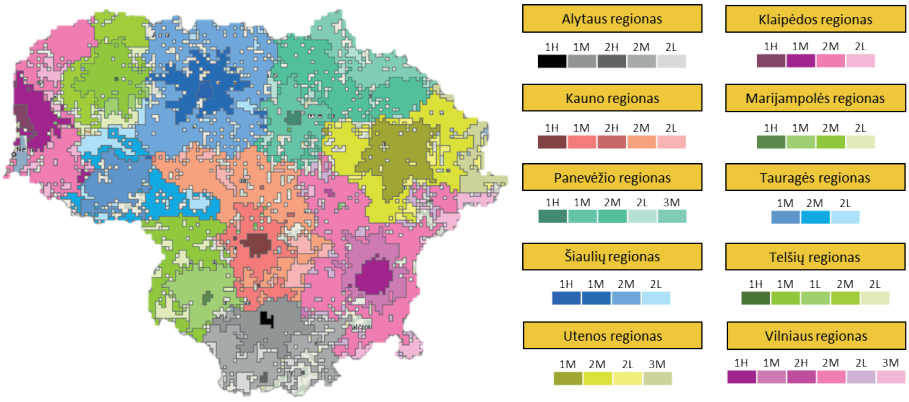
Table 1.: Transport accessibility matrix

Transport accessibility	Short distances, high density		Middle distance travel zone		Long distance travel zone (periphery)	
High	1H	„HH" (high-high) clusters are dominating, hot spots of public transport.	2H	Some hot spots of public transport, scarce of statistically valid areas	3H	Hots spots for periphery
Middle	1M	Up to 30 min travel by car from centre of a region, scarce of statistically valid areas or clusters.	2M	30-60 min travel by car from centre of a region; scarce of statistically valid areas or clusters.	3M	More than 60 min travel by car from centre of a region; scarce of statistically valid areas or clusters.
Low	1L	Cold sport, there are number of areas	2L	Cold spots, scarce of statistically valid areas or clusters.	3L	Cold spots, scarce of statistically valid areas or clusters.

Source: Ministry of Interrior of Republic of Lithuania.

Taking into account the data of public transport travel and the territorial division of the Ministry of the Interior and the geographical distribution of the population, the study analyses 4 out of 9 territorial division layers - (1H); (1M / 1L); (2H); (2M / 2L / 3M). All regions in Lithuania were reflected by using ARC GIS tool with precision of transport accessibility by 500 meters.

Figure 1: Lithuanian regions and transport clusters according accessibility level



Source: Authors.

To statistically represent all four layers the number of respondents was selected as N=3186. Distribution of respondents along regions is presented in the table below.

Table 2: Number of respondents per region

Region	Number of respondents	Region	Number of respondents
Alytaus	240	Šiaulių	274
Kauno	674	Tauragės	96
Klaipėdos	303	Telšių	141
Marijampolės	156	Utenos	148
Panevėžio	210	Vilniaus	944

Source: Authors.

Analyzing the distribution of respondents according to the level of accessibility of the territory by public transport, it was found that 2160 respondents belong to the high level of accessibility, 919 respondents to the medium level, and 54 respondents to the low level. Assessing the distribution of respondents according to the peripherality of the territory, it was found that 2252 respondents are assigned to the near travel zone, 919 respondents to the middle, and 15 respondents to the distant travel zone.

For data analysis SPSP Statistics was applied. The one-way analysis of variance (ANOVA) is used to determine whether there are any statistically significant differences between the means of two or more independent (unrelated) groups (although you tend to only see it used when there is a minimum of three, rather than two groups).

Survey questionnaire consisted of 65 question which determine the long list of indicators of quality of life to check their interrelations with the layers of transport accessibility.

4. RESULTS

To determine the links and dependencies between the accessibility of public transport and other economic, social, human capital characteristics. a survey conducted by the authors in 2020 was used for the analysis.

Table 3: General economic and public services correlation with public transport accessibility

Transport accessibility	Activity	Unemployment	High Education	Income level	Public services quality	Public transport quality	Affordability of clothes	Affordability of shoes	Internet access
1H	63,2%	4,2%	76,4%	76,0%	4,0	3,9	69,4%	99,4%	68,8%
1M	55,3%	4,9%	66,3%	67,7%	4,0	3,8	66,5%	98,9%	62,8%
1L	100,0%	0,0%	71,4%	85,7%	4,3	3,0	58,1%	100,0%	51,2%
2H	53,8%	4,9%	70,6%	74,4%	4,0	3,9	68,3%	96,7%	64,2%
2M	52,8%	6,4%	57,4%	64,0%	3,9	4,1	60,6%	98,8%	57,5%
2L	51,1%	2,1%	63,8%	72,3%	3,8	3,8	63,7%	98,1%	61,1%
3M	40,0%	0,0%	40,0%	73,3%	3,9	3,2	37,7%	97,1%	44,9%
Correlation	strong	strong	strong	strong	no	no	strong	strong	strong

Source: Authors.

Where a cross-tabulation using the Chi-square criterion, p = 0.000 <0.05, the variables are statistically significantly dependent and a relationship exists. Where the One-way Anova method was used, p = 0.588> 0.05, it was found that there was no statistical significance and no relationship.

The evaluation found that where public transport is more accessible:

- a higher share of the employed population among the total population;
- the share of people with higher and post-secondary education is higher;
- a higher share of people receiving income;
- change of clothes more often;
- having the right shoes more often;
- Having Internet access is more common.

It has also been found that a higher proportion of the unemployed among all people where public transport is less accessible. In summary, the availability of public transport affects employment, unemployment, education, income levels and other aspects such as changing clothes or accessing the internet at home. However, public transport does not affect the totality of the services received or the quality of public transport services.

In summary, the availability of public transport affects employment, unemployment, education, income levels and other aspects such as changing clothes or accessing the internet at home. However, public transport does not affect the totality of the services received or the quality of public transport services.

Table 4: Satisfaction of life aspects which was found corelated with public transport accessibility

Transport accessibility	Life satisfaction	Satisfaction on financial situation	Job satisfaction	Satisfaction in time spent for hobby	satisfaction by personal connections
1H	6,7	5,5	7,2	6,2	8,0
1M	6,2	5,2	6,9	6,2	7,8
1L	4,4	4,2	6,3	4,7	8,3
2H	6,7	5,4	6,6	6,6	7,7
2M	5,8	4,6	6,7	5,9	7,7
2L	5,8	4,7	6,5	5,9	7,2
3M	5,1	4,2	7,0	6,1	7,6

One-way ANOVA method was used for evaluation, p = 0.000> 0.05. Significant differences were not found between all groups, such as more differences in life satisfaction between 1H, 1L, and 1M, and other groups. It can be said that the evaluation indicators differ depending on the accessibility layer of public transport. In summary, whether satisfaction depends on the stratum is not an option - one can only point out that assessments differ, and why and what factors influence this remains not clear after analysis.

Table 5: Quality of social life aspect which was found corelated with public transport accessibility

Transport accessibility	Leisure activities	Cinema attendance	Attendance cultural objects	Meeting friends and family members	Attendance of live performance	Attendance sport events
1H	36,1%	38,6%	33,9%	69,5%	60,0%	22,0%
1M	24,5%	24,3%	22,7%	69,2%	63,8%	29,6%
1L	11,6%	18,6%	7,0%	74,4%	12,5%	0,0%
2H	39,2%	41,7%	44,2%	76,7%	0,0%	0,0%
2M	24,6%	21,5%	20,8%	70,2%	54,2%	24,2%
2L	19,0%	18,0%	20,9%	73,3%	37,8%	24,3%
3M	18,1%	10,1%	14,5%	67,4%	40,0%	10,0%

A cross-tabulation, Chi-square criterion, p = 0.000 <0.05 was used in the evaluation, so the variables are statistically significantly dependent. It has been found that where public transport is more accessible, participation in leisure activities is higher, visits to cinemas and cultural sites are also more frequent, participation in live performances and sporting events is higher, and meetings with friends and relatives are also more frequent. In summary, the accessibility of public transport affects all aspects analysed.

5. CONCLUSIONS AND INSIGHTS FOR FURTHER SCIENTIFIC DISCUSSION

Transport accessibility is closely related to the such quality-of-life indicators as participation in cultural activity, visiting theatres, sport and culture events. In the areas with better transport accessibility are living people with higher income, higher education and rates of unemployment are lower there.

It is important to mention, that research proved statistically only interdependences between public transport accessibility and identified indictors of quality of life, however results doesn't reflect causality. Still is not enough data to prove if scarcity of public transport is cause of lower quality of life indicators, or if it is consequence of that. There are still theoretical options that impact is in both direction, and causality of such situation could be justified as mutual evolution of both factors. That means that more educated and higher reimbursed inhabitants are moving to the areas, where public transport is more accessible, and in parallel, for those areas where are declining population, politicians are reducing the public transport supply. This mirroring effect causes slowly pattern to the total absence of public transport in particular geographical areas, as it is happening now.

However, finding causality is a challenge for future research. If, however, research proves that access to transportation determines the factors that determine quality of life, then this would be a strong argument for policy makers. Subsidies for the public transport system and the development of infrastructure could raise the parameters of the quality of life of the population, especially in those regions where these indicators are poorer.

One of the research methods could be a longitudinal study, choosing as the research region the one in which interventions in the development of public transport infrastructure and greater subsidization have been carried out. If the results of the study show that the investment led to an increase in quality of life and accessibility to the public transport, then causality could be proven.

It is also important to mention, that results show us, that in areas where is absence of public transport near to 4/5 of populations is using private cars. Research was carried out in Lithuania, where average age of the car is 14,3 year and there are no significant taxes that prevent of spreading automobilization. So, scarcity of public transport is easily replaced by private vehicles, but it could be a matter just in those countries, which has similar low taxation regime for using cars. If country will implement limitation of acquisition and usage of private vehicles by regulatory burdens or emission-based taxation, the presented survey model could show much higher relations between public transport accessibility and quality of life standards. Taxation for using of cars is started in Lithuanian since July 2020, right after the data from the survey was collected. CO_2 tax at EU level since 2023 was announced by the President of European Commission. Conducting a similar study in a country

where the public transport supply is significantly higher would also provide valuable conclusions. It would be especially important to compare the strength of the correlation between the availability of public transport and the quality of life in the case of Lithuania and a country with a larger supply of public transport.

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