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ON THE DETERMINANTS OF UNEMPLOYMENT IN NIGERIA: WHAT ARE THE ROLES OF TRADE OPENNESS AND CURRENT ACCOUNT BALANCE?

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ABSTRACT

Attention of international trade and macroeconomic experts has focused on the effect of international trade, precisely trade openness, on economic growth and by extension on unemployment rate, albeit with mixed results. However, scanty attention has been drawn towards the effect of current account balance on unemployment rate despite the arguments from different quarters trailing such relationship. By employing Autoregressive Distribution Lag estimation technique, this study specifically focuses on the short-run dynamic and long-run effects of trade openness and current account balance on unemployment rate in Nigeria using the data that span 1981-2014. We found that trade openness worsens unemployment rate both in the short-run and long run. We also discovered that in the short run, current account balance increases unemployment rate but reduces it in the long run. Control variables used in the study such as inflation rate, exchange rate, and FDI followed a priori expectation while real GDP, wages and government consumption expenditure failed to follow a priori expectation. We, therefore, concluded that there is need for sound trade and macroeconomic policies to aid domestic firms' production to ensure international competitiveness of these firms so as to guarantee employment generation.

Keywords:

Trade openness, current account balance, unemployment rate, Autoregressive Distribution Lag Method (ARDL), Nigeria

1. INTRODUCTION

Theoretically, it has been argued in the literature that when an economy is growing at a certain percentage, unemployment rate is expected to reduce by a certain percentage (Okun, 1962). Due to expected gain from trade, economists also believe that international trade tends to promote employment (Brecher, 1974, Davis, 1998, Helpman et al., 2010). However, the real experiences of many countries, particularly developing countries, run contrary to these theoretical assertions as many countries in the world face daunting challenges of rising unemployment despite impressive records of economic growth over the years (Rad, 2011). Nigeria is not an exception. Until recently, Nigerian economy has experienced a remarkable growth in the past decade, particularly in the current democratic dispensation. To be specific, Nigeria became the largest economy in Africa after rebasing her GDP. As a result of rebasing exercise, the value of gross domestic product at nominal face value stood at N80.20 trillion (\$510 billion). Similarly, in terms of trade performance measured by net exports¹, Nigeria has been doing considerably well. For instance, average net exports, over the past decade, stood at N4268.52 billion. Despite the notable growth and trade performance, the country is still battling with many socioeconomic malaises.

Of all socioeconomic malaises confronting Nigeria, the problem of unemployment has become a chronic one. Over the years, unemployment rate has soared at an alarming rate as many young graduates graduating from the higher institutions are joining the labor market without the capacity to absorb them. Historically, during the first two decades after independent of Nigeria as a country, unemployment was not an issue. This is because majority of citizens during that time resided in rural areas and engaged in farming and those in urban areas were gainfully employed. In other words, unemployment rate as at that time was very low. However, the country made a journey into unemployment when the oil sector took over as a primary driver of the economy (Nwankwo and Ifejiofor, 2014). Since then, unemployment issue has become a thorny one in the country. To buttress this point, the trajectory of unemployment rate shows that unemployment rate in 1967 stood at 1.7%. It, however, grew astronomically over time until it reached 25.10% in 2014 (NBS Unemployment Review, 2014).

In search for the causes of soaring unemployment rate in Nigeria, many authors have attributed it to several factors. Fajana (2000) noted that persistence soaring of unemployment figure can be attributed to the long period of initial unemployment among the job seekers or university graduates (otherwise called hysteresis), faulty manpower planning, increase in population, economic recession, collective bargaining process or labor market conditions, rural-urban migration, and formal and informal sector wage differentials. Apart from these, macroeconomic policy

1 Net export is the difference between export and import ($NX = X - M$) where NX is the net export, X is export and M is import

instability and dysfunctional financial system often lead to capital flight which puts limitation on business investment and productivity are also considered to be part of harbingers of soaring unemployment rate (IMF, 2010, Verick and Islam, 2010, Choudhry, et al., 2012).

Empirical studies devoted towards the determinants of unemployment are enormous but the findings are mixed. In other words, agreeable determinants of unemployment are scarce to be found in the literature. The findings depend on so many reasons which include the economic environment in which the study is carried out (Developed or Developing Countries), the kinds of variables the researcher considered, the methodologies he/she employed as well as the scope or period of study considered. On the subject matter of this study which is the examination of trade openness and current account balance as determinants of unemployment, the findings are also mixed, particularly with regards to trade openness. There are ample of studies which concluded that trade openness helps in reducing unemployment (Felbermayr et al., 2009; Dutt, Mitra and Ranjan, 2007; Kim 2011; Loganathan et al., 2011 and Hassan, et al. 2012). On the other hand, there are also studies which suggested that trade openness aggravates unemployment problem (Egger and Kreickemeier, 2009 and Helpman and Itskhoki 2010). Some even concluded that trade openness has no significant impact on unemployment (Moore and Ranjan, 2005). While there are batteries of theoretical and empirical studies on the relationship between trade and unemployment, most of the studies that examine the relationship between current account (either deficit, surplus or balance) and unemployment are theoretical with scanty empirical studies (details in literature review).

In the light of this, we set to re-examine trade openness as a determinant of unemployment rate in Nigeria using recently rebased dataset with 2010 as base year. Besides, we also provide first-hand empirical evidence on the effect of current account balance on unemployment rate. While Hojjat, (2014) examined the relationship between current account balance and unemployment in the United States using both descriptive and Ordinary Least Squares approaches, thus depicting only a long run relationship between the two variables, we seek to examine the short-run dynamic and long-run effects of both trade openness and current account balance on unemployment rate. This we do by using a novel approach developed by Pesaran et al., (2001), known as Autoregressive Distribution Lag (ARDL) method. ARDL has several advantages over the convention way of estimation short-run and Long-run impact of one or more variables on other variable such as Error Correction Model (ECM). One of these advantages of ARDL estimation technique is that it is employable irrespective of the order of integration of our variables of interest. Also, it enables us to simultaneously determine the short run dynamic and long run impact of independent variables and dependent variable.

As a preview to findings, our results showed that current account balance could either reduce or aggravate unemployment rate depending on the time dimension

under consideration and economic conditions. However, it is apparent that current account balance worsens unemployment rate in the short run but reduces it in the long run. In addition, we also discover that trade openness worsens unemployment rate both in the short run and the long run. Macroeconomic variables considered in the study have mixed effect on unemployment rate. For instance, inflation rate, exchange rate, and FDI tend to reduce unemployment rate in both runs. While government consumption expenditure and compensation of employee tend to increase unemployment rate, the real GDP, a measure of economic performance, has no significant effect on unemployment rate in Nigeria.

The rest of the study is organized as follows. Section two presents an extensive review of extant theoretical and empirical findings. Section three provides methodology approach employed, data sources and description. In section four, we present our findings and discussion while section five concludes and offers policy recommendations.

2.REVIEW OF EXTANT LITERATURE

2.1. Theoretical Literature Review

On the one hand are the theories of unemployment and on the other hand are the theories of trade and how trade affects the economy and employment (unemployment). Among the theories of unemployment², I consider two important theories of unemployment. This includes Classical theory of Unemployment and Keynesian Theory of Unemployment. This is followed by theories of trade and how they are related to employment (unemployment).

2.1.1. Classical Theory of Unemployment

Classical theory of unemployment has two arms that describe the determinants of unemployment; they are labor demand and labor supply. Labor demand, a derived demand, is a function of wages and it is negatively sloped downwards, which implies that as wage increases demand for labor declines and vice versa. The labor supply, on the other hand, is a function of labor force and the willingness to either supply labor or not (leisure) which is also a function of real wage. In equilibrium, the intersection of labor demand and labor supply produces a unique equilibrium of wages and employment. Classical theory of unemployment which is predicated on the assumptions of free market and perfect competition among others does not believe in any involuntary unemployment as it believes that the economy is always at full employment. Unemployment can only arise, according to the classical economists, when there are distortions in the free market such as mismatch in the labor market which may result

2 See Mouhammed, (2011) for an excellent review of theories of unemployment

from excess supply over demand for labor. This scenario can be self-corrected by the invisible hand of market demand and supply of labor.

2.1.2. Keynesian Theory of Unemployment

Keynesian theory of unemployment has its root traced to the work of the British born economist, John Maynard Keynes entitled, *"The General Theory of Unemployment, Interest and Money."* The Keynesian Theory of Unemployment links employment to effective demand for goods and services produced by firms under the assumption of fixed prices. Thus, aggregate demand produces an income at a given price which leads to the employment of new workers. This implies that employment changes when aggregate demand changes. On the supply side, Keynes postulated that labor supply, as in classical theory, is a function of real wage, however not flexible due to the labor bargaining power. This implies that wages may remain unchanged in the face of surplus of labor supply. The mismatch between labor supply and the intersection of labor demand and spiral wages give rise to involuntary unemployment. In other words, unemployment in Keynesian theory is owing to cyclical or deficiency in aggregate demand.

Based on the two theories above, several models have been developed to provide lucid rationales for the occurrence of unemployment. The models include competitive model of unemployment, search-matching model (Stigler, 1962; Phelps, 1970; McCall, 1970), efficiency wage theory (Yellen, 1984), workers' motivation and bargaining among others.

2.1.3. Theories and Theoretical Models of Trade and Unemployment

The prediction of classical theory of trade leads to many outcomes.³ One of these outcomes of classical theory of trade is that trade has capability to generate employment. However, most of the models that are based on the classical theory of trade produce ambiguous findings. According to Dutt et al. (2009), trade based on the Ricardo's comparative advantage affects unemployment through differences in technologies among the countries in the world. The transmission mechanism through which trade influences unemployment is that trade increases the marginal productivity of workers in the exporting sector owing to an increase in the domestic relative prices of the goods and services produced in the sector. Since it is assumed that trade would lead to specialization, the marginal productivity of workers in the import-competing sector of the economy will fall due to trade liberalization. Aggregately, the marginal productivity of all the workers in the economy will rise owing to increase in efficiency which leads to increase in investment, resulting in more job creation, thereby reduces unemployment.

3 Classical theories of Trade include Adam Smith's Absolute Advantage, Ricardo's Comparative Advantage, Heckscher-Ohlin model to mention but a few.

In the case where comparative advantage is based on H-O model, unemployment is affected through international differences in relative factor endowments. This makes the outcomes controversial because it depends on the factors of production a country is blessed with. In the labor abundant economy, comparative advantage based on H-O model will reduce unemployment but unemployment may rise in capital-abundant economy. Using these two classical trade theories to build the model of trade liberalization and unemployment, Dutt, et al., (2009) found a robust empirical support for the Ricardian theory of trade prediction and no support for H-O model prediction. Before Dutt et al., (2009), Davidson et al., (1999) and Moore and Ranjan (2005) had developed models linking trade with unemployment. While in Davidson et al's model, comparative advantage arises as a result of difference in search technologies and/or job breakup rates to explain the impact of trade on unemployment and the welfare of the unemployed, Moore and Rajan (2005) based their comparative advantage on difference in skilled-based technology to bring about implication for unemployment and wage inequality. In recent time, other researchers have sought to theoretically explain the rationales for trade and unemployment nexus (see Helpman and Itskhoki, 2010, Mitra and Ranjan 2010, Felbermayr et al. 2010, Hassan et al. 2011). Their conclusions however differ. In Felbermayr et al. (2010) model, trade liberalization-unemployment reducing nexus is driven by productivity. Accordingly, an increase in overall productivity caused by trade liberalization occurs through the forcing out of the least productive firms and the reallocation of labor into more productive firms in the model of heterogeneous firm productivity. Helpman and Itskhoki (2010), however, reported opposite results where two forms of sector modelled yielded the same results. Apart from a differentiated products, heterogeneous productive sector with labor market frictions where trade results in higher aggregate productivity in the differentiated products sector with cumulative expansionary spill-over effect on the size of the sector and the other sector. This leads to fall in unemployment.

2.2. Empirical Literature Review

Taking clue from theories, several attempts have been made to empirically examine the determinants of unemployment in different countries around the world. It has been argued that several factors tend to determine unemployment. These factors may be internal or external and they vary from one country to the others based on some socioeconomic and political fundamentals such as institutions, legal frameworks and market settings that are peculiar to a specific country.

To begin with, Maghbool et al., (2013) comprehensively examined the effect of some macroeconomic variables on unemployment rate in Pakistan over a period of 1976-2013. Using autoregressive distribution lag model, they found that macroeconomic variables such as GDP, population, inflation, FDI were crucial determinants

of unemployment in Pakistan both in the short-run and long-run. In specific terms, their study showed that all the aforementioned variables were correctly signed in the sense that they had negative effects on unemployment. Akin to their findings, Oniore et al., (2015) concluded that GDP growth rate, inflation rate, degree of openness and private domestic investment exhibited short-run and long-run relationship with unemployment in Nigeria. However, while it was shown that GDP growth rate and inflation had reducing effects on unemployment, degree of openness, and domestic private investment worsened unemployment in Nigeria. Contrary to Oniore et al. (2015), O'Nwachukwu (2017) noted that real GDP did not have any significant effect on unemployment rate in Nigeria but only government expenditure, inflation rate and population had significant effects on unemployment rate. In Ghana, Baah-Boateng, (2013), who considered both demand factors and supply factors as determinants of unemployment, discovered that high growth generates weak employment. Also, he found that, in some instance, education and gender played significant roles in determining unemployment rate. A priori, reservation wages was found to worsen unemployment. On the determinant of youth unemployment in Romania, Condratov, (2014) carried out a survey of literature and found that demographic structure, economic environment, regulations of labor and education system were the key determinants of youth unemployment in Romania. In Limpopo province in South Africa, Kyei and Gyekye examined the factors that determine unemployment in the province. Through their study, they showed that GDP, male, matriculation, and youth had no important bearing on unemployment but females, postgraduate studies, middle aged, primary, incomplete secondary schooling and race were important determinants of unemployment in the province in South Africa. Folawewo and Adeboje (2017), instead of focusing on country-specific study, considered the macroeconomic determinants of unemployment in the region of West Africa. Their findings depicted that though GDP had a reducing effect on unemployment, the effect was however insignificant. Also, inflation, labor productivity and population were found to have an increasing effect on unemployment. They equally documented that FDI and external debt had weak effects on unemployment.

Due to some recent occurrences in international arena, economists have begun to examine other factors that serve as determinants of unemployment. Issues such as immigration and trade, in recent time, have become hot debate as citizens from one country to other worry about the implications of immigration and trade for their employability. On how immigration can affect unemployment, Latif, (2015) who used the provincial level panel data from Canada and employed the series of econometric techniques such as FMOLS, DOLS and VECM, found that immigration aggravated unemployment in the short run but reduced it in the long run. He also showed that there was unidirectional Granger-causality between immigrant and unemployment with causality running from immigration to unemployment. In France, Fromentin, (2017) examined the relationship between immigration and unemployment and

found that in the long-run there is no observable increase in aggregate unemployment due to immigration. When VECM estimation method was employed, immigration had a negative effect on unemployment. In the case of OECD countries, Jean and Miguel, (2011) studied the effect of immigration on unemployment over the period of 1984-2003. Their results showed that immigration had a temporary impact on natives' unemployment.

On the impact of international trade on unemployment rate, studies are inexhaustible but characterized with mixed findings. While some studies such as Felbermayr et al (2009); Dutt, Mitra and Ranjan, (2009), Kim (2011), Loganathan et al., (2011), Hassan, et al. (2012) as well as Anyanwu, (2014) agreed that trade openness and unemployment were inversely related, that is, trade openness reduced unemployment, there were ample of other studies such as Davis (1998), Egger and Kreickemeier (2009), Helpman and Itskhoki (2010) and Nwaka, et al. (2015) suggested that trade openness worsened unemployment. Deviation from the two contracting sides above are the studies such as Sener (2001) and Moore and Ranjan (2005) who concluded that trade openness had no direct effect on unemployment. Even in the case where reducing effect exists between trade openness and unemployment rate, Kim (2011) noted that such effect was hampered by labor market rigidity and regulations.

Despite the huge literatures on the effects trade openness on unemployment, little attention has been paid to the possibility of effect of current account balance on unemployment rate. However, there are scanty literatures that have tried to look at this issue. Theoretical relationship between current account and unemployment is provided by the studies of Mayer (2010) and Eaton, Kortum and Neiman, (2013). Besides the aforementioned theoretical studies, there are two empirical studies that specifically focus on the nexus between current account and unemployment (Hojjat, 2014 and Ozer and Yeldan, 2016). While Hojjat, (2014) examined the relationship between current account balance and unemployment in the United States, Ozer and Yeldan, (2016) looked at the relationship between current account deficits and unemployment in Turkey. Using both descriptive analysis and Ordinary Least Squares estimation approach, Hojjat, (2014) reported that there was a significant correlation between current account balance and unemployment and that improvement in current account balance brought about decline in unemployment rate in the United States. In a similar way, though employed different methodological approach, Ozer and Yeldan, (2016) used Vector Error Correction Model (VECM) in conjunction with Impulse Response and Variance Decomposition approaches and documented that there was existence of a unidirectional causality between current account deficits and unemployment that the causality ran from current account deficits to unemployment.

3. METHOD AND MATERIALS

3.1. Method: Autoregressive Distribution Lag (ARDL)

This study is specifically designed to examine trade openness and current account balance as determinants of unemployment in Nigeria. In order to do this, Autoregressive Distribution Lag (ARDL) estimation technique developed by Pesaran, Shin and Smith (2001) was employed. We employed this method for two reasons. First, ARDL technique is useful for time series analysis irrespective of order of integration of the variables, either order 1 or 0. In other words, one can conveniently use ARDL estimation technique for level stationary or first difference stationary variables. Second, ARDL technique combines the estimation of both short and long runs together, a major important advantage over estimation techniques that deal with the short-run and the long-run issues such as Engle and Granger as well as Johansen estimation tests. Thus, following Pasaran, Shin and Smith (2001) framework, we specify the model as follows:

$$\begin{aligned} unemp_t = & \alpha_0 + \lambda_1 unemp_{t-1} + \lambda_2 cab_{t-1} + \lambda_3 cpi_{t-1} + \lambda_4 rGDP_{t-1} + \lambda_5 open_{t-1} + \lambda_6 exrate_{t-1} + \lambda_7 fdi_{t-1} \\ & + \lambda_8 rGGCE_{t-1} + \lambda_9 wag_{t-1} + \sum_{i=1}^n \beta_i \Delta unemp_{t-1} + \sum_{i=0}^{m1} \delta_i \Delta cuact_{t-1} + \sum_{i=0}^{m2} \phi_i \Delta cpi_{t-1} + \sum_{i=0}^{m3} \varphi_i \Delta rGDP_{t-1} + \\ & \sum_{i=0}^{m4} \gamma_i \Delta open_{t-1} + \sum_{i=0}^{m5} \mu_i \Delta exrate_{t-1} + \sum_{i=0}^{m6} \pi_i \Delta fdi_{t-1} + \sum_{i=0}^{m7} \vartheta_i \Delta rGGCE_{t-1} + \sum_{i=0}^{m8} \theta_i \Delta wag_{t-1} + \varepsilon_t \end{aligned} \quad (1)$$

Where signifies the first difference operator, α_0 denotes drift component, ε_t is the white noise or error term, λ_1 to λ_9 are the long-run multiplier of each of the variable or the long run relationship between the variables, β_i , δ_i , ϕ_i , φ_i , π_i , μ_i , ϑ and θ_i with signs summation are the short-run dynamic variables, the variables $unemp$, cab , cpi , $rGDP$, $open$, $exrate$, fdi , $rGGCE$ and wag are unemployment rate, current account balance, consumer price index (inflation), real gross domestic product, trade openness, exchange rate, foreign direct investment, government consumption expenditure and compensation of employee (wage) respectively. All variables are logged except current account balance for it has been expressed as a percentage of GDP. Equation 1 comprises of two parts. The first part of the equation captures the long-run equation while the second equation with lags captures dynamic short-run equation.

The null hypothesis governing the use of ARDL cointegration test is that there is no long-run relationship between our variables of interest. This is depicted as:

Long run Null Hypothesis (Ho)

$$\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 = \lambda_7 = \lambda_8 = \lambda_9 = 0 \quad (2)$$

Long-run Alternative Hypothesis (H₁)

$$\lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq \lambda_6 \neq \lambda_7 \neq \lambda_8 \neq \lambda_9 \neq 0 \quad (3)$$

Previously, particularly in the early day of application of ARDL in empirical studies, the calculated F-test value obtained from the estimation of the above equation would be compared with the lower and upper critical values given in the Pesaran et al., (2001) table. If the F-test value obtained is greater than the Pesaran et al's upper critical value, then it means there is cointegration, that is, there is long-run relationship and the null hypothesis of no cointegration is not accepted. However, if the F-test value is less than the lower critical value, then there is no long-run relationship. The decision is inconclusive, if the F-test value lies in-between the upper and the lower critical values.

Building on the proof of existence of cointegration among the variables, the study would proceed to the estimation of the error correction model (ECM). The ECM shows the speed of adjustment to the long-run equilibrium after initial short-run disequilibrium in the economy. The ECM model is specified as follows:

$$\Delta unemp_t = \alpha_0 + \sum_{i=1}^n \beta_i \Delta unemp_{t-i} + \sum_{i=0}^{m1} \delta_i \Delta cuact_{t-i} + \sum_{i=0}^{m2} \phi_i \Delta cpi_{t-i} + \sum_{i=0}^{m3} \varphi_i \Delta rGDP_{t-i} + \sum_{i=0}^{m4} \gamma_i \Delta open_{t-i} + \sum_{i=0}^{m5} \mu_i \Delta exrate_{t-i} + \sum_{i=0}^{m6} \pi_i \Delta fdi_{t-i} + \sum_{i=0}^{m7} \vartheta_i \Delta rGGCE_{t-i} + \sum_{i=0}^{m8} \theta_i \Delta wag_{t-i} + \varpi ECM_{t-1} + \varepsilon_t \quad (4)$$

Where: ECM = error correction model term and other variables remain as defined in equation 1

In recent time, however, EViews Software computes Bound testing approach to cointegration as well as both short-run dynamic and long-run estimation automatically and generate both F-test value and Pesaran et al., (2001)'s critical table for decision making about whether the variables of interest are cointegrated or not

3.2. Material: Data Sources and Descriptive Statistics

The study examines the link between trade openness, current account balance and unemployment rate in Nigeria employing the annual data that span from 1981 to 2014. The data were sourced from the World Development indicators (2016) version, the Nigerian Bureau of Statistics and Central Bank of Nigeria Statistical Bulletin. Unemployment rate, obtained from National Bureau of Statistical, is the percentage of people who are willing to work at prevailing wage rate but unable to find job. Current account balance and compensation of employees are obtained from the Central Bank of Nigeria Statistical Bulletin. While current account balance provides a revelation about the trading position of Nigeria with the rest of the world (whether Nigeria is a creditor or debtor to the rest of the world), compensation of employee is the aggre-

gate amount of wages accrued to workers annually. Consumer price index (a measure of price level in the economy), real gross domestic product which captures economic performance measured in local currency unit, trade openness expressed as the summation of exports and imports divided by GDP and multiplied by 100 stands for how the country is opened to the rest of the world in terms of its trading activities, exchange rate measures the domestic currency in terms of foreign currency, foreign direct investment captures foreigners' investment in Nigeria (inflow FDI) and government consumption expenditure stands for the amount of money the government spent on the provision of public goods- are all extracted from World Development Indicators. The descriptive results of the variables are presented in the Table 1. From the table, it can be shown that most of the variables recorded moderate variability and are normally distributed as shows by standard deviation and Jaque-Bera normality test.

Table 1.: Descriptive Statistics of the Variables

Variable	LUNEMP	CAB	LCPI	LRGDP	LOPEN	LOEXRAT	LVFDI	LRGGCE	LWAG
Mean	2.024	10.369	2.525	30.931	3.897	3.165	21.143	27.133	10.485
Median	1.909	12.145	3.218	30.725	3.997	3.092	21.087	26.383	10.468
Maximum	3.311	29.830	4.982	31.850	4.404	5.066	22.903	29.258	12.379
Minimum	0.588	-12.240	-0.706	30.355	3.162	-0.482	19.058	26.100	8.860
Std. Dev.	0.799	10.595	1.927	0.472	0.350	1.937	1.108	1.265	1.029
Skewness	0.006	-0.277	-0.405	0.715	-0.739	-0.682	0.008	0.856	0.352
Kurtosis	1.776	2.395	1.656	1.976	2.492	2.105	2.057	1.876	1.946
Jarque-Bera	2.122	0.953	3.488	4.380	3.459	3.769	1.261	5.939	2.276
Probability	0.346	0.621	0.175	0.112	0.177	0.152	0.532	0.051	0.320
Observations	34	34	34	34	34	34	34	34	34

Source: Author's computation using EViews 9 software

Note: All the variables except current account scaled by GDP are in logged forms. LUNEMP = log of unemployment rate, CAB = current account balance scaled by GDP, LCPI = log of consumer price index proxied for inflation, LRGDP = log of real GDP, LOPEN = log of trade of openness, LOEXRAT = log of nominal exchange rate, LVFDI = log of value of foreign domestic investment, LRGGCE = log of real government consumption expenditure, LWAG = log of compensation of employee proxied for wage

4. EMPIRICAL RESULTS AND DISCUSSION

4.1. Correlation Matrix Results

Table 2. presents the results of correlation matrix analysis of the variables. The correlation matrix analysis is done for two major reasons. First is to determine the degree of association between two or more variables. Second is to detect the degree of multicollinearity among the explanatory variables. From the table, it can be shown that most of the independent variables are positively and significantly correlated with unemployment

rate except current account balance which is only positively but insignificantly associated with unemployment rate. In specific terms, inflation rate, real GDP, exchange rate, foreign direct invest, government consumption expenditure and wages have correlation coefficients of 0.655, 0.828, 0.628, 0.646, 0.773 and 0.612 respectively. Conversely, trade openness exhibits negative insignificant relationship with unemployment rate with correlation coefficient of -0.011. Among the explanatory variables, more moderate correlations can also be observed except on some occasions when independent variables are occasionally highly correlated among themselves. However, this does not pose a threat to our model and empirical findings because the Variance Inflating Factor (VIF) that shows the degree of interconnection among the variables which results in the inflation of variance and covariance of estimated parameters of model as R^2_{xy} increases does not exceed the tolerable level. According to Asteriou and Hall, (2007, pp. 90) states that VIF that is not exceed 10% does not pose multicollinearity threat to econometric model. VIF exceeds 10% when $R^2_{xy} > 0.9$. For instance, foreign direct investment and government consumption expenditure are highly correlated with real GDP with correlation coefficient (r) equals 0.773 which when squared; it yields R^2_{xy} of 0.598 which is less than to 0.9 benchmark criterion. Even where it appears that $R^2_{xy} > 0.9$ as in the case of association between real exchange rate and consumer price index and that of government consumption expenditure and economic growth, the post estimation technique, particularly Breusch-Godfrey Serial Correlation LM Test with probability value of 0.4449 shows that there is no problem of multicollinearity in our model.

Table 2.: Correlation Matrix of the Variables

CORRELATION ESTIMATION RESULTS									
Variable	LUNEMP	CAP	LCPI	LRGDP	LOPEN	LOEXRAT	LVFDI	LRGGCE	LWAG
LUNEMP	1.000								
CAB	0.017	1.000							
LCPI	0.655***	-0.383**	1.000						
LRGDP	0.828***	-0.161	0.850***	1.000					
LOPEN	-0.011	-0.093	0.449***	0.088	1.000				
LOEXRAT	0.628***	-0.315*	0.966***	0.772***	0.539***	1.000			
LVFDI	0.646***	-0.183	0.885***	0.887***	0.404**	0.849***	1.000		
LRGGCE	0.773***	-0.055	0.755***	0.966***	-0.003	0.677***	0.858***	1.000	
LWAG	0.612***	0.131	0.278	0.715***	-0.437***	0.159	0.478***	0.817***	1.000

Source: Author's computation using EViews 9 software

Note: ***, ** and * represent 1%, 5% and 10% levels of significance respectively Probability values are in parenthesis

4.2. Time Series Unit Root Test Results

We employed two time series unit root tests-augmented Dickey-Fuller and Philip-Perron unit root tests. The unit root test is carried out with the objective of determining the stationarity properties of our variables of interest so as to avoid any

form of spurious regression. Thus, Table 3. presents the results of unit root test based on the Augmented Dickey-Fuller and Philip-Perron unit root tests. The results show that all the variables are integrated of order 1. In other words, all the variables contain unit root at level, that is, they are trending with time or not stationary at level but only made stationary after they are first differenced.

Table 3.: Unit Root Test Results

Variable	AUGMENTED Dickey-FULLER (CONSTANT)		PHILLIP-PERRON (CONSTANT)		Order of Integration
	Level	First Difference	Level	First Difference	
LUNEMP	-0.4750 (0.8836)	-5.0856* (0.0002)	-0.5879 (0.8601)	-5.0769* (0.0002)	I(1)
CAB	-2.6722 (0.0896)	-5.7213* (0.0000)	-2.7075 (0.0835)	-6.8464* (0.0000)	I(1)
LCPI	-1.4671 (0.5366)	-3.2893** (0.0241)	-1.4419 (0.5499)	-2.9029*** (0.0561)	I(1)
LRCGP	1.76052 (0.9995)	-4.2478* (0.0022)	1.7605 (0.9995)	-4.2329* (0.0023)	I(1)
TOPEN	-1.8845 (0.3352)	-7.4070* (0.0000)	-1.9018 (0.3275)	-7.4070* (0.0000)	I(1)
LOEXRAT	-2.0103 (0.2812)	-4.8471* (0.0004)	-2.1413 (0.2307)	-4.8471* (0.0004)	I(1)
LVFDI	-0.7890 (0.8087)	-10.9284* (0.0000)	-1.2592 (0.6365)	-10.7823* (0.0000)	I(1)
LRCGCE	-0.0430 (0.9476)	-6.0694* (0.0000)	-0.0115 (0.9508)	-6.0544* (0.0000)	I(1)
LWAG	-0.7219 (0.8274)	-6.4108* (0.0000)	-0.6598 (0.8432)	-6.3976* (0.0000)	I(1)

Source: Author's computation using EViews 9 software

Note: *, ** and *** represent 1%, 5% and 10% levels of significance respectively

Probability values are in parenthesis

4.3. Cointegration Test Results

Having determined the order of integration of our variables, we proceeded to determine whether these variables are cointegrated, that is, whether they possess a long-run relationship. In order to achieve this and for consistency, two sets of cointegration tests were carried out-Johansen cointegration test and Peseran Bound testing cointegration method. Cointegration test, particularly Johansen cointegration test, is sensitive to choice of lag length. Thus, one lag length was selected for Johansen cointegration test to avoid the problem singular matrix. Table 4. and 5. present the results of both Johansen and Pesaran cointegration tests respectively. The results from the tables show that our variables of interest are cointegrated, that is, the null hypothesis of no cointegration among the variables is not accepted. In other words, our variables of interest possess a long run relationship. In specific terms, results from Johansen cointegration test show that for trace test, there are 5 cointegrating equations while for maximum eigenvalues test there are 3 cointegrating equations. On bound testing cointegration method; the F-test statistical value of 5.067 is greater than the upper bound critical value of 3.06 at 1 per cent level of significance, thereby showing that there is a long-run relationship among the variables, that is, our model is cointegrated.

Table 4.: Johansen Cointegration Test Results

TRACE TEST K = 1				MAXIMUM EIGENVALUES TEST K = 1			
Ho	H _A	(λ trace)	Critical values (5%)	Ho	H _A	(λ Max)	Critical values (5%)
r ≤ 0	r > 0	412.219 (0.0000)	197.371	r ≤ 0	r > 0	171.331 (0.0000)	58.434
r ≤ 1	r > 1	240.888 (0.0000)	159.530	r ≤ 1	r > 1	83.230 (0.0000)	52.363
r ≤ 2	r > 2	157.658 (0.0001)	125.615	r ≤ 2	r > 2	48.935 (0.0251)	46.231
r ≤ 3	r > 3	108.724 (0.0047)	95.754	r ≤ 3	r > 3	37.968 (0.0848)	40.078
r ≤ 4	r > 4	70.756 (0.0420)	69.819	r ≤ 4	r > 4	32.197 (0.0782)	33.877
r ≤ 5	r > 5	38.559 (0.2782)	47.856	r ≤ 5	r > 5	20.916 (0.2814)	27.584
r ≤ 6	r > 6	17.643 (0.5925)	29.797	r ≤ 6	r > 6	10.753 (0.6719)	21.132
r ≤ 7	r > 7	6.890 (0.5905)	15.495	r ≤ 7	r > 7	5.457 (0.6834)	14.265
r ≤ 8	r > 8	1.433 (0.2313)	3.841	r ≤ 8	r > 8	1.433 (0.2313)	3.841

Source: Author's computation using EViews 9 software

Note: Probability values that signify the level of significance are put in parenthesis. Also, r represents number of cointegrating vectors and k represents the number of lags in the unrestricted VAR model.

Table 5.: Pesaran, Shin and Smith Bounds Testing Cointegrating Results

Test Statistic	Value	K
F-Statistic	5.067	8
Critical Value Bounds		
Significance	I(0) Bound	I(1) Bound
10%	1.95	3.06
5%	2.22	3.39
2.5%	2.48	3.7
1%	2.79	4.1

Source: Author's computation using EViews 9 software

4.4. Short-run and Long-run ARDL Model Results

Sequel to cointegration tests, we estimated the short-run dynamic and long-run effects of trade openness and current account balance on unemployment rate using ARDL method. The results of this experiment are presented in Table 6. Beginning from error correction term in the short run model, the unrestricted ECM follows a priori expectation in that it is statistically significant at -0.246. This implies that when an economy is in disequilibrium position such as unemployment crisis, it adjusts by one-fourth within first year of disequilibrium. In other words, it will take about four years for economy to converge towards long run equilibrium. This implies

that any policy by authority to bring economy to equilibrium (in this case to address unemployment) will take about 4 years to have a full effect. This connotes a moderate convergence of the Nigerian economic model.

Making reference to Table 6, again, our results show that current account balance in the short run worsens unemployment rate for it is positively and significantly related to unemployment rate. Specifically, we found that an increase in current account balance by one per cent results in an increase in unemployment rate by 0.008 per cent in the short run. This can be explained that in the short run Nigeria probably experiences current account surplus that contributes to soaring unemployment rate. This, however, runs contrary to a priori expectation. Theoretically, it is expected that when a country experiences current account surplus, unemployment rate is supposed to decline drastically due to its improvement in the export segment of its international transactions. However, in the literature of international trade, a country may record current account surplus which shows that the country has great export competitiveness but such country may have deficit in its capital account. Capital account deficit may connote capital outflow or flight from the economy which may be an offshoot of lack of confidence in the domestic economy by the foreign investors due to macroeconomic crisis or during major significant economic recession. Whether current account surplus will lead to more employment therefore depends on whether export competitiveness outweighs capital flight. In the long run, we found that current account balance has a negative and significant effect on unemployment rate. This implies that current account lowers unemployment rate in the long run. More specifically, one per cent improvement in current account lowers unemployment rate by 0.10 per cent. This finding is akin to finding of Hojjat, (2014) who discovered in the United States when there is improvement in the current account balance, unemployment rate falls. Our finding can be explained in this sense, in the long run, Nigerian economy probably records current account deficit which help in lowering her unemployment crisis. Current account deficit may be considered to be harmful to the economy in the sense that it shows that imports are greater than the exports. However, current account deficit may mean there is a surplus in the financial aspect of current account. In other words, current account deficit could be inflow of capital which could be used for investment in the domestic economy and thereby generate more employment and reduce unemployment rate.

As touching the effect of trade openness on the unemployment rate, our results show that trade openness worsens unemployment rate in Nigeria both in the short run and in the long run, albeit with different magnitudes. In more specific terms, a one per cent increase in trade openness would lead to increase in unemployment rate by 0.700 and 4.321 per cents both in the short-run and the long-run respectively. The results suggest that trade openness has been continuously led to high unemployment rate in Nigeria. Since in most trade literature, trade openness is often used to proxy the trade liberalization, it therefore implies that policy of trade liberalization

is not favorable to Nigerian economy. This result may be attributed to the labor institutional market condition in the country because it has been argued that where there is pronounced restrictive labor market regulation and more prevalent of informal labor market, trade openness may worsen unemployment rate (Menezes-Filho and Muendler, 2011). Our results are also akin to the finding of Nwaka et al., (2015) who found that trade liberalization proxied by trade openness worsens unemployment in Nigeria.

Apart from the effects of current account and trade openness on the unemployment rate in Nigeria, we also considered other factors that could have greater influence on unemployment rate. These variables include consumer price index (inflation), real GDP, exchange rate, foreign direct investment, government consumption expenditure as well as the compensation of employee (wages). The results of this experiment are also presented in table 6. From the table inflation rate is negatively and significantly related to unemployment rate both in the short-run and in the long-run. This suggests that an increase in inflation rate would bring about a decline in unemployment rate in Nigeria. To be more specific, a one per cent increase in inflation rate will bring about 0.788 and 0.736 per cent decline in unemployment rate in the short-run and in the long-run respectively. This finding is consistent with the a priori expectation that posits that when inflation is rising, unemployment should be declining-Philips curve prediction pointed out by Philips, (1958). Working on the trade-off between inflation and unemployment rate, Mankiw (2001) noted that there is only short run trade-off between inflation and unemployment rate due to monetary policy shock by the monetary authority. Our finding also supports the one obtained by Furuoka and Munir (2014) who found a negative long run relation between inflation and unemployment rate for Malaysia. Thus, inflation rate reduces unemployment rate in both short run and long run. On the other hand, real GDP seems to worsen unemployment problem though its effect is statistically insignificant in Nigeria both in the short run and the long run. For instance, we discovered that an increase in real GDP by one lead to 0.7759 and 3.084 per cent increase in unemployment rate in the short and the long run respectively. Our findings suggest that growth in Nigeria is not pro-employment generation which is contrary to the theoretical prediction (Okun's Law).

In addition, we observed that exchange rate and foreign direct investment are germane to reduction of unemployment rate in Nigeria for both variables have negative and significant effect on unemployment rate in Nigeria both in the short-run and the long run. For instance, when exchange rate and foreign direct investment improve by one per cent, unemployment rate will decline by 0.018 and 0.487 per cent in the short run and 0.074 and -3.771 per cent in the long run respectively. These findings suggest that improvement in exchange rate (domestic currency vis-à-vis of foreign currency) is one of the solutions to unemployment problem in Nigeria. The result is plausible one because theoretically improvement in a country's

exchange rate (improvement home currency in terms of other trading countries' currencies) stimulates the country's exports which would lead to increase in the ability of firms, particularly the export oriented firms to employ more workforces. This finding is akin to the one obtained by Bakhshi and Ebrahimi (2016) who discovered that there is a negative relationship between exchange rate and unemployment for Iranian economy. In terms of the effect of foreign direct investment on unemployment rate, this study shows that FDI is indispensable to Nigerian economy as shown above, particularly real FDI (establishment of new factories by foreign investors in the domestic economy) often leads to employment of more labor force or workers and thus leads to reduction in employment rate. Our result could find allies in many empirical findings in the literature on FDI-unemployment rate nexus (Craigwell, 2006; Zeb et al., 2014; Shaari et al., 2012, Karlsson, et al., 2009 and Habib and Sarwar, 2013). Concerning the effect of government consumption expenditure on unemployment rate; our results show that government expenditure worsens unemployment rate both in the short-run and the long run. For example the results from table 6 show that if government increase its consumption expenditure by one per cent, unemployment rate rises by 0.658 and 4.368 per cent in the short-run and the long-run respectively. The results are however run contrary to a priori expectation and this may not be unconnected with some augments in public sector economics that government sometimes does engage in unproductive investment or spending. On the final note, our results show that wage rate reduces unemployment rate in Nigeria both in the short-run and the long-run; however, only short-run coefficient is statistically significant 5 % level. While the classical school of thought favors reduction in wages to stimulate employment so as to reduce unemployment, Keynesian favors increase in wages will stimulate employment and thus reducing unemployment, provided there is an increase in price level which makes real wages to remain unchanged. This connotes that our finding corroborates Keynesian Theory of wages and unemployment.

In order to prove the reliability of our results, we carried out diagnostic tests which include normality, serial correlation, and heteroscedasticity as well linearity or functional form tests. The results of these various diagnostic tests are presented in Table 6. The overall results show that all the models pass all the tests conducted. Thus, the models are reliable and can be used for economic policy, forecasting and prediction.

Table 6.: Short-run and Long-run Autoregressive Distribution Lag Results

ARDL Short-run Cointegration Form	
Variable	Coefficient
CAB	0.008* (2.074)
LCPI	-0.788** (-2.308)
LEGDP	0.759 (1.352)
LOPEN	0.700** (2.823)
LOEXRAT	-0.018 (-0.214)
LVFDI	-0.487*** (-4.222)
LRGCCE	0.658** (2.518)
LWAG	-0.432** (-2.285)
CointEq(-1)	-0.246** (-2.799)

ARDL Long-run Coefficients	
Constant	-126.702* (-2.054)
CAB	-0.100* (-2.017)
LCPI	-0.734 (-1.396)
LEGDP	3.084 (1.565)
LOPEN	4.321* (2.048)
LOEXRAT	-0.074 (-0.207)
LVFDI	-3.771** (-2.511)
LRGGCE	4.364* (2.098)
LWAG	-1.755 (-1.728)
R ²	0.9809 (98.09%)
Adjusted R ²	0.9661 (96.61%)
F-statistic (prob)	66.056 (0.0000)
Durbin-Watson Stat	2.2810

Jarque-Bera	1.154 (0.5616)
Breusch-Godfrey Serial Correlation LM Test	0.612 (0.4449)
Heteroskedasticity Test: ARCH	0.435 (0.5147)
Ramsey RESET Test	1.447 (0.245)

Source: Author's computation using EVIEW 9 software

Note: Number of models evaluated: 256

Selected Model: ARDL (1, 1, 1, 0, 1, 0, 1, 1, 0)

Model selection method: Akaike Info Criterion (AIC)

No. of lag selected: 1 lag period

*, ** and *** represent 1%, 5% and 10% levels of significance respectively

5. CONCLUSION AND POLICY RECOMMENDATIONS

This study is designed specifically to empirically examine how trade openness and current account balance have affected the unemployment rate in Nigeria. To achieve this objective, the study employed the novel time series econometric technique developed by Pesaran et al., (2001)-ARDL Bound Test to Cointegration. Applying this novel estimation technique, the results are much more revealing. First, on the effect of current account balance on the unemployment rate in Nigeria, our study show that there is no clear cut effect because current account balance could worsen or improve the unemployment situation depending on the time dimension under consideration and the state of the economy. However, what is apparent from this study is that in the short run, current account balance seemed to worsen the unemployment situation while in the long run it seemed to improve it. It is therefore become imperative that the authority in charge of trade and investment to be cognisance of the movement of events in the international transactions in terms of volume and nature of transactions in real and portfolio trade. Second, it is unarguable that trade openness does not favor the developing countries, particularly Nigeria. Several studies, not this alone, have shown empirically that trade openness worsens unemployment situation in Nigeria. This may be attributed to a considerable number of factors which may include the state of our economy, the status and the competitiveness of our firms or industries, the nature of goods and services put forward for transaction and the nature of some of our institutions put in place to oversee the international transactions. Thus government, therefore, needs to be more proactive in terms of put-

ting policies in place and provide infrastructure facilities required to encourage the domestic firms to be more productive and competitive in the international market. Also there is need to strengthen the weakened institutions. In specific terms, while trade restriction policies are no more encouraged in the international arena, a more reasonable ways of protecting the growing domestic firms or industries must be put in place. Besides, since financial backing is indispensable for the survival of firms, it is imperative for government to reduce the cost of borrowing and even gives financial consideration to some specific firms in the sectors where the majority of citizens are seeking employment. We also discovered in the course of this study that despite the fact that the country has recorded some remarkable growth (not until recently) particularly in this democratic dispensation, the growth has not been pro-poor or pro-employment. As economy is growing, unemployment rate is also increased astronomically. Many factors may be responsible for this phenomenon. However, the salient questions in this case include: which sector is driving the growth? Can the sector employment more people? Do people or citizens possess the technical know-how required by the sector? Answers to these questions will guide the policymakers on how to design policies that would make growth pro-employment. If the sector that is driving growth cannot employ more people or people do not have required technical know-how by the sector, then government should focus more on other sectors where the skills of the citizens can be mostly employed and educate them along that sector so that they can be more employable and be productive. The policy implications of other factors that affect unemployment rate considered in this study are that government should pursue sound macroeconomic policies in more aggressive and holistic ways that will be favorable to both domestic and foreign firms so that they can serve as hubs of employment generation and thereby contribute to reduction in unemployment rate in Nigeria as it is apparent that government alone may not be able to provide employment to all the citizens.

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REFERENCES

- Anyanwu, John C. "Does Intra African Trade Reduce Youth Unemployment in Africa?." *African Development Review* 26, no. 2 (2014): 286-309
- Asteriou, D., and S. G. Hall. "Applied econometrics: A modern approach using eviews and microfit revised edition: Palgrave Macmillan." (2007)
- Baah-Boateng, W., "Determinants of unemployment in Ghana", *African Development Review*, Vol. 25, No. 4, (2013): 385-399
- Bakhshi Z and Ebrahimi M., "The effect of real exchange rate on unemployment", *Marketing and Branding Research*, 2, (2015): 4-13
- Blanchard, Olivier. "Monetary policy and unemployment." In *Remarks at the Conference "Monetary Policy and the Labour Market: A Conference in Honor of James Tobin"*, New School University. 2003.
- Brecher, R., "Minimum wage rates and the pure theory of international trade", *Quarterly Journal of Economics* 88(4), (1974): 98-116
- CBN, 2013, "Annual Statistical Bulletin", Central Bank of Nigeria, Various Issues
- CBN, 2014, "Annual Statistical Bulletin", Central Bank of Nigeria, Various Issues
- Choudhry, M. T., Marelli, E. and Signorelli, M. 2012, "Youth unemployment rate and impact of financial crises", *International Journal of Manpower*, Vol. 33, No.1, (2012): 76-95
- Ciżkowicz, Piotr, Michał Kowalczyk, and Andrzej Rzońca. "Heterogeneous determinants of local unemployment in Poland." *Post-Communist Economies* 28, no. 4 (2016): 487-519
- Condratov, I. 2014, "Determinants of youth unemployment: a survey of literature", *ECOFORUM*, Vol. 3, Issue 2(5).
- Craigwell, Roland. "Foreign direct investment and employment in the English and Dutch-speaking Caribbean." *Project prepared for ILO*, Trinidad and Tobago (2006)
- Davidson, Carl, and Steven Joseph Matusz. *International trade and labor markets: Theory, evidence, and policy implications*. WE Upjohn Institute, 2004.
- Davidson, Carl, Lawrence Martin, and Steven Matusz. "Trade and search generated unemployment." *Journal of International Economics* 48, no. 2 (1999): 271-299
- Davis, D. R., "Does European unemployment prop up American wages? National labour markets and global trade", *American Economic Review*, 88, (1998): 478-494
- Dutt, P. Mitra, D. and. Ranja, P., "International trade and unemployment: theory and cross-national evidence", *Journal of International Economies*, 78(1), (2009): 32-44
- Eaton, Jonathan, Samuel Kortum, and Brent Neiman. "On Deficits and Unemployment." *Revue économique* 64, no. 3 (2013): 405-420
- Egger, H., and U. Kreickemeier. 2009, "Firm heterogeneity and the labor market effects of trade liberalization" *International Economic Review* 50 (1), (2009): 187-216
- Essien, Sunday N., Garba A. Many, Mary OA Arigo, Kufre J. Bassey, Suleiman F. Ogunyinka, Deborah G. Ojegwo, and Francisca Ogbuehi. "Monetary Policy and Unemployment in Nigeria: Is there a Dynamic Relationship?." *Cbn Journal Of Applied Statistics* 7 (2016)
- Eze, O. R. and Uwambeke, G. C., "Effect of deficit financing on unemployment rate in Nigeria: An error

correction model", International Journal of Small Business and Entrepreneurship Research, Vol. 3, No. 7, (2015): 28-46

Fajana, S. "Functioning of the Nigerian Labour Market, Labonfin and Company, Lagos." Provide page (2000)

Felbermayr, Gabriel, Julien Prat, and Hans-Jörg Schmerer. "Globalization and labor market outcomes: Wage bargaining, search frictions, and firm heterogeneity." Journal of Economic theory 146, no. 1 (2011): 39-73

Felbermayr, Gabriel, Julien Prat, and Hans-Jörg Schmerer. "Trade and unemployment: What do the data say?." European Economic Review 55, no. 6 (2011): 741-758

Folawewo, Abiodun O., and Oluwafemi M. Adeboje. "Macroeconomic Determinants of Unemployment: Empirical Evidence from Economic Community of West African States." African Development Review 29, no. 2 (2017): 197-210

Fromentin, Vincent. "The relationship between immigration and unemployment: The case of France." Economic Analysis and Policy 43, no. 1 (2013): 51-66

Furuoka, Fumitaka, and Qaiser Munir. "Unemployment and Inflation in Malaysia: Evidence from Error Correction Model." Malaysian Journal of Business and Economics (MJB) 1, no. 1 (2014)

Habib, Malik Danish, and Saima Sarwar. "Impact of foreign direct investment on employment level in Pakistan: A Time Series Analysis." JL Pol'y & Globalization 10 (2013): 46

Hasan, Rana, Devashish Mitra, Priya Ranjan, and Reshad N. Ahsan. "Trade liberalization and unemployment: Theory and evidence from India." Journal of Development Economics 97, no. 2 (2012): 269-280

Helpman, Elhanan, and Oleg Itskhoki. "Labour market rigidities, trade and unemployment." The Review of Economic Studies 77, no. 3 (2010): 1100-1137

Hojjat, Mehdi. "Will the Unemployment Rate Fall with a Robust Forecast for the US Current Account Balance?." Journal of Economic & Financial Studies 2, no. 04 (2014): 28-33

IMF, 2010, "IMF survey: sharp rise in unemployment from global recession. IMF survey online" <http://www.imf.org/external/pubs/ft/survey/so/2010/NEW090210A.htm>

Jean, Sebastien, and Miguel Jiménez. "The unemployment impact of immigration in OECD countries." European Journal of Political Economy 27, no. 2 (2011): 241-256

Karlsson, Sune, Nannan Lundin, Fredrik Sjöholm, and Ping He. "Foreign firms and Chinese employment." The World Economy 32, no. 1 (2009): 178-201

Keynes, J., "The general theory of employment, interest and money", London: Harcourt, (1936)

Kim, J., 2011, "The effect of trade on unemployment: Evidence from 20 OECD countries" Department Economics, Stockholm University, Sweden.

Kyei, Kwabena A., and Kwame B. Gyekye. "Determinants of unemployment in Limpopo province in South Africa: exploratory studies." Journal of Emerging Trends in Economics and Management Sciences 2, no. 1 (2011): 54-61

Latif, Ehsan. "The relationship between immigration and unemployment: Panel data evidence from Canada." Economic Modelling 50 (2015): 162-167

Loganathan, Nanthakumar, Muhammad Najit Sukemi, and Mori Kogid. "Dynamic causal relationship between trade balance and unemployment scenario in Malaysia: granger non-causality analysis." Economics and Finance Review 1, no. 3 (2011): 13-20

- Mankiw, N. Gregory. "The inexorable and mysterious tradeoff between inflation and unemployment." *The Economic Journal* 111, no. 471 (2001): 45-61
- Maqbool, Muhammad Shahid, Tahir Mahmood, Abdul Sattar, and M. N. Bhalli. "Determinants of unemployment: Empirical evidences from Pakistan." *Pakistan Economic and Social Review* (2013): 191-208
- Mayer, J., 2010, "Global rebalancing: Effects on trade flow and employment", UNCTAD Discussion Paper, No.200.
- McCall, John Joseph. "Economics of information and job search." *The Quarterly Journal of Economics* (1970): 113-126
- McDonald, Ian M., and Robert M. Solow. "Wage bargaining and employment." *The American Economic Review* 71, no. 5 (1981): 896-908
- Menezes-Filho N. A. and Muendler M. A., 2011, "Labour reallocation in response to trade reform", NBER Working paper 17372. Cambridge, MA: National Bureau of Economic Research Inc
- Mitra, Devashish, and Priya Ranjan. "Offshoring and unemployment: The role of search frictions labor mobility." *Journal of International Economics* 81, no. 2 (2010): 219-229
- Moore, Mark P., and Priya Ranjan. "Globalisation vs Skill Biased Technological Change: Implications for Unemployment and Wage Inequality." *The Economic Journal* 115, no. 503 (2005): 391-422
- Mouhammed A. H., "Important theories of unemployment and public policies" *Journal of Applied Business and Economics*, Vol. 12(5), (2011): 100-110
- NBS, 2014, "The review of definition and methodology for computing unemployment statistics in Nigeria" *Report of National Stakeholders' Workshop held at Ayalla Hotel, Garki, Abuja, 8-10, September, 2014.*
- Nwaka, Ikechukwu D., Kalu E. Uma, and Gulcay Tuna. "Trade openness and unemployment: Empirical evidence for Nigeria." *The Economic and Labour Relations Review* 26, no. 1 (2015): 117-136
- Nwankwo, Cosmas Anayochukwu, and Adaobi Patricia Ifejirofor. "Impact of unemployment on Nigerian economic development: a study of selected local government area in Anambra State, Nigeria." *European Journal of Business and Management* 6, no. 35 (2014): 103-112
- Okun, A. M., "Potential GNP: Its measurement and significance", *Proceeding of the Business & Economic Statistics Section of the American Statistical Association*, (1962): 98-104
- O'Nwachukwu C. I., "Determinants of the rate of unemployment in Nigeria" *Information Journal of Information Research and Review*, Vol. 04, Issue 01, (2017): 3593-3595
- Oniore J. O. Bernard A. O. and Gyang E. J., "Macroeconomic determinants of unemployment in Nigeria" *International Journal of Economics, Commerce and Management*, Vol. III, Issue 10, (2015): 215-230
- Ozer, Mustafa, and A. Erinc Yeldan. "The Relationship between Current Account Deficits and Unemployment in Turkey." *In Handbook of Research on Comparative Economic Development Perspectives on Europe and the MENA Region*, pp. 492-510. IGI Global, 2016.
- Pesaran, M. Hashem, Yongcheol Shin, and Richard J. Smith. "Bounds testing approaches to the analysis of level relationships." *Journal of applied econometrics* 16, no. 3 (2001): 289-326
- Phelps, Edmund S. "Microeconomic foundations of employment and inflation theory." (1970)
- Phillips, A.W., "The relationship between unemployment and the rate of change of money wage rates in the United Kingdom 1861-1957", *Economica*, 25 (100), (1958): 283 - 299

- Pigou, A. C., *"The theory of unemployment"*, London: Macmillan, (1933)
- Rad, Sahar Taghdisi. "Jordan's paradox of growth without employment." *Development Viewpoint* 65 (2011)
- Rogerson, Richard, Robert Shimer, and Randall Wright. "Search-theoretic models of the labor market: A survey." *Journal of economic literature* 43, no. 4 (2005): 959-988
- Schmillen, Achim, and Joachim Möller. "Distribution and determinants of lifetime unemployment." *Labour Economics* 19, no. 1 (2012): 33-47
- Schumpeter, J., *"Theory of economic development"*, Cambridge, MA.: Harvard University Press, 1934.
- Şener, Fuat. «Schumpeterian unemployment, trade and wages.Ç *Journal of International Economics* 54, no. 1 (2001): 119-148
- Shaari, M. S., Hussain, N. E and Halim, M. S. B. A., *"The impact of foreign direct investment on the unemployment rate and economic growth in Malaysia"*, *Journal of Applied Sciences Research*, 8(9) (2012): 4900-4906
- Shapiro, Carl, and Joseph E. Stiglitz. "Equilibrium unemployment as a worker discipline device." *The American Economic Review* 74, no. 3 (1984): 433-444
- Stigler, George J. "Information in the labor market." *Journal of political economy* 70, no. 5, Part 2 (1962): 94-105
- Veblen, Thorstein. *The theory of business enterprise*. C. Scribner's sons, 1904.
- Verick S. and Islam, I., 2010, *"The great recession of 2008-2009: causes, consequences and policy responses"*, IZA Discussion Paper NO. 4934.
- WDI, 2015, *"World development indicators"*, World Bank
- Yellen J. L., *"Efficiency Wage Models of Unemployment"* *The American Economic Review*, Vol. 74, No. 2 Papers and Proceedings of the Nineth-Sixth Annual Meeting of the American Economic Association, (1984): 200-205
- Zeb N., Qiang, F. and Sharif, M. S., *"Foreign direct investment and unemployment reduction in Pakistan"*, *International Journal of Economic Resource*. Vol. 5, Issue 2, (2014): 10-17

SYNCHRONICITY AND SIMILARITY OF BUSINESS CYCLES; CROATIA VIS À VIS NEW EMU COUNTRIES

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ABSTRACT

The introduction of the euro for Croatian citizens meant the abandonment of the deutsche mark, a reliable currency, which had been used for a long time for comparison purposes and savings. Today, Croatia is a small, opened, indebted and highly euroised country, in which frequently mentioned introduction of euro is seen as a solution that could improve country's economic position. The question of a common monetary policy is closely related to the issue of business cycle coherence between the members of such an area. By analyzing two measures of business cycle coherence, namely synchronicity and similarity, between Croatia and new EMU members, we want to reconcile with vast empirical evidence supporting the hypothesis that monetary integration process results from a greater business cycle convergence and leads to an optimal currency area which finally leads to greater economic welfare in each of the member countries. Estimations are based on deviation cycle approach. Results in general indicate relatively similar cycle dynamics across the observed variables, suggesting that Croatia satisfies this selective criterion for its inclusion into the monetary union. Nonetheless, monetary integration is far more complicated issue, hence it requires further scientific verification and conceptualization.

Key words:

Business cycle coherence, Deviation cycle analysis, HP filter, Chow test, Croatia, EMU

1. INTRODUCTION

Reversals in business cycles raise a question whether a group of countries can achieve macroeconomic stability and/or economic growth by coordinating its economic policies. Common shocks imply the co-movement of economic activity across the countries, within a phase of a business cycle, which in turn is more likely if their economic structures are similar. For example, countries with more correlated and synchronized business cycles are more likely to 'bear the fruit' of any economic bond, especially of a monetary union for they are less sensitive to asymmetric shocks, hence the cost associated with the central monetary policy is lower. As Stanišić (2013) put it well, a strong degree of business cycle synchronization across monetary union reduces the cost of giving up an independent exchange rate and monetary policy, especially when alternative adjustment mechanisms are unable to absorb the impact of asymmetrical shocks across countries because of price and wage rigidities and insufficient labor mobility. Business cycle synchronization is therefore an important aspect of the readiness of potential members outside the eurozone to enter the monetary union. Recent economic turmoil reminded the EU that adequate degree of cross-country business cycle coherence is important for monetary unions to be viable in the long-run, as one can argue that the current degree of eurozone economic integration is too low for viable currency union (Ahmed, Chaudhry and Straetmans, 2015).

The aim of this paper is to evaluate the synchronization process between the new EMU (European Monetary Union) members and Croatia, as reflected in the degree of coherence between the countries cycles. By analyzing business cycle aspects of the Croatian economy, we are in fact addressing key macroeconomic issues that are or might be crucial for the economic stability and a sustainable progress. Considering different roles of fiscal and monetary policies within decision-making dilemma, each economic problem should be approached differently depending upon the specific cycle characteristics of the country. By estimating two different measures of business cycle coherence between Croatia and new EMU members, we want to reconcile with vast empirical evidence supporting the hypothesis that monetary integration process arises from greater business cycle convergence and leads to an optimal currency area (OPA) which finally leads to greater economic welfare in each of the member countries. We opted for deviation cycle analysis, whereas cyclical characteristics of the variables are obtained through the HP filter. By applying the methodology proposed by Mink et al. (2012) we have calculated two measures of coherence, i.e. synchronicity and similarity in order to capture both co-movement and relative amplitude of the Croatian macroeconomic variables *vis à vis* new EMU member countries.

Section 2 provides theoretical background and empirical literature. Section 3 gives a full perspective to the analytical part by explaining used methodology and data whereas Section 4 evaluates the results through brief discussion. Section 5 offers some concluding remarks.

2. THEORETICAL FRAMEWORK AND STYLIZED FACTS

2.1. Theoretical background

Before we get any further into the subject let us clarify some basic terminology. Broadly used term business cycle synchronization, as an indicator of the degree of co-movements of the fluctuations across countries and time, is a mere coherence measure. Hence, most of the scholars use term synchronization to explain coherence between the cyclical patterns of growth between the countries. We will follow their example in this theoretical part, though in the empirical section we will make a distinction, namely methodological, distinguishing two coherence measures (see Section 3).

In their paper, Crowley and Schultz (2010) pointed out two important reasons why synchronicity in movement of economic growth rates is economically relevant: (1) the more globalize world becomes, the more likely is that trade and financial flows will cause great synchronization in growth rates between countries which could result in creation of 'the international business cycle' and (2) for countries that use the same currency (such as EMU) similar movements in economic growth could either indicate (i) *ex ante*, the suitability for adopting same economic policy (for example monetary policy in OPA theory for EMU) or (ii) *ex post*, the fact that that (monetary) policy has been a major factor in achieving similar patterns of growth (an interesting debate on the relationship between the business cycle synchronization and growth perspectives is provided by Škare and Tomić (2015)). Since the notion of synchronization is frequently related to the question of optimum currency areas i.e. OPA theory, as it has come to be recognized as a prerequisite for any higher level of economic integration. The benefits from a common currency are seen in the reduction of transaction costs and predictability of exchange rates as higher levels of integration are associated with larger benefits for the member countries. On the other hand, the costs of such cohesion are related to the loss of monetary policy as a stabilizing tool. To the extent that member countries are *de facto* faced with common aggregate (external) shocks, the costs of losing independence of monetary policy may not be important.

Issue of synchronization is important from a policy point of view. If the business cycle coherence in the monetary union is high and/or increasing, there will be no tension between the member countries. However, a reverse situation could lead to a destabilization of a monetary union as it can further lead to more volatile reactions to external shocks and similar transmission of country-specific shocks through various channels such as international trade and financial assets (Stanišić, 2013). For example, persistent cross-border swings in financial markets can be potentially destabilizing for EMU and in the end also for the real economic developments, so Ahmed, Chaudhry and Straetmans (2015) suggest that a proper monitoring of (financial)

synchronization by regulatory bodies and policy makers is desirable. Additionally, the autonomy of fiscal policy on national levels is a major offset to the synchronization process, as it counteracts the efforts of the European Central bank in its impact on the whole EU economy. Nonetheless, higher synchronicity implies that member countries will increasingly need monetary policy moves in the same direction to achieve common goal. But as Wälti (2009) explained, this is a necessary and not a sufficient condition for a harmonious monetary union. Strong synchronicity does not mean that all countries demand policy moves of the same magnitude. The amplitude of business cycles may still differ across countries, so that even if synchronicity is perfect, 'one size still does not fit all' paradigm is a suitable conclusion. Most of the studies use correlation coefficients in the analyses of business cycle coherence, however since they can ambiguously interpret these two cycle characteristics, they are not informative on the suitability of the common monetary policy in terms of both direction and magnitude of policy moves. This is the argument for the reliance on an alternative approach, i.e. two measurements that imply direction and magnitude in the periods of high and low coherence between the countries.

2.2. Overview of the literature

Academic literature as well as the media press is full of references and studies that emphasize the importance of the synchronization process, even on a global scale. To curtail vast empirical base as to make it easier to comprehend the importance of this topic, we will analyze evidence for cyclical synchronization only for the EU and/or EMU countries (and those issues conceptually related to the topic). But first, we must inquire into the methodological prospect and significance of these studies. Namely, we find a variety of methodologies that have intrinsically different approach to the analysis of business cycle synchronization, regardless of mean of the identification of cyclical movements (parametric or non-parametric methods). This variety is seen through the broadness of methods used within different studies, ranging from simple to asymmetric to dynamic correlations between the cyclical series across countries, rolling correlations, different vector regressive models, dynamic factors models, VAR to GARCH models, panel VAR models, GLS regressions, multi-level structural factor models, multivariate logit models, Markov switching models, different concordance measures, spectral analysis, and etc. (interesting systematizations are provided by De Haan, Inklaar and Jong-A-Pin (2008), Škare and Tomić (2015) and Ahmed, Chaudhry and Straetmans (2015)). Here are some of the studies that have addressed business cycle synchronization in the EU or in eurozone.

Fatás (1997) by using data from 1966 to 1992, studied the evolution of business cycle synchronization between the EU countries together with the regions. By calculating employment growth correlation in EU 12, Fatás concluded that correlations were higher in the EMU then before it, however he also identified a fall in

cross-country correlations between the same-country regions. Artis and Zang (1997, 1999) by using different band-pass filters, calculated lead and lag bivariate correlations indicating that cycles have become more group specific after the exchange rate mechanism (ERM). Angeloni and Dedola (1999) analyzed GDP correlations and came to conclusion that there has been a significant rise of the output correlation between Germany and other European countries, particularly in the period from 1993 to 1997. Döpke (1999) made rolling contemporaneous correlations based on a five year moving average for HP detrended data and suggested an increase in correlation between most of EU countries and the eurozone. Harding and Pagan (2001), on the other hand, made correlations and regression on binary series and found relatively low correlations between members countries and euro area. Camacho, Perez-Quiros and Saiz (2006), with three different measures of synchronization, found relatively high linkages across euro countries, but these are prior to the establishment of the monetary union. Next, Woźniak and Paczyński (2007) used the Kalman filter to extract time-varying spectral properties of GDP growth rates within the new member states and the eurozone in order to estimate the coherence between these series. The analysis of individual spectra has confirmed the existence of several common features such as concentration of power in the low business cycle frequency ranges. Montoya and Haan (2007) also analyzed the synchronization of business cycles in the eurozone countries. The authors came to the conclusion that there is a synchronization period between the observed countries, and that its duration decreases in time.

Mink et al. (2007, 2012) exposed a new cycle co-movement measure which allowed them to determine the synchronization of cycles and the differences between their amplitudes. Overall conclusion was based on the fact that the synchronicity and similarity between output gaps of individual countries and the reference fluctuate over time, and often are not higher than would be expected under output gap independence. Van Aarle et al. (2008) came to conclusion that on average business cycle convergence in the euro area has not changed substantially since the introduction of the euro. This result was robust to the measurement of the cycle and to different sample periods. Wälti (2009) by using probit regressions of synchronicity found that although the introduction of the euro has raised the likelihood of business cycle synchronicity, it has not affected the relative amplitude of business cycles.

Afonso and Furceri (2009) evaluated the sectoral synchronization in the EU 27 for the period 1980-2005 and concluded that, in general, some sectors such as industry, building and forestry contribute more to the aggregate output synchronization in comparison to the services sector. Afonso and Sequeira (2010) also noticed very high degree of business cycle synchronization to that of some EU-15 countries. Crowley and Schultz (2010) by measuring topological differences between GDP growth pattern in recurrence plots for individual countries concluded that there are certain periods of time when growth rate synchronicity increased and these appear after 1983 up until roughly 1990, and then again from 1997 through

until 2002. After 2002 synchronicity is only higher against the non-euro area European member countries. Artis, Chouliarakis and Harischandra (2011), conducted a more extensive research involving a larger period and more countries entitled 'Business cycle synchronization since 1880's. This work showed that there exists synchronization between the countries that are geographically related to the EU and those countries that are related by a language factor. They additionally proved that these synchronization processes accelerate between the surveyed countries in a time perspective. Sella et al. (2012) used spectral analysis when observing cycle synchronization for Italy, the Netherlands and the UK. They concluded that there indeed exists the synchronization process between these three countries for the duration (on average) of five years for one cycle. Stanisic (2013) found that Slovenia had one of the highest average correlations of business cycles with the euro area. Antonakakis and Tondl (2014) reassessed that business cycles have become more synchronized in the EU.

2.3. Stylized facts about Croatia

We can also trace some relevant papers in the business cycle (synchronization) literature that considered Croatia as a part of their studies. Šonje and Vrbanc (2000) analyzed similarity measurement of economic trends in Central Europe through business cycle approach. By using HP filter, they came to conclusion about close correlation of cyclical movements in Central Europe with strong correlation of unemployment between Croatia and Germany. Arčabić (2011) investigated business cycle synchronization (by using rolling correlations) and transmission (by using two-variable VAR model) from the EU to Croatia with the results indicating a high degree of synchronization (above 0.9) and an increasing level of synchronization since 2002. Jovančević, Arčabić and Globan (2012) showed that Croatia has been extremely sensitive to economic shocks from abroad and that the intensity of transmission of business cycles has further increased in recent period. Demanuele (2017) analyzed some aspects of coherence measures between Croatia and selected EMU countries and came to conclusion that Croatia still does not satisfies Maastricht criteria, however he found relative similar cyclical movements within this set of countries. Tomić and Stjepanović (2017a) offered conclusion regarding the nature of business cycle synchronization, cyclical regularities, and macroeconomic interdependence by studying the data on the output and related macroeconomic variables for the EU countries with the spectral analysis. They found that in the group of countries, mainly developing ones (including Croatia) we can identify cycle synchronization in the duration of between four and five years. Tomić and Stjepanović (2017b) also analyzed important macroeconomic variables for Croatia for the period from 1997 to 2016 by using spectral analysis. They offered some forecasting assessments that include very pronounced seasonal effects in the variables.

By looking into the period of our investigation, it can safely be said that Croatia, in general, had met some of the convergence criteria. Until joining the EU in 2013, Croatia was satisfying only two criteria; inflation and long-term interest rate criteria. In next two years, Croatia managed to fulfil additional legislation compatibility criteria, but still it did not meet the public finance and ERM membership criteria. The 2016 Convergence Report (2016) concluded that Croatia currently fulfils three out of the five criteria necessary for adopting the euro; the criteria relating to legal compatibility, price stability and long-term interest rates, and does not fulfil the criteria related to public finances or the exchange rate. The problem with public finance criteria is that for 2015 budget deficit to GDP was 3.2% (over max. 3.0%) and debt to GDP ratio was 86.7% (above the limit of 60.0%). On the other hand, Croatia is yet to be approved for ERM II membership, therefore it cannot satisfy the exchange rate criteria (even though it satisfied the additional criteria of only 0.3% change in the exchange rate which is below allowed max. off $\pm 15\%$).

As the EU leaves to the individual countries to calibrate their own path towards the euro and there is no timetable prescribed, it still emphasizes the importance of euro adoption as a medium-term policy anchor for the benefits of the common currency are diverse and can be accomplished on different socio-economic scales (such as stable prices that lead to stable economies, more transparent and competitive market, more trade and travel, better access to capital and etc.). Though we can say that preparation for the eurozone membership is essential for Croatian prosperity, some of the latest developments (such as Brexit and some other announcements for the euro abandonment, Denmark negotiated an opt-out as did the UK, 2008 financial crisis put an enormous strain on the eurozone, especially on some lagging countries such as Portugal, Spain and Greece, the lack of discipline in the whole euro area) shed a new light on this topic. Should Croatia therefore rush towards the euro or adopt a wait and watch policy, becomes an intriguing question.

3. METHODOLOGICAL ISSUES AND THE RESULTS

3.1. Methodology

This paper investigates the degree of business cycle synchronization between the new euro area member countries and Croatia over the period of almost 20 years. Determining the phases of the cycle is not the objective of this paper. We would rather focus on the coherence measurement issue using the periods of high and low coherence between the variables across the reference countries. In order to analyze the business cycle synchronization across a set of European countries, we first computed cross-correlation coefficients between the cyclical component of a set of variables in Croatia and the cyclical component of a set of variables in the euro area i.e. EMU19. Cross-correlation coefficients would reveal us which variables should we use within

the next phase of the research. In the next phase, we have calculated the two mentioned coherence measures, namely synchronicity and similarity, to uncover the extent of business cycle coherence between Croatia and new EMU countries. In the third phase, we have applied the Chow test for structural break across the countries and variables to see if we can also trace an analogy in these developments.

First, in order to evaluate cyclical components of selected macroeconomic variables we have followed the works of Stock and Watson (1998), Agresti and Mojon (2001), and Napoletano, Roventini and Sapio (2005). Though their work was based on Baxter-King filter, instead we have used Hodrick-Prescott (HP) filter that has come to be recognized as standard method for removing long run movements from the time series in the business cycle literature. Furthermore, we tested integration properties of the data to evaluate their methodological possibilities (similar to Benazić and Tomić, 2014). The popularity of the HP filter to detrend a time series is certainly due to the fact that it is easy to estimate and to comprehend. Hodrick and Prescott's (1997) analysis was based on the assumption that time series are presented through cyclical and growth components, so if growth accounting can provide estimates of growth components with errors that are small relative to the cyclical component, computing the cyclical component is just a matter of calculating the difference between the observed value and the growth component. It resulted in creation of the filter that became standard method for removing long run movements from the time series in the business cycle literature. The HP filter focuses at removing a smooth trend τ_t from some given data y_t by solving next minimization problem:

$$\min_t \sum_{t=1} ((y_t - \tau_t)^2 + \lambda((\tau_{t+1} - \tau_t) - (\tau_t - \tau_{t-1}))^2) \quad (1)$$

so the residual $y_t - \tau_t$ is then commonly referred to as the business cycle component. This is actually a linear filter that requires previous specification of a parameter known as lambda (λ). Based on the form of the observation (annually, quarterly or monthly) this parameter tunes the smoothness of the trend i.e. penalizes the acceleration in the trend component relative to the cycle component. Many point that the parameter λ does not have an intuitive interpretation for the user and that its choice is consider the main weakness of the HP filter. Non-the-less, HP filter has been applied in a number of relevant studies¹.

According to Stock and Watson (1998) and Napoletano, Roventini and Sapio (2005), co-movements between variables are revealed through the cross-correlation of the cyclical component of each series with the cyclical component of a reference cycle as a benchmark variable (country or a set of countries), which is thought to represent the business cycle. This is the correlation between x_t and y_{t+k} , where x_t is the filtered series and y_{t+k} is the k -quarter lead of the filtered reference variable. A large positive

1 Benazić and Tomić (2014) as well as Demanuele (2017) explained the applicability and relevance of HP filter for the study of business cycle characteristics of the Croatian economy.

correlation at $k = 0$ (i.e. around lag zero) indicates pro-cyclical behavior of the series; a large negative correlation at $k = 0$ indicates counter-cyclical behavior; and no correlation indicates acyclical behavior of the series. A maximum correlation at, for example, $k = -1$ indicates that the cyclical component of the variable tends to lag the aggregate business cycle by one quarter. In other words, if the absolute maximum (or minimum) is achieved at some reference variable lead, then the variable is denoted as *leading*, whereas it is called *lagging* in the opposite case. Finally, *coincident* variables are those displaying the bulk of their cross-correlation with the reference variable at lag zero.

Second, in order to observe and evaluate conclusions from the previous analysis we introduced two concepts of coherence as a part of the *deviation cycle analysis*². The usual interpretation given by scholars to the concept of synchronization between growth and business cycles relates to the pattern of growth between these countries rather than the magnitude of growth rates or the amplitude of the growth trend or business cycles as stated by Crowley and Schultz (2010). By synchronicity we always mean the similarity of movements in growth rates over time, so we have to be careful when we analyze convergence which presents the proximity of growth rates with growth rates of other observed country or unit. Many studies opt to calculate both indicators in order to serve better conclusions. An intensive work by Mink et al. (2007) led to a paper in 2012 which introduced new insight into business cycle coherence by measuring two separate indicators: a) *synchronicity* (φ_{ir}) and b) *similarity* (γ_{ir}). Within their study, coherence of the EU member country i and the benchmark r represented by the enlarging euro area was measured:

$$\varphi_{ir}(t) = \frac{g_i(t) g_r(t)}{|g_i(t) g_r(t)|} \quad (2)$$

and

$$\gamma_{ir}(t) = - \frac{n |g_i(t) - g_r(t)|}{\sum_{i=1}^n |g_i(t)|} \quad (3)$$

where $g_i(t)$ is the cyclical component of the analyzed output of a country i in time t and $g_r(t)$ refers to the cyclical component of the reference country r in time t . When averaged over a time interval and transformed to a uniform scaling, the synchronicity measure shows the fraction of time that the output gap of country i has the same sign as the output gap of the reference cycle, whereas averaging similarity between individual countries and the reference over all n countries in the sample yields co-movement for the region as a whole (Mink et al., 2012). In general, synchronicity between

2 Deviation cycle analysis is concerned with phases of above and below trend rates of growth as it is known also as a growth cycle approach. Alternative measure is viewed as classical cycle approach.

the business cycle of an individual country and the reference cycle ranges between 1 and -1, while for co-movement these values are 1 and 1 - n. As the value is closer to 1, synchronicity and/or similarity is higher. Important feature of this measurement is 'right' reference cycle. Besides considering each one of the new EMU country as a reference variable, we also included *ex post* approach by selecting few more reference cycles that lie closest to Croatia i.e. the median of all EU 28 countries, next EU 15 countries, Germany as a strongest individual economy and off course EMU 19 countries. This would enable us robustness in conclusions.

In the third part, we evaluated Chow test which is the most commonly used to test for the presence of a structural break at a period which can be assumed to be known *a priori*. In this part we opted for two structural breaks. One in 2004:Q2 which is when selected new EMU countries entered the EU, and the other one is 2008:Q3 when the global crisis started. Additionally, we tested for more structural breaks, mainly related to the timing of euro adoption by each county.

3.2. Data

Quarterly data for each country were collected from International Financial Statistics and Eurostat for the period of 1995:Q1- 2014:Q3. Selected new EMU countries are: Cyprus (CYP), Estonia (EST), Latvia (LAT), Lithuania (LIT), Malta (MAL), Slovakia (SVK) and Slovenia (SLO). For additional reference variables we used Germany (GER), EU15, EMU19 and EU28 countries³. Data were seasonally adjusted using the Census X12 seasonal adjustment procedure. In order to extract the business cycle component that presents the stationary cycle of the variable we used smoothing parameter λ of 1,600 which is the standard value for quarterly frequencies. To test the integration properties we have analyzed the graphical displays of the variables and applied three unit root tests Augmented Dickey Fuller test (1979), Phillips-Perron test (1988) and Kwiatkowski-Phillips-Schmidt-Shin test (1992); available upon request. Generally, graphs and tests confirmed the absence of a unit root in the observed variables which is an important property of detrended variables. Initial variables included in the evaluation are: unemployment (UNEMP); total number of unemployment, industrial production (IND), debt to GDP ratio (D/GDP), real gross domestic product *per capita* (GDPpc), real gross domestic product index (GDP), imports of goods and services (IMP), exports of goods and services (EXP), consumer price index (CPI) and real effective exchange rate (REER).

3 So far, seven of the twelve countries that joined the EU in 2004 or 2007 have already adopted the euro. Slovenia did so in 2007, Cyprus and Malta in 2008, Slovakia in 2009, Estonia in 2011, Latvia in 2014 and Lithuania in 2015. Currently, more than 338 million people in 19 EU member countries use the euro. The euro area countries are: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain.

3.3. Results

Here are some stylized facts on the business cycle positions (see Table 1.). By interpreting cross-correlations with lags/leads between Croatia and EMU19 we can notice positive i.e. pro-cyclical leading behavior across the selected set of variables. This is important since it suggests that Croatian cycle developments are generally synchronized with the macroeconomic developments within the euro area. Pro-cyclicity suggests that fluctuations first occur within the EMU19 countries and then are transferred into Croatia. Another important point is that most of cross-correlations are statistically significant with coefficients above 0.5 meaning that we trace moderate to strong positive linear relationship across the variables. The only exception is variable unemployment that has shown weak and negative correlation coefficients with lagging pattern. This is nothing strange considering that Croatian labor market is characterized as rigid, inelastic and specific on Phillips-curve reaction (see Basarac (2009) and Benazić and Učkar (2017)). We found some moderate correlation in $t-4$ and $t-3$ time points and there have been certain signs of latent recovery of employment in Croatia lately (similar to the movements across the whole EU), however this did not encourage us to use this variable in the next phase of the analysis. Considering moderate and strong cross-correlations with a leading pattern, we have chosen next variables for the analysis of synchronization properties, namely industrial production, debt to GDP ratio, gross domestic product, imports and exports.

Table 1.: Cross-correlations; Croatia vs. EMU19

Variables	t-4	t-3	t-2	t-1	0	t+1	t+2	t+3	t+4
UNEMP	-0.553	-0.536	-0.451	-0.347	-0.276	-0.097	0.088	0.245	0.379
IND	-0.110	0.074	0.282	0.486	0.565	0.533	0.425	0.236	0.062
D/GDP	-0.172	0.018	0.246	0.440	0.631	0.737	0.772	0.757	0.706
GDPpc	-0.121	0.058	0.074	0.163	0.284	0.405	0.414	0.400	0.362
GDP	-0.057	0.114	0.341	0.571	0.753	0.729	0.629	0.489	0.353
IMP	-0.359	-0.173	0.087	0.371	0.559	0.600	0.565	0.458	0.306
EXP	-0.032	0.111	0.261	0.460	0.602	0.618	0.549	0.352	0.077
CPI	-0.281	-0.115	0.059	0.235	0.392	0.331	0.333	0.234	0.147
REER	0.093	0.193	0.308	0.363	0.395	0.350	0.381	0.346	0.275

Source: Authors' calculation.

Following the methodology presented in Section 3.1., we have calculated two measures of coherence for Croatia, namely the synchronicity and similarity of five as-sorted variables across different reference cycles and presented them in their graphical form (Figure 1.). Results and figures suggested that synchronicity and similarity levels fluctuated substantially over time, however the similarity seemed to be much less volatile than synchronicity. For example, the average correlation between these two measures over time for the variable industrial production of 0.49 (0.55 with new EMU

countries and 0.37 for selected overall EU reference cycles) illustrates that synchronicity and similarity are in fact two different concepts that tend to change and fluctuate within time domain. Similar results are evident across all other variables. This also means that deviations in business cycles and impact of different shocks have different effects on the pattern and amplitudes of movements in these variables in Croatia, which is indicative for economic policy reasoning also. The overall conclusion is that both coherence measures increased within the analyzed period, however, their positive trend was somewhat different. In general, (1) synchronicity was rather weak in the beginning due to political and economic turmoil in the late 1990s, but as the Stabilization and Association Agreement between the EU and Croatia was signed in 2001, Croatia started achieving a higher degree of synchronization with selected new EMU countries, and the EU in general, especially in industrial production, debt to GDP ratio, national output and imports. Explanation for the rise in business cycle synchronicity can be found in the stronger trade and financial linkages with the EU and the increase in the symmetry of macroeconomic shocks across countries. Crises of 2008 resulted in drastic decline and/or volatility in cycle synchronicity probably due to austerity measures and a decline in general consumption. Weak demand side from the EU and especially new EMU countries could represent a great obstacle for a higher degree of synchronization for Croatia. As the crises was abating, synchronicity started increasing, especially after 2013. On the other hand, (2) similarity for Croatia seemed to be relatively stable over the time with only serious decrease around the EU accession point for the new EMU countries (and with the EU in general), probably due to their last preparations which included trade transaction costs and financial information costs, tendencies towards institutional quality, financial deepening, more flexible labor and product markets etc. After the 2005, similarity measure followed synchronicity measure in trend perspective, which is especially seen following the start of the crisis. Since the similarity measure represents an average co-movement between Croatia and selected reference variable, and we already concluded that we can track positive correlations in trend across different variables, high similarity was in fact expected.

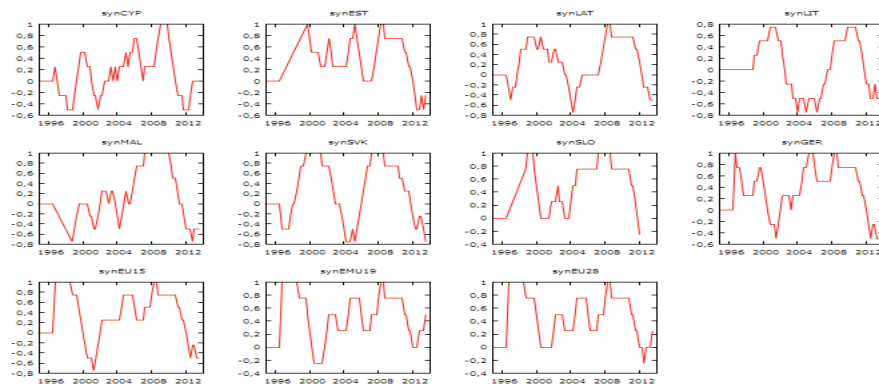
When observing these measures by countries, i.e. different reference cycles, we see almost analogous movements in the synchronicity of Croatia with the new EMU countries and Germany in all five variables, but with slight difference when comparing EU15, EMU19 and EU28 countries. We noticed a minimal divergence in the synchronicity movements when observing Malta and Cyprus compared to other Central and East European countries in all the variables, except the debt to GDP ratio, probably because Croatia traditionally does not have strong economic bonds with those countries. Similar conclusion could be drawn for the similarity measure. We found relatively stable similarity across all the variables with few peaks that are related to the EU accession point and global crisis. Again, the movements in similarity are analogous for most of the countries with some differences when observing Central and East European countries vs. Malta and Cyprus vs. EU15, EMU19 and EU28 countries.

Additionally, we have applied Chow test (see Appendix) for structural breaks to see whether the breaks in time series are analogous as well, which should suggest that we can expect a higher degree of synchronicity and similarity across the variables and countries. We found that most of the structural breaks in 2004:Q2 (EU accession point for the new EMU countries) and 2008:Q3 (start of a global crisis) was within the variables imports and exports across all reference countries, that those breaks are found, but on a smaller scale for the variables industrial production and gross domestic product, and there are almost none of the important structural breaks for the variable debt to GDP ratio. Some of the breaks we found could be related to the monetary union accession point. The absence of odd and inconsistent structural breaks suggested that the coherence of movements across the variables between Croatia and selected countries was relatively stable and thus could provide robust conclusions since they arise from specific empirical points.

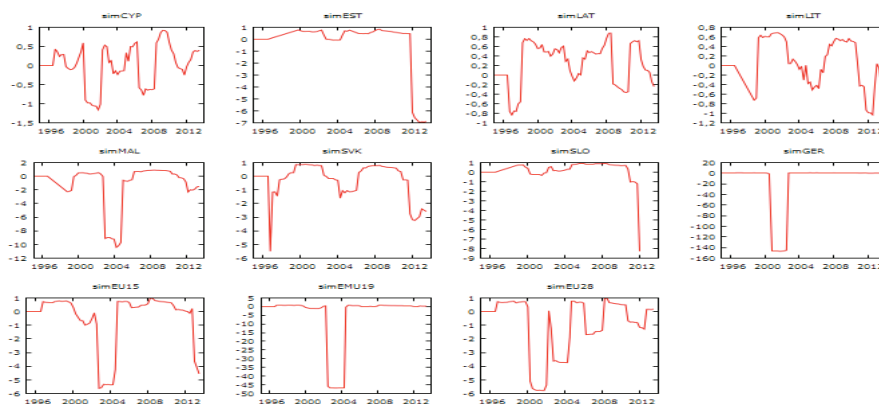
Figure 1.: Coherence measures: all variables across different reference variables

Industrial production (IND)

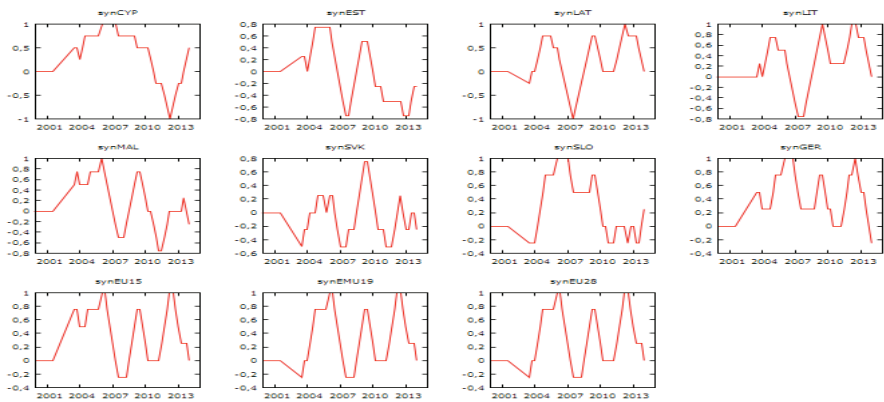
Synchronicity



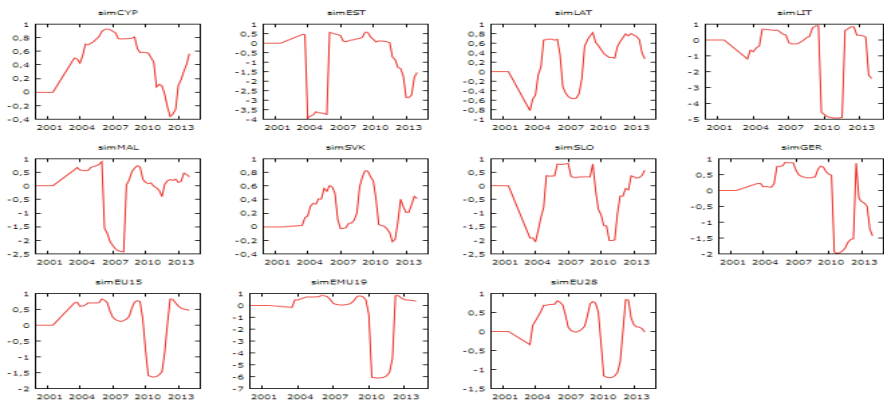
Similarity



Debt to GDP ratio (D/GDP)
Synchronicity

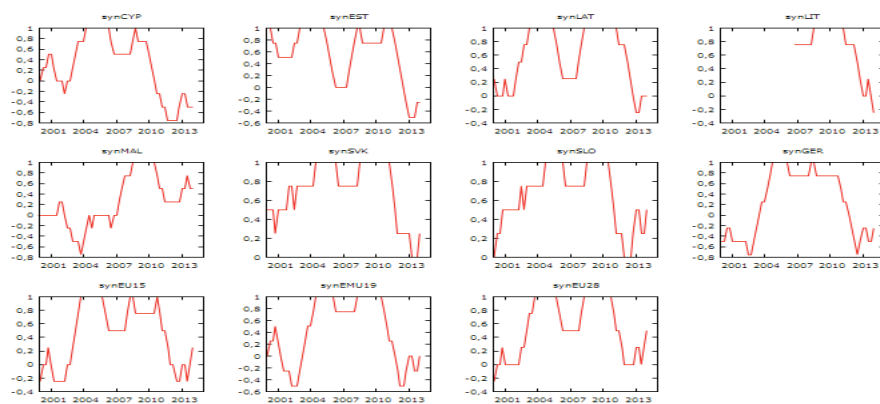


Similarity

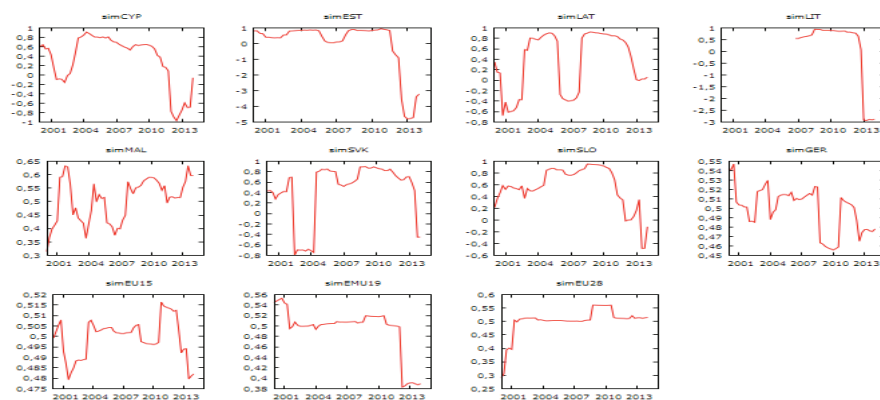


Gross domestic product (GDP)

Synchronicity

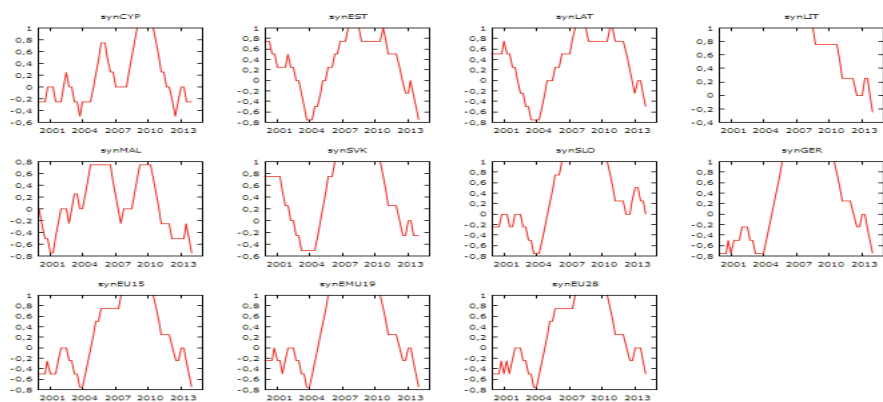


Similarity

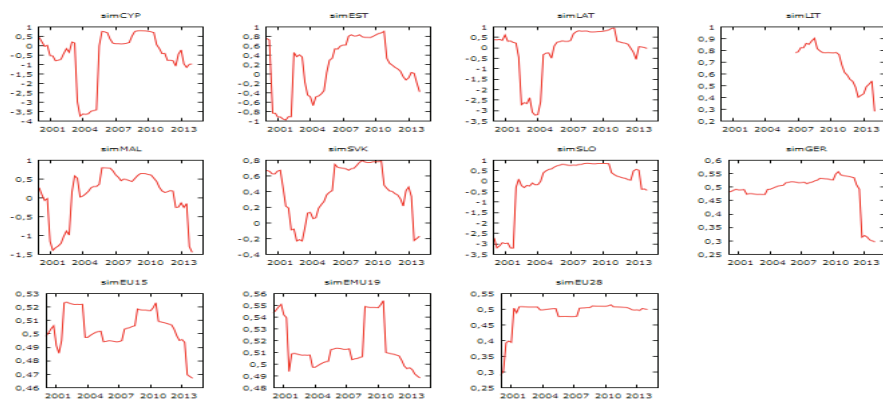


Imports of goods and services

Synchronicity

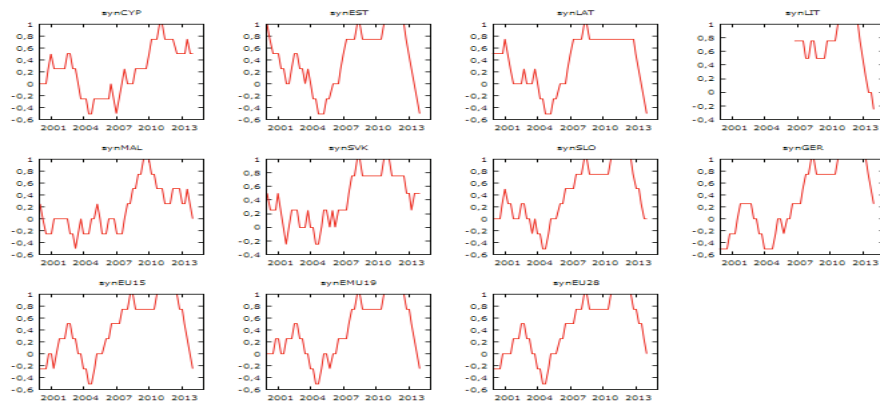


Similarity

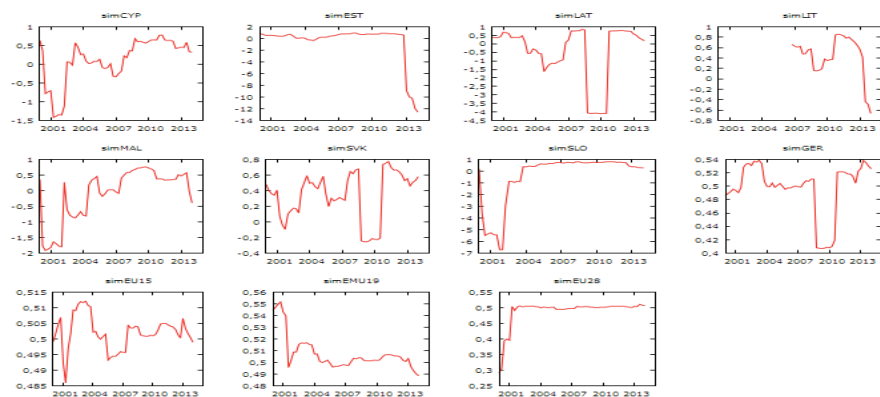


Exports of goods and services

Synchronicity



Similarity



Source: Authors' calculations.

4. A SHORT OVERVIEW OF THE POLICY IMPLICATIONS

Overall results suggest that coherence levels for Croatia fluctuated substantially over time, however, they have a tendency of decreasing with a higher synchronization of the whole EU. The global crisis certainly had a greater negative effect upon the EU business cycle coherence, as synchronicity and similarity decreased likewise in many other Central and East European countries, meaning that the impact of the euro introduction upon the business cycle coherence maybe would not have that desirable stabilization impact. Though we have lately witnessed some de-synchronization processes, the stable monetary policy conducted by the European Central Bank did not amplify the negative trends in business cycle developments in the EU, therefore, it represented a close substitute for national monetary policies. The external environment has significantly worsened recently and will likely remain uncertain for a prolong period of time. Recent events such as Brexit, suggest that access to a large EU market and the political stability factor, while crucial, are not sufficient to achieve country development by itself. Namely, EU membership generates both opportunities and challenges that need to be timely recognized. Aligned economies, i.e. synchronization tendencies are certainly a factor that could assure better development framework.

Our empirical findings indicated a general rise in a synchronicity levels and relatively stable similarity levels for Croatia compared to new EMU countries (and the whole EU and EMU). Hence, if we expect in the future that the implementation of monetary policy in the enlarged EMU is to be more successful if the member countries have synchronized business cycle, the development of co-movements in cycle synchronicity and amplitude of the Croatian economy is of utmost importance for its economic policy. First, although economic shock can be a country specific, a common monetary policy might have asymmetric effects on the countries outside the euro area. Though Croatia manages its own monetary policy and has relatively synchronized economy with the rest of the EU, it is still the question as to what extent its national bank can use exchange rate to effectively stabilize economic activity. So far it has proved to be successful, but this is probably because Croatia is a highly euroized country which monetary reserves come from a strong tourism sector and not from exports. The renewed political uncertainty, coupled with the slow export growth and low investment means that there is no room for ambivalence, hence policy responses must be both immediate and resolute. Unclear responses, both from fiscal and monetary policy, could add to market uncertainty and magnify economic and social tensions. *Ditto*, it indicates that the fast convergence with other EU countries is not an easy process and that the adoption of the euro is not an easy task. At this moment, Croatia does not satisfy the Maastricht criteria, therefore, its monetary policy is limited by the process of fulfilling the criteria and managing national (macro and micro policy) requirements. On the other side, further positive developments on

the demand side in Croatia with optimistic trends on the whole EU market should boost more cooperative international system that will be weighed against the expansion of production capabilities, interaction between consumption and investment, fiscal consolidation, improved quality of life and sustainable development. All that should guide Croatian macroeconomic management to a more comprehensive and pragmatic economic policy goals and decisions.

5. CONCLUSION

Our paper is supplement to the strand of literature that tries to evaluate controversies over business cycle dynamics within the EU, i.e. the compatibility of business cycles and/or coordination of economic policies, as well as it offers constructive analytical commentary. Particularly, we were focused on the question whether Croatia is ready for a deeper degree of economic integration within the EU i.e. common monetary policy. This paper has analyzed the (growth) path of the Croatian economy, comparing it with the cycle dynamics experienced by seven EU countries, namely Cyprus, Estonia, Latvia, Lithuania, Malta, Slovakia and Slovenia (plus with Germany and selected EU aggregates such as EU15, EMU19 and EU28), which are the latest countries that have joined the eurozone and thus abandoned their national currency in order to replace it with the euro. First, we have concluded that in this moment Croatia does not entirely comply with the Maastricht requirements. Satisfying the inflation and interest criteria, and by-passing other convergence criteria, primarily the public debt, implies that Croatia still has a long and difficult (formal) way to go before it can become a euro area member. Besides the question of convergence, in order to offer a wider perspective onto the readiness of Croatia for the introduction of the euro, we also introduced the business cycle synchronization analysis. The dynamics of Croatian business cycle is altogether comparable with that of the latest EMU countries. Results in general indicate relatively similar cycle dynamics across the observed variables, suggesting that Croatia satisfies this selective criterion for the inclusion in monetary union. None the less, monetary integration is far more complicated issue, hence it demands further scientific verification and conceptualization. Our deductions as made above are just mere observations and could/should be subject to a revision in the future.

REFERENCES

- Afonso, A. and Furceri, D., Sectoral Business Cycle Synchronization in the European Union, *Economics Bulletin*, 29(4), (2009): 2996-3014
- Afonso, A. and Sequeira, A., Revisiting Business Cycle Synchronization in the European Union, ISEG Working Paper 22 (2010), School of Economics and Management, Technical University of Lisbon.
- Agresti, A. M. and Mojon, B., Some Stylised Facts on the Euro Area Business Cycle, ECB Working Paper 95 (2001), European Central Bank.
- Ahmed, J., Chaudhry, S. and Straetmans, S., Business and Financial Cycles in the Eurozone: Synchronization and Decoupling, Discussion Paper Series 2015-01 (2015), Birmingham Business School, University of Birmingham.
- Angeloni, I. and Dedola, L., From the ERM to the euro: new evidence on economic and policy convergence among EU countries, Working Paper No. 4 (1999), European Central Bank.
- Antonakakis, N. and Tondl, G., Has Integration Promoted Business Cycle Synchronization in the Enlarged EU?, FIW Working Paper 75 (2011), Research Centre International Economics.
- Arčabić, V., Usklađenost i prijenos poslovnih ciklusa Europske unije na Republiku Hrvatsku. Specijalistički poslijediplomski rad (2011), Ekonomski fakultet Zagreb.
- Artis, M., Chouliarakis, G. and Harischandra, P., Business Cycle Synchronization since 1880, *The Manchester School*, 79(2), (2011): 173-207
- Artis, M.J. and Zhang, W., International business cycles and the ERM: Is there a European business cycle?, *International Journal of Finance & Economics*, 2(1), (1997): 1-16
- Artis, M.J. and Zhang, W., Further evidence on the international business cycle and the ERM: is there a European business cycle?, *Oxford Economic Papers*, 51(1), (1999): 120-132
- Basarac, M., Nova kejezjanska Phillipsova krivulja na primjeru Hrvatske: VEC model, Privredna kretanja i ekonomska politika, 19(119), (2009): 27-52
- Benazić, M. and Tomić, D., The evaluation of fiscal and monetary policy in Croatia over a business cycle, *Zbornik radova Ekonomskog fakulteta Rijeka*, 32(1), (2014): 75-99
- Benazić, M. and Učkar, D., Macroeconomic determinants of unemployment in Croatia: Subset VEC model. 20th International Scientific Conference 'Economic and Social Development', Prague (2017) 27-28 April.
- Camacho, M., Perez-Quiros, G. and Saiz, L., Are European Business Cycles Close Enough to be just One?, (2006) Retrieved from www.sciencedirect.com/science/article/pii/S2212567114003815, (22th December 2016).
- Crowley, P. and Schultz, A., A new approach to analyzing convergence and synchronicity in growth and business cycles: cross recurrence plots and quantification analysis, *Research Discussion Papers*, Vol. 16 (2010), Bank of Finland.
- De Haan, J., Inklaar, R. and Jong-A-Pin, R., Will business cycles in the euro area converge? A critical survey of empirical research, *Journal of Economic Surveys*, 22(2), (2008): 234-273
- Demanuele, D., Usklađenost poslovnih ciklusa i kriterija konvergencije Republike Hrvatske i odabranih zemalja eurozone, Poslijediplomski specijalistički rad (2017), Fakultet ekonomije i turizma 'Dr. Mijo Mirković', Sveučilište Jurja Dobrile u Puli.

Döpke, J., Stylized Facts of Euroland's Business Cycle. *Journal of Economics and Statistics (Jahrbuecher fuer Nationaloekonomie und Statistik)*, 219 (5/6), (1999): 591-610

Eurostat: Retrieved from: <http://epp.eurostat.ec.europa.eu>. (22th December 2016).

Fatás, A., EMU: Countries or regions? Lessons from the EMS experience. *European Economic Review*, 41(3), (1997): 743-751

Hodrick, R. J. and Prescott, E. C., Postwar U.S. Business Cycles: An Empirical Investigation, *Journal of Money, Credit and Banking*, 29(1), (1997): 1-16

International Financial Statistics. Retrieved from: <http://www.imf.org/external/data.htm>. (22th December 2016).

Jovančević, R., Arčabić, V. and Globan, T., Prijenos poslovnih ciklusa zemalja Europske unije na Republiku Hrvatsku, *Ekonomski pregled*, 63(1-2), (2012): 3-21

Mink, M., Jacobs, J. and de Haan, J., Measuring coherence of output gaps with an application to the euro area, *Oxford Economic Papers*, 64(2), (2012): 217-236

Mink, M., Jacobs, J. and de Haan, J., Measuring Synchronicity and Co-Movement of Business Cycles With an Application to the Euro Area, CESifo Working Paper 2112 (2007), Ifo Institute for Economic Research, Munich.

Montoya, L.A. and de Haan, J., Regional Business Cycle Synchronization in Europe?, Bruges European Economic Research Paper No. 11 (2007), College of Europe, Bruges Campus.

Napoletano, M., Roventini, A. and Sapio, S., Are Business Cycles All Alike? A Bandpass Filter Analysis of the Italian and US Cycles, LEM Working Paper Series 2004/25 (2006), Laboratory of Economics and Management.

Sella, L., Vivaldo, G., Ghil, M. and Groth, A., Economic cycles and their synchronization: Spectral analysis of macroeconomic series from Italy, The Netherlands, and the UK, *Euroindicators Working Papers EWP 2011/029* (2012), Eurostat.

Stanišić, N., Convergence between the business cycles of Central and Eastern European Countries and the Euro area, *Baltic Journal of Economics*, 13(1), (2013): 63-74

Stock, J. H. and Watson, M. W., Business cycle fluctuations in us macroeconomic time series, NBER Working Paper Series 6528 (1999), National Bureau of Economic Research.

Škare, M. and Tomić, D., Business cycle - growth nexus: a review, *Technological and Economic Development of Economy*, 21(3), (2015): 519-538

Šonje, V. and Vrbanc, I., Mjerenje sličnosti gospodarskih kretanja u Srednjoj Europi: povezanost poslovnih ciklusa Njemačke, Mađarske, Češke i Hrvatske, Istraživanja HNB-a I-5, lipanj (2000), Hrvatska narodna banka.

The 2016 Convergence Report, Assessment of Member States regarding the condition for euro adoption, Fact Sheet (2016), European Commission.

Tomić, D. and Stjepanović, S., Business cycle synchronization within the EU countries: the spectral analysis, 20th International Scientific Conference 'Economic and Social Development', Prague (2017a) 27-28 April

Tomić, D. and Stjepanović, S., Spectral analysis of macroeconomic series for Croatia, The 8th International Scientific Conference 'Future World by 2050' (2017b), Faculty of economics and tourism 'Dr. Mijo Mirković', Juraj Dobrila University of Pula.

Van Arle, B., Kappler, M., Seymen, A. and Weyerstrass, K., Business cycle synchronization with(in) the euro area: stylized facts, 5th Eurostat Colloquium on Modern Tools for Business Cycle Analysis (2008), Eurostat and European University Institute.

Wälti, S., The myth of decoupling, MPRA Paper 20870 (2009), University Library of Munich, Germany.

Woźniak, P. and Paczyński, W., Business cycle coherence between the Euro area and the EU new member states: a time-frequency analysis, CERGE-EI Working Paper, Manuscript No. 3 (2007), Center for Economic Research and Graduate Education - Economics Institute.

APPENDIX

Chow test for structural breaks in synchronicity and similarity (Croatia vs. reference country/group of countries) by variables

Reference/ Variable	Synchronicity		Similarity	
	2004:Q2	2008:Q3	2004:Q2	2008:Q3
	Industrial production (IND)			
Cyprus	F = 0.80 (p = 0.45)	F = 0.52 (p = 0.59)	F = 0.53 (p = 0.59)	F = 2.16 (p = 0.12)
Estonia	F = 1.23 (p = 0.30)	F = 1.30 (p = 0.28)	F = 0.21 (p = 0.80)	F = 1.60 (p = 0.21)
Latvia	F = 0.08 (p = 0.92)	F = 2.35 (p = 0.10)*	F = 0.16 (p = 0.86)	F = 1.83 (p = 0.17)*
Lithuania	F = 0.83 (p = 0.44)	F = 0.78 (p = 0.46)	F = 2.19 (p = 0.12)*	F = 1.61 (p = 0.21)
Malta	F = 2.87 (p = 0.06)	F = 3.06 (p = 0.05)	F = 1.61 (p = 0.21)*	F = 0.04 (p = 0.96)
Slovakia	F = 0.01 (p = 0.99)	F = 2.77 (p = 0.07)	F = 6.23 (p = 0.00)	F = 4.69 (p = 0.01)
Slovenia	F = 1.41 (p = 0.25)*	F = 3.90 (p = 0.03)	F = 5.19 (p = 0.01)	F = 6.44 (p = 0.00)
Germany	F = 2.04 (p = 0.14)	F = 2.29 (p = 0.11)	F = 0.38 (p = 0.68)	F = 0.12 (p = 0.88)
EU15	F = 0.42 (p = 0.66)	F = 1.92 (p = 0.15)	F = 2.13 (p = 0.12)*	F = 0.96 (p = 0.39)
EMU19	F = 0.12 (p = 0.88)	F = 2.22 (p = 0.80)	F = 9.52 (p = 0.00)	F = 0.12 (p = 0.88)
EU28	F = 0.02 (p = 0.98)	F = 0.69 (p = 0.51)	F = 1.66 (p = 0.20)	F = 0.14 (p = 0.87)

* Latvia (2008:Q4) structural break both in synchronicity and similarity; Lithuania (2004:Q1) structural break in similarity; Malta (2004:Q3) structural break in similarity; Slovenia (2004:Q3) structural break in synchronicity; EU15 (2004:Q3) structural break in similarity

Reference/ Variable	Synchronicity		Similarity	
	2004:Q2	2008:Q3	2004:Q2	2008:Q3
	Debt to GDP ratio (D/GDP)			
Cyprus	F = 0.65 (p = 0.53)	F = 0.70 (p = 0.50)	F = 0.26 (p = 0.77)	F = 1.16 (p = 0.32)
Estonia	F = 0.34 (p = 0.72)	F = 0.04 (p = 0.96)	F = 5.79 (p = 0.00)	F = 0.38 (p = 0.68)
Latvia	F = 0.59 (p = 0.56)	F = 0.91 (p = 0.41)	F = 0.33 (p = 0.72)	F = 2.73 (p = 0.08)
Lithuania	F = 0.89 (p = 0.42)	F = 1.56 (p = 0.22)	F = 0.11 (p = 0.90)	F = 1.09 (p = 0.34)
Malta	F = 0.04 (p = 0.96)	F = 0.24 (p = 0.79)	F = 0.05 (p = 0.95)	F = 0.41 (p = 0.67)*
Slovakia	F = 0.26 (p = 0.77)	F = 0.09 (p = 0.91)*	F = 0.20 (p = 0.84)	F = 0.20 (p = 0.84)
Slovenia	F = 0.36 (p = 0.70)	F = 1.48 (p = 0.24)*	F = 0.94 (p = 0.40)	F = 0.65 (p = 0.53)
Germany	F = 0.47 (p = 0.63)	F = 0.11 (p = 0.89)	F = 0.02 (p = 0.98)	F = 1.58 (p = 0.22)
EU15	F = 0.24 (p = 0.78)	F = 1.50 (p = 0.24)	F = 0.00 (p = 0.99)	F = 0.03 (p = 0.97)
EMU19	F = 0.70 (p = 0.50)	F = 0.62 (p = 0.55)	F = 0.10 (p = 0.90)	F = 0.32 (p = 0.72)
EU28	F = 0.70 (p = 0.50)	F = 0.62 (p = 0.55)	F = 0.89 (p = 0.42)	F = 0.37 (p = 0.70)

* Malta (2008:Q1) structural break in similarity; Slovakia (2009:Q4) structural break in synchronicity; Slovenia (2007:Q2) structural break in synchronicity

Reference/ Variable	Synchronicity		Similarity	
	2004:Q2	2008:Q3	2004:Q2	2008:Q3
	Gross domestic product (GDP)			
Cyprus	F = 1.54 (p = 0.22)	F = 2.02 (p = 0.14)*	F = 0.22 (p = 0.80)	F = 0.62 (p = 0.52)
Estonia	F = 0.65 (p = 0.53)	F = 1.32 (p = 0.27)*	F = 0.33 (p = 0.72)	F = 1.35 (p = 0.27)*
Latvia	F = 1.00 (p = 0.37)	F = 1.38 (p = 0.26)	F = 0.03 (p = 0.97)	F = 0.47 (p = 0.63)
Lithuania	/	F = 0.49 (p = 0.49)	/	F = 0.22 (p = 0.80)
Malta	F = 2.57 (p = 0.08)*	F = 0.08 (p = 0.92)	F = 0.32 (p = 0.72)	F = 1.14 (p = 0.32)
Slovakia	F = 1.85 (p = 0.17)	F = 1.45 (p = 0.25)	F = 2.99 (p = 0.06)	F = 0.87 (p = 0.42)
Slovenia	F = 2.04 (p = 0.14)	F = 1.83 (p = 0.17)*	F = 1.56 (p = 0.22)	F = 1.81 (p = 0.17)
Germany	F = 0.19 (p = 0.82)	F = 2.80 (p = 0.07)	F = 0.64 (p = 0.53)	F = 3.94 (p = 0.03)
EU15	F = 1.32 (p = 0.27)	F = 1.36 (p = 0.64)	F = 0.19 (p = 0.83)	F = 0.21 (p = 0.81)
EMU19	F = 0.19 (p = 0.83)	F = 1.37 (p = 0.26)	F = 0.23 (p = 0.80)	F = 1.08 (p = 0.35)
EU28	F = 0.99 (p = 0.38)	F = 0.87 (p = 0.43)	F = 0.33 (p = 0.72)	F = 0.71 (p = 0.50)

* Cyprus (2008:Q4) structural break in synchronicity; Estonia (2011:Q1) structural break both in synchronicity and similarity; Malta (2006:7) structural break in synchronicity; Slovenia (2008:Q4) structural break in synchronicity

Reference/ Variable	Synchronicity		Similarity	
	2004:Q2	2008:Q3	2004:Q2	2008:Q3
	Imports of goods and services (IMP)			
Cyprus	F = 1.68 (p = 0.20)	F = 0.64 (p = 0.14)*	F = 1.60 (p = 0.21)	F = 0.18 (p = 0.83)
Estonia	F = 2.16 (p = 0.12)*	F = 1.98 (p = 0.15)*	F = 5.40 (p = 0.01)	F = 0.51 (p = 0.60)
Latvia	F = 2.61 (p = 0.08)	F = 1.63 (p = 0.21)*	F = 10.32 (p = 0.00)	F = 0.04 (p = 0.96)
Lithuania	/	F = 1.18 (p = 0.29)	/	F = 1.11 (p = 0.34)
Malta	F = 0.68 (p = 0.51)	F = 0.52 (p = 0.60)	F = 2.05 (p = 0.14)	F = 1.38 (p = 0.26)
Slovakia	F = 2.75 (p = 0.07)	F = 1.18 (p = 0.31)	F = 0.69 (p = 0.51)	F = 0.51 (p = 0.61)
Slovenia	F = 2.87 (p = 0.07)	F = 1.37 (p = 0.26)	F = 0.12 (p = 0.88)	F = 0.23 (p = 0.80)
Germany	F = 1.31 (p = 0.28)	F = 5.29 (p = 0.01)	F = 0.37 (p = 0.69)	F = 1.34 (p = 0.27)
EU15	F = 0.83 (p = 0.44)	F = 4.45 (p = 0.02)	F = 2.04 (p = 0.14)	F = 2.16 (p = 0.12)
EMU19	F = 0.93 (p = 0.40)	F = 3.85 (p = 0.03)	F = 0.24 (p = 0.79)	F = 0.26 (p = 0.77)
EU28	F = 1.72 (p = 0.19)	F = 2.83 (p = 0.07)	F = 0.29 (p = 0.75)	F = 0.12 (p = 0.89)

* Cyprus (2005:Q1) structural break in synchronicity; Estonia (2004:Q1, 2011:Q1) structural break in synchronicity; Latvia (2014:Q1) structural break in synchronicity

Reference/ Variable	Synchronicity		Similarity	
	2004:Q2	2008:Q3	2004:Q2	2008:Q3
	Exports of goods and services (EXP)			
Cyprus	F = 0.46 (p = 0.64)	F = 2.40 (p = 1.00)*	F = 1.88 (p = 0.16)	F = 1.61 (p = 0.21)
Estonia	F = 3.58 (p = 0.04)	F = 3.67 (p = 0.03)	F = 0.16 (p = 0.85)	F = 1.06 (p = 0.35)*
Latvia	F = 1.15 (p = 0.32)	F = 4.04 (p = 0.02)	F = 0.47 (p = 0.63)	F = 0.56 (p = 0.58)
Lithuania	/	F = 1.61 (p = 0.22)	/	F = 0.17 (p = 0.85)
Malta	F = 3.67 (p = 0.03)	F = 3.84 (p = 0.03)	F = 12.81 (p = 0.00)	F = 0.98 (p = 0.38)
Slovakia	F = 4.23 (p = 0.02)	F = 0.52 (p = 0.60)	F = 0.09 (p = 0.91)	F = 0.05 (p = 0.95)
Slovenia	F = 2.29 (p = 0.11)	F = 0.82 (p = 0.44)	F = 1.60 (p = 0.21)	F = 0.12 (p = 0.89)
Germany	F = 1.28 (p = 0.28)	F = 0.64 (p = 0.51)	F = 0.19 (p = 0.83)	F = 0.22 (p = 0.79)
EU15	F = 0.95 (p = 0.39)	F = 3.15 (p = 0.05)	F = 0.77 (p = 0.47)	F = 0.11 (p = 0.90)
EMU19	F = 0.81 (p = 0.45)	F = 2.71 (p = 0.08)	F = 0.85 (p = 0.43)	F = 0.47 (p = 0.63)
EU28	F = 0.83 (p = 0.43)	F = 1.51 (p = 0.23)	F = 0.02 (p = 0.98)	F = 0.01 (p = 0.99)

* Cyprus (2008:Q4) structural break in synchronicity; Estonia (2011:Q1) structural break in similarity; Malta (2008:Q1) structural break in synchronicity

Source: Authors' calculations.

AN EVALUATION OF THE IMAGE OF POLAND AS A NATIONAL BRAND PERCEIVED BY YOUNG FOREIGNERS

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ABSTRACT

The article provides an overview of the literature on notions including national image, national brand and national branding, then presents selected campaigns promoting Poland in the international arena. It evaluates how Poland, as a national brand, is perceived by young foreigners. Empirical studies were conducted among foreigners at the age of 20-25. 103 respondents from 23 countries participated in the research. The most common associations respondents had with Poland were history, Pope John Paul II and Polish vodka. Warsaw and Krakow are definitely the most recognizable Polish cities. Many respondents expressed positive opinions about Poland's nature, landscapes, mountains and seaside. Among numerous events organized in Poland, the most well-known were the European Football Championship EURO 2012, the Woodstock Festival and Wroclaw - European Capital of Culture 2016. I believe Poland continues to be perceived through stereotypes, with associations to the Pope, vodka and religion predominating. These were enumerated as the main associations in a 2011 study and since then, despite Poland's numerous promotional work in the international arena, there has been no success in creating new associations, such as Poland being an innovative and modern country or its people being entrepreneurial, to name two.

Keywords:

Country image, National branding, National brand, Promotion, Poland.

1. INTRODUCTION

Today, numerous countries appreciate the importance of a strong national brand as it translates into an improved international position and development. Building a strong national brand is a complex process involving various institutions and organizations. Marketing activities must be addressed to different target groups, including tourists, entrepreneurs, residents and the media. Poland has for many years been marketing internationally through the Polish Tourist Organization, the Ministry of Foreign Affairs and Polish Investment and Trade Agency. Having a strong national brand carries numerous benefits. A country is associated with certain values and symbols, which increases its international recognition and increases confidence in the state. This in turn translates into increased foreign investment, more tourist visits and talented people who want to learn and grow in the country. However, a strong national brand is built neither quickly nor easily. When looking at this issue, comparisons of national brand and traditional branding cannot be avoided. The former can be interpreted as adapting branding tools for a macroeconomic scale. This means that in addition to the branding elements such as identity and positioning, the cultural, social and political conditions in which the brand operates must also be taken into account.

The general aim of this article is to evaluate how Poland as a brand is perceived by young foreigners. Other goals include examining spontaneous associations with Poland, familiarity with Polish cities, people and events, and opinions on the subject of promotional campaigns and Poland's image. The article provides an overview of the literature on the notion of national image, national brand and national branding, and also presents selected campaigns promoting Poland on the international arena. In order to achieve these goals, empirical studies were conducted among foreigners at the age of 20-25, with 103 respondents from 23 countries participating. An internet survey was used to collect the data. The vast majority of the surveyed persons were Erasmus programme students. Selecting this particular group for research was intentional as it is the Erasmus students who are one of the target groups which Poland wants to reach with its advertising message. Polish institutions responsible for promoting Poland on the international market believe that members of this group may be good ambassadors of Poland abroad. The main hypothesis set out in this paper is that despite many advertising campaigns having been conducted, young foreigners have little knowledge about Poland.

2. NATIONAL BRAND AS A FACTOR IN A COUNTRY'S SUCCESS

The definition of the process of national branding and its effect, the national brand, are essential to understanding this issue, and as such are discussed widely in the subject literature. It is important to understand the essence of the process of na-

tional branding itself in order to understand the effect it may have. As mentioned above, national branding has been further extended to include cultural, political and social perspectives in such a way that the process can be adapted to a comprehensive organizational structure—that is, the national state. In turn, the national brand has many common features with classic business branding, though we must be cognizant of the importance of the context in which it is analyzed. The mark of a nation as a tourist destination is perceived differently than the national brand as the exporter of products – a friendly country does not mean an economically viable one, and vice versa.

National branding is a strategic process. It aims to improve the image and reputation of the country through the involvement of national brand stakeholders. This process takes place on three levels (Hereinafter, 2011):

- (I) Public Institutions
- (II) International opinions among the public, investors, tourists and consumers
- (III) Society

The levels of national branding management correspond to a variety of stakeholder groups of the national brand. Each level has its own separate functions and tasks, which ultimately work together. The first level, public institutions, coordinates activities responsible for the most important functions of the national brand—public diplomacy, tourism, foreign direct investment and exports. To address the second level, plans for communicating with and forming messages for the international public, investors, tourists and consumers should be coordinated. The communication should include elements of national identity that are relevant to the target group and the value they will gain through contact with the country. The last level involves two elements: the society in which the process of creating a national brand on a local scale should be carried out and, second, individuals involved in promoting its ideas by getting them to identify with the national brand.

A country's national brand is both a goal and a result of national branding. Strictly speaking, a national brand cannot be created – it exists as long as the country does. Through history, political and economic activity, natural and environmental value, among other factors, nations have for centuries been creating their own brand. Nonetheless, the process of national branding can change a nation's brand. A national brand, which has a lot in common with company brand, is characterized by a large number of stakeholders who have different, often contradictory, goals for the country. A conflict of interest may arise, for example, between investors and tourists. The first may look for cheap land to build factories on, while the latter are interested in quiet holiday areas and fresh air. As a concept, national brand is even more complex than brand creation done by enterprise. It does not allow for the transfer of the most well-known and most commonly used brand definition, developed by

the American Marketing Association and adopted by Kotler (1994). This definition is limited to the material characteristics of the brand, the identity of the creator or seller, and the aspect of the brand being distinguished or standing out. Only the issue of how the brand interacts with the environment allows one to begin to understand today's national brand concept.

According to Holt (2004), brands rise to become icons through their creative interaction with the environment and the process of cultural branding. In Holt's opinion, it is this aspect of brand-environment coexistence that is best adapted to the national brand. For Lodge (2002), national brand is more than just symbolism and visualization: It is a manifestation of the collective desire to offer competitive and attractive value. Anholt (2002) maintains that national brand serves to express the country's competitive position, its strengths resulting from geographic location, economy, culture, the education system, attractiveness as a tourist destination, and export products. While both definitions underline the importance of brand for the country's competitiveness, the first one focuses on engaging the public, while the other emphasizes the strength of the brand. Another author (Allan 2004) represents the national brand as a symbolic creation that emphasizes values that are memorable, attractive, unique and important for those partaking of them, and which maintain the nation's values. Jaffe and Nebenzahl (2001) define the national brand through the definition of national branding, which seeks to create a clear, simple and distinctive idea built around emotional traits that can be illustrated verbally and visually and understood by different audiences in different situations. For a national brand to be effective, political, cultural, business and sports activities must be taken into account.

The process of creating a national brand is a relatively new area of research. The term nation branding was first used by Anholt in the late 1990s. However, as Olins (2002) points out, countries looking after how they are perceived abroad is nothing new—competition has been occurring for centuries. In addition to obvious factors such as infrastructure, taxation, education and access to cheap labor, countries also compete with their image, created through intangible values such as international significance, sporting, cultural and scientific achievements. Considered by many the father of the concept of national branding, Anholt created the hexagon model to represent the six major areas that make up the national brand: people, tourism, culture and heritage, branded exports, foreign and domestic politics and investment (Anholt 2007).

3. DEVELOPMENT OF THE POLSKA BRAND - KEY PREMISES OF THE COUNTRY'S BRAND BUILDING PROGRAM

While POLAND (POLSKA, in Polish) as a brand exists, because the country lacked a cohesive image campaign and common branding concept for many years at the central level, it is not very visible, well-known or well-defined. In order to unify the strategy of building the POLSKA brand, the Polish Council of Promotion in 2013 adopted "Rules for Communicating the POLSKA Brand" (2013). This document was created on the basis of a thorough analysis of other strategic documents related to promotion and branding (among them the Strategy for the Promotion of Poland until 2015, Promoting Poland through Culture, Communication Strategy in the UK, German and French Markets, Brand Promotion in the UEFA EURO 2012™ Context). The basic conclusion drawn from the analysis of these documents, which became the basis for building the POLSKA brand, is that Poles are the brand's strongest asset; and it is through them that the brand is best reached by foreigners. Poles' numerous talents, manifest in various sectors of the economy, affect how the country is perceived. It is therefore mainly through the prism of people that POLSKA should be built. Four points have been identified to characterize the brand's identity, fashioned in colloquial, rather than official or marketing language (Rules for Communication...2013).

- (I) POLSKA IS INTENSE. As people of action who take great interest in the world, Poles are continuously pressing ahead.
- (II) POLSKA IS COMMITTED. Poles never have enough time for everything and are not afraid to take risks if they can gain more. As a nation, they are mild, a positive case of ADHD.
- (III) POLSKA WON'T LEAVE YOU FEELING INDIFFERENT. Poles' proverbial hospitality cannot be overestimated. Few other nations in this part of the world allow newcomers to become so close. It is against our nature to leave visitors to their own devices. Poles are determined to host them as best they can, show them around and explain everything, even if they are hard pressed for time.
- (IV) POLSKA KNOWS HOW TO SWIM AGAINST THE TIDE. Poles can create exceptional things even if they lack advanced infrastructure or resources in a given area. They have a knack for making something out of nothing. Poles can use their ingeniousness to create things without outside help.

The next step was to elaborate the promises the POLSKA as a brand is to convey. The slogan "Polska empowers" was chosen, and was intended to help people understand the brand and unify its communication, though it was not meant to be used in advertising campaigns. The idea was that POLSKA fuels imagination, entrepreneurship, initiative and experiences. However, the document "Rules for Communicating the POLSKA BRAND" does not lay out how the competences and responsibilities for advertising

campaigns and events promoting Poland are to be divided. Numerous institutions and organizations participate in the process of building the POLSKA brand and producing advertising campaigns. The Polish Tourist Organization is responsible for the promotion of Polish tourism, while the promotion of the Polish economy is handled by the Polish Investment and Trade Agency together with the relevant ministries. Apart from state agendas, there are also various foundations involved, e.g. the Polish Promotional Emblem Foundation "Teraz Polska" as well as private institutions. Territorial governments of Polish cities and regions play an important role. Their marketing activities also influence how the country's image is built. It is laudable that such a multitude of institutions is involved: The country and its institutions consider promotion and branding to be an important issue. However, the sheer number of entities is at the same time to blame for the inconsistency of the message, the lack of synergies, and the organizational problems, particularly as regards the division of responsibilities (Hereźniak, 2011).

4. SELECTED CAMPAIGNS AND ACTIVITIES PROMOTING POLAND

In recent years, numerous marketing activities have been undertaken on foreign markets. 2014's image campaign "Polska. Spring into." well illustrates the direction "Rules for Communicating the POLAND Brand" took. The wide variety of measures undertaken within this campaign reveals a holistic approach to the promotion of Poland based on Poles. The guiding idea of the campaign was the 25th anniversary of Poland's freedom, which coincided with its 10th anniversary of EU membership and its 15th anniversary of NATO membership. The campaign slogan "Polska. Spring into." was developed by Olins, a branding expert that has been involved in building Poland's brand nearly since the country began its effort.

The fact that the country's name, POLSKA, doesn't translate into foreign languages plays an important role. This name is unique and cannot be mistaken for another (as sometimes happens with the English pronunciation of Poland and Holland). Another important element is the use of the English word spring, which can be defined as a symbol of energy and joy (the season), the accumulation of energy (the coiled object) and as a source (strength). Due to the difficulty of translation and the universal message, it was created only in English (www.msz.gov.pl). The campaign was targeted at markets in the EU, particularly the countries with the largest concentration of Polish emigrants—Great Britain, Germany, Belgium and Sweden. In London alone, 150 posters were hung, including in the underground and at Heathrow Airport. However, neither the poster nor the slogan escaped criticism. Instead of photographing Poles at the core of the entire campaign, a stock photo from the advertising agency's collections was used, while the "25 Freedom" logo in font reminiscent of Poland's Solidarity movement meant so little to Brits that its very real significance was lost on them.

An article by Frymorgen and Kwolek (2014) cited other negative comments from the British on the ads. One individual observed that the grammar in the slogan "Polska. Spring into" makes no sense, and he didn't know what the phrase actually meant. He guessed that it was intended to encourage people to visit Poland or invest in the country. Others criticized the use of the ambiguous word spring, because it makes the message unclear. Another element of the campaign was an advertising spot featuring the photographer Chris Niedenthal. According to the Ministry of Foreign Affairs, he is an expressive person who is not only connected with Polish history but also bridges the Polish and Anglo-Saxon worlds. The spot was aired by four media giants: BBC, CNN, Eurosport and Sky News. A shorter spot shows Mr. Niedenthal walking through Warsaw, narrating as he goes. He introduces himself to the audience and talks about the pictures he shot under martial law. The narrator talks about his fascination with Poles' struggle for freedom and how they use it today. He then describes Poles as ambitious people who work hard, but with passion and dynamism, because they want to succeed. In his opinion, this is why Poland has achieved so much in 25 years and why Poles still want to change the world. At the end he says that life in Poland is much more intense, because Poland is new. Viewers then see the slogan "POLAND. Spring into New" with the website www.polska.pl. The spot emphasizes people (both younger and older) and their emotions in a variety of situations—at university, at work and on the street, all of which accords with the principles established for communicating the brand communication.

Another campaign Poland carried out on foreign markets was called "Move Your Imagination". It set out to show Poland as an intriguing place and to highlight the changes that have taken place in it over recent years. Both the slogan and the new branding served to break stereotypes about the country. The main focus was on image issues, emphasizing that Poland is a modern country and Poles have a sense of humor and don't take themselves too seriously. The promotional film "Move your imagination" took first place (there were 20 competitors) during the prestigious film festival "The Golden City Gate". The film had seven parts showing Poland through the prism of emotions experienced by foreigners visiting the country. The action of the film associated emotions and states with particular places: youth - Warsaw, love - Kraków, creativity - Poznań, freedom - Gdańsk, passion - Łódź, friendship - Mazury, music - Wrocław (www.pot.gov.pl).

The "Made in Poland" slogan headlined yet another advertising campaign, this one overseen by the Ministry of Economy. It encouraged foreign investors from the Czech Republic, Germany, Ukraine, China and Russia to establish business cooperation with Polish companies. The campaign included advertising in the press, the Internet, outdoor and PR activities.

The Polish Tourist Organization conducted a large-scale campaign promoting Poland as a destination for Chinese, Indian and Japanese tourists. Advertising from Poland appeared online, on television, in the press and on outdoor advertising in

large cities in the three countries. At the same time, research was done on what people there know about Poland, how they perceive it and whether they are interested in visiting it. It was also important to recognize what our competitive position relative to our neighbors' - Germany, the Czech Republic and Hungary. Unsurprisingly, what people in the three target countries knew about Poland is superficial and imprecise. Poland did not have a clear image, character or unique features in their eyes. The Chinese proved slightly more knowledgeable as some associated the country with Maria Skłodowska-Curie and Copernicus. World War II, holocaust, communism, Chopin's music and history were also mentioned by members of all three countries, but they knew nothing of today's Poland (www.rp.pl).

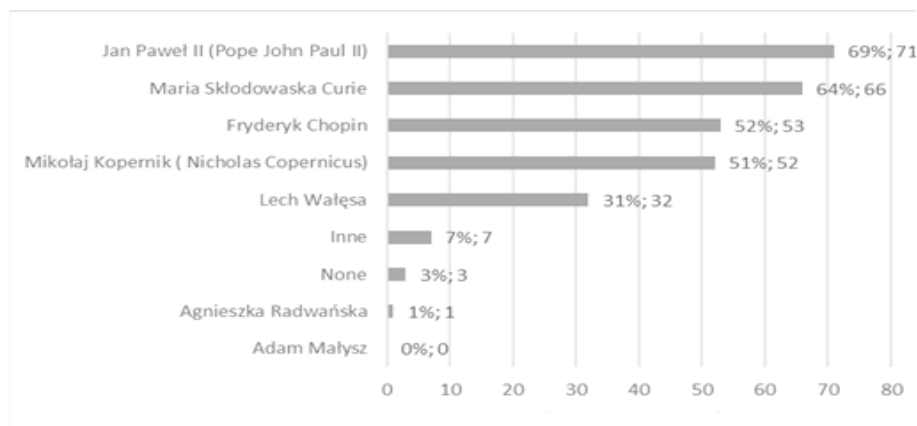
Over the last few years Poland has carried out several promotional campaigns on international markets. They corresponded to different institutions. That is why it was very important to adopt the "Rules for Communicating the POLAND Brand" in 2013, which allowed us to develop a coherent basis for building the brand. The next part of the article presents the results of research on the awareness of the campaign and the evaluation of the POLAND brand by foreign respondents.

5. RESEARCH RESULTS

One hundred and three foreign respondents aged 20-25 participated in the study. Respondents represented 23 nationalities, but the majority (72%) came from Western European countries. The study also included representatives of US, Mexico, Israel and China. One of the aims of the study was to check the spontaneous associations respondents had with Poland. Most prominent among them were vodka, Cracow, religion/Catholicism, Poles are nice people and John Paul II. Most respondents associate Poland with a variety of historical events, primarily the Second World War (11%), the Holocaust (many mentioned Jews), the Warsaw ghetto, concentration camps (especially Auschwitz) and communism. Respondents also mentioned Lech Walesa and Solidarity. Some respondents associated Poland with modern day politics, and referred to Polish President Andrzej Duda and the President of the European Council, Donald Tusk. One respondent from Bosnia mentioned the tragic Polish plane crash at Smolensk.

Because the "Rules for Communicating the POLAND Brand" devotes so much attention to the approach that people should be the foundation of the POLAND brand, the survey sought to determine the most well-known Polish figures. They included Pope John Paul II (69%), Maria Skłodowska-Curie (64%), Fryderyk Chopin (52%) and Nicolaus Copernicus (51%) (Figure 1.).

Figure 1.: The best-known Poles according to the respondents



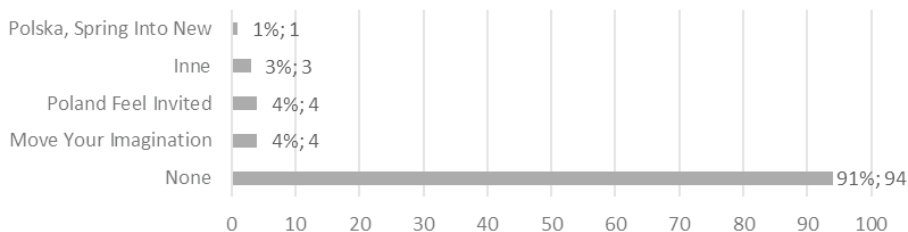
Source: Survey results.

As regards the assessment of Poles and their typical characteristics, respondents cited tradition, friendliness, religion, alcohol, and family. Negative traits—gloomy (23%), unfriendly (9%) and negative (8%)—also made the list, though they were cited less frequently.

Respondents were quite familiar with Polish cities and events taking place in the country. The most well-known cities were Warsaw and Cracow (almost all the respondents knew these cities) followed by Gdańsk (67%) and Poznań (63%). As for events that had taken place in Poland, the respondents were most familiar with EURO 2012, the Woodstock Festival Poland and World Youth Day in Cracow 2016. A five-point scale was used to evaluate the current image of Poland, where 1 was very bad and 5 was very good. More than 40% of the respondents rated the country a 3, recognizing Poland's image as neutral. Almost 30% perceive Poland well, and 9% very well. At the opposite end of the spectrum, 21% of the respondents rated Poland poorly. The average rating of Poland's image among respondents was a 4.

This article has investigated foreigners' awareness of campaigns promoting Poland internationally. To make it easier for the respondents to identify them, each slogan was accompanied by a logo, though respondents nonetheless struggled—to such an extent that over 90% were unfamiliar with a single promotional campaign in Poland. A small proportion of respondents referred to the Move Your Imagination campaign (4%) and the Poland Feel Invited campaign (4%). Only one person said he recognized the campaign of Polska, Spring into New (Figure 2.).

Figure 2.: The respondents' familiarity with campaigns promoting Poland



Source: Survey results.

In the light of the money poured into each of these campaigns, these results are unsatisfactory, especially as they seem to have had no effect and failed utterly to lift Poland's image.

6. CONCLUSIONS

Building a positive, recognizable image of a country on the international stage is no easy task. For measures to produce their intended effect, they must be sustained over a long period of time. Taking into account the results of empirical research carried out as well as the results of other surveys of Poland done by various institutions (the oldest dating to 2011), a number of similarities can be observed in foreigners' assessments of Poland's image. The results of studies on Poland's image are not very different from the results of the research I carried out, and the perception of Poland has not changed much. Still, the prevailing associations with Poland are history, John Paul II and vodka. Despite the country's redoubling its promotional efforts abroad over the last few years, new and interesting associations have not been created. Unfortunately, Poland is still perceived very stereotypically, with vodka, religion, Catholicism and Pope John Paul II all figuring prominently in the stereotype, which continues unchanged. A positive and consistent response from respondents has been that Poles are good people. One has to admit that the young foreigners, which have participated in the survey, possessed quite a substantial amount of knowledge about famous people, places, and events organized in Poland. These findings demonstrate that the hypothesis specified in this paper has not been confirmed.

In Poland, attempts are being made to solidify the image of what Polska should convey in the international arena. Promotional campaigns aimed at specific markets and recipients, seeking to educate foreigners and encourage them to visit the country or invest, are being conducted. However, these measures do not bear real fruit and benefits. Precious few know the slogans or logos of the campaigns that have been carried out, while the perception of Poland by outsiders' remains mired in certain stereotypes. I maintain that young people should be a very important target group of

marketing activities. The country should encourage this demographic to visit, work or study in Poland. If the government fails to take action directed at this particular group, they are not likely to take an interest in the country in the future.

Another issue concerns the consistency of advertising campaigns the country carries out abroad. Such campaigns should not correspond to different institutions, leaving the image of Poland as inchoate and incoherent, with each of the campaigns offering a different logo. Such activities certainly make it difficult to build a coherent, recognizable image of the country. Perhaps a bit of Warren Buffet's wisdom would be appropriate here: It takes 20 years to build a reputation and five minutes to ruin it.

REFERENCES

- Allan, M. (2004), Why Brand Places?, http://beyond-branding.com/Agenda_MSA_Article_Feb2004.pdf. [access: 31.07.2017]
- Anholt, S., Foreword to Journal of Brand Management. Journal to Brand Management, Vol. 9, No 4-5, (2002): 229-239
- Anholt, Simon. Brand new justice: How branding places and products can help the developing world. Routledge, 2005.
- Frymorgen, B., Kwolek, G. (2014). Polska promuje się w Londynie. Tylko gdzie te plakaty?. <http://www.rmfm24.pl/fakty/polska/news-polska-promuje-sie-w-londynie-tylko-gdzie-te-plakaty.nId.1428175> [access: 31.07.2017].
- Hereźniak, M., Marka narodowa. Warsaw: Polskie Wydawnictwo Ekonomiczne, 2011.
- Holt, Douglas B. How brands become icons: The principles of cultural branding. Harvard Business Press, 2004.
- Jaffe, E.D., Nebenzahl, I.D. National image and Competitive Advantage. The theory and practice of country-of-origin effect. Copenhagen: Copenhagen Business School Press, 2001.
- Kotler, Philip. Marketing: analiza, planowanie, wdrażanie i kontrola. Gebethner i Ska, 1994.
- Ministry of International Affairs (2014). Polska. Spring into. Kampania wizerunkowa przyciąga uwagę Polaków i obcokrajowców, http://www.msz.gov.pl/pl/aktualnosci/wiadomosci/polska_spring_into_kampania_wizerunkowa_przyciaga_uwage_polakow_i_obcokrajowcow [access: 31.07.2017].
- Turyści z Azji jadą do Polski. <http://www.rp.pl/artykul/1165571-Turysci-z-Azji-jada-do-Polski.html#ap-1> [access 31.07.2017]
- Olins, Wally. "Branding the nation—The historical context." The journal of brand management 9, no. 4 (2002): 241-248
- Ministry of International Affairs (2013), Rules for Communicating the POLSKA Brand, www.msz.gov.pl [access: 30.07.2017]

MONETARY POLICY AND THE SUSTAINABILITY OF THE MANUFACTURING SECTOR IN NIGERIA

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ABSTRACT

The conflicting results in relationship between monetary policy and the sustainability of the manufacturing sector necessitated this research. The study carried out some preliminary tests including the descriptive statistics and the Augmented Dickey Fuller unit root tests. The optimal lag length criteria, and the Johansen Co-Integration test were applied to verify long run association among the series. The Vector Error Correction model was estimated as a verification of the short run adjustment. The Breusch-Godfrey Serial Correlation Lm test, Durbin Watson Statistic, and Breusch-Pagan Heteroscedasticity tests were conducted. The results confirmed the existence of a long run relationship among the variables. A positive relationship between monetary policy and manufacturing sector performance in Nigeria was observed at the 5% level of statistical significance. No short run association between the external reserves and inflation rates was recorded. The study therefore recommends that the government avoid monetary policy summersaults.

Keywords:

Monetary Policy, Manufacturing output, Inflation, Interest rate, Foreign Exchange rate,

1. INTRODUCTION

Industrialization has been reported as the major driving force serving as the veritable vehicle for goods production, service provision, employment generation and the enhancement of income (Kaldor, 1966, 1967). The manufacturing sector is a leading sector in the Nigerian economy which, in the findings of Onakoya (2015), provides the opportunities for the employment of local human and capital resources, the avenue for import substitution, and the generation of much-needed foreign exchange earning capacity.

The contributions of Nigerian manufacturing into the GDP has been irregular over the years. The sector contributed a paltry 4.8% to the GDP at the time of independence in 1960. Ku, Mustapha and Goh (2010) report an increase to 7.4% a decade later largely as a result of foreign direct investments. The highest contribution record of 10.7% was achieved as of the next decade in 1980. The growth however, plummeted to 6.3% in 1985 and continued its downward spiral to 6.3% in 1997, and 4.21% in 2009 (Adenikinju & Chete, 2002). The result of the re-basing of the GDP of Nigeria to 2010 (hitherto set in 1990) indicated an economy more diversified than had been previously reported. The new contribution of the manufacturing sector to GDP was reported at 6.46% (in 2011) and 6.83% (in 2013). As of Quarter 1, 2016. The contribution of manufacturing to Nominal GDP was put at 9.33% by the National Bureau of Statistics (2016).

Monetary policy is the well-considered procedural efforts of the relevant authority (currency board or central bank) of a country. The objective is usually to achieve price stability and / or a general trust in the currency through the control of the money supply by targeting a desirable interest rate or a rate of inflation. Such policy, as explained by Chigbu and Okonkwo (2014), was usually deployed to influence economic activities. The real objective was to accomplish the desired macroeconomic stability by using the variations in the money supply, the direction of credit, the cost of credit, and the size of credit availability.

The effects of monetary stratagem on the different sectors of the economy do differ. Nwosa, Agbeluyi and Saibu (2011) identified two monetary policy regimes: tight and loose. The deployment of either type depends on the need to achieve prices stability and the maintenance of balance of payment equilibrium. The essence of monetary policy as identified by Onyemu (2012) however, is the achievement of external and internal balance of the value of money in addition to the enhancement of the real sector of the economy, and the promotion of long run growth of the economy.

Fasanya, Onakoya, and Agboluaje (2013) observed that despite efforts made towards achieving the desired macroeconomics objectives through monetary policy, the results have not been sustained over time. This relatively high rate of unemployment, increased poverty rate, low standard of living, unacceptable rate of inflation are manifest evidence, especially in less developed economies. Altering the mon-

etary policy in the opinion of Ireland (2008) has vital effects on aggregate demand, output and prices. He identified several transmission channels through which policy actions are manifested in the real economy. These include the interest rate channel, balance sheet channel, the bank lending channel and the exchange rate channel.

Several studies have reported conflicting relationship between the effect of monetary policies and the performance of the manufacturing sector. Different reasons have also been adduced. Adebisi and Babatope (2004) and Rasheed (2010) suggest that the manufacturing sector growth level had been negatively affected due to high lending rate interest which, is in turn responsible for high cost of production. The reason adduced by Bakare-Aremu and Osobase (2014) for the declining performance of the sector are the low level of budget implementation by government and monetary policy summersault by the monetary authorities. The epileptic manufacturing sector contributions to national growth in the opinion was firmly laid by Okafor (2012) on the inconsistent monetary policies leading to the inflationary pressures. Indeed, inflation remains a major threat to the Nigerian industrial growth despite the various monetary regimes that have been adopted by the Central Bank of Nigeria. However there seem to be no correlation between the two variables.

The prevalence of these macroeconomic difficulties as mentioned above clearly showed that the issues of economic development especially in Nigeria might not have been effectively addressed by monetary policy. The essence of the study therefore, is the scrutiny of the possible impact of monetary policy on the sustainability of manufacturing firms in Nigeria.

The remaining part of the research is section two and three covering the review of literature and the estimation method respectively. In sections four, the results are presented whilst the conclusion and recommendation are reported in section five.

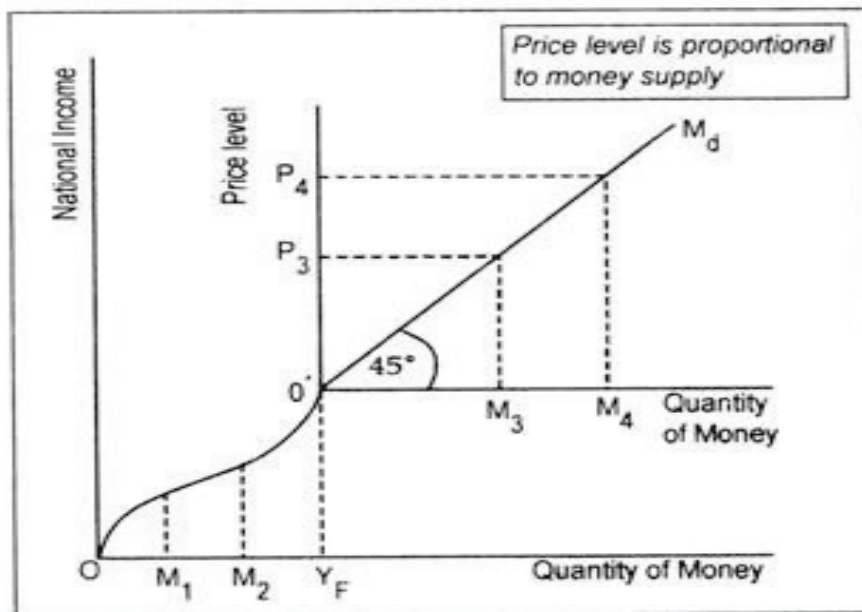
2. LITERATURE REVIEW

This section focuses on the review of both theoretical and empirical literature.

2.1. Theoretical Review

The classical theory postulate that in the short run, the monetary transmission mechanism of monetary policy is neutral in influencing employment, income, real aggregate demand and output. The changes in the supply of money however, affect the real sector magnitudes in the transition period. The nexus between prices levels and money supply is illustrated in Figure 1.

Figure 1.: The Quantity of Money, Price Levels and National Income



Source: [www.economicdiscussion.net/Money/Quantity Theory of Money/Theories](http://www.economicdiscussion.net/Money/Quantity%20Theory%20of%20Money/Theories)

The relationship between national output and the supply of money is depicted at the origin (O) which is below the level of full employment (Y_F). At the level of full employment, the connection between price level and money supply is depicted at origin (O'). Prior to the achievement of full employment level (Y_F), a rise in the supply of money (from OM_1 to OM_2 and to OY_F) results in a rapid increase in the national output, which is in excess of the increases in the price level. With efficient utilization of national resources, and increases in investment arising from increased supply of money, the national output can be increased. Given the limitation of output expansion due to the attainment of full employment, a rise in the supply of money from say M_3 to M_4 will propel the price level to move up rise from P_3 to P_4 . For the sustenance of stable price levels, the supply money should rise in proportion to growth in output.

The disputation of the monetarists (Fisher, Pigou and Marshall) is that the velocity of money (V) is exogenously determined and is totally independently of the supply of money (M) in the long- run. Consequently, any variation in money supply (M) does not affect velocity (V) but brings an equivalent variation in expenditure (MV). This is because of the relatively fixed output in the long run. Indeed, variations in the price level (P) is shaped by the fluctuations in the stock of money (Friedman, 1968). Consequently, monetary policy could be a powerful tool for controlling national output / aggregate demand (PQ).

The theory of portfolio balance postulates that individuals hold diversified assets: physical assets, bonds, bills, shares commercial papers etc. A portfolio disturbance occurs when the supply of money supply is increased, resulting in idle money in the hand of the people. The extra funds are spent in buying liquid assets and near money, which increases their market price. This portfolios restructuring continues equilibrium is achieved. This of course has similar implications for the manufacturing sector, a sub-set of the national economy.

The Keynesians on the other hand postulates that except when at the approach of full employment, the aggregate supply is relatively elastic, in which case Q is variable. Therefore, a tight monetary policy will most likely cause a reduction in output and the price level to the extent that it does upset aggregate demand. This is especially so where trade unions and monopolistic firms resist cuts wage and prices. The consequential impact of this is the possibility of a prolonged recession where the monetary policy successfully reduces aggregate demand.

A contrary position taken by the Keynesians is that no direct nexus exist between a variation in the supply of money and aggregate demand. The transmission mechanisms are affected indirectly through variations in interest rates and / or exchange rates. Indeed, with the economy at less than full employment equilibrium, the transmission is automatic. The mechanism is ignited by a change in the interest rate regime from the financial intermediation system to the real sector of the economy. This cuts off and de-emphasizes the direct role of money supply influence on the real sector because due to the liquidity preferences of the public, an increase in the supply of money reduces the general level of interest rate. This in turn stimulates investments. An expectation of returns marginal efficiency of investment and investors' confidence further enhance the employment of resources and output.

Under the balance of payments flow approach, the market demand and supply for foreign currency determines the price of the domestic currency (Copeland, 2000). The demand and supply for a currency are generated from the foreign direct and portfolio investments, trading activities in goods and services, and funds transfers (Feridun, Folawewo and Osinubi, 2005). The emphasis of the modern exchange rate model is on the role of the financial-asset markets as monetary transmission mechanism. Unlike the traditional opinion that adjusting the rate of exchange equilibrates the international trade in commodities, seeking equilibrium of the financial assets is the main concern of the modern exchange rate model. The greater flexibility, fluctuation and variation of the prices of financial asset relative to commodities has led to a shift in emphasis from goods markets to financial asset markets. The consequence of this for the monetary authorities is germane particularly in the use of the exchange rate channel for managing the economy in general and the manufacturing sector in particular.

The monetary transmission as presented by the classical, Monetarist and Keynesian schools of thought demonstrates that the quantity of money in circulation goes a long way to determine the value, which people attach to it. This in part, de-

termines the cost and prices of manufacturing operations and products respectively. The monetary theory of inflation in addition, suggests that money supply as a major determinant of output and prices bear strong similarity to the Fisher's theory in the strength of influence exerted by supply money on the economy.

2.2. Empirical Review

The literature records diverse impact of monetary regulations and stratagem on the different sectors of the economy. The year 2000 Hayo and Uhlenbrock's study measured the impact monetary policy German industrial outputs and report disparate consequences. Similar research by Dedola and Lippi (2000) using secondary data from five OECD also report dissimilar effects across the economic sectors. The study by Sahinöz and Coşar (2010) had the objective of investigating the influence of monetary policy shock on the output of the manufacturing industries in Turkey. The degree reduction in output is distributed unevenly across the sector. The rate of decline in the output of the manufacturing firms is greater at the onset of the introduction of the monetary policy. The decline bottoms-up by the end of the third quarters. The fiscal and monetary policy influence of on the Indonesian manufacturing sector was of interest to Oktaviani, Hakim, Siregar and Sahara (2010) who found powerful minimizing impact monetary policy on external and internal shocks.

The transmission mechanism by which the monetary policy translates into action has engaged the attention of several studies. Examples are the credit channel method by Kahn (2010), the Classical school expounded upon by Majumder (2007), and the Keynesian approach by Barro (1997). The specific study in Kenya by Olweny and Chiluwe (2012) traced the transmission mechanism through which the effect of formulated monetary policy manifest in the economy. The results are conflicting in the short run and long run.

Charles- Anyaogu (2012) investigated the performance of monetary policy on manufacturing sector in Nigeria. The findings signpost the fact that the manufacturing index performance positively money influences supply. On the other hand, negative effect on the output of manufacturing sector is manifested in the lending rate of the company, the rates of income tax, inflation and exchange. A more complex study by Odior (2013) in Nigeria deployed the VECM method and reveal long-term positive connection between monetary policy and manufacturing output. The thirty-six-year (1973-2009) Nigerian study by Obamuyi, Edun, and Kayode (2011) also applied the VECM method. They came to similar conclusion that reduced bank interest leads to increased capacity utilization of the manufacturing. Bakare-Aremu and Osobase conducted a similar study in 2014 using both monetary and fiscal policies and reported that both variables influence the growth and development of Nigerian industrial sector. Indeed, Akano (2016) recorded several policy summersaults in the country over the years, which led to the parlous impact on the economy.

The research by Sangosanya (2011) which, was predicated on the Gibrat's law of proportionate outcome deployed the panel regression analysis technique. The study came to the same conclusion by Bakare (2011) who in own case reported the existence of an optimum debt-equity mix for firms that monetary policy influences the operations of the manufacturing firms. Similar study in Republic of Sudan by Abdulrahman (2010) reports that the deployment of monetary policy had little bearing on manufacturing activity between 1990 and 2004. Epstein and Heintz (2006) came to analogous conclusion in Ghana. Alam and Waheed (2006) who took the matter further in Pakistan using quarterly data from 1973:1 to 2003:4. The results of Ordinary least Squares suggest that significant changes in the real sector were transmitted by the shocks arising from the monetary regulations.

The review of theoretical and empirical literature has opened the avenue for the exploration of the possible influence of monetary policy on the sustainability of the manufacturing sector.

3. METHODOLOGY

3.1. Data Source and Description

Secondary data were obtained from the World Bank Development Indicators (2016), Central Bank of Nigeria Statistical Bulletin (2005 and 2015) covering 1981 through 2015. The period is sufficiently large enough for a comprehensive review of the impact of monetary policy on the performance of the manufacturing sector in Nigeria based on the scope of the study. The proxy for manufacturing sector output (MOP) is the sectorial contribution of manufacturing to GDP. Other data for analysis include external reserves (*EXTRE*), exchange rate (*EXR*), Broad money supply (*MS₂*), inflation rate (*INF*) and Interest Rate (*INT*). The next presentation is on the specification of the model.

3.2. Model Specification

Altering the monetary policy in the opinion of Ireland (2008) has vital effects on aggregate demand, output and prices. He identified several transmission channels through policy actions are manifested in the real economy. These include the interest rate channel, balance sheet channel, the bank-lending channel and the exchange rate channel. This study adopts the Ireland model and base the operationalization and analytical procedure on the assumption of Keynesian Investment-Savings - Liquidity-Money function. The following relationship model is derived:

$$\text{MOP} = f(\text{MS}_2, \text{INF}, \text{INT}, \text{EXRE}, \text{EXRATE}) \quad (1)$$

As a result of the large magnitude of the value of some of the independent variables however, the log-log mode is applied (except for in-

flation and interest rates). Equation (1) thus transmutes into:

$$LN MOP = \alpha_0 + a_1 LN MS_t + b_2 INF_t - c_3 INT_t - d_4 LN EXRE_t - e_5 LN EXRATE_t + \varepsilon_t \quad (2)$$

Where:

MOP = manufacturing sector output (manufacturing Output to GDP)

$EXTRE$ = external reserves,

EXR = exchange rate,

MS_2 = Broad money supply,

INF = inflation rate,

INT = Interest Rate

ε_t = Stochastic term (error term); and

$a_0 > 0, a_1 > 0, b_2 > 0, c_3 < 0, d_4 < 0, e_5 < 0$, apriori expectations of parameters.

3.3. Model Estimation Procedure

The study employs three-step procedural steps. The first step is the use of descriptive statistics in order to understand the nature of the data. The next step is the determination of the stability of the variables. The Augmented Dickey-fuller (ADF) unit root test was deployed. In the second step, the optimal lag length is selected before conducting the Johansen co-integration long-run test. The Vector Error Correction Model (VECM), a test for short run relationships or dynamics between variables is also conducted as specified as in equation (3):

$$\Delta \ln MOP_{t-1} = a_0 + \sum_{i=1}^p b_i \Delta \ln MS_{t-1} + \sum_{i=1}^p c_i \Delta INF_{t-1} - \sum_{i=1}^p d_i \Delta INT_{t-1} - \sum_{i=1}^p e_i \Delta \ln EXTRE_{t-1} + \sum_{i=1}^p f_i \Delta \ln EXRATE_{t-1} + \pi ECT_{t-1} + \varepsilon_t \quad (3)$$

Where Δ is the first difference operator, a_0 and b_i, c_i, d_i, e_i and f_i are the coefficients estimated from equation (2). The VECM mechanism will indeed tell how much of deviation from the long run is being corrected.

In order to confirm the robustness and validity of regression model, some post estimation tests were conducted. These are the autocorrelation, and Heteroscedasticity tests. E-views version 8.0 software was utilized to compute these tests. Having described the estimation procedure, the next discussion is on the preliminary analysis of the data.

4. FINDINGS AND DISCUSSIONS

4.1. Preliminary Analyses

The preliminary analyses are in two parts: descriptive statistics and stationarity test

4.1.1. Descriptive Statistics

The summary of the descriptive statistics of the variables are, presented in Table 1.

Table 1.: Descriptive Statistics of the Variables

Statistics	LNEXRATE	INF	INT	LNEXTRE	LNMOPI	LNMS ₂
Mean	3.23	19.72	17.81	11.06	25.56	27.04
Median	3.09	12.22	17.80	11.06	25.69	26.99
Maximum	5.26	72.84	31.65	12.58	29.83	30.55
Minimum	-0.48	5.38	8.92	8.61	22.27	23.45
Std. Dev.	1.94	17.94	5.04	1.10	2.39	2.45
Skewness	-0.71	1.63	0.18	-0.48	0.25	-0.02
Kurtosis	2.15	4.37	3.43	2.25	2.037	1.63
Jarque-Bera	4.03	18.17	0.44	2.15	1.73	2.73
Probability	0.13	0.000113	0.80	0.34	0.42	0.26
Sum	112.88	690.01	623.18	387.14	894.62	946.32
Sum Sq. Dev.	128.12	10937.60	863.24	40.91	194.23	203.18
Observations	35	35	35	35	35	35

Source: Authors' computation using E-views 8.0 (2017)

As shown in Table 1., there exist a wide variation in within all the variables. The results based on the statistical distribution of the series shows that inflation, interest and the manufacturing sector output are skewed positively while others are negatively skewed. The values of exchange rate, external reserves and money supply are slightly platykurtic because of value kurtosis of less than 3. The inflation and interest rates are leptokurtic. The goodness of fit test (Jacque-Bera) statistic is an indication of the normality of the series shows that all the variables are not normally distributed. A further test of stationarity is therefore required. This is reported in the next section.

4.1.2. Stationarity Test Results

The results of the Augmented Dickey Fuller (ADF) test is presented in Table 2.

Table 2.: Unit Root Test Results: Augmented Dickey Fuller Test

Series	5% Critical Value	ADF Test at first difference (Prob.)	Equation Specification	Order of integration
INF	-2.96	-5.35 (0.00)	Intercept	I(1)
INT	-2.96	-5.05 (0.00)	Intercept	I(1)
LNEXRATE	-2.96	-4.96 (0.00)	Intercept	I(1)
LNEXTRE	-2.96	-6.86 (0.00)	Intercept	I(1)

Series	5% Critical Value	ADF Test at first difference (Prob.)	Equation Specification	Order of integration
LNMOPI	-2.96	-5.45 (0.00)	Intercept	I(1)
LNMS2	-2.96	-3.27 (0.00)	Intercept	I(1)

Source: Authors computation using E-Views 8.0 (2017)

Given that all the variables are integrated in order of at unity, the appropriate estimation technique to be deployed is the Johansen Co-Integration test. The selection of an optimal lag length will have to be conducted. This done in the next section.

4.2. Estimation Results

4.2.1. Optimal Lag Length Selection

The result of the lag length, which explains the effect of the outcome of previous period on the current one, is presented in Table 3.

Table 3.: Optimal Lag Length Selection Criteria

Lag length	LogL	LR	FPE	AIC	SC	HQ
0	-231.59	NA	0.11	14.85	15.12*	14.94*
1	-190.74	63.83*	0.09	14.55	16.47	15.18
2	-148.61	50.03	0.08*	14.16*	17.74	15.35

Source: Authors computation using E-views 8.0(2017)

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: -Hannan- Quinn information criterion

The test criteria (LR, FPE, AIC, SC and HQ) selected different lag lengths. The results of Schwarz information criteria and Hannan- Quinn information criterion depicting lag order length of (0) for the model is selected. This implies that the lagged values of the series are not correlated with the current values. The estimated long-run co-integration, and short run VECM are presented and discussed in the next section.

4.2.2. Johansen Co-Integration Test Result

Table 4.: Result of Long Run Johansen Co-Integration Test Result

Trace Statistic						Max-Eigen Value	
No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.	Max-Eigen Value	0.05 Critical Value	Prob.**
None *	0.83	135.30	95.75	0.00	55.42	40.08	0.00
At most 1 *	0.67	79.88	69.82	0.01	34.05	33.88	0.05
At most 2	0.51	45.83	47.86	0.08	22.31	27.58	0.21
At most 3	0.31	23.53	29.80	0.09	11.42	21.13	0.61
At most 4	0.19	12.10	15.50	0.05	6.34	14.27	0.57
At most 5 *	0.17	5.77	3.84	0.02	5.77	3.84	0.02

Source: Authors computation using E-views 8.0 (2017)

The result of the Johansen co-integration test in Table 4. is divided into two namely the Eigenvalue and Trace statistic tests. The result shows that at most, five variables exhibited long run association with the dependent variable based on the satisfaction of the decision criteria (Trace Statistic and Max-Eigen Value being both greater than the 5% Critical Value) as provided for the selection of the alternative hypotheses.

The Vector Error Correction model test result in Table 5., for the short run association among the variables, reveals the absence of any short run association amongst the external reserves, inflation rate and the dependent variable - manufacturing output. A contrary case holds for interest rate, exchange rate and money supply.

Table 5.: Result of Short Run VECM Result

Error Cor- rection:	D(LNMOP,2)	D(INF,2)	D(INT, 2)	D(LNEX RATE,2)	D(LNEXT RE,2)	D(LNMS2,2)
CointEq1	-0.17 (0.19)	5.05 (6.73)	4.29 (1.43)	0.44 (0.16)	-0.10 (0.29)	0.12 (0.05)
T-stat (Cal)	[-0.95]	[0.75]	[2.99]	[2.78]	[-0.36]	[2.65]
Regression Result						
Variable	Co-Efficient (After Normalization)	Standard Error	T-Statistic (2.05 at df29).			
LNMOPI	1.00					
LNMS2	1.81	0.49			3.70	
INF	0.07	0.01			8.66	
INT	-0.01	0.04			-0.23	
LNEXTRE	-1.05	0.22			-4.84	
LNEXRATE	-0.18	0.34			-0.52	
R-Squared	0.60					
Adjusted R-Squared	0.56					

Source: Authors computation using E-views 8.0 (2017)

The estimated model is restated in equation (4) as:

$$LNMOPI = -0.17 + 1.81LNMS_2 + 0.07INF - 0.01INT - 1.05LNEXTRE - 0.18LNEXRATE \quad (4)$$

The regression result indicates that broad money supply (MS₂) and inflation rate have positive and significant relationship with manufacturing output at 5 percent since the absolute calculated t statistics (3.70 and 8.66) are greater than tabulated t-statistics (2.05 at df₂₉).

A negative relationship however exists among interest rate, exchange rate on the one hand and manufacturing output on the other. Both independent variables were not statistically significant since absolute calculated t statistics (0.23 and 0.52) are less than tabulated t-statistics (2.05 at df₂₉). The external reserves is significantly but negatively related to manufacturing output.

The Adjusted R-squared of 56% indicates that only 56% of the variations in manufacturing output to GDP is explained by broad money supply (MS₂), inflation rate, interest rate, exchange rate and external reserves.

4.3. Post-Estimation Tests

It is still necessary to confirm the validity and robustness of the model. To achieve this, the study conducted the Breusch- Godfrey serial correlation LM test, Durbin Watson statistic test, Breusch-Pagan-Heteroscedasticity tests. The results are presented in the next sub-sections

4.3.1. Breusch-Godfrey Serial Correlation Lm Test

The result of the Breusch-Godfrey Serial Correlation Lm Test which essence is to check for possible serial relationship between the variables can be found in Table 6.

Table 6.: Result of Breusch-Godfrey Serial Correlation LM Test

F-statistic	1490.55	Prob. F (2,25)	0.00
Obs*R-squared	33.71	Prob. Chi-Square (2)	0.00

Source: Authors computation using E-views 8.0 (2017)

The result shows the presence of serial correlation probability given that the chi-square value of 0.00 is lesser than the 5% level of significance. Next test is the Durbin Watson statistics, which is used to detect the presence of autocorrelation in the residuals.

4.3.2. Durbin Watson statistics Tests

This result of the test performed to determine the level of auto-correlation between the variables is presented in Table 7.

Table 7.: Durbin Watson Autocorrelation Test Results

DW value (d)	D-UPPER (dU, α)	D-LOWER (dL, α)	DECISION CRITERIA
1.02	1.88	1.10	Reject auto-correlation

Source: Authors computation using E-views 8.0 (2017)

The import of this test is to ascertain if the disturbance terms are correlated over time. The Durbin Watson statistics is very useful for the immediate past period. The result shows absence of auto-correlation result exists since d .

4.3.3. Breusch-Pagan-Heteroscedasticity Tests

One of the basic assumptions of OLS is the absence of heteroscedasticity as it can invalidate statistical tests of significance that assume that the modelling errors are uncorrelated and uniform. In order to test for heteroscedasticity, the study conducted the Breusch Pagan test to show how good and fit the model is. This result is presented in Table 8.

Table 8.: Result of Breusch-Pagan-Godfrey Heteroscedasticity Test

F-statistic	2.35	Prob. F (6,27)	0.06
Obs*R-squared	11.65	Prob. Chi-Square (6)	0.07
Scaled explained SS	4.88	Prob. Chi Square (6)	0.56

Source: Authors computation using E-views 8.0 (2017)

After estimation, result shows that the Probability or P Value of the Obs* R-squared is 0.06 which is greater than 5% level of significance therefore the acceptance of no presence of heteroscedasticity which is the null hypotheses.

As advised by Fox (1997) cited by Gujarati & Porter, (2009), there is no need to be bothered about the presence of heteroscedasticity, unless the problem is severe. Because the validity model is not compromised.

4.4. Discussion of Findings

Monetary policy as described by Friedman (1959) is about the manipulation of the cost and availability of credits as to sway both monetary and other financial conditions. It is therefore appropriate to utilize the supply broad of money as a proxy for monetary policy. The result of this research confirms the positive and significant relationship between broad money supply, and manufacturing output. Indeed, an increase of about 1 percent in broad money supply would about double (1.8%) rise in manufacturing output. This is in congruence with the findings of Olweny and Mambo Chiluwe (2012); and Charles-Anyagogu (2012); Bakare-Aremu and Osobase (2014) and Odior (2013) in the context of Nigeria. Indeed, Shiryani and Bayram (2013) reported that an increase in the

supply of broad money raises the production output of the Malaysian manufacturing sector due to the increased availability of investment facilities.

On the contrary, divergent findings of Sahinöz, and Coşar (2010) concluded that the manufacturing sector responded to contractionary monetary policy shock with a reduction in absolute output. The result of this research is in congruence with the Keynesian monetarist school of thought which states that any discretionary variation in money supply positively and permanently sways real output by reducing the rate of interest. This is because the direct transmission mechanism of increases money supply and boosts aggregate demand. Thus, monetary policy could be a powerful tool for controlling national output / aggregate demand since in the findings of this research monetary policies are significant determinants of manufacturing industry growth in Nigeria.

This study finds that inflation affects manufacturing output positively and significantly. This negates the postulation of the quantity theory of money that an upsurge in the supply of money would result in inflation in the short-run, which is harmful in terms of the productivity. Indeed, based on the regression result, in the long-run, the inflationary influence would be neutralized by the adjustments in price levels considering the minuscule effect of 7% change in manufacturing output because of 100% change in inflation. This research supports the findings of Mbutor (2014), and Ihsan and Anjum (2013) in Nigeria and Pakistan respectively which, reveal that rise in broad money supply, leads to boost in manufacturing sectoral growth in addition to resulting in inflationary spiral. It is however contrary to the finding of Modebe and Ezeaku (2016).

Interest rate exert negative but insignificant effect on the manufacturing output. This finding is inconsistent with the report of the study of Odior (2013) that an increase in interest rate inhibits the availability of funds at reasonable rates to the manufacturing sector. High cost of funds reduced the ability of the companies to maximize their capacity utilization, which between 2009 and 2017 was an average of about 56% percent. The maximum-recorded utilization was about 61 % in 2015 Q1. The lowest was about 49% 2016 Q3. This contrast poorly with the average of 99% in Japan and 77% in the United States of America during the same period (Trading Economics, 2017).

The impact of foreign exchange rate movement on the real economy is also negative and insignificant. The instability in the exchange rate had led to higher cost of manufacturing production due to importation of raw materials at exorbitant prices. The insignificance of foreign exchange variation is explained by the Marshall Lerner condition. This theory states that the devaluation of the nation's currency only becomes beneficial when the sum of the foreign elasticity of demand for exports and the demand elasticity for imports in the devaluing nation exceeds unity. Nigeria imports most of its critical machineries, spare parts, raw materials and other manufacturing inputs while exporting primary commodities, with exogenously determined prices.

The result of this study shows that an increase of about 1 percent increase in external reserves led to about 1.05% reduction in manufacturing output. The conventional viewpoint perceives external reserves as a store of assets that is available for influencing the exchange rate of the domestic currency (IMF, 2004; Nda, 2006). The Nigerian foreign exchange reserves recorded an average value of 10 billion USD between 1960 and 2017. The wide fluctuation from a minimum level of 63.22 USD Million in June 1968 to a maximum level of 62 billion USD in September of 2008 (Trading Economics, 2017) did not appear to affect the manufacturing production output. The adversely slanted terms of trade could not provide credible explanations for the lack of nexus between the foreign reserves and the output of the manufacturing sector. This is because between year 2000 and 2017, Nigeria had an average index points of 98.94, which is less than par. In addition, the terms of trade also varied widely. The highest index of about 160 was recorded in March of 2010 and the lowest of 49.48 recorded in April 2006 (Trading Economics, 2017). The reason to be ascribe is the pre-eminence of the oil and gas sector in the economy, which is deleterious to the manufacturing industry.

5. CONCLUSION

The empirical findings in this study is that monetary policy has a positive and statistical significant relationship with manufacturing output both in the short and long run and meets the apriori expectation. The study therefore recommends that the government avoid monetary policy summersaults, which has been the bane of many developing economies.

REFERENCES

- Abdulrahman, Badreldin Mohamed Ahmed. "The role of monetary policy on economic activity in Sudan: An empirical investigation, 1990-2004." *Journal of Human Science* 44 (2010)
- Adebisi, Michael Adebayo, and Babasanmi Babatope-Obasa. "Institutional framework, interest rate policy and the financing of the Nigerian manufacturing sub-sector." In *African Development and Poverty Reduction: A Macro-Micro Linkage Forum*, (2004): 13-15
- Akano, O. (2016). Trade, Technological Innovation and Development. 5th Inaugural lecture, Samuel Ajayi Crowther University, Oyo, Professor of Development Economics
- Alam, Tasneem, and Muhammad Waheed. "Sectoral effects of monetary policy: Evidence from Pakistan." *The Pakistan Development Review* (2006): 1103-1115
- Bakare-Aremu, T. A. & Osobase, A. O., An empirical analysis of response of Nigerian industrial output to macro-economic adjustment policies. *International Journal of Management Sciences and humanities*, 2(9), (2014): 178-196
- Charles-Anyagou N. B., Investigating the performance of monetary policy on manufacturing sector in Nigeria. *Arabian Journal of Business and Management Review (OMAN Section)*, 2(1), 2012.
- Chigbu E. E & Okonkwo O.N., Monetary policy and Nigeria's quest for import substitution industrialization. *Journal of Economics and Sustainable Development*, 5(23), (2014): 99-105
- Dedola, Luca, and Francesco Lippi. "The monetary transmission mechanism: evidence from the industries of five OECD countries." *European Economic Review* 49, no. 6 (2005): 1543-1569
- Epstein, Gerald, and James Heintz. "Monetary policy and financial sector reform for employment creation and poverty reduction in Ghana." (2006)
- Fasanya, I.O., Onakoya, A.B & Agboluaje, M.A., Does monetary policy influence economic growth in Nigeria? *Asian Economic and Financial Review*, 3(5), (2013):635-646
- Friedman, M., The quantity theory of money Assessment. In Milton Friedman (Ed.). *The Quantity Theory of Money*, Chicago: The University of Chicago Press, 1968.
- Friedman, Milton. "The demand for money: some theoretical and empirical results." *Journal of Political economy* 67, no. 4 (1959): 327-351
- Hayo, Bernd, and Birgit Uhlenbrock. "Industry effects of monetary policy in Germany." In *Regional aspects of monetary policy in Europe*, Springer US, (2000):127-158
- Ihsan, I., & Anjum, S. (2013). Impact of money supply (M2) on GDP of Pakistan. *Global Journal of Management and Business*, 13(6). Available from https://globaljournals.org/GJMBR_Volume13/1-Impact-of-Money-Supply.pdf
- Durlauf, Steven N., and Lawrence Blume, eds. *The new Palgrave dictionary of economics*. Vol. 6. Basingstoke: Palgrave Macmillan, 2008.
- IMF (2004). *Guidelines for Foreign Exchange Reserve Management*, IMF: Washington DC.
- Kaldor, Nicholas. *Causes of the slow rate of economic growth of the United Kingdom: an inaugural lecture*. Cambridge University Press, 1966.
- Kaldor, Nicholas. "Strategic factors in economic development." (1967).
- Modebe, N. J., Ezeaku, H.C., Dynamics of inflation and manufacturing sector performance in Nigeria: Analysis of effect and causality. *International Journal of Economics and Financial Issues*, 6(4), (2016): 1400-1406

Mbutor, Mbutor O. "Inflation in Nigeria: How much is the function of money?." *Journal of economics and international finance* 6, no. 1 (2014): 21

National Bureau of Statistics (2016). Nigerian gross domestic product report issue quarter one 2016, Abuja - Nigeria. May Retrieved from nigerianstat.gov.ng/download/398.

Nda, A. M. (2006). Effective reserves management in Nigeria: Issues, challenges, and prospect. Central Bank of Nigeria Bullion, 30 (3), July - September

Nwosa, Philip Ifeakachukwu, Ajibola Mary Agbeluyi, and Olufemi Muibi Saibu. "Causal relationships between financial development, foreign direct investment and economic growth the case of Nigeria." *International Journal of Business Administration* 2, no. 4 (2011): 93-102

Obamuyi, Tomola Marshal, Adebisi T. Edun, and Olawale Femi Kayode. "Bank lending, economic growth and the performance of the manufacturing sector in Nigeria." *European Scientific Journal*, ESJ 8, no. 3 (2012):19- 36

Odior, Ernest Simeon. "Macroeconomic variables and the productivity of the manufacturing sector in Nigeria: A static analysis approach." *Journal of Emerging Issues in Economics, Finance and Banking* 1, no. 5 (2013): 362-380

Oktaviani R., Hakim D.B., Siregar H., Sahara, The impact of fiscal policy on Indonesian macroeconomic performance, agricultural sector and poverty incidences (A Dynamic Computable General Equilibrium Analysis), Department of Socio-Economics Sciences Faculty of Agriculture, Bogor Agricultural University, 2010.

Olweny, Tobias, and Mambo Chiluwe. "The effect of monetary policy on private sector investment in Kenya." *Journal of Applied Finance and Banking* 2, no. 2 (2012): 239-287

Onakoya, A.B., The Kaldor-Verdoorn's law on manufacturing: Test of the Nigerian experience. Redeemer's University Journal of Management and Social Sciences, 3(1), (2015): 37-49

Rasheed, O. A., Productivity in the Nigerian manufacturing sub-sector. *European Journal of Economics, Finance and Administrative Sciences*, 6(8), (2010): 1450-2275

Sahinöz, S. & Coşar, E.E. (2010) Understanding sectoral growth cycles and the impact of monetary policy in the Turkish manufacturing industry. Central Bank of the Republic of Turkey, Working Paper No. 3. Retrieved from www.tcmb.gov.tr/wps/wcm/connect/d1d9fo34-5c31-4c80.../WP1013.pdf?

Sangosanya, A. O., Firm's growth dynamics in Nigeria's manufacturing industry: A panel analysis. *Journal of Applied Econometric Review*, 1(1), (2011): 2-15

Trading Economics (2017) Nigeria's capacity utilization 2009-2017. Retrieved from <https://tradingeconomics.com/nigeria/capacity-utilization>

SELF-EVALUATION OF THE NECESSARY SOCIO-ECONOMIC AND DIGITAL COMPETENCE OF SCHOOL STUDENTS OF INVESTMENT IN EDUCATION IN THE PROCESS OF 'EVER RISING' IMMIGRATION

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ABSTRACT

Globalization is frequently viewed in economic and environmental terms. Goods and services move easily across regions and national boundaries. The United States, the European Union, and countless other nation-states and political bodies are struggling to define attitudes and policies towards immigrants and immigration for the 21st Century. The debate over language is often a heated one. Most nations encourage newcomers to learn the national language. Language can be seen as a mechanism for integration and acculturation. For full participation in the national and political life of a country, immigrants benefit from knowledge of the language. Just an Investment in Education in the process of learning the language immigration country Germany considers very important socio-economic factor in the process of socialization of immigrants. Where language differences are accepted, there are costs such as bi-lingual education, multi-lingual signs and instructions, and a constant need for qualified interpreters. Language is fluid and constantly changes, especially in terms of the development's informational and communication technologies where it's necessary adoption of digital competence. Digital society implies a transformation of the traditional way of life and the economic, industrial, educational, and labor changes as well as changes of personal and individual way of existence, but also the question of the "new" partnership in education. The study was conducted on N=185 students of higher education institutions in German among various constituents (faculties and departments) in Mannheim, Mainz, and Heidelberg. The research was conducted during winter semester 2016/2017 academic year, from November 9 to January 14. The survey instrument used was the first part of the questionnaire to record students' opinions on different variables related to various multimedia foreign language learning tool. Research results show that students feel that it's necessary to invest in the Education of immigrants in order to prevent the demolition of (inter)national identity, as well as to facilitate the realization of the process of socialization and more employment.

Keywords:

Globalization, Ever Rising Immigration, Socio-economic and digital competence, Technology in education, Employment

1 INTRODUCTION

Appropriate and good quality human resource development is an essential ingredient of any competitiveness strategy. Migration is increasingly helping the economic performance in 'sending' (developing) countries through remittances and increased trade in goods and services and possibilities as a source of FDI. However, there are specific problems related to migration of key occupational groups (IT, nurses, and teachers) in certain countries, even though the evidence shows that return migration is substantial. Thus while in general immigration options could be beneficial for 'sending' countries - though this requires encouragement such as targeting the diaspora - developing countries need to deal with the specific problems posed by losing key workers. This can include encouraging temporary immigration by asking for more and better access for temporary services providers or partnerships with developed countries that can support training programmes of teachers, nurses and IT workers in developing countries.¹ Globalization has generated the most hostilities where it has placed local cultural identities, including local meaning systems, local religious identities. In 2015, close to half a million people requested asylum in Germany, a historical record and a tenfold increase over 2010. Of the 1.3 million asylum claims submitted throughout the European Union in 2015, Germany received the lion's share, with 36 percent (followed by Hungary and Sweden, with 13 percent and 12 percent, respectively)². Germany's response to these historic humanitarian flows has been mixed: A warm welcome and civic engagement supported by countless volunteer workers increasingly compete with growing anti-immigrant sentiment and support for hardline populist movements and rhetoric³. In Germany, all areas examined here (economy, culture and politics) show research deficits to a greater or lesser extent. As an introduction, a recapitulating overview on the desiderata of research have emerged from the following sections shall be provided here (Hunger, 2003; Habermas, 1981; 1990). The general problem arises as to whether and how cultural influences in Germany can be analytically distinguished from aspects of globalization and internationalization of culture (markets). The effects of globalization on the labor market in European countries have become a major issue of public debate. The concern is that either jobs will be exported to low wage countries, or that immigrants will replace domestic workers in the destination country or depress local wages (DeVoretz, 2004). Similarly, it happened in France and it would not be good for such problems to occur in Croatia, where unemployment rises year after year. Compared to studies for the United States, the empirical evidence for the Euro-

1 <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/2484.pdf>

2 http://www.migrationpolicy.org/article/new-reality-germany-adapts-its-role-major-migrant-magnet?gclid=EAlaIQobChMIsuCH1d6p1QIVTmQZCh27vAfREAAAYAiAAEgKUBPD_BwE

3 Deutscher Gewerkschaftsbund (Hg.), 2017. Erleichterte Einbürgerung - Ius Solis - Doppelstaatsbürgerschaft. Forderungen, Informationen, Grundlagen. Düsseldorf.

pean labor markets is relatively scarce and not as clear cut (for an overview on studies for Germany c.f. Bauer and Zimmermann, 1999). One of the preventive measures is possible through the multimedia learning of a foreign language in which immigrants are immigrated and investment in education in the field of socio-economic competences and digital competencies. During the last thirty years, educational standards of second and third generation immigrants have indeed approached the level of German students, but have not reached it yet (Hunger/Thränhardt 2004; Gogolin, 2000; Durand, 2004). This is insofar of importance as the social and cultural integration mainly conveyed by language skills and educational achievement are basic preconditions for structural integration. For these reasons, it was also the motivation for this research in three German institutions (constituents' faculties and departments in Mannheim, Mainz, and Heidelberg). Problems in data technology and deficits in contents rather affect immigration and integration research as a whole (Hunger, 2003; Hoefer, 2009). Language education is usually the first introduction immigrants have to their new society and, together with practical skills training, it is also expected to help settled communities to further their integration, the next important is the development of socioeconomic coexistence and digital for easier access to the labor market, socialization and the suppression of the gray economy as a prevention of dissemination to other EU countries, especially Croatia. Croatia may also be an example of preventative measure of emigration and investment in education.

2. METHODOLOGY

One hundred and eighty - five students (M=105, F=80) participated in this research, from the following fields: 1. Faculties of humanities and social sciences, department for English language and literature, University of Mannheim (N=66 students, M=36, F=30, the second and third year of undergraduate study); 2. University of Mainz, Institute of Education sciences (N=70, M=40, F=30, the second and third year of undergraduate study) and University of Heidelberg, Faculties of Law, Economics, and Social Sciences (N=49, M=25, F=24, the second study year of undergraduate study). *The research was conducted during winter semester 2016/2017 academic year, from November 9 to January 14.* The survey instrument used was the first part of the questionnaire to record students' opinions on different variables related to various multimedia foreign language learning tool, digital and socio-economic competences. Original Likert-type scale was used, with the following scale: 1=strongly disagree, 2=mostly disagree, 3=neither agree nor disagree, 4=mostly agree, 5=strongly agree. The second part of the online questionnaire consisted of nineteen questions where respondents assessed their own level of knowledge of digital competence, their belonging to the digital generation, the frequency of application of new educational paradigms in teaching, manner of acquiring knowledge and forms of education that can contribute to the development of digital competence. In matters where there was

the assessment of the agreement with the following statements about the importance of digital competence of immigrants what are they need to learn a foreign language, to work with new multimedia tools, and the purpose of the use of modern technology in labor market; respondents were choosing on a scale of one to five (1 - completely disagree, 5 - completely agree). In the third part of the questionnaire a semantic differential⁴ method was used. Under each default term) were a couple of adjectives, and between them numbers from 0 to 3, where numbers 1, 2 and 3 indicated a degree in which the adjective describes the default term. For each pair of adjectives, students had to choose one adjective that best described the default term, and circle the one degree number that best describes the adjective of the concept. If students thought that both adjectives in a pair described the concept equally well, they circled a zero. Based on data analysis, 20 testing attributes were selected, with the use of the following criteria: 1) only the statements that clearly express a positive or a negative attitude of the immigrants and some dimension from the socio-economic competences; 2) statements considered included the categories of students' answers, including their general ideas about the advantages and disadvantages of the multimedia use in the foreign language learning; and 3) an equal amount of positive and negative opinion statements was taken into consideration. While constructing the semantic differential, the emphasis was on covering the evaluation factor, potency factor and activity factor. While analyzing the results in SPSS, we used Cronbach's alpha coefficient. Measurement reliability was 0.93. Cramer's and Scheffov correlation coefficient was used for correlation.

2.1. The aim of the research

Consider and perceive perceptions of student perceptions of investment in education of foreign language learning by means of multimedia tools developing digital competencies, explaining the need for the development of socio-economic competencies of immigrants and determining which levels of socio-economic competencies immigrants should acquire in order to integrate and socialization; which is also the problem area of this work, given that it is Germany, which has been the leading country in the EU for the past two years when receiving immigrants.

4 The semantic differential is a method designed to measure students' attitudes which can offer the widest and most comprehensive approach for understanding attitudes, which is particularly important for relationship between attitudes and behavior. This method is based on connotative meaning of words and their differentiation from denotative meaning. It is the most frequently used in media psychology (Pečjak, 1981).

2.1.1. Results

Table 1.: Comparison of prevalence of respondents with regard to gender, nationality, place of study (means (M), standard deviations (SD))

Gender	Percentage (%)	Frequency	M	SD
M	56,75%	105	2.05	0.64
F	43,24 %	80	3.15	0.41
Nationality				
German	55,13%	102	4.68	1.65
Another EU - member state (French, Italy, Croatia, UK, Poland, Greece etc.)	40,00 %	74	3.65	0.71
Eastern countries	4,86%	9	2.54	1.45
Place of study				
University of Mannheim	35,67%	66	4.39	0.51
University of Mainz	37,83%	70	3.41	1.54
University of Heidelberg	26,48%	49	3.69	0.56
Total	100%	185		

Source: Authors'.

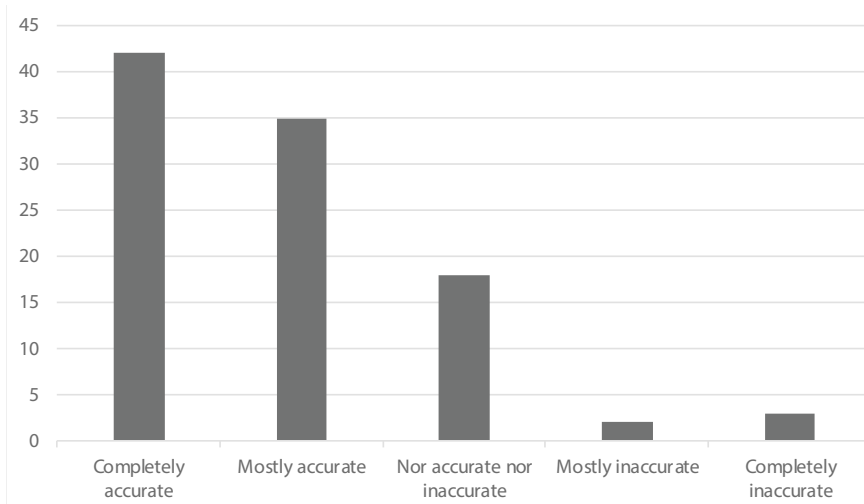
Table 2.: Relationship between the nationality of students and opinion of students on immigrants - attitude on them

Relationship	χ^2	df	p	Φ	p
German students and Attitude on immigrants	83,31	1	< 0,01	-0,43	< 0,01
Another EU - member state (French, Italy, Croatia, UK, Poland, Greece etc.) and Attitude on immigrants	55,17	2	< 0,01	-0,35	< 0,01
Eastern countries and Attitude on immigrants	41,23	1	< 0,01	0,33	< 0,01
Attitude on migrants					

Source: Authors'.

Table 2. shows that the students who are not German nationality has are more positive mind about the immigrants (M = 61.6, SD = 2.15) compared to students who are German nationality (M = 44.1, SD = 0.45). Variability analysis has also show that there are differences in relation to the frequency of socializing with foreigners via the Internet. Scheffe's test showed that there is a statistically significant difference in the number of students who access the Internet every day and are in contact with people another nationality (M = 42.9, sD = 2.65) compared to those who contact several times a week (M = 44.9, SD = 2.54) and those students who have less contact with the others without the German nationality (M = 39.0, SD = 2.54).

Figure 1.: Self-assessment of the respondents about the use of various forms of multimedia tools in the socialization process of immigrants



Source: Authors'.

Figure 1. shows statistically significant differences and connections in the level of each of these claims that are mentioned in the table in relation to the frequency and purpose of using the media to need of the educational socialization process. The following are significant differences and high correlations among claims: methods of active foreign language to learning and in improving learning outcomes ($r = .787652$, 5611 , $p \leq .05$), a using the multimedia tools for the new method of practical work ($r = .634512$, 6.521 , $p \leq .05$), and the hybrid-cooperative learning and the implications of new learning environments ($r = .413426$, 5521 , $p \leq .05$). In the another part of the questionnaire, students have assessed their own perceptions on investing in development of multimedia tools like a digital education of immigrants through significance aspect of foreign language because of the easier socialization and involvement in the working world. Five statements were offered in total (Table 3.).

Table 3.: Data representation of students on the significance of important to development digital competences for a foreign language (%)

Variable	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	N=Total	χ^2	*df	*p
Because of general socialization	(7.05)%	(6.69)%	(18.19)%	(16.23)%	(51.84)%	N=185100%	13.236	4	0.001
For easier to find a work	(12.4)%	(5.16)%	(14.38)%	(14.26)%	(53.79)%	N=185100%	18.236	3	0.012
For the purpose of permanent education	(12.8)%	(8.2)%	(11.5)%	(17.2)%	(50.2)%	N=185100%	22.152	2	0.011

Variable	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	N=Total	χ^2	*df	*p
For the purpose of suppressing the gray economy	(13.6)%	(6.7)%	(14.3)%	(19.1)%	(46.0)%	N=185 100%	5.521	2	0.035
For easier collecting of pieces of information on the activities related to the labor market	(9.81)%	(3.8)%	(17.2)%	(24.8)%	(44.1)%	N=185 100%	15.235	4	0.058

Source: Authors'.

(Notes: Every statement in the original scale of Likert type was used with items: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = mostly agree and 5 = strongly agree)

Table 3. shows that 53,79% students ($M = 0.47$, $SD = 0.34$) most often see the purpose of investing in development of multimedia tools like a digital education of immigrants through significance aspect of foreign language because of the easier socialization and involvement in the working world in the variables for the easier find a work, than 51,84% students ($M = 0.41$, $SD = 0.44$) for the general education, 50,2% students think for the purpose of permanent education ($M = 0.42$, $SD = 0.41$), and 44,1% student think the multimedia tools can help for easier collecting of the information what are the immigrants need in the labor market ($M = 0.61$, $SD = 0.41$). A statistically significant correlation ($\chi^2 = 179,11$, $df = 2$, $p < 0.05$, Cramers $V = .17$) is received and it shows that students who also learn a foreign language are often more aware of the significance and the role of learning foreign language for the development of the economy and society. Furthermore, testing statistical significance has shown that the majority of students consider that it is very important to invest in digital education in order to reduce the unemployment rate (considering statistical significance it is less than 1%, $p < 0.01$). Table 4. points to the necessity of development of socio-economic competences of immigrants and it also determines which socio-economic competences are the most necessary for immigrants to integrate themselves in the German country.

Table 4.: The opinion of the students on the type of the socio-economic competences immigrants should acquire (%)

Variable	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	N=Total	χ^2	*df	*p
social and economic competence for the development of entrepreneurship	(24.3)%	(14.3)%	(10.53)%	(28.76)%	(22.07)%	N=185 100%	14.236	4	0.051

Variable	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	N=Total	χ^2	*df	*p
Political values and strengthening of national and international identity	(9.83)%	(8.61)%	(11.45)%	(19.20)%	(50.91)%	N=185100%	19.26	1	0.032
Opening and/or engaging in entrepreneurial institutions	(5.74)%	(14.3)%	(11.11)%	(48.16)%	(20.68)%	N=185100%	27.42	3	0.055
E-orientation	(15.87)%	(22.8)%	(27.69)%	(18.84)%	(14.80)%	N=185100%	19.26	2	0.012
Entrepreneurial skills	(24.3)%	(1.40)%	(7.11)%	(23.15)%	(44.04)%	N=185100%	24.12	2	0.056
Self-assurance	(9.02)	(13.8)	(14.42)	(40.42)	(22.30)	N=185100%	6.521	3	0.057
Awareness for the "Networking European Citizenship Education"	(4.98)%	(0.96)%	(11.38)%	(20.80)%	(61.88)%	N=185100%	13.25	4	0.041
Globality and development of socioeconomic culture	(13.32)%	(14.1)%	(13.5)%	(14.2)%	(44.88)%	N=185100%	14.21	1	0.061
Development of business human resources management	(0.04)%	(0.96)%	(11.84)%	(30.4)%	(56.76)%	N=185100%	15.23	5	0.021

Source: Authors'.

Note: Every statement in the original scale of Likert type was used with items: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = mostly agree and 5 = strongly agree).

Table 4. The data point to an overview of the data that socioeconomic competencies consider students to be most important for survival of immigrants in Germany and inclusion in the work world to prevent the black market invasion and to help immigrants better integrate into Germany. In the first place there are Awareness for the "Networking European Citizenship Education" (61,88%, $M=0.45$, $SD=0.45$), on another they are Development of business human resources management (56,76%, $M=0.51$, $SD=0.58$), on the third place is the variables Political values and strengthening of national and international identity (50,91%, $M=0.81$, $SD=0.95$).

A statistically significant correlation ($\chi^2=129.16$, $df=4$, $p<0.05$, Cramers $V=.14$) has been gained between students who rose awareness for the "Networking European Citizenship Education" and variables Political values and strengthening of national and international identity.

The study also showed a correlation with the mentioned variables from Table 3 with the variables in Table 5., which are related exclusively to certain digital competencies. Table 5. shows the correlations of certain socio-economic competences that are in correlation with digital, which are considered essential for survival in Germany and can also serve as an example for Croatia.

Table 5.: Correlation between digital competences and socio-economic competences (they are find six correlation- Student's opinion)

Digital competences	Correlation	Chi-square	Socio-economic competences
Writing and understanding the text of a foreign language through multimedia tools	.324169	4.451, $p \leq .05$	social and economic competence for the development of entrepreneurship
Collecting e-information through office tools and finding out how to find e-information over the Internet	.784852	5.811, $p \leq .05$	Opening and/or engaging in entrepreneurial institutions
Decoding of collected e-information and working on computer software	.457357	2.241, $p \leq .05$	Political values and strengthening of national and international identity
Analysis and evaluation of e-information	.634912	6.621, $p \leq .05$	E- orientation
To know how to create new media for the purpose of finding a job in the labor market	.423623	3.521, $p \leq .05$	Awareness for the "Networking European Citizenship Education"
Other digital competences for the development of personal entrepreneurship	.274436	3.141, $p \leq .05$	Development of business human resources management

Source: Authors'.

Table 5. shows statistically significant differences and connections in the level of each of these claims that are mentioned in the table in relation to the digital competences who can help to development the socio-economic competences. The following are significant differences and high correlations among claims: Collecting e-information through office tools and finding out how to find e-information over the Internet ($r = .784852$, 5.811 , $p \leq .05$), and Opening and/or engaging in entrepreneurial institutions, than of the Analysis and evaluation of e-information ($r = .634912$, $p \leq .05$) with the E-orientation; than e very high correlation with the variables To know how to create new media for the purpose of finding a job in the labor market ($r = .423623$, $p \leq .05$) and with the variables Awareness for the "Networking European Citizenship Education". This is primarily due to the fact that digital competences are in the ultimate connection with socio-economic competences that are very important to develop with immigrants.

3. CONCLUSION

Since today we live in the society of the so called "Everlasting Immigration" it is necessary and essential to decode a foreign language in order to facilitate socialization in the society. Population immigrations are not particular for the USA and the member countries of the EU. They are not even particular for contemporaneity. It has always been so that a great number of immigrants left their home countries and immigrated to other countries in search for better opportunities or seeking protection from oppression and violence. Statistics show that today around 1505 million people don't live in the country they were born in or the country of their citizenship. International immigrations have become global phenomenon which includes a wide range of countries of origin, transit countries and target countries, as well as different immigrant groups. International immigrations have become global phenomenon which includes a wide range of countries of origin, transit countries and target countries, as well as different immigrant groups. Knowledge is the foundation of modern society and a key factor in economic development. The process of globalization, technological and economic progress, and dynamic labor market requires lifelong learning, ie, continuous improvement of knowledge, skills in personal, social and business skills. The basic prerequisite for lifelong learning is the possession of key competencies. Key competencies are the central concept in European education policy, especially in the process of eternal immigration over the past two years. Digital society implies a transformation of the traditional way of life and the economic, industrial, educational, and labor changes as well as changes of personal and individual way of existence. Under the flurry of globalization, particularly with the appearance of new media, the behavior and motivation in learning are significantly changing. Students are of the opinion that entrepreneurship is one of the key competences in every person's life, it is important to adopt something before. It is a key innovative indicator that is mandatory as part of socio-economic competences. Germany has received most immigrants over the past two years (2016/2017) as a member of the EU countries. The students believe that immigrants must be given the chance and opportunity to survive in that country and that the development of digital competitions and socio-economic competences can be of great use, given that we are in a digital society that is stimulated by the digital economy, especially if it is analyzed enterprises. All of this can be an indicator of black economy ignorance and research will be for example both Croatia and other member states of the EU. The study also found among respondents who are not members of the German state to have a positive attitude towards immigrants in relation to those who are. Research has shown that it is necessary for immigrants to develop awareness of socially responsible en-

5 http://artefact.mi2.hr/_ao1/lang_hr/report_katanec_hr.htm

Decennial Census . Homepage of the U.S. Census Bureau. U.S. Bureau of the Census; Washington, DC: 2010.[April 21, 2010]. <http://www.census.gov/>

trepreneurship, to encourage the development of entrepreneurial personality traits to creativity, self-reliance, adaptation to change, innovation, readiness to take reasonable risks and enable students to recognize and understand their talents, abilities and tendencies Would survive national identity, develop an international identity, and prevent the gray economy. Research results show that students feel that it's necessary to invest in the Education of immigrants in order to prevent the demolition of (inter)national identity, as well as to facilitate the realization of the process of socialization and more employment.

REFERENCES

- Beitragspflichtiger Hochschulzugang. (2010) http://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Ministerium/Geschaeftsbereich/Wissenschaftlicher_Beirat/Gutachten_und_Stellungnahmen/Ausgewaehlte_Texte/1010121a3002.pdf?__blob=publicationFile&v=2
- Decennial Census. Homepage of the U.S. Census Bureau. U.S. Bureau of the Census; Washington, DC: 2010. [April 21, 2010]. <http://www.census.gov/>
- Devoretz Don, J. "Immigration policy: methods of economic assessment. Global Migration Perspectives." (2004)
- Durand, Jorge, and Douglas S. Massey, eds. Crossing the border: Research from the Mexican migration project. Russell Sage Foundation, 2004.
- Habermas, J., 1990. Strukturwandel der Öffentlichkeit. Untersuchung zu einer Kategorie der bürgerlichen Gesellschaft. Mit einem Vorwort zur Neuauflage 1990. Frankfurt/Main: Suhrkamp.
- Habermas, J., 1981. Theorie des kommunikativen Handelns. 2 Bände. Frankfurt a.M. Suhrkamp.
- Hofer, M; Rytina N; Baker Brian C. , 2009. Estimates of the Unauthorized Immigrant Population Residing in the United States: January Office of Immigration Statistics, U.S. Office of Homeland Security; Washington, DC: 2010. <http://www.dhs.gov/files/statistics/publications/#2>.
- Hunger, Uwe, and Dietrich Thränhardt. "Migration und Bildungserfolg: Wo stehen wir." Migration-Integration-Bildung: Grundfragen und Problembereiche (2004): 179-197
- Hunger, Uwe. Vom Brain Drain zum Brain Gain: die Auswirkungen der Migration von Hochqualifizierten auf Abgabe- und Aufnahmeländer. Friedrich-Ebert-Stiftung, Abt. Arbeit und Sozialpolitik, 2003.
- Katanec Božena, Migracije Kao Globalni i Lokalni Problem, http://artefact.miz.hr/_ao1/lang_hr/report_katanec_hr.htm
- Pečjak, Vid, and Josip Stošić. Psihologija saznavanja. Svjetlost, 1981.
- Rietig Victoria and Andreas Müller, The New Reality: Germany Adapts to Its Role as a Major Migrant Magnet, (2016) http://www.migrationpolicy.org/article/new-reality-germany-adapts-its-role-major-migrant-magnet?gclid=EAIaIQobChMIsuCH1d6p1QIVTmQZCh27vAfREAAAYAiAAEKUBPD_Bw
- te Velde, Dirk Willem. Globalisation and Education What do the trade, investment and migration literatures tell us?. Overseas Development Institute (ODI), 2005 <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/2484.pdf>
- U.S. Government Accountability Office Estimating Irregular Migration in a Survey: The "Two-Card Follow-Up" Method." United Nations, Department of Economic and Social Affairs, Population Division (2009).. Seventh Coordination Meeting on International Migration; 2009. Working Paper No. ESA/P/WP.208.
- Zimmermann, K. F., Tackling the European Migration Problem. In: Journal of Economic Perspectives, 9(2), (1995): 45-62

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ABSTRACT

Multi-document summarization is an automatic procedure aimed at extraction of information from multiple texts written about the same topic. Resulting summary report allows individual users, such as professional information consumers, to quickly familiarize themselves with information contained in a large cluster of documents. This proposed work CBRS (Cluster Based Ranking with Significance) summarizes the multi document with semantic meaning of the terms in the documents. Such that it produces a good results while clustering and ranking with retrieving document. As a clustering result to improve or refine the sentence ranking results. The effectiveness of the proposed approach is demonstrated by both the cluster quality analysis and the summarization evaluation conducted on our simulated datasets.

Keywords:

Documentation Summarization, Sentence Clustering, Sentence Ranking

1. INTRODUCTION

The steady and amazing progress of computer hardware technology in the last few years has led to large supplies of powerful and affordable computers, data collection equipment's, and storage media. Due to this progress there is a great encouragement and motivation to the database and information industry to make a huge number of databases and information repositories; which is available for transaction management, information retrieval, and data analysis. Thus, technology advancement has provided a tremendous growth in the volume of the text documents available on the internet, digital libraries and repositories, news sources, company-wide intranets, and digitized personal information such as blog articles and emails. With the increase in the number of electronic documents, it is hard to organize, analyze and present these documents efficiently by putting manual effort. These have brought challenges for the effective and efficient organization of text documents automatically. Data mining is the process of extracting the implicit, previously unknown and potentially useful information from data. Document clustering, subset of data clustering, is the technique of data mining which includes concepts from the fields of information retrieval, natural language processing, and machine learning. Document Clustering is different than document classification. In document classification, the classes (and their properties) are known a priori, and documents are assigned to these classes; whereas, in document clustering, the number, properties, or membership (composition) of classes is not known in advance. Thus, classification is an example of supervised machine learning and clustering that of unsupervised machine learning.

1.1. PROBLEM STATEMENT

The main problems in the existing work is which clusters and ranks according to the corpus or terms in each document, but it doesn't look up the exact meaning of the word and summarize it. This leads to irrelevant results. To overcome the above problem a real similarity measure is needed so find the exact similarity a WordNet tool is applied.

1.2. PROPOSED SYSTEM

The basic idea is as follows. First the documents are clustered into clusters. Then the sentences are ranked within each cluster. After that, a mixture model is used to decompose each sentence into a K-dimensional vector, where each dimension is a component coefficient with respect to a cluster. Each dimension is measured by rank distribution. Sentences then are reassigned to the nearest cluster under the new measure space. As a result, the quality of sentence clustering is improved. In

addition, sentence ranking results can thus be enhanced further by these high quality sentence clusters. In all, instead of combining ranking and clustering in a two stage procedure like the first category, isolation, we propose an approach which can mutually enhance the quality of clustering and ranking. That is, sentence ranking can enhance the performance of sentence clustering and the obtained result of sentence clustering can further enhance the performance of sentence ranking.

The proposed system includes:

- Integrating Clustering and ranking simultaneously terms and sentences
- A Cosine similarity is used to show their relationships.
- A conditional ranking is integratedly used to perform better results.

1.3. WORDNET TOOL

WordNet is a thesaurus for the English language based on psycholinguistics studies and developed at the University of Princeton .It was conceived as a data-processing resource which covers lexico-semantic categories called synsets. The synsets are sets of synonyms which gather lexical items having similar significances, for example the words "a board" and "a plank" grouped in the synset {board, plank}. But "a board" can also indicate a group of people (e.g., a board of directors) and to disambiguate these homonymic significances "a board" will also belong to the synset {board, committee}. The definition of the synsets varies from the very specific one to the very general. The most specific synsets gather a restricted number of lexical significances whereas the most general synsets cover a very broad number of significances.

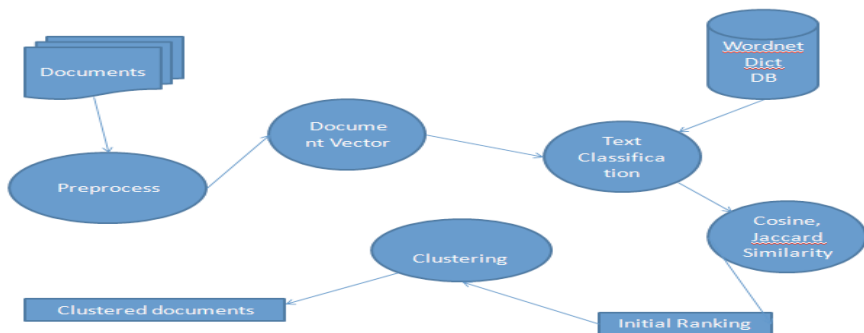
The organization of WordNet through lexical significances instead of using lexemes makes it different from the traditional dictionaries and thesaurus. The other difference which has WordNet compared to the traditional dictionaries is the separation of the data into four data bases associated with the categories of verbs, nouns, adjectives and adverbs. The names are organized in hierarchy, the verbs by relations, the adjectives and the adverbs by N-dimension hyperspaces. The following list enumerates the semantic relations available in WordNet. These relations relate to concepts, but the examples which we give are based on words.

- (1) Synonymy: relation binding two equivalent or close concepts (frail /fragile). It is a symmetrical relation.
- (2) Antonymy: relation binding two opposite concepts (small /large). This relation is symmetrical.
- (3) Hyperonymy: relation binding a concept-1 to a more general concept-2 (tulip /flower).
- (4) Hyponymy: relation binding a concept-1 to a more specific concept-2. It is the reciprocal of hyperonymy. This relation may be useful in information retriev-

- al. Indeed, if all the texts treating of vehicles are sought, it can be interesting to find those which speak about cars or motor bikes.
- (5) Meronymy: relation binding a concept-1 to a concept-2 which is one of its parts (flower/petal), one of its members (forest /tree) or a substance made of (pane/glass).
 - (6) Metonymy: relation binding a concept-1 to a concept-2 of which it is one of the parts. It is the opposite of the meronymy relation.
 - (7) Causality: relation binding a concept-1 to its purpose (to kill /to die).
 - (8) Value: relation binding a concept-1 (adjective) which is a possible state for a concept-2 (poor /financial condition).
 - (9) Has the value: relation binding a concept-1 to its possible values (adjectives) (size /large). It is the opposite of relation value.
 - (10) Similar to: certain adjectival concepts which meaning is close are gathered. A synset is then designated as being central to the regrouping. The relation 'Similar to' binds a peripheral synset with the central synset (moist /wet).
 - (11) Derived from: indicate a morphological derivation between the target concept (adjective) and the concept origin (coldly /cold).

1.4. SYSTEM DESIGN

Figure 1.: Data Flow Diagram



Source: Authors'

1.5. SYSTEM IMPLEMENTATION

The proposed Clustering across Ranking of web documents consists of four main modules. They are:

- Data Preprocessing
- Document Bi-Type Graph
- Ranking
- Similarity Measure

Data Preprocessing: The effectiveness of the proposed approach is demonstrated by both the cluster quality analysis and the summarization evaluation conducted on the DUC 2004-2007 and our simulated datasets. Document pre-processing is a prerequisite for any Natural Language Processing application. It is usually the most time consuming part of the entire process. The various tasks performed during this phase are

Parsing: Parsing of text document involves removing of all the HTML tags. The web pages will contain lot of HTML tags for alignment purpose. They does not provide any useful information for classification. All the text content between the angle braces '<' and '>' are removed in this module. The tag information between them will not be useful for mining purpose. They will occupy more space and it should be removed. This step will reduce lot of processing complexity.

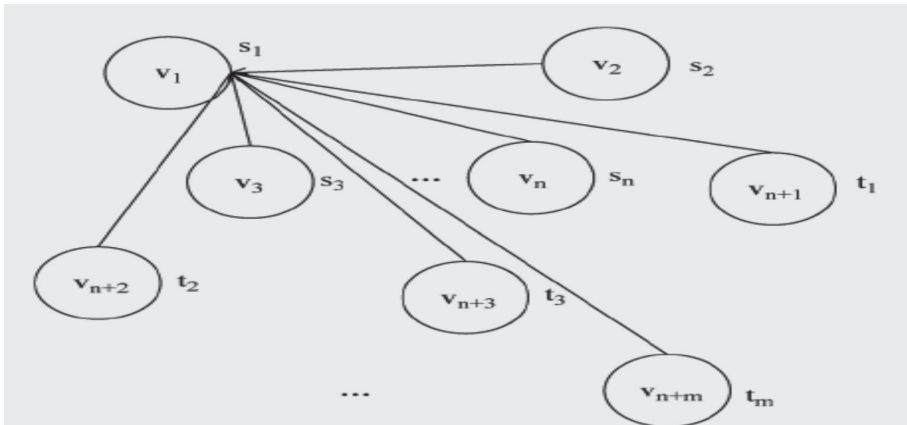
Tokenization: Tokenization is actually an important pre-processing step for any text mining task. Tokenization is the process of breaking a stream of text up into words, phrases, symbols, or other meaningful elements called tokens. The list of tokens becomes input for further processing such as parsing or text mining. Tokenization usually occurs at the word level. Often a tokenizer relies on simple heuristics.

Stop word Removal : Stop word removal removes the high frequent terms that do not depict the context of any document. These words are considered unnecessary and irrelevant for the process of classification. Words like 'a', 'an', 'the', 'of', 'and', etc. that occur in almost every text are some of the examples for stop words. These words have low discrimination values for the categories. Using a list of almost 500 words, all stop words are removed from the documents.

Stemming : Stemming removes the morphological component from the term, thus reducing the word to the base form. This base form doesn't even need to be a word in the language. It is normally achieved by using rule based approach, usually based on suffix stripping. The stemming algorithm used here is the Porter Stemmer algorithm, which is the standard stemming algorithm for English language. Example: Playing, Plays, Played, Play.

Document Bi-Type Graph: The main contributions of the paper are three-fold: (1) Three different ranking functions are defined in a bi-type document graph constructed from the given document set, namely global, within cluster and conditional rankings, respectively. (2) A reinforcement approach is proposed to tightly integrate ranking and clustering of sentences by exploring term rank distributions over the clusters. (3) Thorough experimental studies are conducted to verify the effectiveness and robustness of the proposed approach. Three different ranking functions are defined in a bi-type document graph constructed from the given document set, namely global, within-cluster and conditional rankings, respectively. In first present the sentence-term bi-type graph model for a set of given documents, based on which the algorithm of reinforced ranking and clustering is developed. Let , $G=\{V,E,W\}$ where V is the set of vertices that consists of the sentence set $S=\{s_1,s_2,\dots,s_n\}$ and the term set $T=\{t_1,t_2,t_3,\dots,t_n\}$, i.e. $=S \cup T$, n is the number of sentences and is the number of terms. Each term vertex is the sentence that is given in the WordNet as the description of the term. It extracts the first sense used from WordNet instead of the word itself. E is the set of edges that connect the vertices. An edge can connect a sentence to a word, a sentence to a sentence, or a word to a word, i.e. the graph G is presented in Fig. below. For ease of illustration, we only demonstrate the edges between v_1 and other vertices. All the documents are represented in the form of a vector called Term.

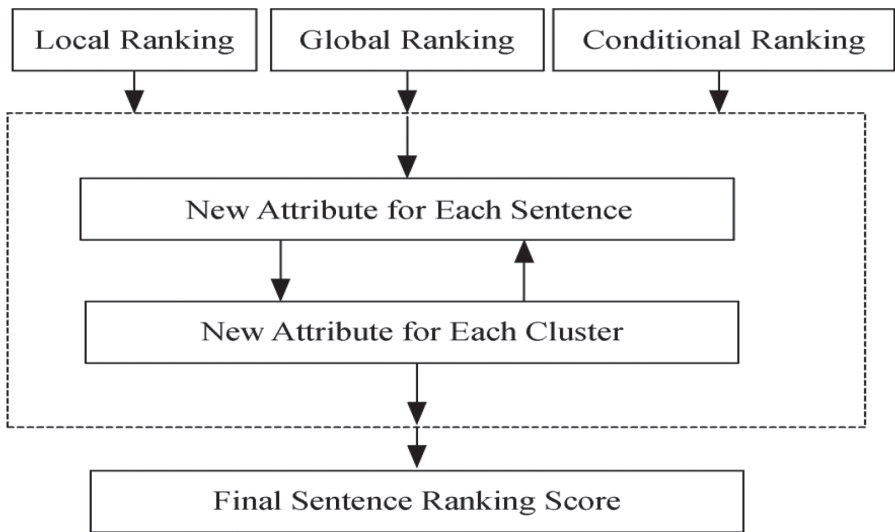
Figure 2.: Bi-Type graph



Source: Authors'

Ranking: Ranking has been done in three types ranking functions

Figure 3.: The sentence ranking process



Source: Authors’

Global Ranking (Without Clustering): A sentence should be ranked higher if it contains highly ranked terms and it is similar to the other highly ranked sentences, while a term should be ranked higher if it appears in highly ranked sentences and it is similar to the other highly ranked terms.

Local Ranking (Within Clusters): We decompose the whole document set into sentences, and obtain K sentence clusters (also known as theme clusters) by certain clustering algorithm. The V theme clusters is denoted as $C = \{C_1, C_2, \dots, C_K\}$ where C_K ($K = 1, 2, 3, \dots, K$) represents a cluster of highly related sentences S_{Ck} , which contains the terms T_{Ck} .

Conditional Ranking (Across Clusters): To facilitate the discovery of rank distributions of terms and sentences over all the theme clusters, we further define two "conditional ranking functions" $r(S|Ck)$ and $r(T|Ck)$. Sentence and term conditional ranks over all the theme clusters and are ready to introduce the reinforcement process. These two rank distributions are necessary for the parameter estimation during the reinforcement process.

Term Ranking: Term ranking is an essential issue in clustering documents. Ranking distinguishing terms higher yields better estimation of similarity between documents and hence higher quality is clustering. Standard frequency based term

ranking methods in Information Retrieval (IR). Term frequency (TF) is the frequency of a term among all the terms in the Web page collection, and calculated as $TF(t) = nt / n$, where nt is the number of occurrences of t in the collection and n is the total number of terms in the collection. Term frequency / inverse document frequency (TF/IDF) is a method to reduce the bias of term frequency by penalizing with the document frequency. It is calculated as $TF/IDF(t) = TF(t) \cdot \log |W| / |D(t)|$ where $D(t)$ is the set of Web pages t appears.

Sentence Ranking: The documents are clustered into k clusters. Then the sentences are ranked within each cluster. Grouping of words or terms and then provide the ranking for sentences.

Similarity measures: The similarity between a sentence and a cluster can be calculated as the cosine similarity between them. Where $WST(i,j)$ is the cosine similarity between the sentence S_i and the term T_j . Thus the value of $WST(i,j)$ is between 0 and 1. If $WST(i,j)$ is near to 1, it means the sentence S_i and the term T_j are semantically similar. If $WST(i,j)$ is near to 0, it means the sentence and the term are semantic different. $WSS(i,j)$ is the cosine similarity between the sentences S_i and S_j . $WTT(i,j)$ is the cosine similarity between the terms T_j and T_j . First we calculate the center of each cluster can thus be calculated accordingly, which is the mean of S_i for all in the same cluster, i.e.,

$$\overrightarrow{Center}_{C_k} = \frac{\sum_{s_i \in C_k} \overrightarrow{s_i}}{|C_k|},$$

where is the size C_k is cluster size.

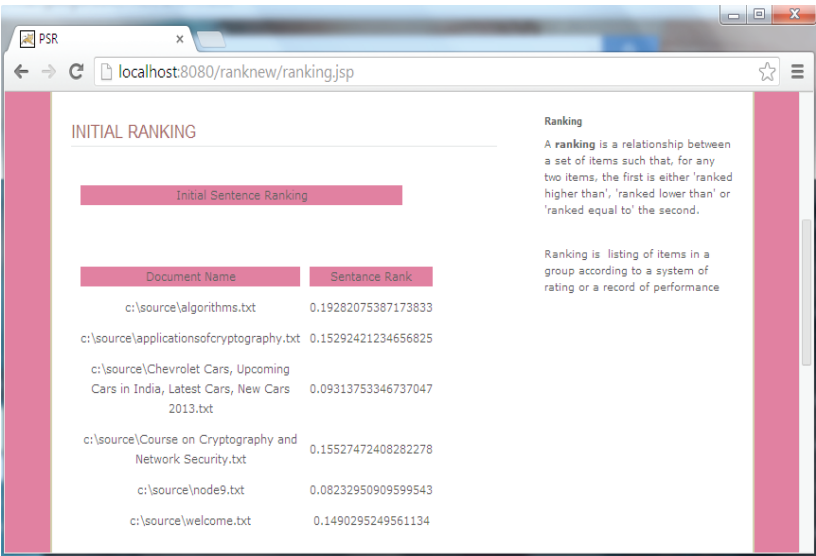
Then the similarity between a sentence and a cluster can be calculated as the cosine similarity between them, i.e.,

$$sim(s_i, C_k) = \frac{\langle \overrightarrow{s_i}, \overrightarrow{Center}_{C_k} \rangle}{\sqrt{\|\overrightarrow{s_i}\|^2} \cdot \sqrt{\|\overrightarrow{Center}_{C_k}\|^2}}.$$

Finally, each sentence is re-assigned to a cluster that is the most similar to the sentence. Based on the updated clusters, within-cluster ranking is updated accordingly, which triggers the next round of clustering refinement.

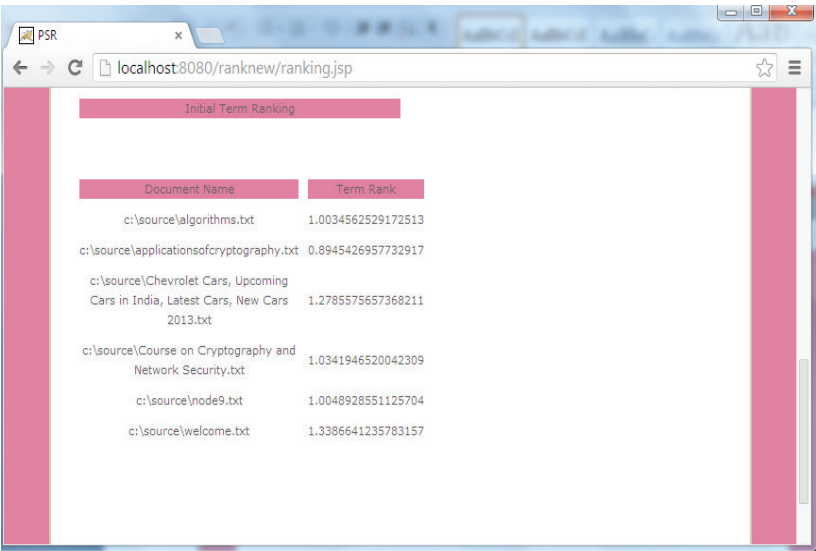
2. EXPERIMENTAL RESULTS

Figure 4.: Initial sentence ranking



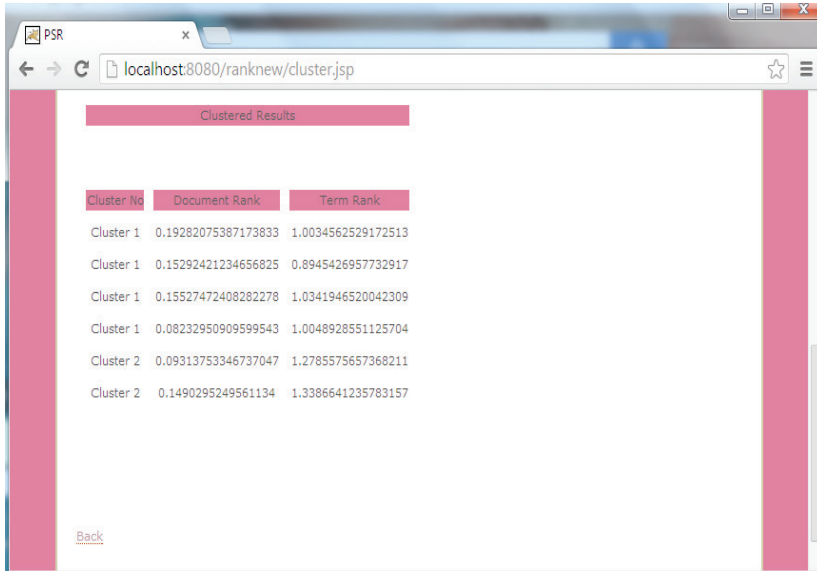
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Figure 5.: Initial term ranking



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Figure 6.: Clustering

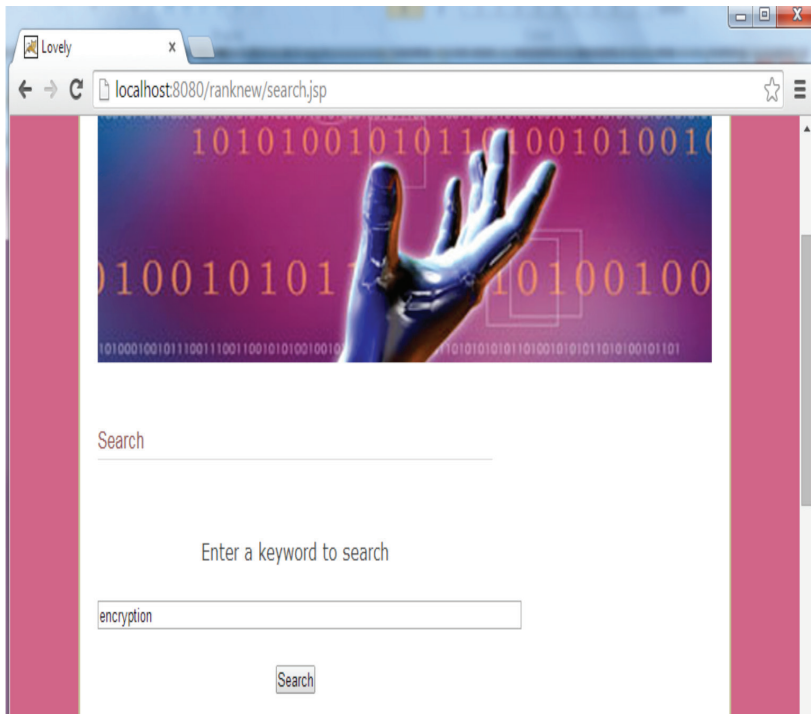


Cluster No	Document Rank	Term Rank
Cluster 1	0.19282075387173833	1.0034562529172513
Cluster 1	0.15292421234656825	0.8945426957732917
Cluster 1	0.15527472408282278	1.0341946520042309
Cluster 1	0.08232950909599543	1.0048928551125704
Cluster 2	0.09313753346737047	1.2785575657368211
Cluster 2	0.1490295249561134	1.3386641235783157

[Back](#)

Source: Authors'

Figure 7.: Search engine



Search

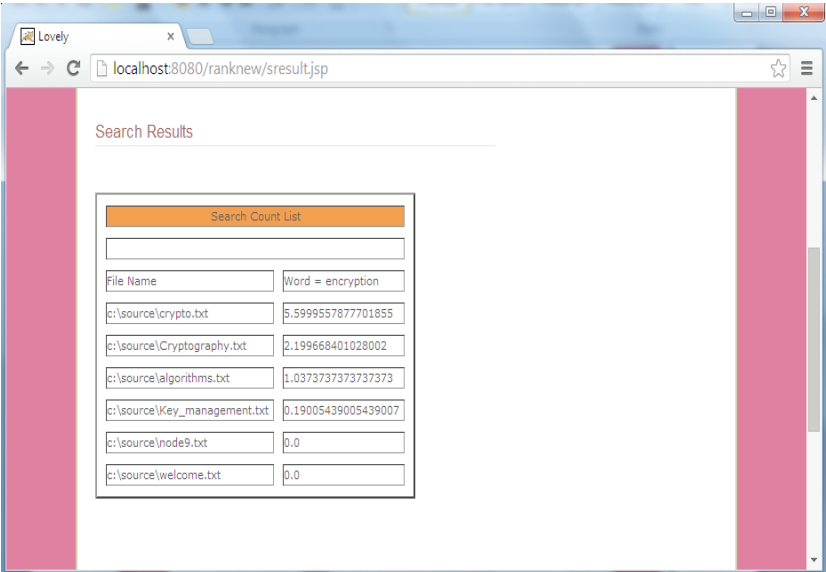
Enter a keyword to search

encryption

Search

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Figure 8.: Searching results



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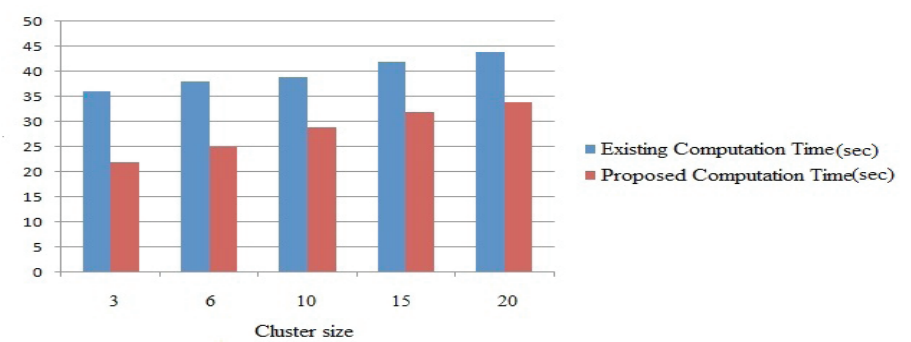
3. PERFORMANCE EVALUATION

Table 1.: Cluster Size and the Computation Time

Clusters size	Existing Time in sec	Proposed Time in sec
3	36	22
6	38	25
10	39	29
15	42	32
20	44	34

Source: Authors’

Figure 9.: Proposed Method Comparison Cluster Size And The Computation Time



Source: Authors’

4. CONCLUSION

This paper, we first define three different ranking functions in a bi-type document graph constructed from the given document set. Based on initial K clusters, ranking is applied separately, which serves as a good measure for each cluster. Sentences then are reassigned to the nearest cluster under the new measure space to improve clustering. As a result, quality of clustering and ranking are mutually enhanced. To further examine how the cluster number influences summarization, we conduct the following additional experiments by varying the cluster number. Given a document set, we let denote the sentence set in the document set, and set in the following way, $K = e * S$. We applied to provide Integrating Clustering and ranking simultaneously terms and sentences and to provide ranking for different word but same meaning and to improve the efficiency of document retrieval.

REFERENCES

- Ahn C.M, Kim D.H, Lee J.H, and Sun P, "Multi-document using weighted similarity between topic and clustering-based non-negative semantic feature," in Proc. APWEB/WAIM Conf., (2007): 60-63
- Barzilay R and McKeown K.R, "Sentence fusion for multi-document news summarization," Comput Linguist., vol. 31, no. 3, (2005): 297-327
- Cai X.Y, Hong Y, Li W.J, and Ouyang Y, "Simultaneous ranking and clustering of sentences: A reinforcement approach to multi-document summarization," in Proc. 23rd COLING Conf. '10, (2010): 134-142
- Cai X.Y and Li W.J, "A spectral analysis approach to document summarization: Clustering and ranking sentences simultaneously," Inf. Sci., vol. 181, no. 18, (2011): 3816-3827
- Cai X.J and Li W.J, "Mutually reinforced manifold-ranking based relevance propagation model for query-focused multi-document summarization," IEEE Tran. Audio, Speech, Lang. Process., vol. 20, no. 5, (2012): 1597-1607
- Celikyilmaz A and Hakkani-Tur D, "A hybrid hierarchical model for multi-document summarization," in Proc. 48th Annu. Meeting Assoc. Comput. Linguist., (2010): 815-824
- Celikyilmaz A and Hakkani-Tur D, "Discovery of topically coherent sentences for extractive summarization," in Proc. 49th ACL Conf. '11, (2011): 491-499
- Chi Y, Gong Y.H, Li T, Wang D.D, and Zhu S.H, "Integrating clustering and multi-document summarization to improve document understanding," in Proc. 17th CIKM Conf., (2008): 1435-1436
- Filatova E and Hatzivassiloglou V, "Event-based extractive summarization," in Proc. 42nd ACL Conf., (2004): 104-111
- Fisher S and Roark B, "Query-focused summarization by supervised sentence ranking and skewed word distributions," in Proc. DUC'06, 2006.
- Mihalcea R, "Graph-based ranking algorithms for sentence extraction, applied to text summarization," in Proc. 42nd ACL Conf., (2004): 20-24
- Wan X.J and Yang J.W, "Multi-document summarization using cluster-based link analysis," in Proc. 31st SIGIR Conf., (2008): 299-306

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