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OIL PRICE SHOCKS AND MACROECONOMIC PERFORMANCE OF THE NIGERIAN ECONOMY: A STRUCTURAL VAR APPROACH

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Abstract. *This study examines the effect of oil price shocks on the macroeconomic performance of the Nigerian economy covering the period from 1980 to 2018. The effect of oil price shocks is investigated on macroeconomic variables like output growth, inflation, interest rate, exchange rate and industrial production index using the structural vector autoregression (SVAR) approach. The results of the investigation reveal that oil price shocks have significantly and negatively affected economic growth and industrial output. Furthermore, while the results show that oil price shocks have a significant positive effect on inflation, the effect is also positive on interest rate and exchange rate, but it is not significant. The results of impulse response function show a negative effect on output growth, it is positive on inflation, but mild and indeterminate on industrial production, interest rate and exchange rate. Based on findings in this study, the Renaissance theory and the Dutch Disease theories of economic growth apply to the Nigerian economy. The policy recommendations include the isolation of the country's real sector from the vagaries of oil price volatility and the pursue of economic diversification to reduce the over-dependence on oil.*

Key words: *Oil price; Economic Growth, Inflation; Exchange Rate; Industrial Production; SVAR*

JEL Classification: C32, E30, F41, Q43

1. INTRODUCTION

Oil has served as the most potent source of energy supply for the industrial development of nations across the world since the 1950s. The dependence on oil for industrial performance has been marked with uncertainty as a result of several global events that have affected the

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selling price of oil in the world market. For instance, there was the Arab-Israeli War of 1973, the Gulf War of 1990-1991 and the Asian financial crisis in 1987. Another global financial disruption was witnessed during the terrorist attack at the World Trade Center in New York on September 11th, 2001. Equally remarkable was the global financial crisis of 2007-2008 that was caused by subprime mortgages. Perhaps of more significance is the on-going global crisis with very severe financial implications caused by the novel pandemic flu called the coronavirus. As expected, in all of these crises, industrial production was affected, and energy consumption disrupted, leading to a change in the world price of oil. With the advancement of nations and the accelerated growth in several developing countries of the world, the world market price of crude oil maintained an upward trend since the early 70s (Ahmed & Wadud, 2011). The global price of oil attained a peak of US$145 per barrel on July 3rd, 2008, during the global financial crisis. However, in recent times, the lowest price of oil has been US$12.34 per barrel on April 28th, 2020, based on the world-wide sludge in economic activity occasioned by the coronavirus pandemic. A lot of uncertainty has been associated with the universal production of oil and its pricing as a result of the close link with the world-wide economic and financial events (Iwayemi & Fowowe, 2011).

Despite innovations around the world on alternative sources of energy, crude oil still represents the primary source of power in the world today (Nazir & Hameed, 2015). The role of energy in different sectors of a modern economy cannot be over-emphasized. For instance, oil is needed to produce electricity, operate machines for production and transportation: Oil products are used as industrial raw material, in telecommunications, building and construction as well as durable household consumables. It means that oil products are used in all the economies around the world, even where such countries are not endowed with crude oil resources. Therefore, most economies around the world are affected by changes in the price of oil in the world market. Whenever there is a serious disruption in the supply of oil to the world market, economic entities become skeptical about the future. There is a temporary fall in consumers' spending on investment goods, household appliances, housing, cars, and so on (Hamilton, 2003).

The existing literature on energy economics has been replete with the debate on the effect of change in world oil price on the level of economic activity. The change in oil price has been found to affect most macroeconomic variables of economies around the world. While oil production would benefit the producing country through revenue earnings from oil sales, it may also have long term effect on the structure and composition of the country's industrial and total output (Okonkwo & Mojekwu, 2018). Changes in the price of oil may also affect inflation and interest rate (Sek et al., 2015). Since oil sale is denominated in US Dollar, the change in the universal price of oil has significantly affected the exchange rate of the oil-producing countries as well as the oil-importing countries (Volkov & Yuhn, 2016).

The Nigerian situation is unique as the country exports crude oil and imports refined oil products from the advanced countries of the world. Since the production of oil in the 50s, the country grew to systematically neglect the other productive sectors of the economy (Udoka & Nkamare, 2014). With the focus on oil production and export, the country has become a mono-product economy. The returns from oil exploration made the government relegate other sources of revenue, including taxation. A country that was reputed for producing and exporting groundnut, rubber cocoa, palm oil, has relegated the production of other export items over the years to concentrate on crude oil. Between 1981 and 2018, the revenue from crude oil export in Nigeria has accounted for over 70% of the total government collected revenue for the period (CBN, 2018). All efforts to develop the

manufacturing sector have failed as the existing few functional manufacturing concerns are almost entirely dependent on the importation of raw material inputs to function. Most states of the country are notorious for their low IGR collections and are condemned therefore to wait for federal allocation and sharing of oil revenue from crude oil export. The country's situation is so bad that the cost of running government, the funding of projects and the monthly remunerations for civil servants all come from federal government oil earnings.

The country's oil export is coordinated by the Nigerian National Petroleum Corporation (NNPC), the government behemoth that has been saddled with corruption over the years. Inflation in Nigeria has been double-digit for many decades, and some authors believe that a significant cause is oil price volatility. Omojolaibi (2013) opines that oil revenue has affected inflation in Nigeria through money supply. Also, some authors have argued that with oil production in Nigeria, the structure of production changes, and consumers have acquired the taste for foreign goods (Aydına, & Acarb, 2011). Therefore, as imports are encouraged, and exports are discouraged, the terms of trade could turn against the country. The emerging trend would depreciate the country's domestic currency against the Dollar over the years.

As new trends from the effect of oil price changes on the economy emerge daily, further studies on the impact of oil price shocks on macroeconomic variables in developing countries like Nigeria have remained viable. This study is fashioned to examine the effect of oil price shocks on macroeconomic variables like output growth, inflation, interest rate, exchange rate and industrial production in Nigeria. Nigeria is a classic example of an emerging developing country that exports crude oil and imports processed oil products.

The remaining part of this study is organized as follows. Section 2 briefly reviews the relevant literature concerning the effect of oil price shocks on the economy. Section 3 is concerned with the applied literature on the subject matter of the study. Section 4 discusses the data source, variable definitions and econometric methodology. Section 5 examines the empirical analysis and results. Finally, Section 6 outlines the conclusions and policy implications of the paper.

2. Literature Review

Many studies have investigated the effect of oil price shocks on macroeconomic variables around the world. Perhaps most outstanding is the effect of oil prices on economic growth, inflation, exchange rate and industrial output. The other studies on this subject matter may include the effect of oil activities on a country’s sovereign risks and perhaps investors’ sentiments and uncertainties. On the relationship with economic growth, there are three categories of outcomes in the studies. The first set of studies argues that oil price shocks have positively impacted on economic growth. For instance, Omojolaibi (2013) examined the effect of crude oil price changes on economic activity in Nigeria between 1985 and 2014. He concluded that oil price changes positively affected economic growth. In the same year, Igberaese (2013) studied the Nigerian economy and drew a similar conclusion. Ani et al. (2014) examined the causal relationship between four macroeconomic variables: real GDP, exchange rate, inflation rate and interest rate in Nigeria. They found that a positive but insignificant relationship existed between oil price and GDP. In the same vein, Yukata (2015) in the study of more advanced countries like US, EU and Japan, argues that oil price increase benefits the more advanced economies. In a related study, Ifeanyi & Ayenajeh

(2016) utilizing secondary data from 1980 to 2014, concluded that crude oil price volatility positively and significantly related to economic growth in Nigeria.

The second set of studies on this subject matter argues that oil price shocks have negatively impacted on economic growth. Bekhet and Yusop (2009), in their study of oil prices and macroeconomic variables in Malaysia, concluded that oil prices negatively affected GDP growth and energy consumption. Tang et al. (2010), in their study of China from 1998 to 2008, found that an increase in oil-price negatively affected investment and output. Iwayemi & Fowowe (2011), in their study of Nigeria 1985 to 2007, concluded that positive oil shocks did not cause GDP but negative oil shocks significantly caused output and the real exchange rate. Similarly, Alley et al. (2014) utilized GMM model to investigate the effect of oil price shocks on economic activities in Nigeria and concluded that oil price uncertainty reduces the level of economic activity in a small open oil-producing economy like Nigeria. Also, Nazir & Hameed (2015), investigated oil prices and GDP in Pakistan using data covering from 1972 to 2011 and concluded that oil prices affected real GDP negatively in the long run. Kiliçarslan & Dumrul (2017) conducted a similar study in Turkey and deployed SVAR analysis for the period from 2005Q1 to 2017Q2. The evidence confirmed that a rise in the price of crude oil elicited a decline in economic growth and increased crude oil prices, inflation and real exchange rate. The final set of studies on the relationship between oil price shocks and economic growth posit that the variables have no effect on each other. This is the position of Muhammad & Ghulam (2017) in their study of Pakistan.

Another set of studies investigate the effect of oil price changes on the consumer price index or inflation. Oil price changes will likely affect consumer prices since crude oil products constitute a direct input for many consumer goods (Sek et al., 2015). One of the earliest studies in this relationship was conducted in India by Bhattacharya & Bhattacharya (2001) using monthly data running from April 1994 to December 2000. Utilizing VAR models and impulse response function, they found that 20 percentage point shock in oil prices lead to a 1.3 percentage point increase in inflation in other commodities. Similarly, Dawson (2007) studied the OECD countries and found that a 1% increase in the oil price elicited a 2.9% depreciation in the real exchange rate. Also, Bermingham (2008) in a study of Ireland from 1996 to 2008 deployed Engle-Granger and ARDL approaches and found that the rising price of oil significantly affected inflation. Castillo et al. (2010) examined the case of United States of America. They isolated the average levels of the oil price and inflation to form three sub-samples, covering the periods 1970-1983, 1984-2002 and 2002-2008. They observed that an increase in oil price volatility triggers a higher level of inflation level. Ogundipe et al. (2014) used annual data spanning 1970 to 2011 to investigate the effects of oil price, exchange rate volatility, external reserves and interest rate in Nigeria. Using Johansen Co-integration and VECM techniques, they found that a proportionate change in oil price elicited a more than proportionate response from exchange rate volatility. Jiranyakul (2016) investigated Thailand data from 1993 to 2015 using the Johansen cointegration test and Granger causality tests. The study concluded that an oil price shock causes inflation index to rise while oil price uncertainty has no effect on the increase in inflation. Bala & Chin (2018) investigated the asymmetric effect of oil price shocks on inflation in small oil exporting economies like Nigeria, Libya, Algeria and Angola. Utilising the NARDL dynamic panels, they observed that both the positive and negative oil price changes affected the level of inflation. While examining the relationship between inflation, oil prices and exchange rate, Mukhtarov et al. (2019) studied Azerbaijan and utilized VECM technique on data covering the period 1995 to 2017. They found that

a 1% increase in oil prices and exchange rate causes inflation to increase by 0.58% and 1.81%, respectively.

The Market transactions concerning the purchase and sale of oil products and services are usually handled in US$. Therefore, any change in the price of oil affects the exchange rate of the countries that may be involved in oil transactions. For instance, an increase in the universal price of oil causes depreciation in the dollar of the oil importing countries and an appreciation of the country that exports the oil. Several studies have been conducted on the relationship between oil price changes and the exchange rate of the countries that may be buying or selling oil products and services. Olomola & Adejumo (2006) deployed VAR in the study of the effects of oil price shocks on output, money supply, real exchange rate and inflation in Nigeria. They found that oil price shocks have a significant effect on the real exchange rate in the long run. Similarly, Dawson (2007) studied the Nordic and OECD countries using multivariate econometric analysis and confirmed that oil price fluctuations significantly affected the relative value of currencies of the countries. More specifically, a 1% increase in the price of oil causes 2.9% depreciation in the real exchange rate in those countries. On the contrary, Huang & Guo (2007) in the study of China, conclude that real oil price shocks would only stimulate a minor appreciation of the real exchange rate in the long-term because of China's lean dependence on oil that is imported. Narayan et al. (2008) investigated the oil price-exchange rate nexus for Fiji Islands, adopting daily data over the period 2000 to 2006. Utilizing GARCH and EGARCH models, they observed that a rise in the price of oil induced an appreciation of the local currency (Fijian dollar) in relation to the US$. Coleman et al. (2010) examined the nonlinear relation between real exchange rate and real oil prices in 13 African countries using quarterly sample that span 1970Q1-2004Q4. They found that real oil prices and real exchange rates are co-integrated and that the price of oil plays an important role in real exchange rate determination. Studying the oil price-exchange rate linkage in Nigeria, Adeniyi et al. (2012) utilized monthly data covering the period 2009M1 to 2010M9. Deploying GARCH and EGARCH techniques, they affirmed that the rise in oil price stimulated an increase in the exchange rate in Nigeria over the period of study. Tiwari et al. (2013) utilized a wavelet transform framework on monthly data observations spanning the period 1986M2–2009M3. They confirmed that changes in oil prices have a strong influence on the real effective exchange rate fluctuations in both the short run and large time horizons.

Still on oil price shocks and currency exchange rates, Sibanda & Mlambo (2014), empirically examined the impact of oil prices on exchange rate in South Africa using monthly data covering the period between 1994 and 2012. They found that an increase in oil price stimulated a depreciation of the rand exchange rate. Oil price significantly impacted on the nominal exchange rate in South Africa. The effect of changes in price of oil on exchange rates in Nigeria was examined by Osuji (2015) using monthly data covering the period 2008M1 to 2014M12. Utilizing OLS and VECM, he observed that oil price movements have a significant causal effect on Exchange rate and the country's foreign reserves. Volkov & Yuhn (2016) investigated the relationship between oil price shocks and the volatility of exchange rate comparing the emerging markets with the developed and advanced markets. Using VECM and GARCH over the period 1998 - 12, they observed that oil price shock is significant in determining exchange rate in emerging markets (Russia, Brazil, and Mexico), but weak in advanced markets (Norway and Canada). In an effort to investigate the dynamics of oil price volatility between the US$/Euro exchange rate and the general oil market, Jawadi et al. (2016) deployed intraday

data in a GARCH volatility approach on a monthly data covering the period between 2014:9 to 2016:1. The analysis revealed that a negative relationship existed between oil returns and the US dollar/Euro rates, implying that an appreciation of the US$ reduced the price of oil in the market. Also, there is a volatility spillover to the general oil market from the US exchange market through the intraday jumps. In a study of six oil-dependent economies over the periods 2000-2007 and 2010-2016, Mensah et al. (2017) used Johansen Co-integration test to explore the relationship between oil price and exchange rate. They confirmed the existence of a growing inverse relationship between oil price and exchange rate, especially in the post-crisis period. Finally, while examining the dynamic effects of the various types of oil price shocks on the real exchange rates of countries that are net importer and exporter, Ji et al. (2020) adopted monthly data spanning from 1974:2 to 2016:12 and deployed an SVAR model. The study results show that oil supply shocks produced greater depreciating effects on exchange rates for the oil exporting countries than the importing countries.

Some studies have examined the relationship between oil price shocks and industrial output. Most of the studies agree that oil price shocks have a negative effect on the industrial output of the economies (Ahmed & Wadud, 2011; Awartani et al. 2019). Perhaps more recent studies have emerged on the effect of oil related activities on the sovereign risks of nations. For instance, in the study of the effect of oil volatility shocks on the sovereign risk of BRICs countries, Bouri et al. (2018) adopted monthly data from 2009:7 to 2017:3 and deployed a multivariate quantile regression. The findings underscored the presence of asymmetry between oil exporters and oil importers with the former being more sensitive to positive oil shocks while the latter showed more sensitivity to the negative oil shocks. While deploying daily data spanning from February 14th, 2011 to July 31st, 2019, Bouri (2019) examined the effect of oil jumps on the sovereign risk of some major world oil exporters. The results showed that the sovereign risk of the countries, though may not be affected by oil price jumps, were significantly impacted by oil volatility jumps indicating a contagion effect. While deploying a quantile-based approach in a study of oil-exporting and importing MENA countries, Bouri et al. (2020) examined how levels of oil volatility and returns affect the sovereign risk of countries in settings that are static and time-varying. They found that the sovereign risk of the countries in the study had specific implications for the oil crash of 2014-2016. The shocks in oil volatility and prices predicted the sovereign risk of the countries with spreads that are time varying and the oil returns impacts across quantiles that were asymmetric. The impacts of disaggregated oil price shocks on investor sentiments and uncertainties for both the short-run and long-run asymmetries was analysed by Shahzad et al. (2019) using the data span of 1995:1 to 2015:12 in a NARDL framework. They conclude that while oil demand shocks affected uncertainties, the oil supply shocks impacted treasury rates. Investor sentiments are affected by both the oil demand and supply shocks.

The gaps in the existing literature on the Nigerian economy stem from the fact that the existing studies like Iwayemi & Fowowe (2011), Omojolaibi (2013), Ogundipe et al., (2014) and Osuji (2015) on the Nigerian economy did not cover an extended period and utilized a limited number of variables. This study covers this lacuna by covering the period of oil price volatility in the world market (2015-2016) and utilizing six macroeconomic variables in the study. Also, studies of this nature which are conducted on a developing economy that produces and exports oil and imports the finished oil-based products are often very revealing at each stage because of the growing and dynamic nature of the global economy.

3. THEORETICAL FRAMEWORK

Within the economic growth literature, there are several growth theories that attempt to establish the relationship between oil price volatility and the macroeconomy or some parts thereof. In what follows, this study tries to briefly highlight four (4) of such theories, namely the Linear/symmetric relationship theory of growth, the Asymmetry-in-effect theory of economic growth, the Renaissance growth theory, and the Dutch disease theory of economic growth. The Linear/Symmetric relationship theory of growth postulates that the fluctuations in a country's total output (GDP) are often occasioned by the volatility in oil prices. Based on the theory, an inverse relationship exists between oil price volatility and the GDP growth in the economy. The pioneering work on this theory was done by Hamilton (1983). As a follow-up, Hooker (1996) building on the work of Hamilton confirmed that a 10% increase in oil price was associated with a 0.6% drop in GDP growth. Also, a similar conclusion was reached by Laser (1987) and Rotemberg & Woodford (1996). On the other hand, Lee et al. (1995) observed that such a sudden and unexpected increase in the price of oil, induced a significant and asymmetric effect on total output and other macroeconomic variables including personal incomes and other forms of earnings.

The Asymmetry-in-effect theory of economic growth proposes that a decline in oil prices is associated with no significant effect on the economic activities in the US and some OECD countries (Mork, 1989; Lee et al. 1995; Ferderer, 1996). For instance, Mork (1989) expanded the work of Hamilton (1983) by investigating the asymmetric response of oil price volatility by disintegrating oil price volatility into real price increases and decreases. The findings show that oil price drop is significantly different and perhaps zero. The results of Mork (1989) are reinforced in the study of Lee et al. (1995) when they examined the asymmetry-in effects during the period before and after 1985. Lee et al. (1995) were able to resolve the issue of whether the asymmetric effect is dependent on the macroeconomic variable or not. As a follow-up, Ferderer (1996) sought to explain the asymmetric relationship between oil price volatility and economic activity by introducing three possible activity channels: sectoral shocks, counter-inflationary monetary policy and uncertainty. Ferderer concluded that the asymmetric oil price-output relationship is partly explained by the responses found in asymmetric monetary policy.

The Renaissance growth theory is considered an extension/fall-out of the symmetric relationship theory of economic growth. The Renaissance growth theory attempts to examine the relative effect of oil price changes or oil price volatility on the level of economic activity of a country during a given time frame. Along this line, Lee (1998) concludes that oil price change and oil price volatility both affect economic growth negatively, but the effect of changes in oil prices wears out immediately after one year. Therefore, Lee (1998) confirmed that the long run appreciable effect on economic growth may be attributed to the volatility in oil prices rather than the changes in the oil price level.

The Dutch disease theory of economic growth posits that higher oil prices would generally alter the production structure of the oil-exporting country to ensure that it concentrates more on oil production and exploration while ignoring the growth of the other sectors of the economy. The accruing increased levels of oil revenues would make for the appreciation of the country's local currency and induce an increase in the country's taste for and import of consumer goods. Consequently, the tendency for increased import of consumer goods would reduce the competitiveness and discourage the local producers. Therefore, the Dutch disease theory contends that an increase in oil prices will not eventually benefit the economy of an oil exporting country (Corden & Neary, 1982).

4. THE MODEL

The dynamics of oil price can be modeled based on the theoretical postulations of Huang & Gio (2007) and Ahmed & Wadud (2011). Their postulation suggests that a stochastic process relates the oil price (Op_t) to the aggregate supply (S_t) and aggregate demand (D_t) activity of the economy at any point in time, hence:

$$OP_t = OP_{t-1} + \mathcal{E}_t^{OP} \tag{1}$$

Aggregate supply can be modeled as follows:

$$S_t = S_{t-1} + \mathcal{E}_t^{S} \tag{2}$$

Similarly, aggregate demand can also be modeled accordingly,

$$D_t = D_{t-1} + \mathcal{E}_t^{D} \tag{3}$$

However, the aggregate supply of output (Y_t^S) may be determined by the process of random walk which leads to equilibrium and the price of oil may now be given as,

$$Y_t^S = S_t + \beta_1 OP_t = S_{t-1} + \mathcal{E}_t^S + \beta_2 OP_t \tag{4}$$

Where, $\beta_1 and\ \beta_2$ are the coefficients of the elasticity of inverse energy of output. Similarly, the process of aggregate demand for output may also be determined by its own process of random walk and exchange rate (e),

$$Y_t^D = D_t + \psi_1 e_t = D_{t-1} + \mathcal{E}_t^D + \psi_2 e_t \tag{5}$$

Where $\psi_1 and\ \psi_2$ are the coefficients of elasticity of demand for energy output. Equations (4) and (5) are similar to the LM and IS form of the aggregate supply and aggregate demand models in macroeconomics which depict the aggregate domestic supply and demand prices for the output of oil in relation to the exchange rate and other macroeconomic variables like inflation, exchange rate, interest rate and industrial output. Huang and Guo (2007) have been able to demonstrate why the real GDP is affected by the supply output and the shocks in oil prices; hence, the oil price shocks can potentially affect the real oil price in the long run. The model to be estimated is represented as follows

$$GDPR_t = \alpha_0 + \alpha_1 OILP_{t1} + \alpha_2 INFL_{t2} + \alpha_3 INTR_{t3} + \alpha_4 EXR_{t4} + \alpha_5 IPI_{t6} + \mu_t - 6 \tag{6}$$

Where: $\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4\ and\ \alpha_5$ are the coefficients to be estimated and μ_t is the stochastic error term. Furthermore, GDPR represents Economic Growth; OIL is Oil Price; INFL is Inflation; INTR is Interest Rate; EXR is Exchange Rate and; IPI is Industrial Production Index.

4.1. Data Sources

The study uses SVAR model over the period 1981 to 2018, which provides 39 annual observations. The variables adopted include: crude oil price, economic growth, Inflation (Consumer Price), Interest rate, Exchange Rate and Industrial production index.

The source of data for this work is mainly secondary data from the World Development Indicators (World Bank). The data set for the variables on consumer prices and industrial production through the WDI source ends at 2018, at the time of writing this article. To standardize the variables, we use the natural logarithm for all variables. The full name, description and source of the data are presented in the table 1.

Table 1 Data and Variable Description

Variable	Full Name	Description	Source
OILP	Brent Crude Oil Price	UK Brent Crude Oil in US$ per barrel	UNCTAD
GDPR	Economic Growth	The annual growth rate (percentage) of GDP at market prices: Estimated as $\left(\frac{Y_t - Y_{t-1}}{Y_{t-1}}\right)\%$ for each year	WDI
INFL	Inflation	Consumer Prices at annual % change	WDI
INTR	Interest Rate	Lending rate at which Banks meet the short and medium-term financing needs of government and the private sector.	WDI
IPI	Industrial Production Index	Value added is the net output of Industrial sectors after adding up all outputs and subtracting intermediate inputs.	WDi
EXR	Exchange Rate	Price at which Nigeria local currency (Naira) exchange for one unit of US$	WDI

4.2. Analytical Framework

In the classical state, a VAR framework has all the variables endogenous and comprised in the set K observations as follows,

$$Y_t = (y_{1t}, y_{2t}, y_{3t}, \dots, y_{kt}) \tag{7}$$

For k = 1…p. Hence, the VAR (p)-process can be formally defined as:

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} \dots + A_p y_{t-p} + \mu_t \tag{8}$$

Where A_i are (K X K) coefficient matrices for i=1… p and μ_t is k-dimensioned with E(μ_t) = 0 and time-invariant with positively defined covariance matrix E ($\mu_t \mu_t^T$) = $\sum u$ (white noise). When given sufficient starting values, the VAR (p)-process is stable and generates stationary time series with reliable means, variances and covariance. A VAR (p) is a reduced form simultaneous equation model. The dynamics of the VAR indicators are obtained by a mechanical technique which is unrelated to economic theory. The Structural VAR technique was developed to account for the short-coming of VAR by imposing restrictions to make the technique more related to existing economic theory. SVAR model in its standard form can be defined as:

$$Ay_t = A_1^* y_{t-1} + A_2^* y_{t-2} + \cdots + A_p^* y_{t-p} + \beta \mathcal{E}_t \tag{9}$$

We can resolve equation (9) for y_t as follows:

$$Ay_t = A^{-1} A_1^* y_{t-1} + A^{-1} A_2^* y_{t-2} + \cdots + A^{-1} A_p^* y_{t-p} + A^{-1} \beta \mathcal{E}_t \tag{10}$$

Where A_i^* for I = 1...p represent the structural coefficients which in general form differ from the corresponding VAR form counterparts. The SVAR model is more adjusted to identify shocks through structural impulse response functions (IRF). The IRF demonstrates the dynamic responses of each variable to the present and future values of the other variables. The structural variance decompositions display the volume of information that each variable gives to the others in the autoregression as the variation in an endogenous variable is divided into component shocks of VAR and allocates the variance of forecast errors in a given variable to its own shocks and other variables. The SVAR model emphasizes

the imposition of restrictions through the inversion of stationary Vector Autoregressive Representation (VAR).

$$y_i = A_1^{-1}(L) + \mathcal{E}_t \tag{11}$$

Where y_i represents the vector of the variables which are to be included in the model and $A_1^{-1}(L)$ refers to the inverted coefficient matrix while $\mathcal{E}_t$ is the error term. To obtain the process of linear combinations which reflect past innovations in line with Wald compositions, we make $A_1^{-1}(L) = \Phi(L)$. Therefore,

$$y_t = \Phi(L)\mu_t = \sum_{h=0}^{\infty} \Phi_h \mu_{t-h} \quad - \quad - \quad - \quad - \tag{12}$$

To recover the unobservable relevant shocks $(\mathcal{E}_t)$ out of the observable reduced form innovations, a structural VAR representation is constituted through the imposition of a set of restrictions. Therefore, the Structural VAR form should be stipulated:

$$A_1 y_1 = \sum_{i=1}^{p} A_1^* y_{t-1} + \beta \mathcal{E}_t \qquad \mathcal{E}_t \sim N(0, 1_m) \quad - \quad - \quad - \tag{13}$$

Where: $y_1 = oil, gdp, infl, intr, ipi \,\&\, exr$ and refers to 4 X 1 vector of endogenous variables; A_1 is the (m x m) matrix of contemporaneous effects; A_1^* is the matrix (m x m) with lagged effects and B represents the (m x m) matrix of shocks referring to the "short-run response" matrix. The next in line is the structural equation that links $\mu_t \; to \; \mathcal{E}_t$ which takes account of the restriction. We can retrieve the reduced form residuals the SVAR model using;

$$\mu_t = A^{-1} B \mathcal{E}_t \tag{14}$$

A^{-1} can be estimated to obtain the vector of structural shocks. $A^{-1}B\mathcal{E}_t$ is the response of $y_1$to the structural shocks. Also, the variance-covariance matrix can be represented by

$$\mu_t = A^{-1} B B^T A^{-T} \tag{15}$$

Further adjustments to equation (15) will depend on the restrictions to be imposed (Lutkepohl 2006; Lutkepohl & Kratzig 2004). The structure of restrictions in the model is defined as $(k - 1)$. Hence the number of restrictions to be imposed can be shown:

$$\frac{k(k-1)}{2} \tag{16}$$

In this study, we handle the case of 6 variables SVAR which imposes the long-run C (1), matrix. The article by Kozluk & Mehrotra (2009) specifies the SVAR modeling procedure for a six-variable case. Note that the 0 element in the matrix means there are no contemporaneous response expectation from specific shock in that element. But, the nonzero elements a_{il} $(i = 1,2,3,4,5,6; j = 1,2,3,4,5,6)$ refer to the coefficients of the i'th element response to the shock of the jth element (Chen et al.,2016, p.45). The scheme in the matrix of equation (17) follows an order of relationship flowing from the exogenous to the endogenous variables. The SVAR restrictions in the matrix follow the constraints that flow from economic theory. Six restrictions are applied in tandem with economic theory.

According to the applicable $cholesky$ triangular factorization, the Structural VAR estimates of short run pattern can be shown as follows:

$$\text{Estimate of Matrix A} \begin{bmatrix} Variables \\ OILP_t \\ GDPR_t \\ INFL_t \\ INTR_t \\ EXR_t \\ IPI_t \end{bmatrix} \begin{bmatrix} GDPR_t & OILP_t & INFL_t & INTR_t & EXR_t & IPI_t \\ 1 & 0 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & 0 & 0 \\ a_{31} & a_{32} & 1 & 0 & 0 & 0 \\ a_{41} & a_{42} & a_{43} & 1 & 0 & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & 1 & 0 \\ a_{61} & a_{62} & a_{63} & a_{64} & a_{65} & 1 \end{bmatrix} \quad (17)$$

$$\text{Estimate of Matrix B} \begin{bmatrix} Variables \\ OILP_t \\ GDPR_t \\ INFL_t \\ INTR_t \\ IPI_t \\ EXR_t \end{bmatrix} \begin{bmatrix} GDPR_t & OILP_t & INFL_t & INTR_t & EXR_t & IPI_t \\ a_{11} & 0 & 0 & 0 & 0 & 0 \\ 0 & a_{22} & 0 & 0 & 0 & 0 \\ 0 & 0 & a_{33} & 0 & 0 & 0 \\ 0 & 0 & 0 & a_{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & a_{55} & 0 \\ 0 & 0 & 0 & 0 & 0 & a_{66} \end{bmatrix} \quad (18)$$

One, oil price is exogenously determined and is not affected by a developing country and minimal producer like Nigeria (Amaiquema & Amaiquema, 2017). Two, Economic growth does not respond simultaneously to any changes in the domestic variables in the equation (Kiliçarslan & Dumrul, 2017). Three, inflation is mainly affected by changes in GDP and oil price. Four, interest rate is not simultaneously affected by exchange rate and industrial output. Finally, while industrial output may not directly be affected by only exchange rate, there are no restrictions on the effect on exchange rate by all the other variables (Basnet & Upadhyaya, 2015).

5. Empirical Analysis and Results

5.1. Descriptive Statistics

This sub-section of the study discusses the statistical properties of the variables that are used in the study. The features that are presented include the mean, median, standard deviation, kurtosis, Jarque–Bera and probability. The results are presented in table 2. The means of oil price, economic growth, inflation interest rate, industrial production index and exchange rate are 3.54, 11.28, 2.68, 2.85, 3.37 and 3.52 respectively. Furthermore, the maximum values associated with the variables are 4.60, 14.17, 4.29, 3.45, 3.63 and 5.72 for oil price, economic growth, inflation interest rate, industrial production index and exchange rate. On the other hand, the minimum values associated with the variables are 2.67, 6.57, 1.68, 2.24, 2.89 and -0.39 for oil price, economic growth, inflation, interest rate, industrial production index and exchange rate respectively. The period of analysis for the variables covers from 1981 to 2018 making 38 observations for all the variables except for the GDP which has 37 observations because of the differencing factor. The variables with the highest variability (standard deviation) for the period are GDP and exchange rate with 2.37 and 1.89 respectively. The peak for the distribution which is measured by kurtosis shows that only interest rate with a value of 3.49 is above 3.0.

Table 2 Descriptive Statistics

	LOIL	LDGDP	LINFL	LINT	LIPI	LEXR
Mean	3.5435	11.2802	2.6762	2.8547	3.3660	3.5229
Median	3.3701	11.7992	2.5301	2.8670	3.3570	4.6220
Maximum	4.6019	14.1671	4.2882	3.4547	3.6299	5.7239
Minimum	2.6686	6.5658	1.6842	2.2443	2.8999	-0.3953
Std. Dev.	0.6285	2.3695	0.7081	0.2783	0.1879	1.8923
Skewness	0.3638	-0.6229	0.8704	-0.6852	-0.5023	-0.8173
Kurtosis	1.7694	2.1344	2.7902	3.4951	2.4876	2.4294
Jarque-Bera	3.1511	3.5478	4.7399	3.2732	1.9607	4.6214
Probability	0.2069	0.1697	0.0935	0.1946	0.3752	0.0992
Observations	38	37	38	38	38	38

Author's Computation

Since all other variables of the distribution have kurtosis value less than 3, the distribution can be classified as platykurtic (short-tailed and fat). The probability values for the distribution are compared to the Jarque-Bera test of normality, to decide the asymptotic test. The table shows that the probability values are low for all the variables, the means are nearly equal to the medians, hence we conclude that the residuals for the distribution are normally distributed.

5.2. Time Series Properties: Unit Root Test

The unit root test for the study is conducted using the Augmented Dickey-Fuller (ADF) Approach.

The unit root test is performed on all the variables in the study (oil price, GDP, inflation, interest rate, industrial production index and exchange rate) and the results presented in Table 3. The values of the t-statistics became greater that the test critical values at 1%, 5% and 10% at first difference I (1). The probability values at first difference confirm the stationarity of all the variables at the level of integration. At the level of the joint stationarity test, the Fisher Chi-square value is 146.42 with probability of zero and the Choi Z-statistic value is -10.75 with probability of zero also. Therefore, the unit root test shows that all the variables are integrated at order of first difference [I(1)].

Table 3 Unit Root Test with ADF

Method			Statistic	Prob.*	
ADF - Fisher Chi-square			146.421	0.0000	
ADF - Choi Z-stat			-10.7456	0.0000	
Series	t-stat	Prob.	Order of Integrtn	Max Lag	Obs
L(OILP)	-5.8071	0.0000	I(1)	2	35
L(DGDP)	-8.3071	0.0000	I(1)	2	35
L(INFL)	-6.7757	0.0000	I(1)	2	35
L(INTR)	-5.9557	0.0000	I(1)	2	35
L(IPI)	-6.4684	0.0000	I(1)	2	35
L(EXR)	-5.1702	0.0001	I(1)	2	35
Test critical values:	1% level		-3.626784		
	5% level		-2.945842		
	10% level		-2.611531		

Source: Author's Computation

5.3. Optimal Lag Selection

The optimal lag selection process is shown in Table 4. The lag that is selected to be used for our SVAR analysis as indicated by AIC and SC is lag four. Therefore, the lag to be used for our analysis of the SVAR is lag four.

Table 4 Optimal Lag Selection

VAR Lag Order Selection Criteria
Endogenous variables: LOIL LDGDP LINFL LINT LIPI LEXR

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-77.47337	NA	6.34E-06	5.058992	5.331084	5.150543
1	59.46202	215.777	1.45E-08	-1.058304	0.846342	-0.417449
2	119.6029	72.898	4.24E-09	-2.521386	1.015814	-1.331226
3	177.6855	49.28226	2.23E-09	-3.859729	1.310024	-2.120265
4	305.8503	62.1405*	5.21e-11*	-9.4455*	-2.6432*	-7.1567*

* indicates order of lag selected based on criterion
LR: Modified LR test statistic (test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: Author's Computation

5.4. Structural VAR Estimates

Table 5 shows the results of the structural VAR analysis in the study. The effect of oil price on the macroeconomic variables is shown in the first column of the table. The effect of oil price shock on the country's GDP and Industrial Production is negative and significant. On the other hand, the effect of oil price shock on inflation and interest rate is positive and significant. However, the effect of oil price shock on exchange rate is positive, but not significant. In other words, an increase in the price of crude oil in Nigeria elicits a decrease in GDP and industrial output. On the other hand, a decrease in the price of crude oil is accompanied by an increase in inflation, interest rate and exchange rate.

Table 5 Results of Structural VAR Test

	OILP	GDP	INFL	INTR	IPI	EXR
OILP	0.2561***					
	'(0.0000)					
GDP	-0.7567***	0.3406***				
	(0.0010)	(0.0000)				
INFL	0.8130**	-0.5970***	0.4750***			
	(0.0233)	(0.0093)	(0.0000)			
INTR	0.0739	0.0079	0.0497	0.1116***		
	(0.4126)	(8936)	(0.2105)	(0.0000)		
IPI	-0.1860***	-0.0858***	-0.0104	-0.0679	0.0444***	
	(0.0000)	(0.0003)	(0.5198)	(0.3127)	(0.0000)	
EXR	0.2358	-0.2436***	0.2928***	-0.6512***	-0.2326	0.1443***
	(0.1302)	(0.0065)	(0.0000)	(0.0033)	(0.6718)	(0.0000)

Note: ***, ** and * indicate significant at 1% , 5% and 10% levels respectively.
Source: Author's Computation

5.5. SVAR Impulse Response

This study applies the framework of impulse-response function to analyze and interpret the interaction between the variables of study in the short-run. The impulse-response function shows the responses of other variables like economic growth, inflation, interest rate, industrial production and exchange rate to one-time shock changes in oil price. This study performs the Cholesky decomposition on the SVAR Equation (17) and examines the responses of economic growth, inflation, interest rate, industrial output and official exchange rate to oil price shocks. Figure 1 shows the results of impulse-response functions for the responses of key macroeconomic variables to oil price shocks in Nigeria.

The first diagram in Figure 1 shows the response of oil prices to a shock from itself. The effect starts with a negative response and maintains it up to the 4th period. The effect turns positive up to the 6th period when it becomes negative. The negative trend is maintained until the 8th period when it becomes damp. On the overall scale, the short run response of oil price to a shock by itself is negative.

The second diagram in Figure 1 shows the response of GDP (economic growth) to short term oil price shocks. The initial response of GDP to oil price shock is negative up to the 2nd period when it turns positive. The upward trend is maintained up until the 5th period. Thereafter, a negative trend emerges until the 8th period when it becomes damp until the 10th period. The overall short-run effect of oil price shock on GDP in Nigeria appears to be indeterminate.

The third diagram in Figure 1 illustrates the response of inflation to short term oil price shocks. The starting response of inflation to oil price shocks is positive and maintained up to the 5th period. From the 5th period to the 8th period, the response is negative and becomes positive again to the 10th period. The overall response of inflation to oil price shocks in Nigeria is positive.

The fourth diagram in Figure 1, shows the response of interest rate to oil price shocks in the short term. The initial response of interest rate is a mild negative up to the 4th period. Thereafter, it turns mildly positive, gets to the 6th period and becomes negative again. From the 8th period, it becomes positive till the 10th period. The average effect of oil price shock on interest rate is mild, damp and can be largely regarded as indeterminate.

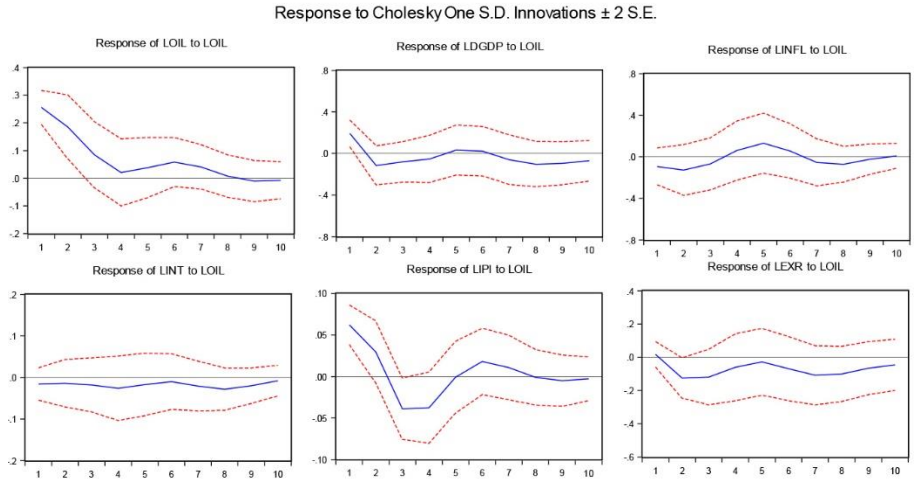

Fig. 1 Impulse-Response Function

The fifth diagram in Figure 1 shows the response of industrial production to oil price shocks in the short term. The starting response of industrial output to oil price shock is a dramatic decline before it becomes flat between the 3rd and 4th periods. This is followed by a sharp increase up to the 6th period. Thereafter, it declines mildly up until the 9th period when it becomes damp till the end. The overall response of industrial output to oil price shocks is very dramatic and has both positives and negatives.

The sixth diagram in Figure 1 depicts the short term response of exchange rate to oil price shocks in Nigeria. The response of exchange rate starts with a sharp decline and flattens out between the 2nd and 3rd periods. This is followed with a positive which peaks in the 5th period before becoming negative. The decline from the 5th period flattens out between the 7th and 8th periods when it rises gently until the end.

6. CONCLUSIONS

This study examines the effect of oil price shocks on macroeconomic variables in Nigeria utilizing annual data over the period 1981 to 2018. Specifically, the study investigated the effect of oil price shocks on economic growth, inflation, interest rate, industrial production and exchange rate. Nigeria, as a small economy that is crude oil exporting and importer of finished oil products, makes the country an interesting case study. Several authors have written on the effect of oil price shocks on developing countries, but very few studies have focused on more than four variables with an expanded period to cover the recent times that witnessed the massive volatility in world oil prices. The study utilized the Structural VAR approach and specifically examined the long-run effect among the variables as well as the short-run impulse response function. The findings in the study suggest that oil price shocks have significantly and negatively affected economic growth and industrial output in Nigeria. This position is in tandem with studies like Bekhet & Yusop (2009), Alley et al. (2014) and Kiliçarslan & Dumrul (2017). However, the conclusion is at variance with Omojolaibi (2013), Igberaese, (2013), Yukata (2015) and Ifeanyi & Ayenajeh (2016). The other set of results in the study shows that oil price shocks have significant positive effect on inflation. Also, while the effect is positive on interest rate and exchange rate, the result is not significant. The impulse response function shows that oil price shocks have negative effect on oil price changes. The results of impulse response function show a negative effect on output growth, while the effect on inflation is positive. While the effect of impulse response function of oil price shocks on industrial production shows large fluctuations, the effect on interest rate and exchange rate is minimal, largely mild and damp.

The findings in this study confirm that the response of the Nigerian economy to oil price shocks falls in tandem with the Renaissance theory of economic growth and the Dutch Disease theory of economic growth. First, the Renaissance theory is operational because an increase in oil price shock is not accompanied by economic growth. Second, the discovery and production of oil in Nigeria has led to the neglect of the other producing sectors of the economy over the years and stimulated the import of consumer goods. This is in line with the Dutch disease theory of economic growth. Nigeria's earnings from non-oil exports are less than 15% of total exports. It explains why the country runs into balance of payments problems any time the earnings from oil export drop. Also, Nigeria's industrial sector is heavily dependent on the external sector for raw material inputs. The heavy dependence of the economy on the external sector makes it very vulnerable to the shocks and volatility from the external sector.

The results from this study like several others: (Omojolaibi, 2013; Khuram et al. 2015; Ifeanyi & Ayenajeh, 2016) show that oil price shocks are a significant cause of macroeconomic fluctuation in oil-importing and exporting small and developing economies like Nigeria. Important macroeconomic variables like output growth, inflation, industrial production and exchange rate may be adversely affected by oil price volatility and shock. The diversification policy direction entails the conscious development of other important producing sectors of the economy like agriculture and industry. With the abundance of natural resources, the country can emphasize production and semi processing activities in the mines and mineral subsector of the economy. The government should encourage export-oriented operators with modern technological content and appropriate incentives in these sectors of the economy. This policy direction for the oil importing developing economy is to isolate the real sector from the vagaries of oil price volatility and diversify the export earning capability of the nation. Therefore, the policy recommendation would ensure that the government pursues the economic diversification that would reduce the nation's over-dependence on oil.

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CENOVNI ŠOKOVI NAFTE I MAKROEKONOMSKE PERFORMANSE NIGERIJSKE EKONOMIJE: STRUKTURALNI VAR PRISTUP

Ovaj rad proučava efekte cenovnih šokova nafte na makroekonomski performans Nigerijske privrede u periodu od 1980 do 2018. Uticaj cenovnih šokova nafte se proučava na makroekonomskim varijablama kao što su: rast proizvodnje, inflacija, kamata, devizni kurs i indeks industrijske proizvodnje koristeći SVAR pristup (strukturna vektorska autoregresija). Rezultati istraživanja su pokazali da cenovni šokovi nafte značajno i negativno utiču na ekonomski razvoj i industrijsku proizvodnju. Dalje, iako rezulteti pokazuju da cenovni šokovi nafte imaju značajan pozitivni uticaj na inflaciju, njihov efekat je pozitivan i na kamatu i devizni kurs, ali ne značajno. Rezultati funkcije impulsnog odziva pokazuju negativan uticaj na rast proizvodnje, pozitivan na inflaciju ali umeren i neodređen na industrijsku proizvodnju, kamatu i devizni kurs. Na osnovu nalaza ove studije, teorije "renesanse" i "holandske bolesti" ekonomskog razvoja primenjive su na nigerisjku ekonomiju. Preporuke za donosioce odluka uključuju izdvajanje realnog sektora zemlje iz hirovitosti cene nafte i potragu za ekonomskom diverzifikacijom da bi se smanjilo prekomerno oslanjanje na naftu.

Ključne reči: *Cena nafte; Ekonomski rast; Inflacija; Devizni kurs; Industrijska proizvodnja; SVAR*

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THE IMPACT OF BRAND VALUE ON MARKET PERFORMANCE INDICATORS OF HIGH-TECHNOLOGY ENTERPRISES

UDC 003.65

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Abstract. *Brand valuation gained in importance in the 1980s, when a difference between the price at which some enterprises are bought and their value, according to the balance sheet, was noticed. Brand value can be considered an intangible asset of an enterprise, whose impact on the market performance indicators must be taken into account. This paper examines the relationship between brand value and selected market performance indicators using correlation and regression analysis. The analysis is based on Interbrand data on brand value and annual reports of selected enterprises from high-technology sector. The sample included top 5 enterprises from high - technology sector, whose corporate brands are on the list of the 100 most valuable brands, in all years of the analysed eight-year period (from 2012 to 2019). This paper discovered a statistically significant positive relationship between brand value and market performance indicators and that brand value positively influences those performances of high - technology enterprises. The focus of this study is on the following market performance indicators: market capitalization, Tobin's Q, market to book ratio and earnings per share. The research contributes to the field of brand value management and emphasizes the importance of investments in corporate branding process.*

Keywords: *brand value, market performance, market capitalization, Tobin's Q, market to book ratio, earnings per share*

JEL Classification: M21, M31, M40

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INTRODUCTION

For decades, the value of an enterprise has been expressed based on material, tangible resources, such as buildings, equipment and land. However, in the era of the knowledge-based economy, the importance of financial and physical resources is decreasing and intellectual/intangible resources are becoming increasingly important. Drucker (1994) has pointed out that the key to the enterprise's growth is the knowledge of not only employees but also other company stakeholders. The knowledge contained in the management structure of the company, business processes, information systems, patents, brands and other forms of intangible assets becomes a source of gaining and maintaining competitive advantage and improving business performance.

The brand valuation concept originates from the UK, from the early 1980s, due to several mergers, joint ventures and licensing. Primarily, the goal was to improve company management and create value for company stakeholders (Davidson, 1998). The history of brand valuation began in 1984, when the News Group included the valuation of publishing titles in its balance sheet and as a result, improved debt-to-equity ratio (Blackett, 1991). In the mid-1980s, companies realized the importance of the brand and the need for brand valuation, when a consulting firm, Interbrand, conducted the first brand valuation for Rank Hovis McDougall company. The goal of this company was to show the value of the brand in the balance sheet and thus improve the company takeover bid that was given (Seetharaman et al., 2001). In the late 1980s, many companies were sold at a price that is several times higher than the value of these companies, according to data from the balance sheet and other company's financial statements (Kapferer, 2012, p. 2). It was observed that for companies with recognizable brands, acquirers were willing to pay much more than the net value of those enterprise's assets.[2] In this way, buyers have purchased already built customer opinions on products with the brand, which is a guarantee of future earnings. Brand value derives from a brand's ability to generate cash-flows in the long run for the enterprise that owns it.

There are many reasons why brand value plays an important role for modern companies that invest in intellectual resources, especially for companies whose business does not depend on fixed assets but human capital and other intangible resources. Such is the case with enterprises in the IT sector. Some of the reasons are the following: connection of the brand valuation model with the enterprise's business model, better allocation of resources, more successful management of the brand portfolio, merger and acquisition planning, tax planning, better communication with internal and external stakeholders of the company (especially with investors), better borrowing conditions, licensing and franchising (Brand Finance, 2000, p. 7). Therefore, different models of brand valuation have been developed. It can be divided into two groups - methods based on consumer perception and methods for determining the financial value of the brand (Krstić et al., 2014; Popović et al., 2015).

The aim of this paper is to indicate the relationship between brand value and market performance indicators. The growing concern for the influence of brand value was transferred to the high–technology sector as well, especially because this sector is characterised by companies with a significantly high value of brands. This paper should point out the importance of investing in the branding process and the importance of brand management

[2] For example, during that period, Nestlé bought Rowntree, Danone bought Nabisco's European business and Grand Metropolitan bought Pillsbury for prices that were significantly higher than the value of the tangible asset of the acquired enterprises, given that it was, in fact, a purchase of recognizable brands (Seetharaman et al., 2001).

in enterprises from the high–technology sector. The research plays an important role because it demonstrates that, by investing in brand value, such companies can improve their market performance. This field of research is becoming increasingly important with increasing corporate investment in intangible assets by companies from the high–technology sector, while intangible assets are becoming dominant in the era of the knowledge economy.

The paper is structured into three parts. In the first part, a literature overview is given - different understandings of the concept of brand value and brand equity and their differences. The theoretical aspect of the relationship between brand value and selected market performance indicators is also presented. The second section includes the methodology of the research and the last part gives the discussion of the study results.

1. Literature Review

1.1. Brand value or brand equity

Before statistical analysis, it is necessary to make a distinction between the terms brand value and brand equity, which are often used as synonyms in the literature. However, there are some differences.

The concept of brand equity appeared in 1980 (Buzdar et al., 2016). There are different definitions of this term as well as different understandings of the dimensions involved in this concept. Aaker (1991) defines brand equity through four dimensions – brand awareness, associations, perceived quality and brand loyalty. Similarly, Yoo and Donthu (2001) argue that the concept of brand equity includes three dimensions: brand awareness, brand loyalty and perceived quality. Christodoulides and De Chernatony (2010) point to certain perspectives involved in this concept. They make the difference between firm-based brand equity - the financial perspective of brand equity and consumer-based brand equity. Some authors (Shankar et al., 2008) developed a model of brand equity that includes financial and consumer perspective. Those dimensions of brand equity are based on offering value and relative brand importance. The first term refers to the net present value of the products with a recognizable brand. It requires forecasting of revenues and margin ratios. Relative brand importance represents factors of brand image, such as: "brand reputation, brand uniqueness, brand fit, brand associations, brand trust, brand innovation, brand regard, and brand fame" (Shankar et al., 2008).

There is no consensus in the literature on which concept - brand value or brand equity, is a broader concept. Feldwick (1996) considers that there are 3 meanings of brand equity – 1) brand description, which is a synonym for the brand image; 2) brand strength, which is a synonym for brand loyalty; and 3) brand value as a monetary category. It can be concluded that according to this approach, brand equity is a broader concept than the concept of brand value since it includes both the monetary value of the brand and the subjective dimensions. Doyle (2001) considers that brand value refers to relationships in value creation and brand equity includes an assessment of value created in this way. Raggio and Leone (2007) point out the brand value to be a broader concept than brand equity. They stated that "brand value represents what the brand means to a focal company". In their opinion, brand value is defined as the sale value of a brand. Brand equity plays an important role because it can affect the higher financial results of brand value since it exists within consumers and can influence their behaviour.

In this research, the term "brand value" will be used, which includes the value from the consumer's point of view, as well as the financial dimension of a brand.

1.2. Brand value as a determinant of market performance indicators

Many studies indicate the impact of brand value on the enterprises's business performance, both financial (Yoo et al., 2000; Kim et al., 2003; Yeung & Ramasamy, 2008; Mohan & Sequeira, 2013; Mizik, 2014; Arora & Chaudhary, 2016; Veljković & Kaličanin, 2016) and market performance (Barth et al., 1998; Kerin & Sethuraman, 1998; Yeung & Ramasamy, 2008; Mohan & Sequeira, 2013; Hsu et al., 2013; Kirk et al., 2013; Krstić, 2014, p. 196; Mizik, 2014; Arora & Chaudhary, 2016; Topuz & Akşit, 2016; Matsumura et al., 2019).

1.2.1. The link between brand value and key market performance indicators

Copraro and Srivastava (1997) analysed market to book ratios (MB ratios) of Fortune 500 enterprises and demonstrated that more than 70% of the market value is based on intangible assets of those enterprises. Research shows that there is a correlation between brand value and stock market value (Bart et al., 2003; Kirk et al., 2012). These authors also point to the impact of brand value on earnings per share (EPS). They claim that brand value provides relevant information about future EPS.

Other studies confirm the strong influence of the brand on the share price (Dutordoir et al., 2015). Topuz and Akşit (2016) concluded that brand value has a positive and statistically significant effect on stock prices. While some other authors (Basgoze et al., 2016) consider that there is an impact of brand value on stock prices; however, this relationship is based on the relatively long run. It means that it takes a long time for the market response to change brand value. Verbeeten and Vijn (2010) claim that the financial value of a brand is a factor that affects the stock prices of an enterprise. Observing data from the 100 Global Brands from 2001 to 2010, Hsu et al. (2013) confirmed a positive correlation between brand value and stock performance (brand value is positively correlated with year-end share price). These analyses, thus, indirectly indicate the influence of brand values on market capitalization. And other authors point to a link between brand value and stock market performance indicators (Yeung & Ramasamy, 2008). De Mortanges and Van Riel (2003) also concluded that brand value significantly affects enterprise value. When it comes to the direct impact of brand value on market capitalization, Madden et al. (2006) argue that brand value, according to Interbrand methodology, includes 37% of enterprise's market capitalization, on average. Moreover, other authors emphasize the close connection between brand value and market capitalization (Matsumura et al., 2019).

The impact of brand value on market performance can be observed through the impact of this value on MB ratio, which indicates the relationship between the market value of the enterprise and the enterprise's value according to the financial statements. Lev (1997) suggests that the average MB ratio increased from 2:1 in the late 1980s to 3:1 in the mid-1990s, which is due to the enterprise's intangible resources. He further concludes that in the early 2000s, of every 6 dollars market value, only 1 dollar was shown in the balance sheet, indicating that 5 dollars represent the enterprise's intangible assets (Lev, 2001, p. 8). Kerin and Sethuraman (1998) analysed the relationship between brand value and MB ratio among 50 US consumer goods enterprises. They concluded that enterprises with higher brand value have higher MB ratios. It confirmed a positive relationship between brand value and MB ratio. This research also led to the conclusion that brand value explains as much as 40 per cent of the difference in MB ratios between enterprises. They showed that the relationship is concave with decreasing returns to scale.

It indicates that, when the accumulated brand value is small, the increase in the enterprise's MB ratio is higher, but enterprises with high accumulated brand value exhibit a relatively modest increase in MB ratio. Rasti and Gharibvand (2013) claim that the growth of brand value affects book value, which indirectly indicates the impact of brand value growth on MB ratio, but also on Tobin's Q.

Tobin's Q is the ratio of the company's market value to the replacement cost of assets shown in the balance sheet (Tobin, 1969; 1978). The research of Varaiya et al. (1987) indicates that management creates value for stakeholders if MB ratio of the company is higher than 1. It means, to create value in a company, the market value of the company must be higher than its book value. This indicates an important influence of market value on value creation. This study shows that MB ratio and Tobin's Q are theoretically and empirically, equivalent measures of value creation. Hirschey and Weygandt (1985) concluded that advertising and R&D expenditure, which are determinants of brand value, have positive and significant effects on Tobin's Q. The study of Berzkalne and Zelgalve (2014), which included 65 Baltic listed companies over the period from 2005 to 2011, indicates that an increase in intangible assets (in which a large part is brand value) leads to increase in Tobin's Q.

The empirical part of the research includes examining the influence of brand value on selected market performance indicators. Therefore, based on the theoretical aspect of these relationships which were given in the previous section, the following research hypothesis will be tested:

Hypothesis H1: Brand value is a significant contributor to market performance.

2. Methodology of Research

Data collecting procedure. The study focuses on the impact of brand value on the market performance. To do so, secondary data was used collected from the annual reports (balance sheet, income statement, cash flow statement, statement of changes in equity, notes to the financial statements) of the analysed enterprises. Furthermore, information from the official websites of the sample enterprises is also used to provide the necessary information.

Instruments. The research is based on the data of five indicators: brand value, market capitalization, Tobin's Q, MB ratio and EPS. Data for the brand value is obtained from the brand value evaluation done by Interbrand methodology. Market capitalization is calculated according to Sontakke (2016) by multiplying the market price per share with the total number of outstanding shares. Tobin's Q is calculated as a ratio of market capitalization and total assets (Lindenberg & Ross, 1981; Perfect & Wiles, 1994), while MB ratio is a ratio of market capitalization and net asset of an enterprise (Chen et al., 2005; Yu et al., 2010). Lastly, EPS were measured by dividing net income attributable to shareholders of parent enterprise by the total number of outstanding shares (Balsam & Lipka, 1998; Slavin, & Yun, 2001; Arora & Chaudhary, 2016).

Sample. The sample included top 5 enterprises from high-technology sector, whose brands are on the list of the 100 most valuable brands according to the Interbrand methodology (Krstić & Popović, 2011), taking into account only top 5 enterprises whose corporate brands are on this list in all years of the analysed eight-year period from 2012 to 2019. These are the following: Apple, Microsoft, IBM, Intel, and Cisco (Table 1).

Table 1 Enterprises and their brand value for the period 2012-2019, in millions of dollars

Name	Average brand value
Apple	159,377
Microsoft	75,072
IBM	59,295
Intel	38,264
Cisco	31,257

Source: Authors' calculations based on the Interbrand survey from 2012 to 2019

Statistical technique. IBM program SPSS (version 26) was employed for analysing the data. Firstly, descriptive analysis was applied to present the main characteristics of the sample. Before conducting parametric tests for measuring relationship and influence of variables, normality tests were applied. Hence, the hypothesis of normally distributed data was not met, all variables have been transformed by taking their logarithm. Secondly, for testing the proposed hypothesis, Pearson's correlation and simple linear regression analysis were applied. For Pearson's correlation coefficient, values of ± .10 present small, ± .30 medium effect and ± .50 large practical effect (Cohen, 1992). The significance level of $p<.05$ was used as a cut-off point.

Model formulation. The study used simple linear regression models that allowed investigating the impact of brand value on market performance of the top 5 high- technology enterprises. The similar research was conducted by Arora and Chaudhary (2016) where they tested an impact of brand value on the financial performance of Indian banks. In our model, brand value was predictor variable while the other four variables were dependent. Therefore, the following models were defined:

$$\text{1st model Market capitalization} = \alpha + \beta\text{Brand value} + \varepsilon \quad (1)$$

$$\text{2nd model Tobin's Q} = \alpha + \beta\text{Brand value} + \varepsilon \quad (2)$$

$$\text{3rd model Market to book ratio} = \alpha + \beta\text{Brand value} + \varepsilon \quad (3)$$

$$\text{4th model Earnings per share} = \alpha + \beta\text{Brand value} + \varepsilon \quad (4)$$

3. THE RESULTS AND DISCUSSION

In this section, the findings and discussion on the relationship and influence of enterprise's brand value on market capitalization, Tobin's Q, MB ratio and EPS will be presented.

Table 2 Descriptive statistical analysis of variables

Variable	N	Minimum	Maximum	Mean	St. Deviation
Brand value (in million $)	40	27,197.00	234,241.00	72,653.00	53,305.40
Market capitalization (in million $)	40	84,626.64	1,105,000.00	345,032.10	281,896.12
Tobin's Q	40	.78	3.61	1.86	.69
MB ratio	40	1.65	13.40	5.46	3.09
EPS (in $)	40	1.20	15.64	5.56	4.42

Source: Authors' calculations

Descriptive statistical analysis was used to present minimum, maximum, mean and standard deviation values of researched variables. Table 2 presents the obtained results of the variables analysed in this paper. The average brand value of researched enterprises is 72,653 (St. dev. = 281,896.12) millions of dollars for the eight years, while this value ranges from 27,197 to 234,241 millions of dollars. Market capitalization ranges from 84,626.64 to 1,105,000.00 millions of dollars and mean market capitalization was 345,032.10 (St. dev. = 281,896.12) millions of dollars. Additional data of researched variables are given in Table 2.

In the following table, correlations between brand value and market performance indicators are presented.

Table 3 Correlations between researched variables

	1	2	3	4	5
1. Brand value	1	.861**	.635**	.644**	.625**
2. Market capitalization		1	.888**	.482**	.284
3. Tobin's Q			1	.379*	.069
4. MB ratio				1	.742**
5. EPS					1

Note: **Significant at 0.01; *significant at 0.05
Source: Authors' calculations

Table 3 shows that among most of researched variables there exists significant and positive correlation. The Pearson correlation coefficient between brand value and market capitalization of $r = 0.861$ ($p < 0.05$, large practical effect) indicates that there is a strong and positive relationship between these variables. Furthermore, brand value correlates significantly and positively with Tobin's Q ($r = 0.635$, $p < 0.05$, large practical effect), MB ratio ($r = 0.644$, $p < 0.05$, large practical effect), and EPS ($r = 0.625$, $p < 0.05$, large practical effect). Additionally, this analysis has confirmed that when the value of enterprise's brand increases, firm market performance will increase likewise.

Simple linear regression analysis was conducted to test the proposed research hypothesis stating that brand value is a significant contributor to market performance. The succeeding table gives an overview of the results obtained.

Table 4 Linear regression results

	1st model	2nd model	3rd model	4th model
Dependent variable	Market capitalization	Tobin's Q	MB ratio	EPS
Brand value (β)	1.036***	.392***	.607***	.835***
R square	.741	.403	.415	.391
Adjusted R^2	.734	.388	.399	.375
Change R^2	.741***	.403***	.415***	.391***
F	108.542***	25.685***	26.944***	24.382***

Note: ***Significant at 0.001
Source: Authors' calculations

Table 4 reflects that in the first model brand value has a statistically significant positive influence on market capitalization. R square = 0.741 indicates that 74.1% of the

variation in market capitalization is explained by brand value. The regression model is statistically significant ($F = 108.542$; $p < 0.05$). The second model shows that brand value influences 40.3% of variations in Tobin's Q (R square = 0.403) and the model is statistically significant ($F = 25.685$; $p < 0.05$). Similarly, in the third model, brand value explains 41.5% of changes in MB ratio (R square = 0.415). F statistics of this model is 26.944 and statistically significant at the level of 0.000 ($p < 0.05$). Lastly, the fourth model points out that brand value explains 39.1% variations in EPS and F statistics indicates that there is a model fit between the independent and dependent variable ($F = 24.382$; $p < 0.05$). In all four models, the beta coefficient is statistically significant ($p < 0.05$) and has a positive value indicating the positive influence of brand value on researched variables.

Previous results point out that hypothesis H1 stating that brand value is a significant contributor to market performance is confirmed.

The results of our study are in the line with Matsumura et al. (2019) who have found a significantly high correlation between brand values and market capitalization of Japanese companies ($r=0.864152$, $p < 0.01$). Yang et al. (2018) revealed a positive correlation between brand value and EPS of Taiwan-based businesses. Another study of Eng and Keh (2007) detected that an advertising expense has a positive correlation with brand value. Consequently, brand value has a significant positive correlation with brand sales and brand-operating income and an increase in brand value would lead to an increase in these indicators. They conclude that spending on advertising is beneficial for brand sales and brand profitability, whereas brand value is a good predictor of brand performance.

Arora and Chaudhary (2016) researched the impact of brand value on the financial performance of the top ten Indian banks during the period from 2009 to 2014. According to their results, brand value has a negative impact on indicators such as return on assets, return on investment and return on equity, while it has a positive impact on stock prices. When it comes to EPS, similarly to results of our study, Arora and Chaudhary (2016) showed that brand value has a positive influence on EPS and together with variables age, ownership and size explains 66.1% of the variability in EPS of Indian banks. They also state that high brand value contributes to the reputation of the bank and motivates investors to buy shares of that bank. In this way, the EPS of banks would increase (Arora & Chaudhary, 2016 p. 94). Rasti and Gharibvand (2013) explored the effect of brand value on book value, earnings before interest and taxes and dividend yield in Malaysian companies. A positive correlation was found with book value and 40.7% of the change in book value was explained by brand value. Moreover, earnings before interest and taxes showed a positive correlation with brand value and brand value determines 50% of fluctuations in earnings before interest and taxes. No significant relationship and influence were found in their study between brand value and dividend yield.

CONCLUSION

This study researched the relationship between brand value and market performance measured by market capitalization, Tobin’s Q, MB ratio and EPS. Moreover, the main objective of the study was to determine the influence that brand value has on the market performance. As the influence of brand value could be significant for one business and its performances, it was important to investigate the extent of that impact using the example of companies from high-technology sector.

The research was conducted on the sample of five high-technology enterprises rated as valuable brands according to the Interbrand methodology. The results have shown that there is a statistically significant positive relationship between brand value and market performance of enterprises, meaning that when the brand value increases, the market performance would increase accordingly. Moreover, brand value proved to be a significant predictor which positively influences the fluctuations in market performance of enterprise.

This study makes a significant contribution to brand value research by demonstrating that enterprise's primary business benefits from its brand value. Additionally, this study positively answers the question whether it is important for one enterprise from high-technology sector to make investments in its brand, because this expenditure will generate bigger market capitalization, Tobin's Q, MB ratio and EPS.

There are a few limitations to the study. Firstly, the results cannot be generalized for all enterprises and sectors. Secondly, the research includes data related to one period of time. Therefore, the authors suggest further research in this field that would overcome these shortcomings.

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UTICAJ VREDNOSTI MARKE NA INDIKATORE TRŽIŠNIH PERFORMANSI VISOKO-TEHNOLOŠKIH PREDUZEĆA

Koncept vrednosti marke dobija na značaju tokom 1980-ih, kada je primećena razlika između cene po kojoj se kupuju preduzeća i njihove vrednosti prema bilansu stanja. Vrednost marke može se smatrati nematerijalnom imovinom preduzeća, čiji se uticaj na finansijske i tržišne performanse mora uzeti u obzir. Ovaj rad ispituje odnos između vrednosti marke i odabranih indikatora tržišnih performansi, koristeći korelacionu i regresionu analizu. Analiza se zasniva na podacima Interbranda o vrednosti marke i godišnjim izveštajima odabranih visoko – tehnoloških preduzeća. Uzorak uključuje top 5 preduzeća iz visoko-tehnološkog sektora čiji se korporativni brend nalazi na listi 100 najvrednijih brendova u svim godinama analiziranog osmogodišnjeg perioda (od 2012. do 2019. godine). Istraživanje je pokazalo statistički pozitivan odnos između vrednosti marke i indikatora tržišnih performansi, kao i da vrednost marke pozitivno utiče na performance preduzeća iz ovog sektora. U fokusu ovog rada su sledeći indikatori tržišnih performansi: tržišna kapitalizacija, Tobin-ov Q, racio tržišne i knjigovodstvene vrednosti i neto dobit po akciji. Rad doprinosi polju istraživanja upravljanja vrednošću marke i naglašava važnost ulaganja preduzeća u process korporativnog brendiranja.

Ključne reči: *vrednost marke, tržišne performanse, tržišna kapitalizacija, Tobin-ov Q, racio tržišne i knjigovodstvene vrednosti, neto dobit po akciji*

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EXPLORING THE DIVERSITY WITHIN THE WORKPLACE OF SMALL FIRMS IN KOGI STATE, NIGERIA

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Abstract. *This study aimed at exploring diversity within the workplace of Small Firms in Kogi State, Nigeria. The study used survey research design. Descriptive statistics, mean score from Likert scale, ANOVA and multiple Regressions were used for data analysis. The study found that age has significant effect on job satisfaction of employees; and that religion, educational background and job experience have strong significant effect on small firms' organizational outcomes in Kogi State. The finding further indicated that gender difference affects organizational performance, job satisfaction, productivity, competitive advantage and customers' satisfaction. The study concluded that age has significant positive effect on job satisfaction; and other factors such as religion, educational background and job experience of employees only affect the performance of small firms in Kogi State positively. This study therefore recommended that owner-managers of small firms should take cognizance of age as it affects job satisfaction of employees; and should strategically manage factors such as religion, educational background and job experience of employees as they affect performance.*

Key words: *Diversity, Job Satisfaction, Organizational Outcomes, Employee Turnover, Organizational Culture*

JEL Classification: L20, M10

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1. INTRODUCTION

Organizational outcomes reflect what the small firms want to achieve in Kogi State. The outcomes of every organization are shaped by its internal and external environmental situations. For organizational outcomes to be realistic, an effective organizational framework must be put in place. According to Madanchian, Hussein, Noordin, & Taherdoost (2017), organization outcomes may reflect corporate performance, job satisfaction, and improved decision. Gomez & Bernet (2019) viewed organization outcomes in terms of "quality and financial performance" (p.383). Hwang & Hopkins (2015) added that "organizational commitment, job satisfaction, and intention to leave" are aspects of organization outcomes (p.44). Organization outcomes may be productivity, competitive advantage and customers' satisfaction. Notably, organization outcomes are both internal and external. For instance, competitive advantage and customers' satisfaction are paradigm of the outcomes that are external to the organization while others are internal to the organization.

Organization outcomes may be predicted given diversity characteristics. Gomez & Bernet (2019) argued that diversity has the propensity to improve performance. Diversity characteristics that place issues before managers of small firms in Kogi State are age, gender, race, religion, experiences, educational background and culture among employees. Saxena (2014) expressed that small firms have inventory of human resource with differences in age, gender, perception, attitude, caste, religion and region. Diversity reflects heterogeneity of characterizing variables in human, but the homogeneity perspective of it is important. This is because a group of employees may possess similar characteristics. For instance, employees within a group may be in the same age bracket, sex or have the same cultural background.

Today, SMEs now manage diversity with the aim of taking advantage of diverse employees' ability. This is targeted at creating a platform for the achievement of desirable outcomes. Pitts, Hicklin, Hawes & Melton (2010) opined that there are scanty researches relative to how diversity management can be used to achieve desirable outcomes in diverse organizations. Rahman, Ferdausy and Bhattacharjee (2014) posited that the success of an organization depends on its workforce. Among different human resource management issues, workforce diversity has received a considerable, conceptual, and empirical attention in organizational area. The finding of Ibidunni et al. (2018) revealed that "workforce diversity significantly influences job satisfaction and commitment" (p.1052). A number of studies (Kalleberg & Leicht, 1991; Gellner and Veen, 2009; Rehman, Ullah & Abrar-ul-haq, 2015) revealed that "individual characteristics have considerable relationship with organization performance". Past studies have shown that diversity among employees culminates into both negative and positive effects (Kochan et al. 2003). Weiliang *et al.* (2011) attributed "the dual effect to lack of evidence linking workforce diversity to employee performance". However, Lindblad (n.d) clarified that diversity in the workplace is generally regarded as a positive one for SMEs, but a workforce that has significant differences in ethnicity, race, religion and gender may create destructive tendency at the enterprise.

The discussion above shows that there is relatively low empirical research on 'the influence of factors of workforce diversity on the organizational outcomes of small firms in Kogi State', Nigeria. The researcher is therefore induced to cover this gap by undertaking the present study.

The main objective of this study is to explore the diversity within the workplace of Small Firms in Kogi State, Nigeria. The three identified objectives of the study are:

i. Ascertained gender difference with reference to the organizational outcomes of small firms in Kogi State; and
ii. Investigate the effect of diversity factors on the organizational outcomes of small firms in Kogi State.

2. Conceptual Review

There are ample collections of scholarly conceptual definitions of diversity. Different perspectives are observed based on peculiarity in disciplines. The conceptual reviews on diversity in this study reflect the business management perspective. According to Lindblad (n.d), the Society for Human Resource Management defined "diversity as valuing the characteristics that make a person unique, such as age, ethnicity, education level and family background". The uniqueness as observed from the definition appears to implicitly or explicitly show that employees possess varying characteristics. This is similar to the addition of Kokemuller (2011) that diversity is the "presence of people from a wide range of backgrounds and possessing different traits". Also, Knippenberg *et al*. (2004) opined that diversity refers to "an almost infinite number of dimensions, ranging from age to nationality, from religious background to functional background, from task skills to relational skills, and from political preference to sexual preference" (p.1015). Diversity research has "mainly focused on gender, age, race/ethnicity, tenure, educational background, and functional background" (Milliken & Martins, 1996; Williams & O'Reilly, 1998). However, Robbins (2009) refers to "workforce diversity as organizations that are becoming more heterogeneous with the mix of people in terms of gender, age, race, and education background". The term 'mix' in his broad definition appears to mean combination and interaction of people from diverse backgrounds. Ehimare & Ogaga-Oghene (2011) posited that "the main concern of this standpoint is that a broad definition may imply that all differences among people are the same" (p.95). Workforce diversity means the composite of people with different/similar psychological, sociological, economic and personality factors at the workplace.

Considering workforce diversity as effective tool for achieving the organizational outcomes of small business firms is very important. Workforce diversity may be constructive when managed effectively and destructive to organizational outcomes when managed poorly. The motive behind the effective management of workplace diversity is that the complexity in human element of organizational life is abrupt by dissimilarities in characteristics.

The "business benefits of workplace diversity have been widely contested since the idea was conceived" (Ehimare & Ogaga-Oghene, 2011). There is an ongoing debate as to whether there is indeed any discernible business benefit (Mulholland, Ozbilgin & Worman, 2005). It is however worthy of note that workforce diversity functions as a vehicle for organizational success through collection of wealth of experience and ideas. Lindblad (n.d) is of the "opinion that the inclusion of diverse individuals fosters a rich exchange of new ideas among employees and helps organization leverage the unique character of its workforce". Andrade (2010) discussed the benefits of workforce diversity in the workplace as follows:

i. *Increased Productivity:* There is no doubt that some SMEs have collection of talents in their enterprise. SME owners can unfold the skills of their employees and take advantage of talents to deliver the best outcome through effective diversity management. It is important to note that diverse employees who have better knowledge of the cultural value of their enterprises may be induced to remain committed to productivity.
ii. *Rising creativity and Problem-solving:* There is possibility that employees have diverse intellectual properties. These may be useful for SMEs, and as such, managers may translate the intellectual properties into innovativeness, creativity, diversification and design of the best approach to solving business problems.
iii. *Attracting and Retaining talent* that add a competitive edge to any SMEs. SME owners/managers can make use of talented employees to distinct themselves in a competitive environment. When skills pool is increased, SMEs may be propelled either to compete in the international global world or to increase its diverse customer base in Nigeria.
iv. *Help to build synergy in teams and enhances communication skills* that brings in new attitudes and processes that profit the whole team
v. Applying the proper diversity and inclusion management strategies does not only save money on *litigation expenses* generated by discrimination lawsuits but is the right thing to do for the business.
vi. *It increases market share and create a satisfied diverse customer base* by relating to people from different backgrounds. It does propel the organization and its status to claim its place and success in the global business world of the 21st century.

No organization ever exists without people from different and similar background. Professionals in the field of human resources must be happy gathering diverse employees for scientifically designed job, and manage such diversity for organizational success. The ability of any organization to plan and manage workforce diversity promotes the tendency of achieving a desired goal. Some small firms find it difficult to be successful today, because of their ill-commitment to ensuring that workforce diversity is part of their day-to-day business conduct. This backdrop may be tied to the fact that owner-managers of these small firms have low know-how on effective practice of diversity management, and the contributory elements in the successful management of diversity, and task that can deal with diversity related issues in their workplace. For effective diversity management practice, Kokemuller (2011) established that "top management and front-line managers in a diverse organization have to set the tone for an effective culture, as this will promote nondiscriminatory work environment, and fair treatment of all workers in the hiring process, job conditions, work evaluations and promotions". Loriann and Carol (2007) insisted that "un-managed diversity is more likely to damage morale, increase turnover, and cause significant communication problems and conflict within the organization".

Though, there have been controversies regarding the influence of workforce diversity on organizational outcomes for many decades. Milliken and Martins (1996) understand that "the influence of diversity on organizational outcomes, such as organizational performance, employee satisfaction, and turnover, is essential". It is believed that diversity is related to organizational outcomes and success. The organizational outcomes considered for the purpose of this study are organizational performance, job satisfaction, productivity, turnover and competitive advantage. It appears that workforce diversity has a correlative impact on each of these variables, particularly in a complex managerial and organizational environment.

Anderson & Metcalfe (2003) argued that "the paucity of stout research examining the impact of diversity upon businesses has raised questions about the existence of any connection between workforce diversity and business outcomes". Though today, there is increased number of quality researches (Cox et al., 1991; Webber and Donahue, 2001; Seyed-Mahmoud, 2004; Roberge and Rolf, 2010; Patrick and Kumar, 2012) which have proven the workforce diversity has both positive and negative effect on organizational performance. This made Choi & Rainey (2010) to express that "previous empirical research on the effects of workforce diversity on organizational performance has found mixed results". Other researches (Kalleberg & Leicht, 1991; Weiliang *et al.* 2011; Rehman *et al.,* 2015) also proved the effect of individual workforce diversity factors on other organizational outcome.

Diversity factors are comparatively explained by the atmosphere of a particular organization and the external environment in which it sub-systemizes. Two organizations may likely witness varying course of workforce diversity due to national or regional factors. The observed fact that has been missing in previous researches is that workforce diversity varies based on economy, individual orientation and organizational culture from country to countries. This implies that research reports are likely to vary according to these factors. This may be a clarification to the studies (Bell & Berry, 2007; Klein & Harrison, 2007) with the position that previous researches analyzed "the impacts of diversity taking into account the complex reality of organizations". The issue is that social and functional factors which are causal of diversity have predictive power on the outcome of small firms. These factors determine the extent at which salient organizational behaviour is approved by organizational members, and this remains the reason it has become essential for effective workforce diversity management. The study of Choi & Rainey (2010) shows "how managerial efforts and other contextual variables (such as diversity management, organizational culture, and team processes) moderate the relationship between diversity and organizational outcomes" (p.102).

3. METHODOLOGY

The study premised on 'survey research design'. The study's population comprised of employees and owner-managers of selected small firms. A purposive sample technique was used to select employees (216) and owner-managers (59) from the selected small firms in Kogi State. The choice of this technique was supported with the fact that there is no adequate data regarding small firms in Kogi State. A well-structured questionnaire was used for gathering primary data. The questionnaire was administered to two categories of respondents (216 employees and 59 owner-managers) in the study area with the aid of five trained research-assistants. The constructs of this questionnaire were validated by a panel of professionals from the field of industrial relation/human resource management. For the aim of this study, 'questionnaire' was scaled and its reliability was subsequently tested through Cronbach's alpha. This study analyzed data using 'descriptive statistics, Analysis of Variance (ANOVA) and regression model'. The model is specified as follows:

$Y_1 = B_0+B_1X_1+B_2X_2+B_3X_3+B_4X_4+ \mu$ ..... (i)
$Y_2 = B_0+B_1X_1+B_2X_2+B_3X_3+B_4X_4+ \mu$ ..... (ii)
$Y_3 = B_0+B_1X_1+B_2X_2+B_3X_3+B_4X_4+ \mu$ ..... (iii)
Where Y_1= Organizational Performance
Y_2= Job Satisfaction

Y_3= Employee Turnover
X_1= Employee Age
X_2= Religion
X_3= Education Background
X_4= Job Experience
B_0= intercept
B_1 to B_8= coefficient to be estimated and
X_1 to X_2 are the independent variables.

4. Results and Discussion

Table 1 Socio-demographic variables of the respondents

Responses	Frequency			Percentage	Mean/Mode
	Employees	Owner/Managers	Total		
Age					
15-25	45	6	51	18.55	
26-36	75	22	97	35.27	
37-47	20	17	37	13.45	38.84
48-58	46	14	60	21.82	
59 & Above	30	-	30	10.91	
Total	216	59	275	100	
Gender					
Male	85	33	118	42.91	
Female	131	26	157	57.09	157
Total	216	59	275	100	
Education					
FSLC	15	-	15	5.45	
SSCE	47	13	60	21.82	
NCE/OND	86	28	114	41.45	114
HND/BSc	52	8	60	21.82	
MSc & above	16	10	26	9.45	
Total	216	59	275	100	
Religion					
Christianity	68	24	92	33.45	
Islamic	121	35	156	56.73	
Traditional	27	-	27	9.82	
Total	216	59	275	100	
Experience					
0-5	98	17	115	41.82	7.06
6-10	57	28	85	30.91	
11-15	61	14	75	27.27	
16-20	-	-	-	-	
Total	216	59	275	100	

Note: FSLC - First School Leaving Certificate; SSCE- Senior School Certificate; NCE- National Certificate; HND- Higher National Diploma; BSc- Bachelor of Science Certificate; MSc- Master of Science
Source: Field Survey, 2020

Table 1 shows the socio-demographic variables of respondents. 51 respondents (18.55%) are within the age bracket of 15 - 25; 97 respondents (35.27%) are within the

age bracket of 26 - 36; 37 respondents (13.45%) are within the age bracket of 37 - 47; 60 respondents (21.82%) are within the age bracket of 48 - 58; and 30 respondents (10.91%) are within the age bracket of 59 & above. The mean score indicates that majority of the respondents are 39 years old. From the table II, 118 respondents (42.91%) were male; and 157 respondents (57.09%) were female. The mode recorded for gender (157) implies that majority of the respondents is female. The table shows that 15 respondents (5.45%) reported that they hold FSLC; 60 respondents (21.82%) hold SSCE; 114 respondents (41.45%) hold NCE (or its equivalent); 60 respondents (21.82%) hold HND/ BSc; and 26 respondents (9.45%) hold MSc (or its equivalent) and above. The mode (114) shows that majority of the respondents have NCE (or its equivalent). The table shows that 92 respondents (33.45%) are Christians; 156 respondents (56.73%) are Muslims; and 27 respondents (9.82%) are traditional worshippers. The mode (156) shows that majority of the respondents are Muslims.

The results (in table 1) indicate that 115 respondents (41.82%) have the 'experience' of about 5 years; 85 respondents (30.91%) have the 'experience' of 6 - 10 years; 75 respondents (27.27%) have the 'experience' of 11 - 15 years; and no respondent has the 'experience' of 31 - 40 years. The mean score (7.06) indicates that majority of the respondents have the 'experience' of about 7 years.

Table 2 Descriptive analysis of workforce diversity factors

Variable Factors	Workforce Diversity							
	Frequency and Percentage							
	SA(%)	A(%)	UD(%)	D(%)	SD(%)	Mean Score	Cut-off Point	Decision
Age	104 (48.1)	66 (30.6)	12 (5.6)	12 (5.6)	22 (10.2)	4.009	3.050	Accepted
Religion	131 (60.6)	39 (18.1)	12 (5.6)	16 (7.4)	18 (8.3)	4.153	3.050	Accepted
Educational Background	79 (36.6)	86 (39.8)	17 (7.9)	4 (1.9)	30 (13.9)	3.833	3.050	Accepted
Job Experience	110 (50.9)	69 (31.9)	25 (11.6)	12 (5.6)	-	4.287	3.050	Accepted
Gender	58 (26.9)	100 (46.3)	44 (20.4)	8 (3.7)	6 (2.8)	3.907	3.050	Accepted
Culture	29 (13.4)	12 (5.6)	46 (21.3)	80 (37.0)	49 (22.7)	2.500	3.050	Rejected
physical ability	7(3.2)	18 (8.3)	12 (5.6)	66 (30.6)	113 (52.3)	1.796	3.050	Rejected

Source: Field Survey, 2020

Table 2 shows workforce diversity factors among small firms in the study area. The factors which appear to be valid and reliable in association with diversity at the surveyed small firms in Kogi State are age, religion, educational background, job experience, gender, culture and physical ability. The mean score of age is 4.009; religion is 4.153; educational background is 3.833; job experience is 4.287; and gender is 3.907 as against the cut-off point of 3.050. Since the mean scores of these variables are greater than the cut-off point, they are accepted as prime factors of workforce diversity in the study area. In terms of educational background, Khoreva (2011) found that "the individuals who are more educated as judge against to who are less educated make out more gender difference" (p.234). It could be observed that variables such as age, religion and job experience seem to be the most severe workforce diversity factors. The table also shows that the mean score of culture (2.500) and physical ability of employees (1.796) do not enter as viable factors of

workforce diversity in the study area. Though, these two factors may be present among the selected small firms, but they may be too insignificant to be noticed.

Table 3 Showing ANOVA for gender difference on the outcomes of small firms in Kogi State, Nigeria

Outcomes		Female	Male	F-Value	F-Crit
Concern for organizational performance	M	2.1525	1.5763	7.334	1.5458
	SD	0.8054	0.6216		
Observed value for job and satisfaction	M	2.2034	2.2542	18.495	1.5458
	SD	0.8047	0.7094		
Contribute effectively to output level through initiative	M	2.0526	2.3509	9.505	1.5518
	SD	0.8540	0.6121		
Talent for firm's competitiveness and advantage	M	2.0678	2.0339	17.068	1.5458
	SD	0.8276	0.7420		
Good customer relation and customer satisfaction concern	M	2.2034	2.1525	7.781	1.5458
	SD	0.8259	0.6647		

Source: Field Survey, 2020

Firstly, table 3 shows the difference between female and male in terms of concern for organizational performance. Females have more concern for organizational performance (2.1525) compared to their male counterpart (1.5763). The standard deviation of concern for organizational performance for female (0.8054) shows more divergence as compared to the male (0.6216). The f-statistics value of 7.3341 appears to be greater than the F-critical value (1.5458). This shows a clear difference in terms of concern for organizational performance between female and male employees of small firms in the study area. It is thus necessary to deduce that in many small firms in Kogi State, the female employees strive to ensure organizational performance (profitability) more than the male employees. In terms of gender differences affecting organizational performance, this finding refutes the assertion of Kalleberg & Leicht (1991) and Weiliang *et al.* (2011) that "the performance criteria for success are expected to be higher for men than for women".

Secondly, the table shows that males have more value for their jobs and are satisfied with it (2.2542) compared to their female counterpart (2.2034). Though, the observed difference seems to be very little based on the compared mean scores. The standard deviation of observed job value and satisfaction among female (0.8047) shows more divergence as compared to the male (0.7094). The f-statistics value of 18.4951 appears to be greater than the F-critical value (1.5458). This result shows that male employees have more value for their jobs and are more satisfied with the job than the female counterpart of the small firms in the study area.

Thirdly, the table shows that males contribute more effectively to output level through their initiative (2.3509) compared to their female counterpart (2.0526). The standard deviation of female (0.8540) shows more divergence as compared to the male (0.6121). The f-statistics value of 9.5050 is greater than the F-critical value (1.5458). This result shows that male employees contribute more effectively to output level through their initiative than the female counterpart of the small firms in Kogi State.

Fourthly, the table shows that female possess more talent for firm's competitiveness and advantage (2.0678) compared to their male counterpart (2.0339). The standard deviation of female (0.8276) shows more divergence as compared to the male (0.7420).

The f-statistics value of 17.0684 is greater than the F-critical value (1.5458). This result shows that female employees possess more talent for firm's competitiveness and advantage than the male counterpart of the small firms in Kogi State.

Fifthly, the table shows that females have good customer relations and are more customer-satisfaction concerned (2.2034) compared to their male counterpart (2.1525). The standard deviation of female (0.8259) shows more divergence as compared to the male (0.6647). The f-statistics value of 7.7808 is greater than the F-critical value (1.5458). This result shows that female employees have good customer relations and are more customer-satisfaction concerned than the male counterpart of the small firms in Kogi State.

Table 4 Summary of Multiple Regression analysis of Potential Covariates with OP, JS and ET

Covariate	Coefficients (β)			Standard Error (β))			Value of t-Statistics			Value of R^2			Value of F-Statistics		
	OP	JS	ET	OP	JS	ET	OP	JS	ET	OP	JS	ET	OP	JS	ET
AG	.476	.579	-.084	.205	.144	.341	2.322	4.029	-.245	.642	.844	.020	5.390	16.229*	.060
RG	.897	.552	.099	.248	.519	.574	3.623	1.063	.172	.814	.274	.010	13.126*	1.130	.030
EB	.967	.907	-.079	.132	.310	.575	7.304	2.926	-.137	.947	.741	.006	53.342**	8.559	.019
JE	.769	.566	-.215	.100	.355	.440	7.692	1.593	-.488	.952	.458	.074	59.164**	2.539	.238

Note: *Significant at the .05 level; **Significant at the .01 level; AG – Age; RG – Religion; EB – Educational Background; JE – Job Experience; OP – Organizational Performance; JS – Job Satisfaction; JP – Job Performance; ET- Employee Turnover

The result (table 4) shows that 84.4% of the variation in job satisfaction is explained by age. The presence of 15.6% unexplained variation suggests that there are other predictor variables which affect variations in job satisfaction among small firms in Kogi State. The co-efficient for age (0.579, $p < 0.05$) indicates 'positive relationship' with job satisfaction. The result shows that increase in the age of employees will account for 57.9% increase in job satisfaction. This aligns with the finding of Rehman *et al*. (2015) which found that one year more age leads to increase in job satisfaction. This implies that employees are prompted to be more satisfied with their jobs as they become of age in Kogi State. This could be as a result of age limit (27 years) placed on job seekers in Nigeria; this explains the minimal employee turnover rate. However, the R^2-value of 0.844 shows a strong predictor. Thus, age has significant effect on job satisfaction of employees among small firms in Kogi State.

The result (table 4) reveals that 81.4% of the variation in the performance of small firms in Kogi State is explained by religious belief of employees. This may be from the fact that one religion's doctrine places limits on the level of female employees' initiatives and commitment to goal pursuit; and the other widely accepted religion teaches morals that encourages hard work in Nigerians' small firms. The presence of 18.6% unexplained variation suggests that there are other predictor variables affecting the performance of small firms in Kogi State, Nigeria. The co-efficient for religion (0.897, $p < 0.05$) shows a positive relationship with organizational performance. This means that additional improvement in religious teachings effort will bring about 89.7% improvements in the performance of small firms in Kogi State. However, the R^2-value of 0.814 shows a strong predictor. We therefore deduce that the religion of employees has strong significant effect on the performance of small firms in Kogi State, Nigeria.

The Table also shows that 94.7% of the variation in the performance of small firms in Kogi State is explained by educational background of employees. The presence of 5.3% unexplained variation suggests that there are other predictor variables affecting the performance of small firms in Kogi State. The co-efficient for educational background (0.967, p = 0.01) shows a positive relationship with the performance of small firms in Kogi State. This implies that increase in knowledge and skill possessed by employees through learning will lead to 96.7% improvement in the performance of small firms in Kogi State. This agrees with the finding of Weiliang *et al*. (2011) that "there is significant positive relationship between education background and performance". It also agrees with the finding of Rehman *et al.* (2015) that a change in educational status will bring proportional improvement in organization performance. However, the R^2-value (0.947) indicates a strong predictor. We therefore deduce that educational background of employees has strong significant effect on the performance of small firms in Kogi State.

The result (table 4) indicates that 95.2% variation in the performance of small firms in Kogi State is explained by job experience of employees. The presence of 4.8% unexplained variation suggests that there are other predictor variables affecting the performance of small firms in Kogi State. The co-efficient for job experience (0.769, p = 0.01) shows a positive relationship with the performance of small firms in Kogi State. This implies that increase in job experience of employees will lead to 76.9% improvement in the 'performance of small firms' in Kogi State. This aligns with the finding of Rehman et al. (2015) that there is positive relationship between experience and organization performance. This simply means that the more the employees accumulate experience on the job, the bigger the tendency for higher performance of small firms in Kogi State. However, the R^2-value (0.952) indicates a strong predictor. We therefore deduce that job experience of employees has strong 'significant effect' on the performance of small firms in Kogi State.

5. Conclusion and Recommendations

Some factors were investigated as triggering diversity in small firms in Kogi State. Factors such as age, religion, educational background, job experience, gender, culture and physical ability are found to be peculiar within small firms in Kogi State. Age, religion, educational background, job experience and gender are significantly strong factors; while culture and physical ability of employees are found weak and insignificant. These two factors may be present among the workforce of the small firms, but they appear to be too insignificant. Meanwhile, empirical investigation proves that age has 'significant positive effect on job satisfaction of employees' among small firms in Kogi State. Other factors such as religion, educational background and job experience of employees only affect the performance of these small firms in Kogi State positively.

Female employees are found significant to organizational success. The female employees of small firms in Kogi State are more spirited to pursuing the organizational performance (profitability, competitive advantage, productivity, market share, etc.). This is coupled with more excellent talent they possess; which can enhance their firm's competitiveness and advantage within the business environment of Kogi State. In addition, female employees have good customer relations and are more customer-satisfaction concerned than the male counterpart of the small firms in Kogi State.

Though, the male employees appear to have more value for their jobs and are more satisfied with the job than the female counterpart of the small firms in Kogi State. The difference is apparently too little. Based on observed behaviour of employees in organizations in Nigeria, the economic situation of a particular period stimulates the job satisfaction of male employees. It is very much apparent that the female employees' turnover rate is low; and this is a pointer of job satisfaction. However, the result stipulates that male employees contribute more effectively to output level through their initiative than the female counterpart of the small firms in Kogi State. This may not have connection with the job value or job satisfaction of employees; as Nigerian women have long consented and maintained the fact that they are weaker virtue. In a nutshell, gender difference, if strategically managed, may influence organizational outcome positively.

Therefore, the study recommends that:

i. Owner-managers of small firms should take cognizance of age as a significant workforce diversity factor that affects job satisfaction of employees. This is because, the older an employee becomes on the job the more he/she is satisfied with the job in Kogi State.
ii. Owner-managers of small firms should strategically manage workforce diversity factors such as religion, educational background and job experience of employees; as they affect the performance of small firms in Kogi State. Proper management of these factors will enhance positive performance of small firms in Kogi State.
iii. Owner-managers should strategically manage gender difference in their firms to enhance organizational performance, job satisfaction, productivity, competitive advantage and customers' satisfaction.

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ISTRAŽIVANJE DIVERZITETA NA RADNOM MESTU U MALIM FIRMAMA U SAVEZNOJ DRŽAVI KOGI U NIGERIJI

Ova studija ima za cilj istraživanje diverziteta na radnom mestu u malim preduzećima u saveznoj državi Kogi u Nigeriji. Studija je koristila model upitnika, a za analizu podataka korišćeni su deskriptivna statistika, srednja vrednost Likert skale, ANOVA i višestruka regresija. Studija je ustanovila da starost ispitanika ima značajnog uticaja na zadovoljstvo poslom kod zaposlenih; a da religija, obrazovni profil i radno iskustvo imaju izražen značajni uticaj na organozacione ishode malih preduzeća u državi Kogi. Nalazi dalje pokazuju da pol utiče na organizacioni učinak, zadovoljstvo poslom, produktivnost, konkurentsku prednost i zadovoljstvo mušterija. Studija zaključuje da starost ima značajan pozitivni uticaj na zadovoljstvo poslom, a drugi faktori kao što su religija, obrazovni profil i radno iskustvo samo utiču pozitivno na poslovanje malih preduzeća u državi Kogi . Preporuka je stoga da vlasnici-menadžeri malih preduzeća uzmu u obzir starost zaposlenih jer ona utilče na zadovoljstvo poslom, i treba strateški da upravljaju faktorima kao što su religija, obrazovni profil i radno iskustvo jer oni utiču na učinak.

Ključne reči: *diverzitet, zadovoljstvo poslom, organizacioni ishodi, fluktuacija zaposlenih, organizaciona kultura*

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MEASURING SUPPLY CONCENTRATION ON THE SERBIAN OIL AND OIL DERIVATES MARKET BY HERFINDAHL-HIRSCHMAN INDEX

UDC 339.13:553.982

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Abstract. *One aspect of the intensity of competition analysis of the national oil market is the measurement of the concentration of supply, to which this paper is dedicated. That is why it is not surprising that there are different interpretations of these economic categories. The analysis of these phenomena dates back to the emergence of production relations and production forces. The relaxation of regulatory measures on the national oil market has opened the space for building quality competitive relationships between the participants. Market opportunities, conditions and competition in practice are determined by concentration in the certain observed market. Competitive relations between market participants change over time. Those changes impact on concentration level of certain and well defined market, in this case the oil market of the Republic of Serbia. As the competition changes, the concentration level changes as well. This is the reason why this paper is focused on concentration level measurement and analysis. In measuring and expressing the concentration level of the certain market, many concentration indicators could be applied. Our choice was Herfindahl-Hirschman Index.*

Key words: *oil and oil derivatives market, concentration indices, competition level*

JEL Classification: L13

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INTRODUCTION

Each relevant market could be described and characterized by a certain level of competition between participants. The market strength of participants in the observed market can be determined based on competitive relations. For this reason, this paper focuses on the competitive relationships between participants, on the level of market concentration, and on the market power that arises from such relationships.

Market strength can be defined as the ability of a company, or several of them, to profitably increase the price of the product(s) in a certain market, above the marginal costs, i.e. competitive prices (Zdravković et al., 2013). According to Kostić, "From the fact that every company operates in the market area and that its market power is expressed in it, it follows that the relevant market should be precisely defined, firstly in a place in which a particular company operates, and then the market power of the company itself", (Kostić, 2013, p. 41), it could be said that the relationship between competitors within a particular relevant market largely determines the degree of concentration in a certain market. Therefore, when studying the concentration and market power of market participants, it is necessary to first determine the framework of the market itself, i.e. the relevant market, and then select an adequate form for its measurement, which is done in this paper.

However, according to Kostić (2016), "The level of concentration in a given relevant market is influenced by various factors, such as competitors, dispersion of market share, barriers to entry/exit from the market, economic potential, geographic size of the market, level of regulation of trade flows, regional integration, technological development, rapid information flow, legal regulations, etc." (Kostić, et al., 2016, p. 94). Thus, the importance of concentration indicators is relative over the time dimension, bearing in mind that they are influenced by many different factors, and the influence of many factors itself changes its intensity over time. However, their importance in measuring the market power of economic entities and pointing out inequalities in the relevant market is not negligible, because they indicate the nature of the branch (market) and the ability of consumers to choose which product to buy. The technological factor and the fast flow of information can have a positive effect on the course of the analysis because it is easier and faster to get the desired data, information, calculations, and possible changes in the relevant market. In economic theory, many examples of measuring the market power of companies could be found that determine the degree of limitation of the observed market. (Veselinović, 2016).

Research by Kostić provides and promotes a large number of indices that could be used for this purpose; we have considered to include in this analysis the Lerner index, cross-elasticity of demand index, and concentration indices. This paper is dedicated to concentration indices. As such, they are used in the implementation of antitrust policy measures, which gives the results presented in this paper practical significance (Kostić, 2009). Antitrust policymakers often rely on the calculated values of these indicators to make important decisions regarding the appearance of certain economic entities in the relevant market. They enable the analysis of the current market situation, taking into account the changes that are happening in it, and they are also used to predict and analyze future market trends.

What we would especially like to point out in this paper is that concentration indices are subject to changes that economic entities go through, and they are related to their market share in the relevant market. Therefore, under these changes, the value of the concentration index also changes. For the concentration indices to be comparable between different branches and periods, they are often subject to appropriate mathematical operations to reduce their value to the interval from 0 to 1 (Zeigenfuss, 2000).

There is a long list of indicators of concentration that economic experts may use to describe as accurately as possible the degree of concentration in the market, or restrictions on competition in the market. The analysis could include the following indicators:

1. Concentration ratio;
2. Herfindahl-Hirschman index;
3. Dominance index;
4. Hal-Tidman and Rosenblatt index;
5. Comprehensive branch concentration index;
6. Gini coefficient;
7. Lorentz curve;
8. Entropy coefficient, etc.

Generally, the image of the level of restrictions on competition in the market, above all, depends on market participants and the distribution of market share, sales, revenue, region, resources in one market, but also the availability of data. If the level of concentration of the four largest companies in the relevant market is methodologically accurate, the difference in the size of market share between all companies in the relevant market is accurate, as well as the uneven distribution of market shares between companies, the image of the level of competition restrictions in the relevant market can be much clearer. Then a series of conclusions and/or further decisions could be extracted regarding the strengthening of competitive relations within the branch. Taking into account the above, and according to the available data, in this paper, we decided to analyze the results obtained by calculating the Herfindahl - Hirschman index.

1. HERFINDAHL-HIRSCHMAN INDEX – THEORETICAL BACKGROUND

This concentration index takes into account the difference in the size of market share between companies. Also, in the calculation of concentration through this index, all companies operating within the branch are taken into account. The Herfindahl-Hirschman concentration index (hereinafter HHI) represents the sum of market shares of companies weighted by their market share:

$$HHI = \sum_{i=1}^{n} WiSi = \sum_{i=1}^{n} (Si)^2 \tag{1}$$

where Wi represents ponder, and Si is the market share of the i-th company (Waldman & Jensen, 2011).

Each firm is assigned a specific weight that corresponds to its market share (wi = si). Mathematically speaking, according to Kostić, „HHI represents a convex function of market shares, so it is very sensitive to inequality in the distribution of market share“, (Kostic, 2013, p. 122).

HHI respects market shares in the industry, with the focus on companies with higher market shares, and a larger number of such companies affect the growth of this index. As can be seen in Table 1, its value ranges from 0 to 1, or from 0 to 10,000, (Begović et al., 2002). In the case of an unlimited number of companies with a very small market share, its value will be equal to 0. Conversely, its value will be equal to 1 if a monopoly

structure operates in a particular market. More detailed levels of concentration are given in the following Table 1.

Table 1 Herfindahl-Hirschman concentration index levels

HHI value	Level of the concentration
HHI less than 1,000 (0.1)	low concentrated supply
HHI between 1,000 (0.10) and 1,800 (0.18)	medium concentrated supply
HHI between 1,800 (0.18) and 2,600 (0.26)	highly concentrated supply
HHI between 2,600 (0.26) and 10,000 (1.00)	very highly concentrated supply
HHI greater than 10,000 (1.00)	monopoly concentrated supply

Source: Begović, B., Bukvić, R., Mijatović, B., Paunović, M., Sepi, R., Hiber, D., 2002. Antitrust Policy in FR Yugoslavia, Center for Liberal-Democratic Studies, Belgrade, p. 35.

The application of HHI enables a clearer analysis of the observed market. The Herfindahl-Hirschman concentration index or HHI is widely accepted in the economic theory and practice of many countries, because it is very easy to calculate and interpret, and it also provides additional info-benefits. Namely, its reciprocal value shows how many economic entities of the same size can achieve a given value on the observed market, (Kate, 2006).

The reciprocal value pattern ($\frac{1}{HHI}$) is as follows:

$$n(2) = \left(\sum_{i=1}^{n} Si^2\right)^{\frac{1}{1-2}} = \left(\sum_{i=1}^{n} Si^2\right)^{-1} = \frac{1}{\sum_{i=1}^{n} Si^2} = \frac{1}{HHI} \tag{2}$$

The value of the reciprocal value of HHI can be from 1 to *n*. If its value is 1, then there is one dominant company in the market, and if it is n, then in the market all economic entities have the same size and the same market share, (Waldman & Jensen, 2011).

In practice, a special form is sometimes used when expert bodies cannot determine market shares for all companies in the observed market. This is the following pattern:

$$HHI = \sum_{i=1}^{n} Si^2 + m\left[\frac{100 - \sum_{i=1}^{n} Si^2}{m}\right]^2 \tag{3}$$

In this form, *n* represents the number of identified and m the number of unidentified companies. For this form to be expedient, it is necessary for the number of identified companies to be higher than the unidentified ones. If there are a large number of unidentified companies, this pattern loses relevance in assessing the concentration of the observed market, (Maksimović, et al., 2011).

2. Methodology, Data Collection and Market Concentration Measurement Procedure

The concentration of the market on the supply side reflects the degree to which the total sales (supply) in a particular market is under the control of a small number of companies, i.e. only one company in the last resort. Starting from the theoretical basis presented in the previous part of the paper, research was performed that includes an analysis of the domestic market of oil and oil derivatives to examine the degree of concentration and conditions of competition. The analysis covers the market of oil and oil derivatives on the territory of the Republic of Serbia. The research was conducted in the period from December 21st, 2018, to July 31st, 2020, and included the following research steps:

1. developing hypotheses and defining subjects and goals, as well as preparing research;
2. data collection, the definition of the relevant market and selection of variables;
3. data processing and analysis;
4. presentation of data gained and conclusions.

Setting hypotheses and defining goals was the starting point in the research. In addition to the active ones, the most important oil companies have been defined, which stand out from other companies in the domestic market of oil and oil derivatives in terms of revenue, and which will be the focus of research. Also, the forms of data that will be collected are defined based on the possibilities of data collection, planned methods of application, and their significance, (Kostić, 2014). During each step, certain actions were realized that were planned for each step, so we will explain them first.

The null and alternative hypotheses from which we started are:

H_0: In the relevant oil and oil products market there exists a high concentration between participants;

H_1: In the relevant oil and oil products market a high concentration between participants does not exist.

Taking into account the views from the null and alternative hypotheses, it is clear that the focus is on concentration in the relevant market. The subject of this paper is the analysis of market circumstances in the domestic market of oil and oil products and the verification of initial hypotheses. The period of 9 years of business, 2010-2018, was observed. A large number of oil companies operate on the market of oil and oil derivatives of the Republic of Serbia. Based on the data of the Serbian Business Registers Agency, in the period 2010-2018, a total of 16 representative economic entities were identified and thus selected, which in that period operated on the domestic market of oil and oil derivatives (Veselinović, 2016). In the meantime, one business entity was excluded from the survey due to the initiated bankruptcy procedure, so the final total number of oil companies for the observed period was 15.

The aim of the research should be a more realistic assessment of the degree of market constraints and market power of certain companies in a given market in order to assess

market circumstances, as well as giving recommendations to strengthen competition. The results of the research will also be used to undertake economically based activities. Therefore, the research aims to determine the level of limitations of the market of oil and oil derivatives under the obtained results, but also at the measures that should be applied. The measures should take into account the size and complexity of the Serbian market of oil and oil derivatives, but also the economy size itself.

3. DEFINITION OF THE RELEVANT MARKET FOR THE CONCENTRATION MEASUREMENT

In the process of measuring the concentration and market power of participants in a particular market, it is necessary to define a framework within which to analyze the competitive positions of economic entities themselves. The market to be determined, to which the concentration indicators will relate, is the relevant market. The purpose of its definition, i.e. determining its boundaries, is to identify economic entities that will be in the focus of the application of economic analysis as mutual competitors in that market (Gerald & Ewin, 2008).

Determining the domain of analysis implies determining the relevant market. The relevant market is closely related to the elasticity of supply and demand, depending on the nature of supply and demand of the market itself. Also, the relevant market has a subject and a spatial dimension. Therefore, the determination of the relevant market implies its determination both from the geographical aspect and from the aspect of the product sold on that market. Thus, from the aspect of the activity of participants in a certain market, we distinguish between the relevant product market and the relevant geographic market (Zeigenfuss, 2000).

The area dealing with the definition of the relevant market uses data on price movements, production, domestic consumption, and total sales to form the boundaries of the relevant product market and the relevant geographic market. To define the relevant product market, we used the correlation test in price movements, and for defining the boundaries of the relevant geographic market the Elzinga-Hogarthy test. The data used for these tests were taken from secondary sources, and the methodology and results are presented below.

In determining the relevant product market, we started from the conclusion that there are no very close substitutes for oil and petroleum products. Starting from the manner and representation in meeting the same or similar needs, one of the substitutes could be electricity. To examine the correlation, we started from statistical hypotheses:

H_O: There is no statistically significant correlation between the movement of average retail prices of oil and oil derivatives and electricity;

H_1: There is a statistically significant correlation between the movement of average retail prices of oil and oil derivatives and electricity.

Table 2 Movement of current prices, annual inflation rate, and adjusted prices of fuel and electrical energy in the period from 2006 to 2015

Year	The average retail price of fuel (per liter)	Average retail price el. energy (per kilowatt-hour)	Average annual inflation (%)	Average the retail price of fuel (per liter) in 2006 prices	Average retail price el. energy (per kilowatt-hour) in 2006 prices
2006	80.2	5.1	12.7	80.2	5.1
2007	83.3	5.3	6.5	80.1	5.6
2008	112.1	6.8	12.4	126.0	7.6
2009	99.8	6.9	6.7	186.5	7.4
2010	110.4	6.8	6.6	117.7	7.2
2011	121.4	7.5	5.5	128.1	7.9
2012	124.6	7.6	4.9	130.7	8.0
2013	133.2	7.8	4.4	109.1	8.1
2014	131.5	7.9	4.3	137.2	8.2
2015	130.1	8.1	4.2	135.6	8.4

Source: Republic Bureau of Statistics, review, http://webrzs.stat.gov.rs/WebSite/Public/PageView.aspx?pKey=3, visited on July 5/2019

The level at which average retail prices of oil and petroleum products and electricity correlate over ten years (2006-2015) is estimated (Table 2). The correlation testing is performed through prices adjusted to the 2006 level. To eliminate the effect of image distortion provided by testing, we have canceled the effect of inflation. We did this by using data on the calculation, i.e. correctors on the inflation rate, which were determined through the movement of consumer prices obtained from the website of the European Bank for Reconstruction and Development and the Republic Bureau of Statistics website.

Based on the obtained results on the degree of correlation and indicators of statistical significance, we rejected the zero and accepted the alternative hypothesis. It turns out that there is a direct correlation between the prices of the observed products (Table 3). The relationship is statistically significant, which confirms the probability value of r, which is less than 0.05 (0.042 / 0.027). However, the value of the correlation coefficient that we obtained indicates that these two products are not substitutes (0.661), i.e. the value of r is not above 0.8 (0.661 / 0.685). We believe that similar results would be obtained if similar potential substitutes were taken into account. Thus, the market for oil and oil derivatives independently constitutes the relevant product market.

Table 3 Correlation coefficient of the movement of average retail prices of fuel and electrical energy in the period from 2006 to 2015

MPC2006	Pearson Correlation	1	.661*
	Sig. (2-tailed)		.042
	N	10	10
MPCee2006	Pearson Correlation	.685*	1
	Sig. (2-tailed)	.027	
	N	10	10

* Correlation is significant at the 0.05 level (2-tailed).

Source: Author's calculation based on the database of the European Bank for Reconstruction and Development, public stat., Http://www.ebrd.com/where-we-are/serbia/overview.html, accessed 22.11.2019

Furthermore, the data required for the Elzing-Hogarthy test were also collected from secondary sources, i.e. Statistical Yearbooks of the Republic of Serbia, the Energy Balance of the Republic of Serbia, and the European Bank for Reconstruction and Development web site, where the statistical calendar of important variables is presented. Based on the results of LOFI, i.e. LIFO tests, it is clearly determined where the domestic market of oil and oil derivatives belongs (Table 4 and 5). The LOFI test measures the share of exports in the production of the relevant market, and the LIFO test measures the share of imports in the consumption of the relevant market. This statement can be followed by the fact that during the last fifteen years, several European well-known oil companies have entered the domestic market, such as Lukoil, OMV, Gazpromneft, Eko. Namely, "Frech argued while the computation of LIFO and LOFI in a given area is a straightforward task, an area in which both the LIFO and LOFI criteria are simultaneously satisfied need not be unique. For example (using zip codes as the "building blocks" with which to construct a geographic market, as is common in practice), suppose that for a given zip code, LIFO and/or LOFI does not meet the 0.75 thresholds. This implies that this zip code in isolation does not constitute a geographic market according to the Elzing-Hogarthy criteria, and thus to create a geographic market, additional zip codes need to be included. The choice of which zip code(s) should be incrementally added to the initial zip code can potentially affect the size of a market and the number of competitors. For example, adding zip codes based on a fixed radius from an initial geographic point can produce a different market than if one were to iteratively add zip codes based on the zip code that contributes the most to either the LIFO or LOFI statistic", (as cited in Gaynor, 2012, p. 9).

Table 4 Relevant geographic market depending on the value of Elzinga-Hogarty test results (LOFI/LIFO test)

LOFI /LIFO value	Description of the relevant geographic market
< 10%	Highly relevant market
10% - 25%	Poorly relevant market
>25%	Share of the wider relevant market

Source: Hendry, L.C., Eglese, R.W. 1990. Data Envelopment Analysis. Operational research Society. The United Kingdom.

Table 5 Values of the Elzing-Hogarthy test (LOFI/LIFO test) for the period from 2011 to 2014

Year	LOFI values	LIFO values
2011	0.091	44.6
2012	0.063	44.5
2013	0.059	43.3
2014	0.052	40.2

Source: Author's calculation based on the database of the European Bank for Reconstruction and Development, public stat., Http://www.ebrd.com/where-we-are/serbia/overview.html, accessed 22.11.2016

Starting from the fact that the territory of the Republic of Serbia is a rounded territory where the legal framework, antitrust regulations, and numerous oil companies operate, we concluded that the relevant geographic market of oil and oil derivatives is independently

constituted in the Republic of Serbia. The relevant geographic market of oil and oil derivatives on the territory of the Republic of Serbia is also confirmed by the results of the Elzinga-Hogarti test (LOFI/LIFO test), obtained based on the collected data. To make the results more objective, we took into account the period longer than two years (2011-2014), which is part of the time frame of the analysis itself. Based on the criteria presented in Table 4 and based on the data shown in Table 5, it can be concluded that the domestic market of oil and oil derivatives is a very relevant geographic market viewed from the aspect of exports, i.e. part of the wider relevant market from the aspect of imports. Namely, the values for the observed period moved between 5.2% and 9.1% (Table 5).

After collecting, supplementing, and verifying data obtained from the Serbian Business Registers Agency, the Serbian Republic Bureau of Statistics, and the European Bank for Reconstruction and Development, the survey included 15 oil companies. The representative sample is also included. Namely, there is a belief that taking a large number of economic entities into the analysis can reduce the analytical significance of this concentration indicator by increasing the value of this index, and for that reason, we followed the recommendations in the instructions for calculating selected indicators.

The representative sample contains four to seven large, medium, and small companies, depending on the methodology and instructions for calculating the indicators themselves. In addition to NIS i.e. Gazprom Neft, OMV, Lukoil, Eko, and Knez Petrol also stand out as large companies. Some of the above also deal with the wholesale trade of oil and oil derivatives, for example, the Transnafta company. In addition to larger oil companies, a large number of small oil companies have been registered. According to the collected data, a larger number operate unprofitably and are on the verge of bankruptcy, while a certain smaller number successfully manage the market and generate significant revenues.

4. Market Concentration Analysis by Using Herfindahl-Hirschman Index

After defining the relevant market, the obligatory step is the selection of the appropriate variable through which the degree of concentration of competitors in the relevant market will be measured. The variable is used to calculate the market share of each economic entity in the relevant market. Taking into account the subject and goal of economic analysis, but also the availability of primary and secondary data sources, in practice it can be used through variables such as profit, realized income, and production for a certain period, number of employees, total assets, number of branches, sub-branches, and their turnover, distribution of organizational units, number of subcontractors, etc. Combining variables is possible, but only under specific circumstances.

In general, economic analysis can also yield contradictory conclusions if different variables are used. At the very least, such results may be seemingly accurate, but substantially far from the desired objectivity. For that reason, it must be borne in mind that each variable brings with it certain limitations. The practical application of the obtained results often depends on the analytical and subjective assessment of the researcher, but also on the circumstances under which the analysis itself is realized. For the purposes of this paper, the results obtained based on the analysis could be applicable only if, when determining the domain of the analysis, they put market power in the foreground. As market power is reflected through the realized income on the relevant market, the focus of this research is in the first place the realized income that the companies realized on the relevant market for the observed period.

Annual realized income is taken as an adequate indicator for many reasons: it gives us information about the value of sales on an annual basis, regardless of whether the product/service was created in the observed or previous year, and sales revenue is related to the core business of oil companies and excludes revenue generated on the other bases. Annual realized incomes of oil companies can be found in the attached link addresses, and the percentage shares of realized incomes of individual oil companies in the total realized revenue for the period 2010-2018, which we will rely on in the assessment, are given in Table 6.

Table 6 The percentage share of realized incomes of individual oil companies in the realized total income of all oil companies for the period 2010–2018

Company/Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
NIS/Gazprom Novi Sad	55.1	52.7	54.4	60.2	59.9	57	54	56.6	58.8
Lukoil Serbia Belgrade	13	12.4	10.9	7.2	8.4	9.1	8.8	7.4	7.6
OMV Serbia Belgrade	11.1	9.8	9.2	7.4	7.2	9.2	8.5	8.0	8.0
Knez Petrol Serbia Belgrade	6.4	8.8	9.7	8.9	9.7	6.2	7.7	10.6	9.7
Intermol Serbia Belgrade	3.9	3.7	4.3	4.8	4.9	10	11	10.3	9.8
Nafte Serbia Belgrade	3.2	3.6	1.3	1.2	1.3	0.9	0.3	0.0	0.0
PC Transnafta Pancevo	0.17	0.13	0.14	0.20	0.16	0.0	0.0	0.0	0.0

Source: Made by the author based on data from the Business Registers Agency of the Republic of Serbia, http://www.apr.gov.rs, visited 7.5. 2020

Based on the data about the market shares of oil companies shown in Table 6, it can be said that the market of oil and oil derivatives of the Republic of Serbia is an oligopolistic market with one dominant company (about 55% market share), several large ones that follow it (about 10% market shares), several smaller (followed by 5-10% shares), and a group of small businesses (less than 1% shares). In the following, based on the collected information, the level of limited competition on the market of oil and oil derivatives of the Republic of Serbia for the period 2010-2018, will be determined by estimating the Herfindahl-Hirschman index.

The HHI index for the relevant market in the observed period 2010-2018 ranged between 3,100 and 3,840, which can be seen in the attached Table 7 and on the graph in Figure 1.

Table 7 Herfindahl-Hirschman index of supply concentration in the relevant market of oil and petroleum products in the period 2010 – 2018

Year/HHIndex	HHI	ΔHHI
2010	3360.45	
2011	3133.17	-227.28
2012	3286.19	153.02
2013	3838.34	552.15
2014	3793.49	-44.85
2015	3638.90	-154.59
2016	3212.98	-425.92
2017	3538.72	325.74
2018	3768.37	229.65

Source: Author's calculation based on the data of the Business Registers Agency of the Republic of Serbia, http://www.apr.gov.rs, visited 7.6. 2020.

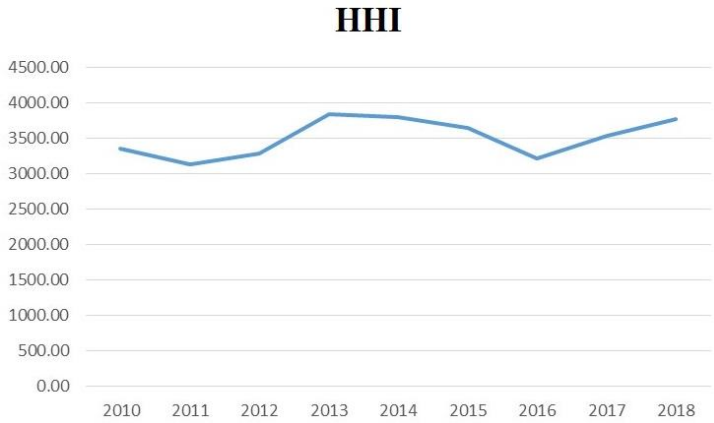

Fig. 1 Herfindahl-Hirschman supply concentration index in the relevant market of oil and oil derivatives in the period 2010 - 2018
Source: Graphic presentation based on the author's calculation based on the data of the Business Registers Agency of the Republic of Serbia, http://www.apr.gov.rs, visited 7.6. 2020

NIS/Gazprom Neft, Lukoil, OMV, Knez Petrol, and Mol are big players in the domestic supply market. This is confirmed by the data on the market share of each oil company in the realized income, which is shown in Table 1. Therefore, the obtained values of the Herfindahl-Hirschman concentration index objectively reflect the distribution of market share and market power concentration in the relevant market (Table 7). According to the value of HHI, it is obvious that the offer on the relevant market is very highly concentrated.

CONCLUDING REMARKS

The obtained results of the conducted research give us a basis for drawing interesting conclusions. The results of the analysis of the relevant market for the period from 2010 to 2018 unequivocally indicate a high level of concentration, and resume may be in the next form: HHI index for the relevant market in the observed period ranged between 3,100 and 3,840.

It is unequivocally clear that the supply of the oil and oil derivatives market of the Republic of Serbia is very highly concentrated. The obtained values of the calculated coefficients and the specific state of uneven distribution are caused by the high concentration of supply on the domestic market of oil and oil derivatives. This is confirmed by the data on the market share of each oil company in the realized incomes, shown in the first table. Of course, NIS/Gazprom Neft with 55%, and the group Lukoil/Knez Petrol/Mol/OMV stand out in terms of the percentage share of the realized incomes, and together hold over 85% of the participation in total realized incomes. More specifically, the oil and oil products market is an oligopolistic market with one dominant company NIS/Gazprom Neft (about 55% market share), several large ones following it (about 10% market share), several smaller ones following them (5-10% participation) and the group of the smallest companies (less than 1% participation). As a reflection of these relations on the market, the upward growth of the trend of uneven distribution of market share stands out.

The high values of the HHI also reflect structural changes and developments in the domestic market of oil and oil derivatives. During 2010, the program of transformation and modernization of NIS/Gazprom Neft was realized, which enabled a profitable and stable position of this oil company. Since 2011, the already large market share of NIS/Gazprom Neft has gradually increased. Thanks to investments and support from the state, NIS/Gazprom Neft has become a vertically integrated company since 2013. The complete process from research and development, through production and logistics, all the way to wholesale and retail represents one closed functional system of NIS/Gazprom Neft. That is why it is not surprising that this oil company dominates the relevant market of oil and oil derivatives of the Republic of Serbia. The relative decreases in the values of certain indicators during 2011 and 2016 are related to the decrease in the number of gas stations (supply quantity) of NIS/Gazprom Neft concerning the decrease/increase in the number of gas stations of other serious market participants (Lukoil, OMV, Eko) during the observed period.

It is logical that this analysis also results in a better understanding of the competitive behavior of the leading oil companies in the market. As the market for oil and oil derivatives is relatively small, no increase in the number of participants on the supply side is expected. For this type of market, it is typical for companies to use a limited market to install a large profit margin, and to make as much profit as possible, all at the expense of customers. This kind of situation in the domestic oil and oil derivatives market is subjected to the anti-monopoly policy of both domestic and foreign legislation. Commission for Protection of Competition should pay special attention to the policy of the retail price formation. Appropriate implementation of the regulation for forming prices in the oil and oil derivatives market is only possible under the strict control of the Commission, because the chances of an agreed performance in the relevant market are really big, which is supported by indicators. In this context, we draw attention to the potential for the agreed performance and the agreed price.

Formal and tacit agreements certainly exist, but they are difficult to prove. This practice should be stopped as soon as possible by adequate and systematic measures. The

strengthening of competitive relations, and thus the increase of business efficiency between companies is not expected unless the state reacts. Based on the derived conclusions and findings, appropriate measures can be taken to increase competition and the business efficiency of oil companies. In such circumstances, maintaining and raising the quality of products and services is questionable, and it would be best to encourage competition between oil companies and increase their economic efficiency.

However, it should be emphasized that large companies, such as NIS/Gazprom Neft in the observed market, greatly contribute to increasing efficiency across the branch. We should keep in mind that restricting the operations of NIS/Gazprom Neft and/or Lukoil may be wrong, and the applied measures could be ineffective and wrong. Large companies, such as NIS/Gazprom Neft, by investing in the development of efficient business, set a good example of how to plan in the long run and strategically. Then, large companies, by taking over small and unsuccessful companies and turning them into successful ones, contribute to increasing the quality of the branch's supply The focus of preventing abuse is the impact of large oil companies on the business of smaller companies, but also on customer choice as well. Finally, the market for oil and oil products can be further monitored and researched to reach additional conclusions.

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MERENJE KONCENTRACIJE PONUDE NAFTE I NAFTNIH DERIVATA U REPUBLICI SRBIJI HERFINDAL-HIRŠMANOVIM INDEKSOM

Jedan od aspekata analize intenziteta konkurencije na određenom tržištu jeste merenje koncentracije ponude, čemu je ovaj rad i posvećen. Zato i ne čudi činjenica da postoje različita tumačenja ovih ekonomskih kategorija. Analiza ovih fenomena datira još od nastanka proizvodnih odnosa i proizvodnih snaga. Liberalizacija domaćeg tržišta nafte i naftnih derivata otvorila je prostor za izgradnju kvalitetnih konkurentskih odnosa. Tržišni uslovi i konkurencija u praksi su određeni nivoom koncentracije na posmatranom tržištu. Konkurentski odnosi između tržišnih učesnika se menjaju tokom vremena. Te promene utiču na nivo koncentracije određenih i jasno definisanih tržišta, u ovom slučaju tržište nafte Republike Srbije. Kako se nivo konkurencije menja, nivo koncentracije se takođe menja. Iz tog razloga je ovaj rad posvećen merenju i analizi nivoa koncentracije. Postoji niz pokazatelja koncentracije koji se mogu primeniti u cilju merenja i prikaza nivoa koncentracije na određenom tržištu. Naš izbor je Herfindal-Hiršmanov indeks.

Ključne reči: *tržište nafte i naftnih derivata, indeksi koncentracije, nivo konkurencije*

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MACROECONOMIC FACTORS AND STOCK MARKET BEHAVIOUR: AN ANALYSIS OF THE 2008 CRISIS

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Abstract. *This study investigates the long term relationship between the behaviour of stock markets during the 2008 crisis and some selected international macroeconomic variables using information from January 2005 to December 2015. The procedures of the Autoregressive Distributed Lag modeling techniques (ARDL) are employed for the analysis. The bounds testing procedure in the ARDL framework is used to test for the existence of long term relationships between stock market behaviour and global economic factors (interest rate, exchange rate, index of industrial production and oil price) as well as the direction of effects, while estimated coefficients are used to test the pattern of long term relationships among the variables. The study revealed that a significant long term relationship exists between stock price movements and these global economic trends while the stock market crash significantly impacted the efficiency of the markets under review. Thus, it is recommended that market fundamentals should remain the capstone of stock market analysis, and policies should encourage the delinking of stock markets from the international commodity market factors.*

Key words: *Stock Market Behaviour, Macroeconomic variables, ARDL Model***.**

JEL Classification: GOI, G1, G14

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1. INTRODUCTION

External (non-fundamental) forces have always been acknowledged to have certain levels of influences on stock market behaviour over the years. For instance, it has been demonstrated that the immediate factor behind the 2008 market crashes was the widespread mortgage default in the United States that led to general financial sector collapse which was most extensively reflected on interest rate and exchange rate instability (Kim, Rachev, Bianchi, Mitov & Fabozzi, 2010; Malkiel, 2011). In the same vein, UNCTAD (2012) noted that price boom in international markets for primary commodities has been one of the main features of the world economy since 2002. They noted that such higher prices for primary commodities have an immediate positive impact on most financial markets. Such positive relationship would imply that a sharp negative shock in the price of these commodities could send financial markets spiraling downwards.

Interestingly, price developments in the international stock markets have also coincided with a greater weight on commodity derivatives markets by portfolio managers. The increased linkage of the financial markets with commodity markets has led to 'financialization' of commodity markets (UNCTAD 2012) which was accelerated significantly beginning from the 2002–2004 period. This has led to "increasingly close correlation between returns on investment in commodities and equities, as well as those related to the exchange rates of currencies affected by trade speculation." This kind of arrangement has presented extensive risks for the financial markets and is argued in this study to effectively contribute to market crashes. This may well focus more extensively on development in international commodity markets in determining the future patterns in the stock markets (Obadan & Adegboye, 2016). Other relevant works include Basu & Charola (2012), Chen, Mrkaic, & Nabar (2019), and Sumner (2019). In this study, the effects of macroeconomic variables on stock market behaviour are investigated. The relationship between international macroeconomic variables and stock market crashes over time may be inferred.

2. REVIEW OF RELATED LITERATURE AND THEORETICAL ISSUES

Stock Price Behaviour: In the literature, stock price movement is generally attributed to two major factors: these are the fundamental factors and technical factors. "Prices of securities in the stock market fluctuate daily on account of continuous buying and selling. Stock prices move in trends and cycles" (Kevin, 2001). Fundamental analysis is used to determine the intrinsic value or worth of a share by studying and evaluating the basic information that underlies the company's performance. The essential factors usually studied cut across information on the company itself, the industry it belongs to as well as the economy. In recent times, researchers have attributed a significant percentage of the movement in share prices to a wide range of economy fundamentals. For instance, Osamwonyi & Evbayiro-Osagie (2012) empirically demonstrated that macroeconomic variables influence stock market index in Nigeria. See also Spelta, Pecora & Kaltwasser (2018), and Brownlee, Chabot, Glysels & Kurz (2020). Other relevant studies include Seth & Tripathi (2014), Victor & El Massah (2018), Lee & Wang (2015), Mensi, Hammoudeh, Yoon & Balcilar (2016), and Olokoyo, Ibhagui & Babajide (2020).

Technical analysis is based on the premise that key fundamental factors that are important are already reflected in share prices, and that past patterns in share price movement repeat themselves over time. The technical analysts argue that psychological

factors and other factors, like investors' emotion exemplified in the "sometimes irrational behaviour of investors are also important in determining the behaviour of share prices." Hence, "it is possible to predict the future price of a stock by diligently and carefully carrying out a study of the historical price behaviour of the stock in the market" (Osaze, 2007).

The fundamental and technical approaches to the determination of stock prices challenged the Efficient Market Hypothesis. The random-walk analysts see the stock market as perfect and the stock prices as reflecting all the information available to the market participants. Hence, they conclude that the price changes are completely unrelated and therefore unsystematic (Kendall, 1953; Samuelson, 1965; Fama, 1965 & Malkiel, 1973). For random walk theory, the market has no memory (Eriki, 1995). Osaze (2007) asserts that "in spite of the arguments of the technical and fundamental analysts about the price behaviour of stocks, there is the major underlying theory of stock price behaviour which contends that the market is efficient, so efficient that one cannot beat it." This underlying theory is referred to as the Efficient Market Hypothesis (EMH). The Random Walk Theory argues that there is no serial correlation between past price movements, hence, knowledge of the past price movement cannot help in predicting prices of securities in the future. Fama (1965) asserts that the random walk hypothesis is not likely to provide an exact description of stock price behaviour in the market. However, for realistic reasons the theory "may be acceptable even though it does not fit the facts exactly." This is because successive price change may not be accurately independent but the actual amount of dependency may not be significant. Hence, fundamental analysis would only be of value if the analyst has new information that is not fully reflected in current market prices.

The rational expectations hypothesis developed by John F. Muth in the early part of 1960 and extended by Robert Lucas in 1976 is a theory that describes an economic situation in which its outcome is partly a function of people's expectations. The rational expectations hypothesis states that people make decisions based on their reasonable prospect for the future, available information and past experiences. As exemplified by Sargent (1987), and Sargent and Wallace (1975), the value of a currency and the rate at which it depreciates depend partly on people's expectation of what the rate of depreciation would be. This is as a result of the fact that people rush to sell a currency that they expect a loss in value, thereby contributing to its actual loss in value. Similarly, "the price of a security depends partly on what prospective buyers and sellers believe it will be in the future." One of the earliest and most striking applications of the concept of rational expectations is the efficient markets theory. The efficient market hypothesis "uses the concept of rational expectations to reach the conclusion that, when properly adjusted for discounting and dividends, stock price changes follow a random walk."

3. METHODOLOGY

In the analytical framework in this study, the goal is to determine

i. whether a long term relationship exists between stock price movements and the selected economic variables;
ii. whether the economic variables are forcing variables (i.e. exogenous in the determination of stock market movements in the long run); and
iii. the direction of long term impact of the economic variables on stock market movements.

The procedures of the Autoregressive Distributed Lag modeling techniques are employed for the analysis. The bounds testing procedure in the ARDL framework is used to test the existence of long term relationships among the variables as well as the direction of effects, while estimated coefficients are used to test the pattern of long term relationships among the variables.

The Autoregressive Distributed Lags Approach to Cointegration Model: The ARDL modeling procedure simultaneously tests the existence of long term relationships among variables while estimating the short run and long term effects. The system is applied to address the issue of endogeneity between stock market price movement and selected global economic variables that have been empirically shown to have contributed to stock market crashes. After ensuring the direction of movement between stock market price movements and the other variables, the model is also used to test for a long term relationship between them. If stock market price movements are shown to move together over time, with the global economic indicators (which are the forcing variables or explanatory variables), then, it can be argued that the variables contribute to stock market crashes over time. We seek association with four global economic variables, namely, oil prices (*oilp*), international interest rates (*rint*), US output (*usinp*) proxied by index of industrial production, and the real exchange rates (*rint*).

The ARDL is based on the methodology outlined in Pesaran and Shin (1995). "The main advantage of this procedure is that it can be applied regardless of the stationary properties of the variables in the sample and allows for inferences on long-run estimates, which is not possible under alternative cointegration procedures." The bounds testing procedure proposed by Pesaran, Shin and Smith (1996, 2001) is used "to test for the existence of a linear long-run relationship, when the order of integration of the underlying regressors are not known with certainty." The regression model specified in this direction "is an error-correction form of an ARDL model in the variables of interest" (Belke & Polleit, 2005). More specifically, an unrestricted error-correction model (ECM) regression is initially specified from where all the tests and estimations are carried out. Given a dependent variable, *y* and a vector of independent variables, *x*, the ARDL model to be estimated is shown as:

$$\begin{aligned}\Delta y_t = {} & \alpha_0 + \phi y_{t-1} + \delta_1 x_{1,t-1} + \cdots + \delta_k x_{k,t-1} \\ & + \sum_{i=1}^{p-1} \psi_i \Delta y_{t-i} + \sum_{i=1}^{q_1-1} \varphi_1 \Delta x_{1,t-i} + \ldots + \sum_{i=1}^{q_k-1} \varphi_i \Delta x_{k,t-i} + \xi_t\end{aligned} \tag{1}$$

In the model, ϕ and the δ's represent the long-run multipliers which show the long term effects of the independent variables on *y*; ψ and the σ's represents the short-run dynamic coefficients (which help to estimate the error correction mechanism); p, q represent the order of the underlying ARDL-model (p refers to *y*, q refers to *x*); t is a deterministic time trend; k is the number of explanatory variables; and ξ is the disturbance term that is uncorrelated with the *x*'s.

The second step is to test for long term relationship between the dependent variable and each of the independent variables. The null hypothesis of non-existence of a long-term relationship is defined by testing the hypothesis:

$$\Phi = \delta_1 = \ldots = \delta_k = 0 \tag{2}$$

This test is the *bounds testing procedure* introduced by (Pesaran et al., 1996), along with the critical value bounds for these tests. The test is performed by comparing the F-statistic computed from the ARDL equation with the upper and lower 90, 95 or 99 percent critical value bounds (F_U and F_L). "In the case where the F-statistic lies below the lower bound, the long term relationship may be rejected. On the other hand, if the F-statistic is higher than the upper bound of the critical value band the null hypothesis of no long term relationship between the variables can be rejected irrespective of their order of integration. In the case that the F-statistic is between the two bounds then a unit root test would be applied" (Ioannides, Katrakilidis & Lake, 2005).

If the above procedure for testing cointegration is *repeated* for ARDL regressions of *each* element of the vector of *x*'s on the remaining relevant variables (including y), the direction of effects (in terms of which variable is endogenous) can be determined. In relation to the current study, the expanded ARDL model that explains long term relationship between stock returns movements and global economic variables is specified as:

$$\begin{aligned}\Delta r_t = {} & \alpha_0 + \phi r_{t-1} + \delta_1 oilp_{t-1} + \delta_2 usinp_{t-1} + \delta_3 rexrt_{t-1} + \delta_4 rint_{t-1} \\ & + \sum_{i=1}^{p-1} \psi_i \Delta r_{t-i} + \sum_{i=1}^{q_1-1} \varphi_1 oilp_{t-i} + \sum_{i=1}^{q_1-1} \varphi_2 \Delta usinp_{t-i} + \\ & + \sum_{i=1}^{q_1-1} \varphi_3 \Delta rexrt_{t-i} + \sum_{i=1}^{q_1-1} \varphi_4 rint_{t-i} + \xi_t\end{aligned} \tag{3}$$

Where *r* is the returns in a stock market computed as:

$$R_t = ln\left(\frac{SP_t}{SP_{t-1}}\right) * 100$$

where R_t = return on stock market index
SP_t = contemporary market price index
SP_{t-1} = previous period stock market price index
ln = natural logarithm
oilp = oil prices in the international market (used to represent commodity prices)
usinp = index of industrial production in the US
rexrt = real exchange rate of a given country
rint = real interest rate in the international market (represented by the US Fed rate)

"The conditional long-run model can then be produced from the reduced form solution of (3), when the first-differenced variables jointly equal zero. The long-run coefficients and error correction model are estimated by the ARDL approach to cointegration, where the conditional ECM is estimated using OLS and then the Schwarz-Bayesian criteria is used to select the optimal lag structure for the ARDL specification of the short-run dynamics." This approach has been used by Alqaralleh (2020).

Variables in the Model: Stock market returns are computed as indicated earlier. The stock market index prices are taken as the reported index of the stock market for the given period.

Oil prices (*oilp*) are the prices of oil in the international market and they are used to represent commodity prices. They are measured in dollars per barrel and are expected to move in the same direction with stock returns. In this study as in UNCTAD (2012), it is expected that oil price movements precipitate stock market movements in the long run. Evidence is provided in Yin & Ma (2020), Yin, Peng & Tang (2018), Hoque, Wah & Zaidi (2019), Hu, Liu, Pan, Chen & Xia (2018). Index of industrial production in the US *(usinp)* is the variable used to capture real sector performance in the US. The 2008 stock market crashes all over the world began from the US and the variable is included in the study to capture the influence of the US economic indicator on stock market crashes. Evidence of impact of the market is presented in Basu & Charola (2012), Chen, Mrkaic & Nabar (2019), and Sumner (2019).

Real exchange rate (*rexrt*): one major point of the transmission of foreign or external influences into domestic market is through the real exchange rate effect (Krugman, Obsfeld & Melitz, 2008). Exchange rate depreciation is expected to lead to deterioration in the stock market indices. Supporting evidence is provided in Anetor, Esho & Verhoef (2020), Matlasedi (2017), and Zarei, Ariff & Bhatti (2019). Real interest rate (*rint*): is the real US Fed rate which is used to represent the real interest rate in the international market. Sharp changes in the interest rates during the period of financial crises have strong signaling impact on the stock market. The choice of real interest rate reflects the impact of inflation rate as evidenced in studies such as Singh & Padmakumari (2020), and Ashraf et al. (2019).

Data Sources: Data used in this study covers eleven stock markets that were categorized into advanced, emerging and frontier markets. These are UK, USA, France, Germany, Japan, and Hong Kong (as advanced markets), China and South Africa (as emerging markets), Nigeria, Kenya and Ghana (as frontier markets). Monthly data covering the period 2005 to 2015 were employed for the empirical analysis. The data for stock market indicators were sourced from global stock indices, supplied by Morgan Stanley Capital International (MSCI) and the Dow Jones Indexes Country Classification System. While the data for macroeconomic variables were sourced from the World Bank World Development Indicators and the IMF Financial Structure database.

Test of Hypothesis: The hypothesis in its null form is – *There is no significant long term relationship between stock market crashes and other global economic trends.*

The method of testing this hypothesis was to examine whether a long term relationship exists between stock price movements and the selected economic variables, whether the economic variables are forcing variables (i.e. exogenous in the determination of stock market movements in the long run), and the direction of long term impact of the economic variables on stock market movements. The ARDL model in equation (1) and expanded in equation (3) was used for the general test. The bounds testing procedure is used to test the existence of long term relationships among the variables as well as the direction of effects, while the t-ratios and signs of the coefficients are used to test the pattern of long term relationships among the variables.

4. EMPIRICAL ANALYSIS

Time Series Properties of Stock Returns: A major perspective for analysis of stock return behaviour over time is to examine the time series properties of the data in terms of mean reversion (using unit roots or autocorrelation tests) and long term patterns. In this section, the correlation pattern of the stock returns for each of the markets in the study is evaluated. Autocorrelation tests provide strong background for evaluating the structure of markets in terms of stability or tendencies for crashes within short periods (Mollah, 2007).

Table 1 Time Series Properties Stock Returns (Non-crisis period)

Country	$\hat{\rho}_1$	$\hat{\rho}_2$	$\hat{\rho}_3$	$\hat{\rho}_4$	$\hat{\rho}_6$	$\hat{\rho}_{12}$	Q_{12}	p-value
UK	0.43	-0.242	0.133	0.178	-0.291	-0.277	23.45*	0.02
US	0.357	-0.405	0.407	-0.006	-0.141	-0.224	19.5	0.07
France	0.264	-0.42	0.198	0.083	-0.105	-0.322	27.6*	0.01
Germany	0.216	-0.408	0.19	0.075	0.006	-0.287	24.38*	0.02
Japan	0.349	-0.402	0.265	0.092	-0.18	-0.193	17.85	0.12
Hong Kong	0.397	-0.288	0.237	0.201	-0.193	-0.305	21.53*	0.04
China	0.072	-0.001	-0.007	0.152	0.048	-0.279	7.17	0.84
South Africa	0.165	-0.227	0.103	0.125	0.003	-0.282	12.8	0.37
Nigeria	0.002	0.176	0.345	-0.37	-0.063	-0.165	13.29	0.34
Kenya	0.097	-0.061	0.183	0.071	-0.251	-0.016	7.97	0.78
Ghana	0.122	0.091	-0.329	-0.128	0.027	-0.022	13.71	0.32

Note: The $\hat{\rho}_{is}$ are the autocorrelation coefficients; * indicates significance at 5 percent level

Source: Author's compilation from regression estimates, November 2016

In Table 1, the time series properties of monthly stock returns for the sample period are presented. Again, for the purpose of comparison, the properties are presented for the crisis and non-crisis periods. In the properties reported in Table 1, the first-order autocorrelation is relatively high for the UK, US, Japan and Hong Kong markets. This suggests that for these markets, there may likely be strong persistence of disequilibrium at any given time. In other words, any short-term deviation from the mean returns in these markets may take a relatively long period to be restored. Apart from the returns on the advanced markets in the analysis, the autocorrelation values for each of the markets generally reduce drastically over time (from period 1 to 12). It can be seen that the developed markets exhibit a pattern where autocorrelation initially rises and then falls rapidly. It is also noted that none of the frontier markets have significantly large autocorrelation values for any of the periods in the Table, suggesting that returns in these markets do not heavily or generally rely on market activities in its trend.

In Table 2, the result of the autocorrelation tests for stock returns during the crisis period is reported. Surprisingly, fewer markets in the sample appear to exhibit autocorrelations in stock returns for the crisis period than for the non-crisis period. In this case, only Hong Kong, China, and Ghana have significant joint autocorrelation test coefficient (at 5 percent level). Note that none of the advanced markets exhibited autocorrelation (persistent in stock returns disequilibrium) during the crisis period. This gives an idea with respect to the level of response of developed markets to crisis compared to emerging or frontier markets.

Table 2 Time Series Property Stock Returns (Crisis period)

Country	$\hat{\rho}_1$	$\hat{\rho}_2$	$\hat{\rho}_3$	$\hat{\rho}_4$	$\hat{\rho}_6$	$\hat{\rho}_{12}$	Q_{12}	p-value
UK	-0.169	-0.06	0.153	0.02	-0.013	0.118	14.12	0.29
US	-0.109	-0.073	-0.039	0.053	0.074	-0.043	7.56	0.82
France	-0.087	-0.043	0.054	0.055	-0.048	0.035	6.23	0.91
Germany	0	-0.131	0.056	0.041	-0.124	0.029	13.96	0.54
Japan	0.022	0.01	0.069	-0.107	0.002	-0.14	6.71	0.83
Hong Kong	-0.12	-0.018	0.186	-0.128	-0.196	0.174	23.2*	0.02
China	0.106	0.005	0.084	-0.131	-0.15	0.156	20.75*	0.05
South Africa	-0.078	-0.005	0.102	0.026	-0.038	-0.007	5.45	0.94
Nigeria	0.229	-0.042	0.031	-0.01	0.112	0.062	15.11	0.21
Kenya	0.198	0.199	-0.171	-0.075	0.008	0.096	13.04	0.32
Ghana	0.368	-0.065	0.052	-0.043	0.101	-0.021	22.53*	0.03

Note: The $\hat{\rho}_{is}$ are the autocorrelation coefficients; * indicates significance at the 5 percent level

Source: Author's compilation from regression estimates, November 2016

Preliminary Analysis: The argument in this study is that returns in global stock markets are greatly influenced, if not critically caused, by movements in international macroeconomic variables which have had strong linkages with the markets. Thus, frequent occurrences of market crashes could be as a result of market inefficiency arising from the sharp influences of international macroeconomic variables. As shown in the previous section, four international macroeconomic variables are highlighted as closely linked with long term pattern of movements of stock market returns across the globe. In this sub-section, these variables are estimated as they relate to stock returns for the selected markets in the study.

Table 3 Descriptive Statistics for International Macroeconomic Variables for Non-crisis and Crisis Periods

	Non-crash regime				Crash regime			
	Mean	Std. Dev.	J-B	Prob.	Mean	Std. Dev.	J-B	Prob.
INTR	1.83	2.09	18.27	0	1.533	1.43	2.98	0.23
USINP	0.86	4.97	156.3	0	0.805	4.25	0.84	0.66
OILP	79.75	25.0	9.26	0.01	97.52	20.37	0.53	0.77

Source: Author's compilation from regression estimates, November 2016

The initial analysis is to investigate the characteristics of the variables for the two sub-periods in the study, namely, the non-crash period and the crash period. The result of the descriptive statistics for the variables is presented in Table 3. In the Table, the mean international interest rate (the London Inter-bank Offered Rate) was 1.83 in the non-crash period and 1.53 in the crash period. This shows that the interest rates were lower during the market crash period. Since the market crash was a culmination of the crises in the entire financial system in the global economy, the drop in interest rates can be seen as the general prevailing condition in the market at that period. The standard deviation for the interest rate is higher for the crash period than for the non-crash period, though the average value was higher in the former period. This suggests that the variations in interest rate were larger during the crisis period. The J-B statistics reveal that the interest rates

were normally distributed during the crash period, perhaps due to the fact that a steady decline in the market could result in the nature of the interest rates at this period.

For the index of industrial production in the US – indicates the rate of global economic performance, the average rate for the periods were 0.86 for the non-crash period and 0.81 for the crash period. Surprisingly, the growth rate of the US index was quite close for the two periods, though that of the crash period is lower. This shows that industrial production growth was lower during the market crash period than during the period without crash in the market. The standard deviations for the two periods are also similar, but the J-B value for the non-crash period is significant while that of the crash period is not significant. This implies that there were not many large opposite directional movements in this index during the crisis period. Indeed, the J-B values for each of the variables for the crash period are significant and imply normally distributed functions.

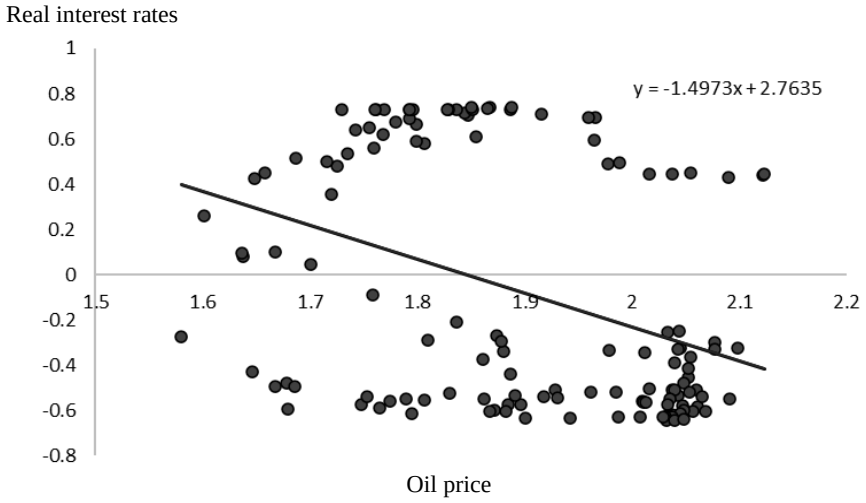

Fig. 1 Oil price and real interest rates
Source: Authors' Analysis

The oil price index was higher in the crisis period than during the non-crash period. Average oil price was 79.75 dollars for the non-crash period but was 97.52 dollars for the crisis period. Although the directions of causality are not tested, many studies have shown the oil price movements usually precede stock market volatility in most markets (see UNCTAD, 2012; Obadan & Adegboye, 2016).

In Fig. 1, the correlation chart and regression line for the relationship between oil prices and real interest rates in the international market is presented. A negative slope is shown for the relationship, indicating that increase in one of the variables leads to decline in the other variables. This confirms the results from the descriptive statistics where the drop in interest rate during the crash period was accompanied by rise in oil prices. The implication of this is that rising oil prices and falling interest rates may combine to generate stock market crashes or act as reinforcement for on-going crashes in the market.

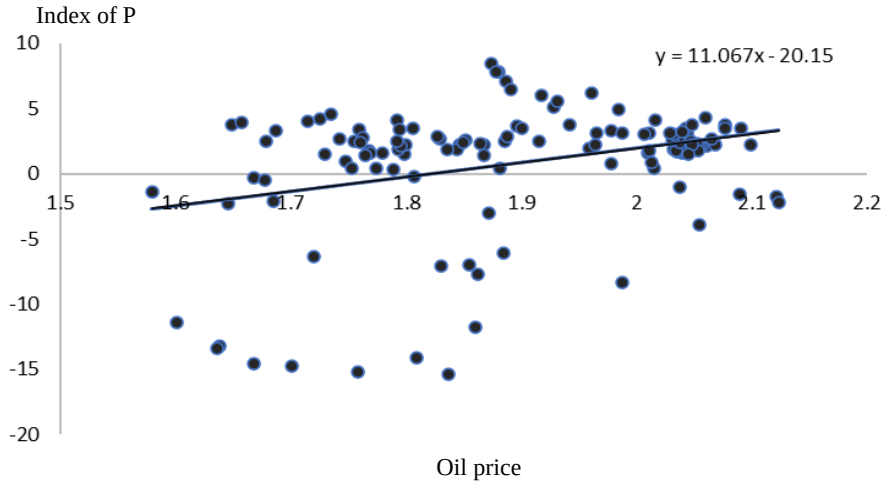

Fig. 2 Oil price and index of industrial production
Source: Authors' Analysis

In Fig. 2, the result of the correlation between oil prices and index of industrial production in the US is presented. The positive slope of the regression line indicates that increase in one variable goes hand-in-hand with increase in the other variable. Thus, oil price spikes are likely to be accompanied by increased global output. This result is surprising though it has interesting implications for the stock markets. Positive correlation between oil prices and index of US industrial production shows that stock markets may have positive responses to oil price spikes since industrial production or global economic activities tend to improve during these periods. Essentially, if the rise in economic performance is greater than the rise in oil prices, then this will be beneficial to the stock markets.

In terms of the effects of the macroeconomic variables on stock market returns, the study proposed the test of long term autoregressive pattern of relationship. The first analysis therefore is to examine whether a long term relationship exists between stock returns for each market and the selected macroeconomic variables.

Table 4 shows the result of the Bounds test of long term effects for the ARDL specification. The evaluation of the results is based on the critical F-statistic values for the lower and upper bounds as also reported in the results. According to the empirical value of the F-values in Table 4, we find that the null hypothesis of no long-term relationship in the case of unrestricted regressions of the stock market returns on the entire macroeconomic variables is rejected for all the markets at the 5 percent level. These results reveal that for each of the markets, the macroeconomic variables had strong long term relationships with the stock returns. Apparently, stock market returns move along with these variables and when these variables change sharply, the returns in the markets tend to follow suit.

Table 4 Testing the Existence of a Long-Term Relationship between Stock Market Returns and International Macroeconomic Variables

Market	Lower bound (5% critical val. = 2.86)	Upper bound (5% critical val. = 4.01)
US	22.15	15.90
UK	2.51	4.62
Japan	22.24	10.16
France	22.51	25.30
Germany	11.51	11.51
Hong Kong	12.41	6.15
China	25.23	20.35
South Africa	35.95	29.07
Nigeria	13.74	13.20
Kenya	34.54	35.03
Ghana	10.82	10.82

Source: Authors' compilation from regression estimates

The ARDL Results: The Bounds test for long term relationships show that the selected macroeconomic variables in the study actually move together with stock market returns across all the markets in the study. This gives the mandate to proceed for the estimation of the long term ARDL models that were specified in Chapter Three. The optimum lag length for the model was selected based on the Shwarze-Bayesian Information criterion (SIC). The results of the estimates are again presented in Table 5 for the market groupings.

In Table 5, the estimates of the ARDL model for the advanced markets are presented. The goodness of fit statistics for the results for each of the markets is generally low although it is quite high for the UK. The performance of each of the macroeconomic variables in explaining stock market returns for the markets is determined by the pattern of the individual coefficients in the model. For the lagged return variables, the coefficients are significant for most of the markets. Only the lagged coefficient for Japan fails the significance test at the 5 percent level. This indicates that for Japan, disequilibrium in the system tends to revert to long term pattern very rapidly. The indexes of industrial US production were significant for Japan result up till the fourth lag, and for the first lag for the US. The coefficients are mostly positive, implying that industrial production tends to stimulate stock returns for the markets.

The exchange rate did not have significant impact on stock returns in the US but has significant and mostly negative impacts on the other markets in the advanced markets. This indicates that exchange rate has strong negative impacts on the stock returns in the markets. Real interest rate also exerts oscillatory effects on stock return, with initial effects on the markets being positive, then it moves to negative and back to positive.

For oil prices, the significant effects in the US are negative, but positive current impact in UK and Japan, while the lag effects for these markets are also negative. For France, the current impact is positive and significant. These results suggest that oil prices have strong positive short term impacts on stock returns in the advanced markets. The coefficient of exchange rate is negative and significant only for Hong Kong market, suggesting that depreciation in exchange rate significantly depletes returns in the market. For oil prices, the effect in the Hong Kong market is initially positive, and then negative subsequently.

Table 5 ARDL for Advanced Economies - Panel 1

	US		UK		Japan	
Variable	Coef.	Pr.	Coef.	Pr.	Coef.	Pr.
R(-1)	-0.11	0.22	0.65	0	0.08	0.39
R(-2)	-0.22	0.02	0.25	0.00	-	-
R(-3)	-	-	-	-	-	-
R(-4)						
USINP	-0.23	0.47	0.00	0.09	-0.14	0.70
USINP(-1)	0.60	0.20	-	-	0.52	0.32
USINP(-2)	0.41	0.40	-	-	0.60	0.26
USINP(-3)	-0.66	0.03	-	-	-1.78	0.00
USINP(-4)	-	-			1.01	0.00
EXRT	1.89	0.97	-0.56	0.00	81.56	0.03
EXRT(-1)	5.99	0.92	-0.19	0.50	-90.93	0.11
EXRT(-2)	39.62	0.51	-0.09	0.74	85.36	0.13
EXRT(-3)	23.46	0.68	0.59	0.00	-82.96	0.02
-EXRT(-4)	-102.58	0.01	-	-	-	-
RINTR	-10.82	0.13	-0.09	0.01	-28.17	0.00
RINTR(-1)	11.02	0.12	0.04	0.53	25.19	0.08
RINTR(-2)			0.11	0.08	25.01	0.10
RINTR(-3)			-0.08	0.04	-42.43	0.01
RINTR(-4)					19.53	0.04
OILP	19.17	0.06	0.12	0.03	21.20	0.03
OILP(-1)	0.75	0.96	-0.15	0.01	-32.77	0.00
OILP(-2)	-25.17	0.03				
OILP(-3)	-	-	-	-	-	
C	17.90	0.00	0.75	0.00	35.79	0.08
R-squared	0.341			0.96	0.431	
Adj. R-sq.	0.246			0.95	0.372	
F-statistic	3.6		196		5.382	

Source: Author's compilation from regression estimates

Table 5 ARDL for Advanced Economies - Panel 2

	France		Germany		Hong - Kong	
Variable	Coef.	Pr.	Coef.	Pr.	Coef.	Pr.
R(-1)	-0.23	0.01	-0.08	0.37	-0.13	0.17
R(-2)	-0.17	0.05	-0.20	0.02	0.02	0.83
R(-3)	-	-	0.11	0.17	0.07	0.43
R(-4)					-0.21	0.02
USINP	0.19	0.19	0.23	0.15	0.07	0.88
USINP(-1)	-	-	-	-	1.27	0.07
USINP(-2)	-	-	-	-	-1.00	0.03
USINP(-3)	-	-	-	-		
USINP(-4)	-	-	-	-		
EXRT	-188.8	0.00	-183.2	0.01	-2994.9	0.01
EXRT(-1)	231.3	0.00	205.4	0.00	2249.6	0.04
EXRT(-2)	-	-	-	-		
EXRT(-3)	-	-	-	-		
-EXRT(-4)	-	-	-	-		
RINTR	-28.80	0.01	-19.87	0.11	-43.96	0.00
RINTR(-1)	10.41	0.59	3.28	0.88	43.23	0.00
RINTR(-2)	44.19	0.03	47.03	0.03		
RINTR(-3)	-50.48	0.01	-53.12	0.02		
RINTR(-4)	23.38	0.06	21.50	0.11		
OILP	33.78	0.03	24.86	0.15	28.87	0.05
OILP(-1)	-20.95	0.36	-7.22	0.77	-5.32	0.82
OILP(-2)	3.27	0.88	-27.29	0.11	-38.71	0.01
OILP(-3)	-22.52	0.11	-	-		
C	17.31	0.11	21.44	0.07	692.7	0.22
R-squared	0.401		0.356		0.35	
Adj. R-sq.	0.327		0.276		0.27	
F-statistic	5.399		4.461		4.26	

Source: Author's compilation from regression estimates

The results for the emerging markets are reported in Table 6. In the result the lags are significantly less than those of the advanced markets, indicating that the effects of the variables on market returns are quite more immediate in the emerging markets than in the advanced markets. The goodness of fit statistics is also low, with R squared values a 0.30 for South Africa and 0.19 for China. This implies that there are other determinant (external) variables that affect the dependent variable that are not captured in the study.

For the significance of the variables, the results show that the effect of the index of US industrial production on the returns is delayed and is only felt after two months have elapsed. The coefficients are negative for the two markets and show that a rise in US industrial production will cause stock market returns to fall significantly after some time in these markets. The impact of international real interest rate on stock returns appears to be very strong, especially for South African market. Real exchange rate is significant for the two lags in both markets; it is initially positive and then turns negative after a lag. The result also shows that as oil prices rise, stock market returns in the country initially fall, but as the prices persistently increase, stock returns begin to improve in the markets.

Table 6 ARDL Results for Emerging Markets

	SA		China	
Variable	Coef.	Pr.	Coef.	Pr.
R(-1)	-0.20	0.03	-0.03	0.78
USINP	-0.36	0.53	-0.13	0.84
USINP(-1)	1.65	0.06	1.90	0.04
USINP(-2)	-1.18	0.04	-1.51	0.02
EXRT	63.28	0.05	-58.97	0.24
EXRT(-1)	-56.49	0.08		
RINTR	-34.09	0.01	-30.37	0.03
RINTR(-1)	20.00	0.41	34.16	0.01
RINTR(-2)	47.74	0.07	-	-
RINTR(-3)	-58.16	0.02	-	-
RINTR(-4)	23.51	0.13	-	-
OILP	67.79	0.00	29.38	0.12
OILP(-1)	-80.14	0.00	-22.91	0.44
OILP(-2)	-	-	-27.66	0.16
C	17.98	0.16	90.45	0.08
R-squared	0.30		0.19	
Adjusted R-squared	0.22		0.12	
F-statistic	3.72		2.77	

Source: Authors' compilation

The result for the Frontier market is presented in Table 7. The results are also generally average in terms of overall fit. The F-values for each of the results are, however, significant at the 5 percent level. The result shows that the impact of the USINP has delayed impacts on the markets with the impact being mostly negative. Exchange rate also has delayed negative impacts on the stock returns for most of the markets. The impact of international real interest rate on stock returns appears to be very strong, especially for Nigeria and Ghana. The results are basically positive, suggesting that as the interest rates rise, stock returns tend to rise also. Apparently, investment in international money market instrument appears to be competitive with investment in the stock markets.

The effects of oil prices are also mixed for the frontier markets with positive and negative alternating between periods. The overall effects appear to be positive and stimulating. This shows that periods of impressive oil price performance in the international markets tend to mark period of higher stock market returns for the frontier markets.

Table 7 ARDL Results for Frontier Market

	Nig		Kenya		Ghana	
Variable	Coef.	Pr.	Coef.	Pr.	Coef.	Pr.
R(-1)	0.08	0.33	-0.17	0.06	0.31	0.00
R(-2)	-0.18	0.03				
R(-3)	0.07	0.37				
R(-4)	-0.35	0.00				
USINP	1.45	0.05	-0.21	0.70	-0.72	0.35
USINP(-1)	-0.96	0.18	1.40	0.07	2.12	0.04
USINP(-2)			0.02	0.98	0.47	0.64
USINP(-3)			-1.81	0.02	-1.33	0.05
USINP(-4)			0.79	0.14		
EXRT	-195.7	0.08	-350.7	0.00	9.73	0.23
EXRT(-1)	427.1	0.01	215.5	0.01		
EXRT(-2)	-359.5	0.03	-4.96	0.95		
EXRT(-3)	210.0	0.05	135.5	0.01		
RINTR	-29.21	0.07	-21.33	0.06	-9.95	0.51
RINTR(-1)	21.26	0.45	20.04	0.10	10.15	0.70
RINTR(-2)	75.27	0.01		0.80	14.06	0.60
RINTR(-3)	-127.27	0.00		0.81	-61.22	0.03
RINTR(-4)	70.14	0.00			60.31	0.00
OILP	70.67	0.00	-1.44		-25.80	0.24
OILP(-1)	-33.07	0.32			121.0	0.00
OILP(-2)	-32.44	0.14			-94.46	0.00
C	-185.8	0.03	12.90		0.58	0.97
R-squared	0.50		0.44		0.42	
Adjusted R-squared	0.42		0.38		0.31	
F-statistic	5.99		6.92		3.85	

Source: Authors' compilation.

Hypothesis Testing: *There is no significant long term relationship between stock market crashes and other global economic trends.*

The analysis of the Bounds test of long term effects for the ARDL specification addresses the hypothesis of this study. The evaluation of the results is based on the critical F-statistic values for the lower and upper bounds. From the F-values obtained at 5 percent level of significance, the results indicate that the selected macroeconomic variables in the study actually move together with stock market returns across all the markets in the study. In particular, all the variables in the study moved steadily with stock market crashes over time while oil prices and real interest rates have very strong de-stabilizing impacts on stock markets across the globe. The null hypothesis of no long-term relationship is thus rejected in this section since the statistical test have confirmed that there is a significant long term relationship between stock market crashes and other global economic trends.

5. CONCLUSION

Macroeconomic factors with international linkages have been increasingly related to stock market patterns around the world, leading to questions on the implications for stock markets efficiency. Their roles in stock market crashes have also been a major issue for consideration. Apparently, long term movements in the stock returns in major markets could be determined by observing long term trends in such macroeconomic variables. This study employed data on eleven stock markets that were categorized into advanced, emerging and frontier markets, to investigate the effects of the macroeconomic variables on stock markets behaviour across the globe. The analysis of the study was done along this line of demarcation in order to observe any differences that may exist in the behavioural patterns of the different market segmentation. Moreover, the Autoregressive Distributed Lags (ARDL) approach was adopted in determining the long term effects of the macroeconomic variables on stock market for the selected countries.

The findings from the study have shown that there is a significant long term relationship between stock market behaviour and global economic trends. Essentially, all the variables in the study moved steadily with stock market activities over time, thus suggesting that these variables could be either stimulating factors or response elements in stock market crashes over time. The strong link between the macroeconomic variables and stock market activities reveals that these variables tend to explain or demonstrate the pattern of stock markets around the globe. Moreover, it was shown in the study that oil prices and real interest rates have very strong de-stabilizing impacts on stock markets across the globe. Thus, strong changes in these variables have been shown to exhibit capacity to generate market crashes, especially for emerging and African markets.

Based on the findings of this study, there is need for the monetary authorities to adopt measures to, at least, limit the impact of the movement of other macroeconomic variables, especially external ones. Policies that have been found useful include diversification, and the use of sovereign wealth fund to manage the impact of oil market volatilities on national budgets, Other measures would have to include exchange rate management techniques that will ensure sustainability of international financial transactions even when oil prices are down (or rising rapidly). In the same vein, prudential regulation of financial institutions at the national level for each country needs to be intensified in the face of increased interlinkages between real sector markets and the stock market. Adequate regulation of the stock market for instance, would ensure that practices that could jeopardize market stability and efficiency are prevented. Finally, the realization that modern markets (whether financial or commodities) are strongly interlinked is particularly relevant in terms of market functioning. Such inter-linkages result from global interactions as well as investors' appetite in modern markets. A more feasible means of dealing with undesirable outcomes of such interactions would be to devise instruments that could fine-tune the relationships and foster unique patterns for future interactions.

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MAKROEKONOMSKI FAKTORI I PONAŠANJE NA BERZI: ANALIZA KRIZE IZ 2008. GODINE

Ovaj rad istražuje dugoročnu vezu između ponašanja na berzi tokom krize 2008. godine i nekih odabranih makroekonomskih internacionalnih varijabila koristeći informacije od januara 2005. godine do decembra 2015. U analizi su korišćene procedure ARDL tehnike (autoregresivni distribuirani lag). Procedura testiranja granica u okviru ARDL je korišćena da se testira postojanje dugoročnih veza između ponašanja na berzi i globalnih ekonomskih faktora (kamatne stope, kursne razlike, indeksa industrijske proizvodnje i cene nafte), kao i smer efekata, dok su procenjeni koeficijenti korišćeni za testiranje obrazaca dugoročnih veza među varijablama. Studija je otkrila da značajne dugoročne veze postoje između kretanja na berzi i ovih globalnih ekonomskih trendova, dok je krah berze značajno uticao na efikasnost tržišta koje su predmet ispitivanja. Prema tome, preporuka je da tržišne osnove ostanu kruna analza berzanskih kretanja, a donosioci odluka trebalo bi da ohrabre kidanje veze između berzi i faktora međunarodnih robnih tržišta.

Ključne reči: *ponašanje na berzi, makroekonomske varjabile, ARDL model*

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Review Paper

THE CONSERVATISM PRINCIPLE IN MODERN FINANCIAL REPORTING

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Abstract. *Various studies point out that the principle of conservatism (prudence) has been too long in the field of accounting, which makes it almost irreplaceable. However, the development of accounting is in line with constant expansion of the circle of stakeholders who impose new requirements regarding information on sources of income, destination of expenditures and calculation of periodic results. This inevitably leads to changes in financial reporting, aimed primarily at applying the fair value concept.*

Key words: *the conservatism principle, the historical cost concept, the fair value concept*

JEL Classification: M41

INTRODUCTION

Modern financial reporting requires high-quality accounting standards, able to respond to a number of challenges that business entities face. Financial statements prepared in accordance with the relevant principles and the standards built on them meet the information requirements of numerous stakeholders. The modern accounting tendency denies the importance of certain traditional accounting principles, the conservatism principle (prudence) in particular, with the aim of promoting the fair value concept.

The fair value concept provides detailed information on conditions under which business entities operate, the market value of their assets and liabilities and provides a better basis than the historical cost concept, to gain from efficient business risk perception. In other words, the fair value concept is oriented towards the future, while the historical cost concept (with its conservatism principle) is oriented towards the past. This paper shows the importance of applying prudence in the process of generating high-

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quality accounting information in order to point out the consequences of inadequate application or even abandoning the conservatism principle. Also, our goal is to point out the potentials of simultaneous application of the conservatism principle, as an integral part of the historical cost concept, and the fair value concept.

1. Contribution of the Conservativism Principle to the Higher Quality of Accounting Information

One of the oldest accounting principles is the conservatism principle (prudence). Despite its traditional dominance over other accounting principles, highlighting its importance in financial reporting, theory lacks its uniform definition. The most common is Bliss's definition of 1924, which is used today as an accounting saying, indicating that in conservatism no gain (income) should be anticipated, but that every loss (expense) should be predicted (Thijssen & Iatridis, 2016, 49). Basu also gives a well-known definition of conservatism in his 1997 paper, in which he defines conservatism as an asymmetry in the recognition and presentation of profits that provides a faster and more complete response to "bad news" than "good news" in doing business (Hansen, Hong & Park, 2018, 76).

The results of numerous studies on the desirability of applying accounting conservatism in modern financial reporting show that a number of theorists and practitioners mark this principle as a basic characteristic of financial reporting, which is contrary to the opinion of standard setters. On the one hand, theorists and practitioners believe that conservatism tends to emphasize reliability in relation to the relevance of information provided (Balachandran & Mohanram, 2011), while, on the other, removing reliability from the group of desirable information characteristics means nothing but that standard setters believe that only information that does not contain elements of conservative bias can be called quality information. Omitting reliability expressed as a requirement to apply a certain degree of prudence when preparing financial statements from the *Conceptual Framework for Financial Reporting* also means pushing the principle of conservatism (prudence) into the background (Savić, 2014, 28). In other words, standard setters believe that the conservatism principle is contrary to the requirement that financial statements should present neutral information to decision makers.

The financial market looks at the quality of accounting information in terms of its credibility, seen as the impact of the presented results on the entity's market value. The value or relevance of accounting information (primarily, financial result) represents "the degree to which book values agree with market values" (Thijssen & Iatridis, 2016, 59). Most studies find a positive link between the level of conservatism and the value that accounting information has for decision makers (Kousenidis, Ladas & Negakis, 2009). In other words, viewed from the perspective of a number of stakeholders, the value of accounting result derives from its ability to explain market returns (Francis & Schipper, 1999). Accounting conservatism increases the timeliness of bad news, i.e. it warns managers and, more importantly, investors in time, who insist on the application of conservative rules in conditions of uncertainty. The studies show that entities that face greater uncertainty report more conservatively (Hsieh, Ma & Novoselov, 2019, 41). However, there are studies indicating that the higher the conservatism, the lower the information relevance, i.e. that there is a negative relationship between these values (Basu,

1997). This is especially true for intangible assets, which are very difficult to value, so conservatism may decrease the value of information provided by the accounting system (Thijssen & Iatridis, 2016, 50). "In certain cases, such as the permanent market crisis, higher levels of conservatism appear as a natural mechanism for investor protection" (Kousenidis, Ladas & Negakis, 2009, 221). The results of the research indicate a gradual increase in the level of conservatism in the USA and several EU countries after the market crisis in 1999 (Grambovas, Giner & Christodoulou, 2006). The outcome of the Asian financial crisis shows that "conservatism decreases during the crisis" (Gul, Srinidhi & Shieh, 2002), but grows after a period of financial crisis (Vichitsarawong, Eng, & Meek, 2010). A study conducted in 2011 (immediately after the last economic crisis) of over 100,000 entities from the United States finds that the level of conservatism increases (Balachandran & Mohanram, 2011). It is believed that the increase in the level of conservatism is due, above all, to the increase in the timeliness of recognizing losses.

Conservative reporting "can increase the reliability of financial information because conservatism results in fewer estimates (and, thus, more objective measurement)" (Balachandran & Mohanram, 2011), reflecting a close correlation with market values (Kousenidis, Ladas & Negakis, 2009). Also, insufficient reliability of information narrows the choice of potential solutions and limits the effects of decisions made by investors, so conservatism is considered to be aimed at increasing rather than decreasing the value of information on business results (Kousenidis, Ladas & Negakis, 2009, 220).

2. Potentials of Abuse of the Conservativism Principle

The benefits of conservative reporting are not unlimited. An extremely high level of conservatism will reduce rather than increase the relevance of accounting information for decision-making purposes (Kousenidis, Ladas & Negakis, 2009, 221). The research results provide empirical support for the Watts's theoretical basis of 2003, who, on the one hand, reports "numerous arguments in favor of conservatism, but, on the other hand, raises questions about the practice of expensive conservative reporting", which is a potential reason for distortions of the correlation between result and market return (Kousenidis, Ladas & Negakis, 2009, 219). Empirical studies indicate that the conservatism principle in the conditions of IAS/IFRS is applied more on a temporary rather than a consistent basis. In the conditions of IAS/IFRS, "the principle of conservatism is not applied consistently, but on an *ad hoc* basis, i.e. according to the current entity and/or management needs" (Savić, 2014, 34). The temporary application of conservatism in accordance with the specific circumstances and entities' goals is reflected in the accounting treatment of certain events (overestimation of provisions or underestimation of income), which leads to the creation of hidden reserves, which will result in uniform or increased results. Users of financial statements see this situation as a source of potential information asymmetry, due to much more complex effects on the determined result in relation to the consistent application of this principle (Helman, 2008, 82), which will have significant repercussions on the quality of presented information.

The historical cost concept and its so-called *ex ante* assessment of the value of assets and liabilities in uncertain business conditions, i.e. asset write-off and considering contingent liabilities are the main sources of hidden reserves as a certain degree of protection against numerous business risks (Savić, 2014, 33). As a segment of equity that

is not shown in the balance sheet, hidden reserves are usually created by underestimating assets, but also by overestimating liabilities. The primary objective of hidden reserve formation is to prevent serious fluctuations in the results presented in the financial statements from being disclosed. Specifically, sudden changes in the amount and structure of the financial result can create a public image of unstable business, which consequently affects the risk of investing in entity's shares. The frequency and proper timing of the formation and decomposition of hidden reserves is a means aimed at achieving time uniformity of results, which is the main argument of critics of hidden reserve policy and its source – the accounting conservatism principle. "It is necessary to develop a culture of creating and decomposing hidden reserves, whose intention is not to mislead balance sheet recipients and lead to wrong business decisions, but to contribute to protecting the interests of the corporation in a dynamic and change-prone business environment" (Savić, 2014, 34). Opponents of the policy of hidden reserves point to its contraindications, manifested by endangering the principle of truthfulness, since "hidden reserves are created not by underestimating the net assets in any balance sheet, but only the one that is true and accurate" (Ranković, 2008, 423).

In addition to influencing the presentation of entity's current business situation, the conservatism principle indirectly has an impact on the accuracy of predicting future results. Specifically, managers who have superior business information in relation to all other stakeholders should be able to predict the future expressive results and the impact of accounting conservatism on them. In other words, managers need to be able to adjust their forecasts of the next accounting period (or even more subsequent periods) to the effects of conservatism (Sun & Xu, 2012, 64). However, in addition to objective limitations (such as the necessary accounting knowledge and experience gained in many years of accounting practice), managers also encounter a subjective limitation in making their predictions embodied in the form of opportunism. Specifically, this managerial personality trait can influence their decision to adjust predictions of the expressive result with reference to a certain degree of conservatism. Literature (Sun & Xu, 2012, 66-67) points to three sources of managerial opportunism, which figure as the most important reasons for incomplete forecasting of future results and their inadequate adjustment with reference to the effects of historical (existing) degree of conservatism: 1) planned external business financing or investment in the forthcoming period, 2) "field preparation" for the implementation of planned mergers and acquisitions, and 3) direct conflict of interest and situations when managers plan to cash in on the shares of the entity they manage. When it comes to the first source of managerial opportunism, Lang and Lundholm (Lang & Lundholm, 2000) suggest that managers are optimistic in predicting results when applying for additional external capital. The artificial increase in results is done in order to deceive creditors regarding the business prospects and entity's potentials in order to reduce the price of borrowed capital. Given that accounting conservatism leads to an underestimation of the stated result, managers try to reduce the degree of conservatism in their predictions when they anticipate the need for external capital. Another source of managerial opportunism appears in a study by Erickson and Wang (1999), who find that entities have an incentive to increase their results before initiating mergers and acquisitions in order to reduce the cost of business growth. Also, Kravet (2014) finds that under more conservative accounting practices, managers make less risky acquisitions. That is why managers consciously underestimate the influence of conservatism on results and publish optimistic predictions of results as much as possible. In explaining the third source of managerial opportunism, the study by Rogers & Stocken (2005) will help, which indicates that managers tend to disclose optimistic forecasts of

results when planning to sell their shares in the entities they manage, i.e. the findings show that managers will not adjust results based on the cumulative historical effects of conservatism, and that pessimistic performance predictions are reserved for the accounting period in which managers plan to purchase entity shares. Viewed from the perspective of shareholders, conservatism in financial reporting reduces managerial motivation and willingness to invest in riskier investment projects with a positive net present value, which leads to the occurrence of lost returns and represents an opportunity cost or the price of conservatism.

The phenomenon of accelerated globalization and internationalization of capital markets has opened up topics of transparency and timeliness of financial reporting (Neag & Masca, 2015, 1114). Entities face increasing business uncertainty, and, in order to survive on the market, their managers need to adhere to prudence in decision-making (Ben-Haim, 2014). In other words, the benefits of applying the conservatism principles in modern financial reporting "by far outweigh its weaknesses" (Škarić-Jovanović, 2015a, 63). Emphasizing the requirements for detailed *ex post* reporting on business results and their impact on stock prices, accounting conservatism points to the importance of *ex ante* information on low returns on investment projects (Ball, 2001), i.e. before their implementation, as well as in their early phases, whereby "conservatism increases the value of work-based learning" (Hsu, Novoselov & Wang, 2017). As a striving for stricter verification of "good news" and recognition of their consequences (gains) in relation to "bad news", accounting conservatism is "a measure that limits the riskiness of information from financial statements" (Lin, Wu, Fang & Wun, 2014, 164). In this way, accounting conservatism helps investors and a number of interest groups by controlling managers' activities (Hsieh, Ma & Novoselov, 2019, 44).

3. The Possibility of Coexistence of the Conservativism Principle and the Fair Value Concept

The conservatism principle, which leads to the recognition of realized transactions and events with material effects on the financial statements, does not provide information that is a good indicator of business risk, which is why it is not suitable for fully meeting the information requirements of investors. Emphasis on the importance of information requirements of investors and creditors and their definition as primary users of financial statements is there because these users invest their financial resources in the entities' operations and are the main participants on financial markets. Accounting information that meets the information needs of primary users is considered to fully meet the information needs of other users of financial statements. It is precisely fair value that has been developed in response to the needs of capital market participants who use anticipated financial data in order to appropriate anticipated profits (Richard, 2015, 24).

3.1. The fair value concept in modern financial reporting

The fair value concept emphasizes the relevance of financial information, while the historical cost concept emphasizes reliability as one of the most important qualitative characteristics of financial information. "Current economic values presented in the balance sheet, rather than assets and liabilities recognized at historical cost, represent real investor requirements" (Benston, Bromwich, Litan & Wagenhofer, 2006, 261). In this

way, the purpose of preparation of accounting information changes, i.e. what changes is the direction of the reporting procedure towards the credible presentation of relevant financial information that will be used for timely business decisions. The accounting basis for this approach is the fair value concept, which ensures the achievement of this objective when applied to the entity's assets and liabilities from period to period.

The fair value concept was developed in the Anglo-Saxon states. The development of their financial-accounting theory and practice is based on the view that fair value is an objective value and represents the optimal basis for financial reporting. "Since the accounting system is determined by the characteristics of the financial system, and the Anglo-Saxon financial system is based on the capital market, the acceptance and application of the fair value concept in Anglo-Saxon practice has a consistent logic and full justification" (Knežević & Pavlović, 2008, 8). It is the transition "from the historical cost concept to the fair value concept" that is "driven by market observation of relevance" (Hitz, 2007).

Financial statements prepared in accordance with the fair value concept should reflect economic reality and market conditions, i.e. should provide information on assets and liabilities valued at current market prices. Investors need this information to determine whether their share in the fair value of net assets is optimal or needs to be changed (increased or decreased), as well as to monitor management activities. The main objective of financial reporting according to the fair value concept is to determine the amount of fair value of net assets at the reporting date and view the financial result of operations "simply as changes in fair value of assets and liabilities shown in the balance sheet" (Škarić-Jovanović, 2009, 422) between the two reporting periods, i.e. changes in the fair value of net assets at the end of the reporting period in relation to its beginning. Therefore, the reported result includes market-verified gains and losses, but also gains and losses that are not realized on the market, which are a consequence of the increase or decrease in the fair value of assets and liabilities at the reporting date. The similarity between the two concepts is the recognition of losses at the time of their occurrence, and the difference relates to the treatment of gains, since the historical cost concept recognizes gains only after their realization, and according to the fair value concept at the time of their occurrence. The consequence of this measurement of results is the acceptance of the view that "the balance sheet has priority in the annual financial reporting", while "the income statement has a secondary role" (Stojilković, 2011, 94). This is in line with the fact that "often contracts with customers contain such clauses that it is difficult to determine the actual amount of revenue generated by the supplier, which relates to the reporting period" (Spasić & Arsenijević, 2017, 53).

The new IFRS and the revised IAS adopted at the beginning of the 21st century include the possibility of expressing the value of individual items in accordance with the fair value concept. However, at the beginning of the application of this concept, no standard defined the procedure for measuring fair value, which quickly proved to be necessary. In May 2011, the IAS Board adopted IFRS 13 "Fair Value Measurement" with effect from 2013. IFRS 13 "provides guidance in determining the fair value of assets and liabilities of business entities and defines the rules for disclosing related information." The weak side of the application of the fair value concept refers to the potential impossibility of using inputs from the first hierarchical level defined in accordance with IFRS 13, which are the optimal indicator of the real value of a certain balance sheet item. As a result, there is a frequent application of inputs from the second and third hierarchical levels, which conditions the existence of (debatable) assumptions and assessment models.

3.2. Mixed basis of financial reporting

Although the concept of historical cost is a clear and practical method that consistently assesses the value of shares when they are not on an active market, theorists who support the fair value concept as a basis for financial reporting believe that the historical cost concept has lost relevance and should be replaced (Hitz, 2007). However, the reliability gap when it comes to the fair value concept contributes to the current situation in accounting theory and practice, which is that standard setters do not accept the fair value concept as the only accounting basis for financial reporting. In order to meet the information needs of modern users of financial statements (above all, investors), a mixed, i.e. combined basis of financial reporting is formed. The normative basis composed as a mixed combination of the two concepts "leads to the conclusion that none of the mentioned concepts alone can provide users with information relevant for making decisions on the allocation of available resources" (Škarić-Jovanović, 2015b, 327). The hybrid basis of financial reporting implies that the principle of neutrality and the prudence principle are applied together as conditions for credible presentation of information, where "prudence should be understood only as a reasonable response to uncertainties that properly takes into account environmental uncertainties and risks associated with the entity's operations" (Škarić-Jovanović, 2015a, 79).

Standard setters tend to make economic entities adjust their financial statements to the fair value concept, because financial reporting should be the basis for assessing and predicting future business performance. However, in order not to neglect the advantages of the older (historical) basis, the mixed basis for valuing certain forms of assets and liabilities prescribes mandatory compliance with the rules arising from the historical cost concept (for example, inventories and short-term receivables), for other forms of assets and liabilities based on the fair value concept (for example, financial instruments), and there is an alternative option for valuing third forms of assets and liabilities through the use of fair value or historical cost (for example, material investment). In that way, this normative basis is very complex for application, but also for understanding the financial statements obtained by its application (Škarić-Jovanović, 2015б, 331).

Also, it should be taken into account that IAS/IFRS are built on a mixed basis consisting of two concepts, the historical cost concept (related to the reliability characteristic) and the fair value concept (related to the relevance characteristic). In this way, financial statements present two types of information, reliable and relevant. Accounting standard makers and market regulators believe that the extended requirements imposed on entities when applying a mixed basis of financial reporting, which relate to fair value measurements, "increase the usefulness of financial statements" (Barth, 2014). Specifically, "when users of financial statements consider that the source of information is insufficiently reliable, they will not consider the information useful for making business decisions. In other words, fair value has less informative value when not reliably measured" (Hernandez Hernandez, 2004).

CONCLUSION

This research has shown that the fair value concept has a potential to provide more detailed information on the business conditions of economic entities, the market value of their assets and liabilities and a better basis than the historical cost concept to achieve benefits based on efficient business risk perception. The lack of the fair value concept is the absence of a standardized procedure and uniform fair value measurement procedures

which have led to a decrease in the quality of financial reporting in the form of a drastic decline in comparability of data. The combination of elements of the historical cost concept and the fair value concept has been seen as the practical solution from many researchers' point of view.

As the research presented, the application of the conservatism principle is still very widespread in practice, which only proves that accountants and professional users of accounting information believe that financial statements will be more relevant and reliable if compiled in accordance with traditional accounting principles. Also, practice has shown that it is not realistic to expect that the application of a certain level of conservatism (as an essential element of the historical cost concept) can be standardized. The reason lies in the fact that the perception of prudence is closely related to the individual's personality (accountant, manager, investor) and their aversion to risk.

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PRINCIP KONZERVATIVIZMA U SAVREMENOM FINANSIJSKOM IZVEŠTAVANJU

Često se u literaturi može naći zapažanje da je princip konzervativizma (opreznosti) u službi računovodstvene nauke predugi niz godina i da ga ova karakteristika čini teško zamenljivim. Međutim, razvoj računovodstva praćen je konstantnim proširivanjem kruga interesenata koji nameću nove zahteve u vezi informacija o izvorima prihoda, odredištu rashoda i obračunu periodičnog rezultata. Ovo neminovno vodi promenama u finansijskom izveštavanju koje su usmerene, pre svega, na primenu koncepta fer vrednosti.

Ključne reči: *princip konzervativizma, koncept istorijskog troška, koncept fer vrednosti.*

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Review Paper

COMPARATIVE ANALYSIS OF DEVELOPMENTAL CONCEPTS OF SOCIAL ENTREPRENEURSHIP IN EUROPE AND THE USA

UDC 005.961:005.914.3]:364-3(4+73)

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Abstract: *The paper presents a comparative analysis of the dominant theoretical concepts and models of social entrepreneurship development in continental Europe and the United States. The initial assumption of the paper was the differences in the model of capitalism that are present in these parts of the world, and the dominant theoretical concepts determine the differences in the form of manifestation of social entrepreneurial activity and the degree of population involvement in its implementation. Empirical research, with the aim of testing this assumption, was conducted on a sample of 50,000 social entrepreneurs from 25 countries. The results showed that there are no significant differences in the degree of involvement of the population in social entrepreneurial activity between Europe and the USA in the initial phase. In the operational phase, there are differences in the degree of involvement of the population in social entrepreneurship between Europe and the USA, but they are also present between Eastern and Western Europe, which means that they are not predominantly conditioned by theoretical concepts and models of social entrepreneurship, but by other factors.*

Key words: *social entrepreneurship, social enterprises, social innovations, start-up development phase, operational development phase of the SE.*

JEL Classification: L31

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1. INTRODUCTION

Many countries had a problem with unemployment in the 1980s, which they could not solve with the existing mechanisms of social policy. New solutions needed to be found that would allow certain social groups to be introduced to the labor market (Certo & Miller, 2008). As a possible solution to this problem, social enterprises began to be established.

Social enterprises were innovations in the public sector whose primary goal was primarily the care of socially vulnerable groups and the training of „people who are disadvantaged in society and cannot be self-employed.“ (Raičević & Glomazić, 2012, p. 7). Initially, social enterprises were founded and financed by the state, but very quickly members of civil society (citizens, informal groups, associations, etc.) self-organized. They independently created social enterprises in various legal forms to enable employment of people who are long-term unemployed and facilitate their inclusion in social flows (Hjorth, 2013; Monzon & Chaves, 2017) or offer goods /services to the most vulnerable social groups, at relatively low prices or completely free and made it easier to overcome the institutional vacuum (Kolin & Petrušić, 2008).

These individual initiatives involved finding new and original ideas for solving social problems, starting a business while providing all the necessary resources and bearing the risk of failure of such a job. In other words, they had all the elements of entrepreneurial activity, so they are beginning to be considered a „form of social entrepreneurship“ (Austin et al., 2006; Zahra et al., 2009; Elkington & Hartigan, 2008).

The benefits of implementing an individual entrepreneurial initiative in the social sphere to solve social problems are being noticed by many international institutions, so they are starting to work on their promotion and development (Hjorth, 2013). These measures have resulted in the emergence of a large number of social enterprises and entrepreneurs (European Commission, 2013). The increase in the number of entrepreneurs with social goals in practice begins to draw the attention of scientists and „leads to the development of the theoretical concept of social entrepreneurship“ (Johnson, 2000; Thompson et al., 2000).

As a concept that uses non-governmental organizations, market-based approaches to address social issues, social entrepreneurship is becoming increasingly accepted and is being applied worldwide. However, under the influence of the specific characteristics of the environment in which it develops, social entrepreneurship begins to take different forms in certain parts of the world. The most obvious differences occur in the development of social entrepreneurship in continental Europe, on the one hand, and the United States and the United Kingdom on the other. According to some authors, one can even speak of different models of social entrepreneurship (Bacq & Janssen, 2011), while others agree that it is the same concept with certain variations (Hjorth, 2013).

The subject of this paper is to present the similarities and differences of the "European" and "American" model of social entrepreneurship through a comparative analysis of theoretical concepts and forms of manifestation of entrepreneurial activity in the social sphere. The aim of this paper is to examine whether there are significant differences in social entrepreneurship in these parts of the world.

The paper will first present the theoretical concepts of social entrepreneurship and the dominant schools that are present in the literature in Europe and the United States. Then, a comparative analysis of the practice of social entrepreneurship on both sides of the Atlantic will be done and the historical factors that shaped different conceptions of social entrepreneurship will be analyzed. Finally, using statistical methods, based on GEM data,

it will be examined whether there are significant differences in the development of social entrepreneurial activity in Europe and the United States.

2. Literature Review

2.1. Different theoretical concepts of social entrepreneurship in Europe and the USA

Social entrepreneurship is a relatively new concept. In its theoretical explanation, there are significant differences between individual authors and institutions (Dacin et al., 2010). Differences in the explanation of the concept of social entrepreneurship appear, first of all, as a consequence of different understandings of entrepreneurship itself. As it is known, entrepreneurship can be viewed as a set of personal characteristics of individuals - entrepreneurial spirit or as a set of the activities - entrepreneurial process (Ivanović-Đukić & Radosavljević, 2019, p. 152). The first group of definitions explains social entrepreneurship from the aspect of personal characteristics of entrepreneurs. In that sense, a social entrepreneur is most generally defined as an individual who is able to find original ideas for solving social problems, provide the necessary resources and start a business in order to create value for society. The second group of definitions explains social entrepreneurship as a set of activities performed by a social entrepreneur. In this sense, social entrepreneurship is "a process of the value creation by combining resources in new ways" (Mair & Marti, 2006, p. 37).

In addition, there are differences in the understanding of the essence of social entrepreneurship that have conditioned the emergence of: schools of social innovation and schools of social enterprises (Dees & Battle Anderson, 2006). The School of Social Innovation arose from the theories of entrepreneurship developed by Josef Schumpeter (Schumpeter, 1934). The focus of this approach is innovation, i.e. "finding new and better means to solve social problems by the individual" (Dees & Battle Anderson, 2006). Accordingly, a social entrepreneur can be defined as an innovator - a person who reforms or revolutionizes traditionally established models of creating social value in the direction of better use of resources to create greater social impact (Dees & Battle Anderson, 2006; Peredo & McLean, 2006; Sharir & Lerner, 2006; Thompson et al., 2000; Nicholls & Cho, 2006). While the primary goal of social entrepreneurial activity is the creation of added value for society by individuals and the introduction of sustainable changes for a society that take precedence over profit creation (Mair & Marti, 2004; Weerawardena & Sullivan Mort, 2006). The focus of this school is an individual, a social entrepreneur when they consider him an activist of social change. Thus, one person who is the bearer of social change, in Schumpeter's sense, is a key driver of social entrepreneurship even if a larger number of people can be involved in the creation of its organization (Dees & Battle Anderson, 2006).

On the other hand, the school of social enterprises advocates the creation of organizations that will simultaneously achieve a social mission and generate income (Defourni & Nissens, 2008, p. 3). A social entrepreneur is a visionary who is able to identify opportunities from the environment and use the resources of a certain group of citizens to achieve "a social mission in an economically sustainable way and find innovative solutions to social problems of their community that are not adequately met by the local government" (Sullivan Mort et al, 2003; Dearlove, 2004; Roberts & Woods, 2005; Sharir & Lerner, 2006; Chell, 2007). The primary goal of social entrepreneurs' activities is to achieve a social mission (all social activities that can be non-profit) in an economically sustainable way, if the business performs activities that generate profit, it must be reinvested in solving social problems (Defourni & Nissens,

2008). Thus, according to this school, the primary role in the social economy is played by social enterprises (citizens' associations), while social entrepreneurs have a secondary role (Skoll, 2008).

The school of social enterprises is more accepted in Europe (Defourni & Nissens, 2008, p. 3), while in the USA the school of social innovations is dominant. Interest in social enterprises in the United States is present only among non-profit organizations working on the establishment of social enterprises to use funds from international funds intended to finance these economic entities (Basq & Janssen, 2011).

2.2. Different practices of social entrepreneurship in Europe and the USA

The development of social entrepreneurship in practice, in addition to dominant theoretical concepts, is greatly influenced by the institutional environment in which the activities of social entrepreneurs take place. The institutional environment is defined by legal regulations, administrative procedures, social policy and other measures implemented by the state. The institutional environment is specific for each country, so there are certain differences in the development of social entrepreneurship. The biggest differences appear in the concept and manner of development of social entrepreneurship in continental Europe on the one hand and the USA and the UK on the other, and they are largely conditioned by the characteristics of capitalism and the role of government. For example, the American model of capitalism is based on individual financial success, short-term financial gain, and media coverage. Not much attention is paid to economic differences. Poverty is seen as a reflection of laziness and irresponsibility. For these reasons, "unemployment benefits are very low, there is no compulsory health insurance or family allowance" (Albert, 1991). On the other hand, the model developed by Rhineland, which is present in continental Europe and Japan, gives greater importance to collective success, encourages long-term orientation and strives to reduce economic disparities in society. The European tradition considers the poor man a victim, not a culprit, so in most European countries there are a large number of forms of social assistance for the most economically vulnerable categories of the population and highly organized social insurance (Basq & Janssen, 2011).

These two very different forms of capitalism lead to a different approach to the development of social entrepreneurship. As the governments of most countries in Europe implement a larger number of social policy measures to reduce social exclusion and poverty, all initiatives that help solve these problems are encouraged and supported. Social entrepreneurship is considered one of the priorities, so most countries provide various forms of financial and institutional assistance in the direction of its development (they push its development). Figure 1 shows the sources of income of social enterprises in Europe, where public funds play a significant role.

On the other hand, in the United States there are no direct state incentives or institutional measures to support the development of social entrepreneurship. It is considered an instrument for creating a welfare state. Through the media, work is done to raise public awareness of its role and importance, but its development is based on the voluntariness and individual initiatives of individuals (Dees & Battle Anderson, 2006). Given that there are more incentives to start social entrepreneurial activity in Europe, it can be expected that a higher percentage of the population in Europe is involved in social entrepreneurial activity in the start-up phase compared to the USA and the UK. Therefore, our first hypothesis is:

H1: Percent of people involved in social entrepreneurial activity in the start-up phase is higher in Europe, compared to the USA & UK.

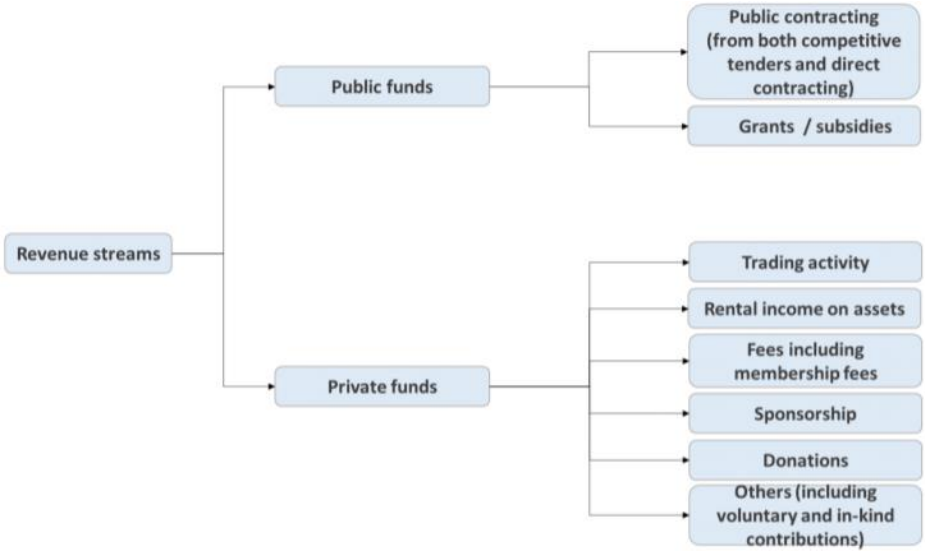

Fig. 1 Revenue streams for social enterprises in Europe
Source: European commission (2015) A map of social enterprises and their eco-systems in Europe. Luxembourg: Publications Office of the European Union

In addition to the characteristics of capitalism and the role of the Government, legal regulations and dominant theoretical concepts affect the characteristics of organizations as a form of manifestation of entrepreneurial activity with a social mission. According to the School of Social Innovation, which is dominant in the U.S., the legal form of an organization founded by a social entrepreneur can be different, and the organization itself can be nonprofit or for-profit. For Austin, Stevenson, and Wei-Skillern (2006), as well as for Mair and Marti (2004), "social entrepreneurship should not be limited to any specific legal form. According to these authors, the choice should rather be dictated by the nature of social needs and the amount of resources required." For Mair and Marti (2004) an important element is the entrepreneurial spirit that gives social initiatives their entrepreneurial nature. This perspective has resulted in the emergence of various hybrid organizational forms that can: be independent, generate profit, hire people and hire volunteers, adopt innovative strategies in search of social change," etc. "The advantages of these hybrid organizations include, among other things, higher market response rates, higher efficiency and innovation rates, as well as higher resource mobilization capacity" (Haugh, 2005; Dees & Battle Anderson, 2006). Given that in the United States, social entrepreneurs have much greater opportunities to take advantage of opportunities from the market, it can be expected that a large percentage of initiated social jobs will survive the initial problems and move from the start-up to the operational phase. Our next hypothesis is:

H2: Percent of people involved in social entrepreneurial activity in the operational phase is higher in the USA & UK compared to Europe.

In contrast, in Europe, the forms of entrepreneurial organizations and the legal forms they can receive are precisely defined. All organizations founded by social entrepreneurs are considered part of the so-called “third sector”, are embedded in the field of social economy and can be: cooperatives, citizens' associations, foundations and mutual benefit societies. Two types of definitions can be found in European literature: conceptual and legal. International organizations as well as research centers have provided conceptual definitions. For example, the OECD defines a 'social enterprise' as "any private activity carried out in the public interest, organized by an entrepreneurial strategy, but whose main purpose is not to maximize profits but to achieve certain economic and social goals and which has the ability to bring innovative solutions to problems of Social Exclusion and Unemployment" (OECD, 1999). The European Commission's definition in the 2011 strategy paper entitled "Social Business Initiative" explains: rather than making a profit for its owners” (Brouard & Lariviet, 2011). A comparative overview of these characteristics of social enterprises is given in Table 1.

Table 1 Comparative overview of social enterprise in the United States and Europe

	Europe	United States
Mission	Creation of social value	Revenue generation
Types of Social Enterprise	Few	Many
Common Organizational Type	Association/Cooperative	Nonprofit
Focus	Human Services	All Nonprofit Activities
Activity of most SEs	Market based	Market based
Help from the government	Substantial	Insignificant

Source: Authors' work based on a literature review

EMES network researchers have developed a common definition of a social enterprise that should fit into the different national contexts of individual EU countries. They list the criteria that an organization needs to meet in order to be considered a social enterprise. On the one hand, “four criteria are stated that reflect the economic and entrepreneurial dimensions of the organization: (1) continuous activity of production and sale of goods and/or services; (2) a high degree of autonomy; (3) a significant level of economic risk; and (4) the minimum amount of work paid.” On the other hand, five criteria are listed that unite the social character of an entrepreneurial initiative: “(1) an explicit goal for the benefit of the community; (2) an initiative launched by a group of citizens; (3) decision-making power that is not based on capital and ownership; (4) participatory nature including all actors of the activity; and (5) limited profit distribution” (Defourni & Nissens, 2008).

Using this definition as a starting point for identifying social enterprises, significant differences in the number of social enterprises in European countries can be observed. Table 2 provides an overview of the estimated number of social enterprises in the EU and non-EU countries, the number of social enterprises per million inhabitants, as well as the estimated number of employees in these enterprises.

Table 2 Estimated number of social enterprise in EU and non-EU countries

	Country	Year	Estimated number of SEs	Number of SEs per million inhabitants	Estimated number of employees
EU countries	Austria	2015	Approx. 1,535	Approx. 174	N.A.
	Belgium	2017	18,004	1,530	572,914
	Bulgaria	2015-2017	Approx. 3,700	Approx. 525	26,000
	Croatia	2018	526	128	N.A.
	Cyprus	2017	190	22	N.A.
	Czech Republic	2018	3,773	356	N.A.
	Denmark	2018	411	71	N.A.
	Estonia	2016	121	92	1,603
	Finland	2018	1,181	214	Approx. 52,500
	France	2015-2017	Approx. 96,603	1,414	>1,187,249
	Germany	2017	77,459	936	N.A.
	Greece	2019	1,148	107	N.A.
	Hungary	2016	15,855	1,621	72,642
	Ireland	2009	3,376	699	>25,000
	Italy	2017	102,461	1,694	894,800
	Latvia	2018	Approx. 200	Approx. 103	N.A.
	Lithuania	2016-2017	3,476	1,237	N.A.
	Luxembourg	2017-2018	928	1,546	24,055
	Malta	2018	31-62	65-130	N.A.
	Netherlands	2015-2016	5,000-6,000	290-350	65,000-80,000
	Poland	2016-2019	29,535	768	428,700
	Portugal	2013	7,938	771	145,734
	Romania	2015-2017	6,317	323	17,117
	Slovakia	2014	3,737	687	N.A.
	Slovenia	2017	1,393	674	15,063
	Spain	2017	9,680	208	>91,500
	Sweden	2009-2016	Approx. 3,000	Approx. 296	N.A.
non-EU countries	Albania	2018	379	132	2,000-2,500
	Iceland	2017	258	740	1,488
	Montenegro	2018	150	241	< 500
	North Macedonia	2013-2015	551	266	N.A.
	Norway	2016	250	47	N.A.
	Serbia	2012	411	59	4,273
	Turkey	2016-2018	1,776	22	N.A.
	United Kingdom	2007-2017	30,753	464	353,357

Source: European Commission (2020) Social enterprises and their ecosystems in Europe. Comparative synthesis report. Available at https://europa.eu/!Qq64ny

Legal definitions cite the national governments of each state to establish clear criteria for entities that can be considered social enterprises, and they vary from country to country (Basq & Janssen, 2011). Also, organizations and instruments of support for their development differ. However, there are some elements that are present in most EU countries that provide the basic infrastructure for the development of social entrepreneurship. First, there is legislation in the field of social entrepreneurship. Legal regulations define the most important conditions that should be met by the subjects of the social economy, their goals, business principles, forms of organization, establishment procedures, etc. Then, in most

countries, state bodies (ministries, councils, etc.) have been formed that are responsible for implementing measures to create a stimulating environment for the development of social entrepreneurship. These bodies work on strategies and implement policies for the development of social entrepreneurship, work on promoting and supporting social enterprises (through media promotion of the role and importance of social enterprises, providing better access to funding sources, creating institutions supporting social enterprises, etc.). Also, the activities of non-governmental organizations that are active in the field of social economy are stimulated. All these measures lead to the creation of a stimulating environment for the development of social entrepreneurship (Mitrović & Mitrović, 2019).

3. METHODOLOGY

3.1. Sample, model and variables

GEM (Global Entrepreneurship Monitor) data from 2015 (analysis of social entrepreneurship was performed at that time, while other reports do not contain this data) are used for the analysis (Bosma et al., 2016). Our sample includes a total of 25 countries: of which 10 are Eastern European countries, 13 are Western European countries, the UK and the USA. In accordance with the standard GEM methodology, each country provides answers for at least 2,000 entrepreneurs, so that our sample includes over 50,000 social entrepreneurs. Respondents of the GEM database consist of individuals aged 18-64 years.

According to GEM, a social entrepreneur is defined as "an individual who initiates or currently leads any type of activity, organization or initiative that has a particular social, environmental or common goal" (Bosma et al., 2016). There are two phases in the development of social entrepreneurial activity: start-up phase and operational phase. The start-up phase implies the initial entrepreneurial activity and refers to new companies (up to 3.5 years old). This phase is characterized by a number of challenges associated with starting a new business, so many businesses fail in the first few months of business and do not reach the next phase. Those companies that have existed for more than three and a half years are in the operational phase. This multi-stage procedure is useful for assessing the state of entrepreneurship at various points.

In order to examine whether there are statistically significant differences in the degree of population involvement in social entrepreneurship in the USA and Europe, a Multivariable Analysis of Variance (MANOVA) was performed. The variables in the model were the percentage of those involved in SE at individual stages in different parts of the world.

3.2. Results and Discussion

The results of descriptive statistics are shown in Table 3.

It can be seen from the table that the average values for the degree of involvement of the population in social entrepreneurship in the observed regions are approximately uniform. In the start-up phase, the average value in Western Europe is 4.05%, in Eastern Europe 3.85%, and in the USA & United Kingdom 4%. The highest degree of involvement is in Hungary (9.7%) and the lowest in Bulgaria 0.6%. Eastern European countries have the largest deviations from the average.

Table 3 Descriptive statistics

	Mean	SD	Min.	Max
Eastern Europe				
Involved in SE, start-up phase	3.28	6.18	0.6	9.7
Involved in SE, operational phase	3.14	2.23	0.7	6.9
Involved in social goal, start-up phase	1.44	3.78	0.3	5.8
Involved in social goal, operational phase	1.64	2.18	0.3	3.9
Western Europe				
Involved in SE, start-up phase	4.05	4.29	0.8	7.4
Involved in SE, operational phase	4.90	6.3	1.5	10.3
Involved in social goal, start-up phase	2.39	1.13	0.5	3.2
Involved in social goal, operational phase	3.13	2.37	0.9	5.5
SAD &United Kingdom				
Involved in SE, start-up phase	4	2.85	2.3	5.7
Involved in SE, operational phase	6.3	3.83	4.2	8.4
Involved in social goal, start-up phase	2.4	2.21	1.1	3.7
Involved in social goal, operational phase	4	3.33	2.5	5.5

Source: Authors' work based on: Bosma et al. (2016) Global Entrepreneurship Monitor 2015 to 2016: Special Report on Social Entrepreneurship. Global Entrepreneurship Research Association.

In the operational phase, the average involvement in Eastern Europe is 3.13%, in Western Europe 3.9%, in the USA & United Kingdom 6.3%. The highest degree of inclusion is in Luxembourg (10.3%), and the lowest in Bulgaria 0.7%.

In order to check whether there are statistically significant differences in the degree of involvement of the population in social entrepreneurship in certain phases, MANOVA was done. The results are shown in Table 4.

Table 4 Degree of population involvement in social entrepreneurship in Europe and the USA

	Eastern Europe	Western Europe	US & UK	F	p-value	Partial Eta Sq.	Bonferroni Test
Involved in SE, start-up phase	3.28	4.05	4	.59	.623	.01	NS*
Involved in SE, operational phase	3.14	4.90	6.3	4.46	.005	.08	1-2, 1-3, 2-3
Involved in social goal, start-up phase	1.28	1.75	2.4	.47	.562	.02	NS*
Involved in social goal, operational phase	1.46	2.49	4	4.05	.008	.07	1-3,2-3

NS - Non-significant differences
Source: Author's own work

As it can be seen, there are no statistically significant differences in the degree of population involvement in social entrepreneurial activity in the start-up phase between Eastern Europe, Western Europe and the US & UK. Our first hypothesis has not been proven. When it comes to the operational phase, there are significant differences, both between Europe and the US & UK, and between Eastern and Western Europe. This result points to the conclusion that theoretical concepts of SE (Dacin et al., 2010) and characteristics of capitalism (Bacq &

Janssen, 2011) are not the key cause of differences in the involvement of population in social entrepreneurship in Europe vs. USA. The analysis of the factors that predominantly influence the development of social entrepreneurship will be the subject of future research.

CONCLUSION

The field of social entrepreneurship is characterized by great diversity from the point of view of defining the concept and its application in practice. In addition to discrepancies in different regions, the distinctions are particularly pronounced in the understanding of this concept in different countries and institutional contexts. This differentiation is especially visible when comparing this type of entrepreneurship in Europe and the USA.

Despite the unique understanding of the essence of the concept of social entrepreneurship, there are significant differences in its development in Europe and the United States. Differences appear in the theoretical explanation and understanding of the essence and in the models of its development in practice. The paper explains the "School of Social Innovations" and the "School of Social Enterprises", as theoretical concepts that explain the essence of social entrepreneurship from different aspects. Also, the differences that occur in the way the concept is applied in Europe and the USA are explained. Comparing social enterprises, it was found that in many areas where the United States has difficulties with social entrepreneurship, Europe has a better solution and vice versa, which leaves space for mutual learning.

However, our empirical research on a sample of 25 countries and over 50,000 social entrepreneurs showed that significant differences in the degree of involvement of the population in social entrepreneurial activity do not exist in the initial phase. In the operational phase, there are differences in the degree of involvement between Europe and the United States, but differences also exist between Eastern and Western Europe, which means that they are not predominantly conditioned by theoretical concepts and development models of SE, but by some other factors.

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KOMPARATIVNA ANALIZA RAZVOJINIH KONCEPATA SOCIJALNOG PREDUZETNIŠTVA U EVROPI I SAD

U radu je izvršena komparativna analiza dominantnih teorijskih koncepata i modela razvoja socijalnog preduzetništva u kontinentalnoj Evropi i SAD. Polazna pretpostavka rada bile su razlike u modelu kapitalizma koje su prisutne u ovim delovima sveta, a dominantni teorijski koncepti uslovljavaju razlike u obliku manifestacije socijalne preduzetničke aktivnosti i stepenu uključenosti stanovništva u njenoj implementaciji. Empirijsko istraživanje, sa ciljem testiranja ove pretpostavke, sprovedeno je na uzorku od 50.000 socijalnih preduzetnika iz 25 zemalja. Rezultati su pokazali da ne postoje značajne razlike u stepenu uključenosti stanovništva u socijalnu preduzetničku aktivnost između Evrope i SAD-a u početnoj fazi. U operativnoj fazi se javljaju razlike u stepenu uključenosti stanovništva u socijalno preduzetništvo između Evrope i SAD, ali su one takođe prisutne između Istočne i Zapadne Evrope, što znači da nisu dominantno uslovljene teorijskim konceptima i modelom razvoja socijalnog preduzetništva, već nekim drugim faktorima.

Ključne reči: *socijalno preduzetništvo, socijalna preduzeća, socijalne inovacije, start-up faza razvoja, operativna faza razvoja SE*

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