Macroeconomics and Monetary Economics

Appraisal of Budgeting and Economic Growth in Nigeria

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Abstract: Federal government of Nigeria budgeted huge sum of money for transport infrastructures and health sector every year. Despite the fund earmarked for transport infrastructures and health sector, Nigerian roads are in bad positions while some roads are death traps and inadequate health facilities bedevil our hospitals. Therefore, this study examines effect of federal government budget on transport infrastructures and health sector on economic growth of Nigeria. The study used ex-post facto design and collected data through secondary source. The study covers Federal Government of Nigeria budgets for the period of 1999 to 2017. The study observed that government spending on transportation infrastructure does not significantly affect economic growth while spending on health has significant effect on economic growth. The study recommends among others that all health agencies within health sectors and other stakeholders should be involved in budget implementation to ensure efficient use of money meant for the sector.

Keywords: budget; transport infrastructure; health sector; economic growth

JEL Classification: O18

Introduction

The Nigerian government has responsibility to provide essential goods, services and good governance to the citizenry which are normally provided through Ministries, departments and agencies (Maritim, 2013). For a government to deliver, it has become a routine at all levels to prepare and approve into law the revenues and expenditures which are made in advance by government for a financial year called budget. Ighodaro & Okiakhi (2010) describe budget as a 'comprehensive document that outlines what economic and non-economic activities a government wants to undertake with special focus on policies, objectives and strategies for accomplishment that are substantiated with revenue and expenditure projections'.

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In Nigeria, section 81 of the 1999 Constitution as amended requires the President to lay the budget before a section of the National Assembly for subsequent enactment. Ekeocha (2012) opined that through budget, government indicates what to spend, determines what to borrow, and sets policy priorities within overall spending limit so as to influence the economy. Nigerian citizens are always eager to know government budget for the years in order to be able to plan for their businesses. Oke (2013) posited that the issue of budget implementation has been a source of concern to the public considering the important impetus of budget implementation on economic growth.

Federal government of Nigeria budgeted huge sum of money for transport infrastructures and health sector every year. Despite the fund earmarked for transport infrastructures and health sector, Nigerian roads are in bad positions while some roads are death traps and inadequate health facilities bedevil our hospitals. Despite the presence of budget office and budget monitoring teams in public sector, the perennial gap between budget implementation and economic growth is a growing concern among academia, economists, accountants, public analysts among others.

The specific objectives for the study are to:

    i.   determine the effect of government spending on transportation infrastructure on economic growth in Nigeria.
    ii.   ascertain how government spending on health affects economic growth in Nigeria.

The study is being guided by the following null hypotheses:

1. Ho: Government spending on transportation infrastructure does not significantly affect economic growth in Nigeria.
2. Ho: Government spending on health does not significantly affect economic growth in Nigeria.

Significance of the Study

The study will educate the electorate on budget implementation impact on economic growth and demand for government accountability. The study will encourage government to reappraised budget implementation process so that that it can have direct effect on the economy.

Scope

The study covers Federal Government of Nigeria budgets for the period of 1999 to 2017. These periods was chosen because the current civilian government administration commence in 1999.

1. Empirical Review

Abiola (2012) observed that citizens expected that larger size of budget and its appropriate allocation to poor sectors could reduce poverty level. Nevertheless, controversy abounds on whether public budget really drives poverty reduction in Nigeria. Going by this argument, the study examines the impact of public budget indicators such as federally collected government revenue and aggregate expenditure on the poverty incidence. The results show that federally government collected revenue and aggregate expenditure increase poverty incidence in Nigeria.

The study did not specify in its methodology the research design, population and sampling technique with source of data. This shows that methodology employed for the study is clearly stated to induce acceptability of its findings.

Olaoye, Olaoye & Afolabi (2017) examined the impact of implementation of capital expenditure on administration, economic services, socio-community services on the growth of Nigerian economy. The study employed techniques of co-integration and error correction model (ECM).The study discovered that there is strong relationship between capital expenditure implementation on administration, economic services, socio community services, transfer and economic growth of Nigeria. Therefore it concludes that capital expenditure implementation is germane to maintaining and sustaining economic growth in Nigeria. Based on the discovery, the study recommends that government should ensure adequate implementation of capital expenditure in the country.

The study gathered data through secondary data without specifying the research design used for the study. The study adopts model used by Oke (2013) without modification. This shows that the findings of this study are likely to be the replica of Oke (2013) study. Moreover, the problem investigated by the study is not clearly stated because it has confirmed in its statement of problem that "a well-implemented budget helps to translate government policies and programs into outcomes that have a direct, positive impact on people". Non clarity of statement of the problem does not give credibility to its findings.

Onakoya & Somole (2013) employ expo facto design and three-stage least square simultaneous equations estimation technique to examine the impact of public capital expenditure on economic growth in Nigeria in the context of macroeconomic framework at sectors level. The empirical results revealed that public capital expenditure contributes significantly to economic growth in Nigeria.

Okoro (2013) observed that there is a mixed feeling among academia about government expenditure and economic growth in Nigeria. This mixed feeling has degenerated to inconclusive debate on whether increasing government spending induces economic growth or not. Based on the above, the study investigates whether increasing government spending induces economic growth performance in Nigeria.

The study used Unit Root, Cointegration, and Error Correction test for his data analysis. The researcher found that both the short-run and long-run expenditure has significant effect on economic growth of Nigeria. In line with the findings, we recommend that Government increase both capital expenditure (investment in roads, power supply, transport, and communication) and recurrent expenditure mostly on issues that should attract economic growth. The researcher did not state the research design, population of the study and sampling technique is not stated in methodology. However, the source of data used for the analysis is not known.

Chude & Chude (2013) investigates effects of public expenditure in education on economic growth in Nigeria over a period from 1977 to 2012. The study used Ex-post facto research design and applied time series econometrics technique to examine the long and short run effects of public expenditure on economic growth in Nigeria. The results indicate that total expenditure on Education is high and statistically significant and have positive relationship on economic growth in Nigeria in the long run.

 Malgwi & Unegbu (2012) investigate how budget performance differs among Borno state, Bauchi state, Yobe state, Taraba state and Adamawa state in Nigeria. Survey design was used for the study while structured questionnaire was administered on target participants namely Administrators, Accountants, Financial Sector employees, Government Workers and Business representatives. The study discovered that budget performance differs from state to state. The researchers recommend that Nigeria should adopt Balanced Scorecard Budget perspectives. The study did not consider Federal government budget but selected few Northern states.

2. Methodology

This study used *ex-post facto* design because the events have already taken place and the researcher has no control over any of the independent variables. Therefore, secondary data will be used for the study. The population of the study will comprises of Nigerian government budget for the period of 1999 to 2017, which is 19 years budgets. Gross Domestic Product was a proxy for economic growth and government spending on infrastructure for transportation and communication, and health from 1999 to 2017 as contained in the Central Bank of Nigeria statistical bulletin for 1999 to 2017 and Nigeria Bureau of Statistical Bulletins for 1999 to 2017.

The measurements of Independent variables: Budget implementation is measured by the amount government spent on infrastructure for transportation and communication, education, health, agriculture and natural resources Dependent Variable: Gross Domestic Product will be proxy for economic growth. It is the total aggregate value of goods and services produced in a country over a given period (normally a year).

Linear regression model was used to analyze the relationship between the variables. The statistical test of the hypotheses formulated in this study was based on the following models:

$$GDP = F(TRCOINF) \qquad \textbf{eq.1}$$

$$GDP = F(HETH) \qquad \textbf{eq.2}$$

Equations 1-2 above can be rewritten in its explicit form as below:

$$GDP_{it} = \beta_0 + \beta_1 \, TRCOINF + \varepsilon_t \qquad \textbf{eq.3}$$

$$GDP_{it} = \beta_0 + \beta_1 \, HETH + \varepsilon_t \qquad \textbf{eq.4}$$

$$GDP_{it} = \beta_0 + \beta_1 \, TRCOINF + \beta_2 \, HETH + \varepsilon_t \, \textbf{eq.5}$$

Where:

GDP   = Gross Domestic Product.

TRCOINF   = Government spending on transportation infrastructure.

HETH   = Government spending on health.

β is intercept

e is error term capturing other explanatory variables not explicitly included in the model.

3. Data Analysis, Results and Discussion

In this section, the hypotheses stated in chapter one of this study in their null form were analyzed by Regression analysis and Analysis of variance (ANOVA). The decisions reached on hypotheses are based on the result obtained from regression calculation and the tabulated value of the regression distribution.

Decision rule:

If the computed value of regression is less than the critical value, the null hypotheses (Ho) are rejected and the alternative hypotheses (Hi) accepted. However if the value of regression is greater than the critical value, the alternative hypotheses (Hi) are rejected and the null hypotheses (Ho) accepted.

Hypothesis One

Ho: Government spending on transportation infrastructure does not significantly affect economic growth in Nigeria.

Hi: Government spending on transportation infrastructure hast significant effect economic growth in Nigeria.

Table 3.1a. Anova Result: Transportation Infrastructure on Economic Growth

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2321E+28	1	2321E+26	.147	.706[b]
	Residual	2680E+28	17	1576E+27		
	Total	2703E+28	18			

a. Dependent Variable: gross domestic product

b. Predictors: (Constant), transportation infrastructure

Table 3.1b. Model Summary for transportation infrastructure on economic growth

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.093[a]	.009	-.050	39702857076118.09000	.044

a.   Predictors: (Constant), transportation infrastructure
b.   Dependent Variable: gross domestic product

Table 3.1c. Regression Coefficient for Transportation Infrastructure on Economic Growth

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	4750E+13	1448E+13		3.280	.004
	transportation and communication infrastructure	-1673E+11	4359E+11	-.093	-.384	.706

Dependent Variable: gross domestic product

The *f*-ratio (.147) shows that government expenditure on transportation infrastructure is not the major determinant in explaining gross domestic product in Nigeria. It can be observed that government expenses on transportation infrastructure do not have a significant effect on the dependent variable based on the *f*-ratio. Government spending on transportation infrastructure explains 9 percent of the variation experienced in gross domestic product. The independent variable is not statistically significant because its significance value is 0.706, which means $P > 0.05$. The government budget for transportation infrastructural facilities is not well implemented. This is an evidence of poor state of our roads in South – East, South – South and some part of South west in Nigeria. Despite the huge sum of money

earmarked to fix and maintain federal rods in Nigeria annually, the state of Federal roads in the above three geographical region is in bad state. Within the period cover by this study, government expenses on railway transportation do not have any meaningful effect on Nigerian economy. Cargos that ought to be moved across the country by railways are being moved by trucks and trailers despite the pitiable conditions of our roads.

Decision

Based on the analysis above, the alternative hypothesis (Hi) is rejected while null hypothesis (Ho) is accepted; which state that Government spending on transportation infrastructure does not significantly affect economic growth in Nigeria.

Hypothesis Two

Ho: Government spending on health does not significantly affect economic growth in Nigeria

Hi: Government spending on health significantly affects economic growth in Nigeria

Table 3.2 a. ANOVA Result: Health on Economic Growth

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2447E+28	1	2447E+28	162.612	.000[b]
	Residual	2558E+27	17	1505E+26		
	Total	2703E+28	18			

a. Dependent Variable: gross domestic product

b. Predictors: (Constant), health

Table 3.2 b. Model Summary for Health on Economic Growth

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.951[a]	.905	.900	12267379345819.42600	2.172

a. Predictors: (Constant), health

b. Dependent Variable: gross domestic product

Table 3.2 c. Regression Coefficient for Health on Economic Growth

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-5750E+12	4758E+12		-1.208	.243
	health	4283E+1	33587880008.	.951	12.752	.000

Dependent Variable: gross domestic product

The *f*-ratio (162.612) shows that government expenditure on health is one of the major determinants in explaining gross domestic products in Nigeria. It can be observed that expenditure on health has a significant effect on gross domestic product based on the *f*-ratio, government spending on health explains 90 percent of the variation experienced in gross domestic products in Nigeria. The independent variable is statistically significant because its significance value is 0.00, which means *P*< 0.05. Government expenditure on health sector of the economy is justified by improvement in medical facilities experienced in our primary health care centers and teaching hospitals. This shows that the budget for the period cover by this study for health sector is well implemented.

Decision

Based on the analysis above, the null hypothesis (Ho) is rejected while alternative hypothesis (Hi) is accepted; which state that government spending on health has significant effect on economic growth in Nigeria.

4. Conclusion and Recommendations

It can be observed from the analysis of hypothesis one that here is no significant positive relationship between Nigerian government budget for transportation infrastructure and gross domestic product. The government budget for transportation infrastructural facilities is not well implemented. This is an evidence of poor state of our roads in South – East, South – South and some part of South west in Nigeria. This result is consistent with Olarewaju & Obisesan (2015) who observed no significant relationship budget implementation and economic growth. Hypothesis two shows that government spending on health has significant effect on economic growth in Nigeria. It is observed from the analysis that government spending on health sector assisted the citizens to be healthy and contribute to the dross domestic products. This result is consistent with Oke (2013); Olarewaju & Obisesan (2015) who discovered a positive and significant relationship between government expenditure on health and social welfares and economic growth.

It can be seen that government spending on health has significant effect on economic growth while government spending on agriculture and natural resources does not significantly affect economic growth in Nigeria.

Based on the finding of this study, the following recommendations are made:

i. Government should increase money earmarked for health sector and monitor the budget implementation very well. All health agencies within health sectors and other stakeholders should be involved in budget implementation to ensure efficient use of money meant for the sector.

ii. It is a known fact that small and medium scale enterprises are catalysts for economic growth and development. Small scale and medium enterprises needs good roads network for distribution of their goods and services. Deplorable condition of roads affects businesses negatively and serves as a cog to the growth of industries in Nigeria. Bad roads also affect transportation of farm produce by farmers. Government should pay more attention to implementation of money earmark for transportation facilities so that most of roads that are in bad position will be fixed and it will help to improve the activities of small and medium scale enterprises. Moreover, government should involve community development associations with budget office and budget monitoring teams in public sector in monitoring money to be spent for transportation infrastructures.

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Investigating Oil Prices and Exchange

Rates Nexus in Nigeria: ARDL Approach

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Abstract: This paper examined the long-run association of real exchange rates, real oil prices, interest rate, inflation and external debt in Nigeria. It used monthly data for the period, 1980-2017. The model employed in the study started with testing for the existence of unit roots which were found to be a combination of orders I(0) and I(1), fulfilling the ARDL condition. Also, using various cointegration tests, the study reveals that cointegration exists among the selected variables. The granger causality test found that oil price positively and significantly impacted exchange rates in Nigeria, suggesting that a rise in global oil prices resulted in exchange rate appreciation. In a similar way, increases in oil prices triggered inflation. In view of this, it is suggested that appropriate policy measures be considered during oil price increases to mitigate unfavourable movement in exchange rates.

Keywords: ARDL; External Debt; Oil Prices; Granger Causality; Exchange Rates

JEL Classification: E0; E1 O0; O13; Q3

1. Introduction

Despite previous studies have observed the significance of oil price variations on exchange rates behaviour especially among the oil exporting economies, the explanation to exchange rates behaviour have remained equivocal (see Babatunde 2015; Aziz, Dahalan, Hakim, 2013; Golub, 1983). Although, these studies have a strong consensus that real exchange rates and real oil prices may cointegrate. They also hold that variations in oil prices dominantly account for persistent shocks and the volatility of US dollar real exchange rates over the period of post-Bretton (see

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Amano and van Norden, 1998; Chaudhuri and Daniel, 1998). Notwithstanding, while interest further emerges and grows at investigating the oil price-exchange rate association among the developed economies like the OECD (Organisation for Economic Co-operation and Development), and Middle Eastern nations (MECs) (see Chaudhuri and Daniel, 1998; Korhonen and Juurikkala, 2009), study on developing Africa's oil exporting countries are meagre. Similarly, studies on nominal exchange rates determination employing monetary techniques are far more extensive than researches on real exchange rates determination. Furthermore, despite the fact researches on the real exchange rates determination in the developing economies are budding, researches carried out on real exchange rates determination in the context of oil-producing countries is somewhat infrequent. Undeniably, very few authors have examined the role of real oil prices on the determination of real exchange rates. Study like Habib and Kalamova (2007) examines whether the real oil price has any effect on the real exchange rates of a few major crude oil exporting countries comprising Saudi Arabia, Russia, and Norway. Their result shows the existence of a positive, long-run relationship association amid the real oil prices and real exchange rates for Russia. However, it is otherwise in Saudi Arabia and Norway. Notwithstanding, few attempts have been made, engaging wide-ranging empirical and conceptual researches to understand the behavior of exchange rates in the developing oil exporting countries, yet have met with only inadequate accomplishments (see Aziz, Dahalan and Hakim, 2013; Babatunde, 2015).

As noted in Brignall and Modell (2000), Arize, Malindretos and Kasibhatla (2003), Hodge (2005), Hausmann (2008), Musonda (2008) and Demir (2010), variations in real exchange rates can cause distortions in the economy, impedes trade flows and creates uncertainty in investment decisions; causes uncertainty in macroeconomic policy formulation. Higher real exchange rates may lead to cheaper domestic production and consequently, results in cheaper exports and expensive imports.

However, to determine the policy option suitable to limit the fluctuations in the values of the domestic currency; understanding the forces associated with the fluctuations in the value of the domestic currency and determine the behavior of exchange rates, this study seeks to address the issue for Nigeria economy, characterized a monocultural economy.

2. Theoretical Background

Basically, various theories like purchasing power parity (PPP) model, monetary model, traditional flow model, and portfolio balance model are found in the literature explaining the exchange rates movement and its relationship with external shocks. Nonetheless, the structural model advanced in Meese and Rogoff (1988) is found suitable in this empirical study to consider the role of real oil price shocks and inclusion of interest rate differential to be accountable for the long-run equilibrium real exchange rates and external debt/GDP (debt GDP). This theory examines the co-movements of real exchange rates and long-term real interest rates over the experience of modern flexible exchange rates.

However, the real exchange rates (Q_t) is expressed in the logarithm term below is premised on three assumptions detailed below. Nonetheless, supposing the real exchange rates are defined as:

$$Q_t = \vartheta_t - (p_t - p_t^*) \qquad\qquad 1$$

Where ϑ denotes the logarithm form of nominal exchange rates (domestic currency per unit of foreign currency); p and p^* are respectively the logarithm forms of domestic and foreign prices of goods and services; t is the time.

Rearrange and simplified (1):

$$Q_t = \vartheta_t - p_t + p_t^* \qquad\qquad 2$$

The assumptions are:

i) it is assumed that the long-run real exchange rates are nonstationary variables; therefore, ii) occurrence of shocks cause real exchange rates to its equilibrium value and at a constant rate; and lastly, iii) revealed real interest rate parity is satisfied given that:

$$\forall_t(Q_{t+\alpha} - Q_t) = (\delta_t - \delta_t^*) \qquad\qquad 3$$

where δ^* and δ respectively are the real foreign and domestic interest rates for an asset of maturity α.

Converging the above three assumptions to interact, the real exchange rates can, therefore, be stated as (4):

$$Q_t = -\tau(\delta_t - \delta_t^*) + \widehat{Q_t} \qquad\qquad 4$$

Accordingly, τ is a parametre and > 0[1].

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[1] τ relatively leaves the question open, what are the determinants of $\widehat{Q}$ that are nonstationary variables?

3. Methodology

Majorly, this study establishes the long-run relationship amidst exchange rates and oil prices. This is carried out by examining the factors determining exchange rates in Nigeria. The study relies on monthly data comprising exchange rates, interest rate, inflation, oil price, exchange rates, and debt/GDP for the period covering 1980 to 2017. Data availability dictates the choice of cut-off. Primarily, the data for this study is sourced from the Central Bank of Nigeria (CBN) statistical bulletin, National Bureau Statistic (NBS) and World Development Indicators (WDI). Data were sampled at different frequencies: annually and quarterly. Therefore, to overcome the dilemma confronting forecasters where data are a sample at varied frequency. Following Ghysels and Wright (2009); Tay (2006), the study adopts the time averaging techniques used in Ghysels, Santa-Clara, and Valkanov (2004 and 2006), Clements and Armesto, Engemann and Owyang (2010), Clements and Galvao (2008), Xu, Zhuo, Jiang, Sun and Huang (2019) to convert those variables employed into monthly data. This approach is favorably supported in the literature and considered standard (See Davoodi *et al.*, 2013; Xu, Zhuo, Jiang, Sun, Huang, 2019).

Real exchange rates are computed, using the domestic level of price and level of price in the US[1]. It is done through a simple mathematical operation[2]. The real oil prices are expressed[3]. The Brent Blend/Brent Crude is considered as a measure for the crude oil because it accounts for the largest oil exports in Nigeria among several major arrangements of oil entailing of Brent Sweet Light Crude, Forties crude, Brent Crude and Oseberg crude (OPEC, 2016). In addition, the real exchange rates and real oil prices are expressed in their natural logarithm forms. We derive the real interest rate, using Fisher's equation. The real interest rate solved from the Fisher equation[4]. For the real interest rate differentials (RDR), It is expressed[5]. The Hodrick Prescott filter is employed into the RDR monthly data series. The external debt to the GDP captures the openness of Nigeria with her trading partners (see Kia 2006; Eslamloueyan and Kia, 2015). Consequently, the model to be estimated is expressed as:

The model to estimate is given as:

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[1] The US is selected to be the numeraire country, based on its wide acceptability and been the country with the most traded currency and a major importer of the Nigeria crude oil.

[2] Real exchange rates equal nominal exchange rates X (foreign price level /domestic price level). (i.e. $Q = E * {P_d}/{P_f}$). Where, E is the nominal exchange rates, P_d and P_f respectively are foreign price level and domestic price level.

[3] Monthly average prices of crude oil defined in relations to the US dollars and deflated by domestic CPI (consumer price index).

[4] (1 + Interest) / (1+Inflation) -1.

[5] $RDR_t = r_t - r_t^*$; Accordingly, r_t symbolise the real interest rate of Nigeria; r^* denotes the real foreign interest rate.

$$Q_\text{t} = \varphi_{1\text{t}} + \varphi_{2\text{t}}I_\text{t} + \varphi_{3\text{t}}rop_\text{t} + \varphi_{3\text{t}}rinf_\text{t} + \varphi_{4\text{t}}dbtgdp_\text{t} + \xi_\text{t} \qquad 4$$

Given that $I_{1\text{t}} = rdr_\text{t}$ $\qquad\qquad$ 4.1

Where: Q is the real exchange rates; $\varphi_1 - \varphi_4$ are the parametres of various determinants; I is differential in real interest rate; rop is the real price of oil; $rinf$ is real inflation; $dbtgdp$ is the stock of external and ξ is the disturbance terms.

Following Chudik and Pesaran (2013), given that the ARDL regression model is expressed as:

$$\Delta q_t = \varphi_0 + \varphi_1\Delta\vartheta_{t-1} + \varphi_2\Delta\vartheta_{t-2} + \cdots + \varphi_p\Delta\vartheta_{t-p} + \Pi_1\Delta q_{t-1} + \Pi_2\Delta q_{t-2} + \cdots + \Pi_z\Delta q_{t-z} + v_t \qquad (5)$$

Where q_t is an endogenous variable that captures the exchange rates; φ_0 is a constant term or intercept; Δ is the first difference operator; ϑ and q are lagged independent variables both in long and short runs respectively. $\varphi_1 - \varphi_p$ represent the model short-run dynamics; $\Pi_1 - \Pi_p$ is the long-run relationships; and u_1 is random walk/white noise. The ARDL technique has the following advantages when it is compared with other earlier and traditional cointegration methods (see Harris and Sollis, 2003): It is not necessary that variables of the models are integrated of the same order. Therefore, the ARDL technique is applicable if the underlying variables are integrated of order zero, order one or fractionally integrated. The ARDL test is comparatively more effectual when the study involves data with finite and small sample size; and finally, Harris and Sollis (2003) observes that the ARDL technique offers unbiased estimates for the long-run model; the ARDL technique holds that, only a reduced single form equation association exists amidst the dependent and exogenous variables (see Pesaran, Smith, and Shin, 2001); through the ARDL technique, the Error Correction Model (ECM) is obtainable through a simple direct transformation, that integrates long-run adjustments with short-run equilibrium, not having to lose long run information.

The corresponding error correction model is expressed as:

$$\Delta q_t = \varphi_0 + \varphi_1\Delta\vartheta_{t-1} + \varphi_2\Delta\vartheta_{t-2} + \cdots + \varphi_p\Delta\vartheta_{t-p} + \theta(q_{t-1} - \mu_0 - \mu_0 rop_t - \mu_2 I_t - \mu_3 rinf_t) + z_t \qquad (6)$$

Where θ is the coefficient measuring the speediness of adjustment of disequilibrium in short-run, $\mu_0 rop_t, \mu_2 I_t$ and $\mu_3 rinf_t$ denote the long run parametres of real oil prices and real interest rate differential respectively, $\varphi_1\Delta\vartheta_{t-1}$, $\varphi_2\Delta\vartheta_{t-2}$ and $\varphi_p\Delta\vartheta_{t-p}$ are respectively the short-run parameters for real oil price, real interest rate differential and inflation rate and z_t accounts for the error term.

4. Empirical Results

4.1. ARDL Unit Root Results

As a starting point, the study conducts a stationarity test presented in tables 1a to 1c, to confirm the existence of unit root. For this reason, the research employs the conventional Augmented Dickey-Fuller (ADF), Dickey-Fuller (DF) and the Phillips-Perron tests, consequent to the Ng and Peron (2001) and the Dickey-Fuller Generalized least square (DF-GLS) de-trending test, following Elliot et al. (1996). The three-standard unit root test techniques are applied to all the variables consisting of exchange rates, inflation, oil price, interest rate, and dbtGDP to test for the existence of unit-roots. The finding reveals that the order of integration is a blend of I(1) and I(0), and none is I(2). These outcomes satisfy the condition for testing and using Autoregressive Distributed Lags (ARDL) (see Paseran, Shin and Smith, 2001).

Table 1a. Augmented Dickey-Fuller (ADF) Unit Root Tests

Variable	(AIC) (Intercept)			(AIC) (Trend and Intercept)		
	Integration Order	t^* Statistic	P-Value	Integration Order	t^* Statistic	P-Value
Oil Price	I(1)	-3.487428	0.0088***	I(1)	-3.455175	0.0457**
Exchange Rate	I(0)	-3.136107	0.0247**	I(0)	-3.441469	0.0473**
Inflation	I(0)	-3.160896	0.0041***	I(0)	-3.599463	0.0310**
Interest Rate	I(0)	-4.217767	0.0007***	I(1)	-4.322131	0.0002***
Dbtgdp	I(1)	-3.519563	0.0079***	I(1)	-3.507899	0.0397**

Source: Authors' computation, 2019

"***", "**" and "*" symbolize statistical significance respectively at 1%, 5%, and 10%.

Table 1b. Philip-Peron (PP) Unit Root Tests

Variable	Newey-West Bandwidth (Intercept)			Newey-West Bandwidth (Trend and Intercept)		
	Integration Order	t^* Statistic	P-Value	Integration Order	t^* Statistic	P-Value
Oil Price	I(0)	-4.918487	0.0000***	I(0)	-4.926509	0.0003***
Exchange Rate	I(1)	-3.763481	0.0036***	I(1)	-3.786368	0.0181***
Inflation	I(1)	-4.688687	0.0001***	I(1)	-4.684901	0.0008***
Interest Rate	I(0)	-3.498766	0.0085***	I(0)	-3.887323	0.0133***
Dbtgdp	I(1)	-3.724325	0.0041***	I(1)	-3.712643	0.0224**

Source: Authors' computation, 2019

"***", "**" and "*" symbolize statistical significance respectively at 1%, 5%, and 10%.

Table 1c. Dickey-Fuller (DF) Unit Root Tests

Variable	Akaike Information Criterion (Intercept)			Akaike Information Criterion (Trend and Intercept)		
	Order of Integration	t^* Statistic	P-Value	Order of Integration	t^* Statistic	P-Value
Oil Price	I(1)	-2.172899	0.0485**	I(1)	-3.400088	0.0007***
Exchange Rate	I(0)	-1.978300	0.0196***	I(1)	-2.741747	0.0070***
Inflation	I(1)	-2.694012	0.0073***	I(1)	-2.842340	0.0047***
Interest Rate	I(0)	-3.972935	0.0001***	I(0)	-4.830498	0.0000***
Dbtgdp	I(1)	-3.339199	0.0009***	I(1)	-3.461080	0.0006**

Source: Authors' computation, 2019

"***", "**" and "*" symbolize statistical significance respectively at 1%, 5%, and 10%.

4.2. ARDL Optimal Lag Selection

Ideal lag length is obtained as displayed in table 2, estimating the regressions separately, following consecutive modified LR t-statistic (each test at 5% significant level). This is achieved using various lag order selection criteria comprising, the Hannan-Quinn Information criterion (HQ), Akaike Information Criterion (AIC), Final Prediction Error (FPE) and Schwarz Information Criterion (SIC) which are basically considered when ARDL estimating technique is employed (see Raza *et al.,* 2015). However, lag length 2 is considered suitable for the variables. This lag gives the least criteria for the value of FPE, AIC, SIC, and HQ.

Table 2. The ARDL Optimum Lag Selection Criteria

Lag Length	FPE	AIC	SIC	HQ
0	7.05e+23	69.10203	69.14879	69.12048
1	1.13e+14	46.55100	46.83158	46.66173
2	1.20e+11*	39.69917*	40.21355*	39.90217*
3	1.33e+11	39.80241	40.55060	40.09768
4	1.48e+11	39.90642	40.88842	40.29396

Source: Authors' Computation, 2019

4.3. Measurement of the Strength of the Model Selection Criteria

The study uses the criteria graph approach as shown in figure 1, to identify and determine the various top twenty models, premised on benchmark analysis.

Basically, this technique helps us to determine the superiority of the (AIC) compared with other estimating criteria like the Hannan-Quinn (HQ) criterion and Schwarz Information Criterion (SIC) for selection of model in the regression, the short and long runs association. The decision rule for this approach is that the better the model, when the amount of AIC is low, implying that, the best ARDL model is considered adequate with the lowest AIC value. However, figure 1 presents ARDL (2, 2, 2, 1, 0) as the model with the minimum negative value of AIC and hence, the most preferred over other criteria for this study.
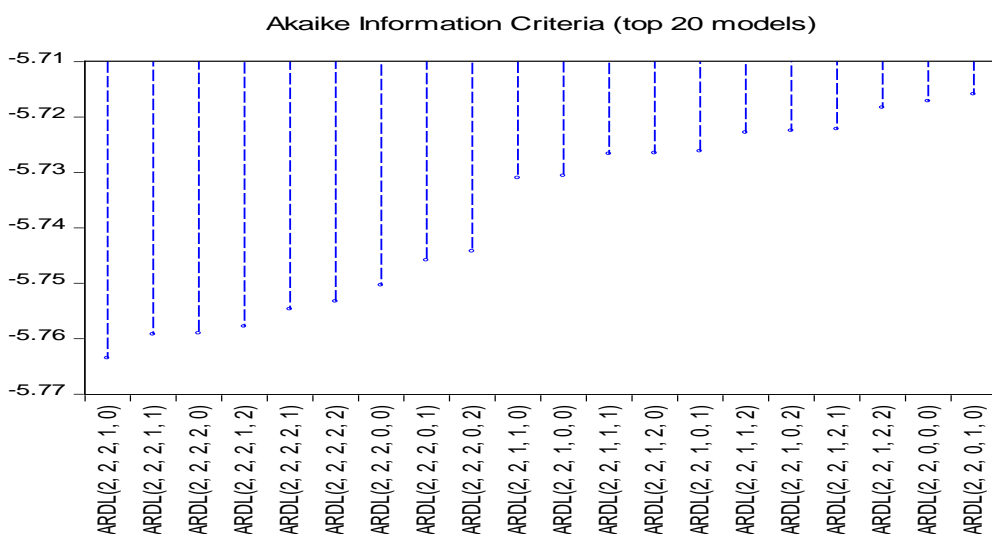

**Figure 1. Summary of the Strength of the Model Selection**

Source: Authors' computation, 2019

Supporting the criteria graph in fig 2, the result in the criterial table shown in table 3 offers supports for the appropriateness of lag 2 as the most suitable lag for the model. This confirms that, among the several models, the appropriate specification satisfying the AIC, LR, SIC, and HQ is ARDL (2, 2, 2, 1, 0). This also buttresses the results from the result for maximum lag length selection shown in table 2.

Table 3. Criteria Table

Model Selection Criteria Table					
Dep. Var.: REXR					
Sample: 1980M01 2017M12					
Model	LogL	AIC*	BIC	HQ	Adj. R-Sq	Specification
6	1285.738534	-5.763523	-5.652446	-5.719711	0.999531	ARDL(2, 2, 2, 1, 0)
5	1285.781124	-5.759191	-5.638858	-5.711728	0.999530	ARDL(2, 2, 2, 1, 1)
3	1285.742897	-5.759018	-5.638685	-5.711555	0.999530	ARDL(2, 2, 2, 2, 0)
4	1286.474776	-5.757804	-5.628215	-5.706691	0.999530	ARDL(2, 2, 2, 1, 2)
2	1285.783892	-5.754678	-5.625089	-5.703565	0.999529	ARDL(2, 2, 2, 2, 1)
1	1286.477959	-5.753294	-5.614449	-5.698529	0.999529	ARDL(2, 2, 2, 2, 2)
9	1281.825826	-5.750343	-5.648523	-5.710182	0.999523	ARDL(2, 2, 2, 0, 0)
8	1281.836441	-5.745866	-5.634790	-5.702055	0.999522	ARDL(2, 2, 2, 0, 1)
7	1282.476099	-5.744236	-5.623903	-5.696773	0.999523	ARDL(2, 2, 2, 0, 2)
15	1277.549514	-5.730993	-5.629173	-5.690833	0.999514	ARDL(2, 2, 1, 1, 0)

Source: Authors' computation, 2019

Figure 2: CUSUM Stability test
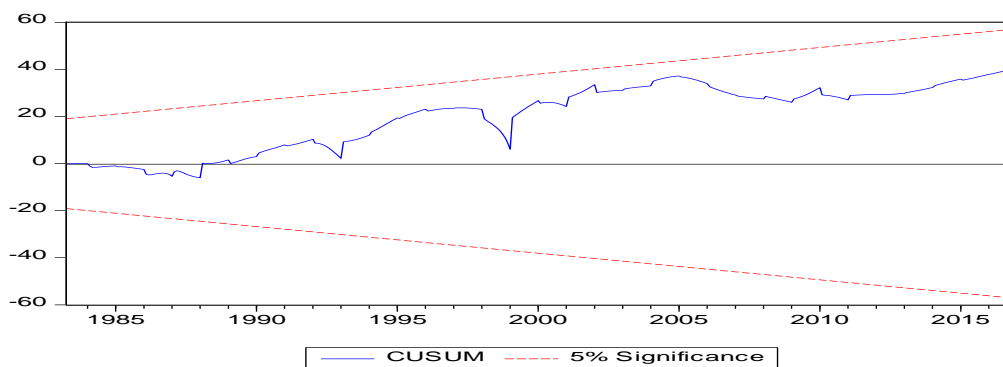
Figure 2. CUSUM Stability test

Source: Authors' computation, 2019.

Table 4. Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.481308	Prob. F(2,429)	0.6183
Obs*R-squared	0.991804	Prob. Chi-Square(2)	0.6090

Source: Authors' computation, 2019.

4.4. The ARDL Regression Model

The regression model that underlies the ARDL equation, shown in (5) fits well and appropriately. The model is statistically significant at 1% level.

Various diagnostic test supports the fitness of the model. These tests include the serial correlation (Breusch-Godfrey and Durbin Watson tests), Normality of errors/Jarque-Bera and Heteroskedasticity tests. In addition, following Pesaran and Pesaran (1997), the study tests for model stability as displayed in figure 2. It depicts that, the model is non-instable because the plotted trend of the CUSUM is captured within the critical bounds of a 5% confidence interval of parameter stability. The covariance test conducted shows that oil price correlates with real exchange rates at a 1% level of significance. In addition, the serial correlation test conducted, using the Breusch-Godfrey Serial Correlation LM Test procedure reveals that the model is not serially correlated (see table 4).

Table 5 presents the results of the ARDL estimation, showing that in the long run, aside from the interest rate, all other variables considered are statistically significant in explaining the exchange rates movement in Nigeria. While interest rate and oil prices have a negative impact on exchange rates, offering robust evidence that, higher real oil prices and interest rates result in an appreciation of real exchange rates and vice versa. This relationship is consistent with empirical evidence and economic theory. Therefore, it validates the studies carried out on a few oil exporting countries (see Koranchelian et al., 2005; Zalduendo, 2006; Korhonen and Juurikkala, 2009). Inversely, inflation rate and debtGDP positively relate with exchange rates, implying that, increase in inflation rate or debtGDP will result in depreciation in the exchange rate. This relationship also satisfies economic theory and empirical studies that, investment is impeded during inflation and hence, growth is distorted. This claim validates Aziz, Dahalan, and Hakim (2013).

Table 5. ARDL Regression for Long and Short Run Estimates

Var	Coefficient	Standard Error	test-Statistic	Probability*
Dep. Var.: LREXR				
Method: ARDL				
Sample: 1994M01-2013M12				
Method for Selecting Model: (AIC)				
Regressor (2 Lag Selected Automatically): LREXR, RINF, RINT, DROP, DBTGDP				
Selected Model: ARDL (2, 2, 2, 1,0)				
Var	Coefficient	Standard Error	test-Statistic	Probability*
Longrun Equation				
RINF	0.086059	0.057426	1.498625	0.0347
RINT	-0.054403	0.045271	-1.201713	0.2301
DROP	-0.130966	0.311571	-0.420342	0.0464
DBTGDP	8.60E-11	5.14E-11	1.673917	0.0499
Short-run Equation				
LREXR(-1)	-0.002305	0.001276	-1.807028	0.0715
RINF(-1)	0.000198	6.29E-05	3.154558	0.0017
RINT(-1)	-0.000125	7.00E-05	-1.790809	0.0740
DROP(-1)	-0.000302	0.000635	-0.475604	0.0346
DBTGDP	1.98E-13	9.50E-14	2.086727	0.0375
D(LREXR(-1))	0.864512	0.024238	35.66701	0.0000
D(RINF)	0.007494	0.001380	5.432040	0.0000
D(RINF(-1))	0.006785	0.001368	4.960139	0.0000
D(RINT)	-0.004038	0.000811	-4.978444	0.0000
D(RINT(-1))	-0.003220	0.000798	-4.033246	0.0001
D(DROP)	-0.004203	0.001406	-2.989148	0.0030
C	0.012096	0.007363	1.642910	0.1011

Source: Authors' computation, 2019.

In the short run, apart from the lagged value of the interest rate, all the coefficients of the independent variables are found to be statistically significant at the five percent level of significance. The result shows the lagged value of exchange rates to have the largest influence on itself. Overall, aside from the lagged value of interest rate, all the variables in the model are statistically significant and affect exchange rates.

4.5. The ARDL Cointegration Results

The study determines where the variables co-integrate using the Wald test technique. The result is presented in table 6, having the p-value as 0.0000, indicating that variables are statistically significant at 1% level. Following Pesaran and Pesaran (1997), the hypotheses to test for the Wald co-integration test are expressed as:

Null Hypothesis (H_0): $C(1) = C(2) = C(3) = C(4)$
$= 0$: *No cointegration among variables*

Null Hypothesis (H_1): $C(1) = C(2) = C(3) = C(4)$
$\neq 0$: *Cointegration exists* among variables

Following the result in table 6 that, the F-Statistic that the $p - value < 5$ percent, the decision rule suggests that the H_0 be rejected while H_1 is accepted, indicating that long-run cointegration association exists among variables in the model. In addition, the F-statistic computed as 13.4578, is greater than the upper bound critical value of 4.23 at 5 percent significant level (see Pesaran and Pesaran, 1997). The result declares supports that, cointegration exists among real exchange rates and other selected variables for this study.

Table 6. The ARDL Cointegration Results

Wald Test			
Equation: ARDL			
test-Statistic	Value	DF	Probability
F-Statistic	13.4578	(4.1471)	0.0000[****]
Chi-Square	53.8312	4	0.0000[****]

Source: Authors' computation, 2019

"[****]" symbolize statistical significance at 1 percent

4.5. The Error Correction Model (ECM)

Basically, this study is set to examine both the long-run and short-run association amidst real exchange rates and real oil prices in Nigeria using the error correction model approach. Therefore, following various studies in literature like Pesaran (2001), the study introduced the ECT coefficient to determine the speed of adjustment at which the model returns to equilibrium. Expectedly, the ECT is suitable when its value is negative and less than one (ECT<1); and statistically significant. Else, there is no evidence of long-run adjustment (see Chudik and Pesaran, 2013). In other word, a significant and negative parameter of the error ECT reveals that the parametres cointegrate. That is, the statistically significant value of the ECT at 5 percent indicates that the determinants of exchange rates in Nigeria co-move to a long-run equilibrium (see Boutabba, 2014; and Sebri and Ben-Salha, 2014). Also, this result is consistent with Bannerjee *et al.* (2008), Waliullah and Rabbi (2011), arguing that a highly significant ECT confirms that, stable long-run relationship exists among the parametres. As shown in the short-run, a few variables have a negative impact on exchange rates, which according to Dritsakis (2011) expresses the dynamic adjustment of the variables. Consequently, Engle and Granger (1987) establish that an error correction mechanism holds where a cointegration relationship exists.

Table 5. Error Correction Coefficient

Variable	Coefficient	Std. Error	t-Statistic	Prob[*]
ECT(-1)	-0.320745	0.074859	-2.664155	0.00030

Source: Authors' computation, 2019.

However, table 5 below presents the results, which fulfill these conditions, having its coefficient as -0.320745 and highly significant at one percent. The minus sign preceding the ECT coefficients indicates the presence of disequilibrium in the earlier short-run period of the ARDL system and the speediness of adjustment from the short-run divergence on the path to long-run equilibrium is at the rate of 32 percent. This suggests that an average of 32 percent of the divergence from long-run equilibrium in the short-run period of the determinants of exchange rates are periodically corrected.

Table 6. Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
RINF does not Granger Cause LREXR	443	21.31400	0.0269
LREXR does not Granger Cause RINF		2.17675	0.0346
RINT does not Granger Cause LREXR	443	1.20831	0.2997
LREXR does not Granger Cause RINT		0.09537	0.9091
DROP does not Granger Cause LREXR	442	0.12425	0.0320
LREXR does not Granger Cause DROP		15.3727	0.2545
DBTGDP does not Granger Cause LREXR	443	12.42756	0.0452
LREXR does not Granger Cause DBTGDP		0.38010	0.6840

Source: Authors' computation, 2019.

Table 6 presents the granger causality results, revealing that oil price granger causes exchange rates. The result establishes that there is a unilateral causality between exchange rates and oil prices. By implications, this validates the long-run result that variation in exchange rates can be accounted for by changes in oil prices but not vice versa. Similarly, external debt reports a unilateral relationship with exchange rates. Thus, external debt granger causes exchange rates. This suggests that change in exchange rates can be explained by changes in the external debt and not in a reversal order. The inflation rate is shown to have a bilateral relationship with exchanges, implying that while inflation granger causes exchange rates, exchange rates also granger causes inflation. Finally, the interest rate does not report any evidence of causality, either moving from interest rate to exchange rate or exchange rate to interest rate.

5. Conclusion

This study investigates whether there an association existing between the real exchange rates and crude oil prices in Nigeria. Five quarterly variables are tested and found stationary at either level or I(0) and first difference or I(1) but not at second difference or I(2). Consequently, the study employs the ARDL estimating technique covering 1980 to 2017, to examine the impact of the real oil price shocks on the real exchange rates. The results reveal a significant effect of real oil price shocks on real exchange rates. Specifically, the results reveal a significantly proportional relationship between real oil prices and exchange rates, implying that exchange rates respond negatively to positive change in oil prices and vice versa. The study reveals the presence of a long-run relation (i.e. cointegration relation) among variables. Also, it reveals that the model is stable and there is covariance in the oil prices and exchange rates. For policy relevance, this finding suggests that policymakers should be cognizant of oil prices in determining an appropriate exchange rate equilibrium. Thus, when oil price shocks occur, relevant monetary policy measures should be employed to stabilize the unanticipated shocks to exchange rates that may distort the economy. The necessary measure is recommended to be put in place to prudently manage the country's debt portfolio to minimize probable shocks that may be associated with a debt burden.

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Foreign Direct Investment Inflows and Oil Exports in Nigeria: Cointegration and Vector Error Correction Model Approach

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Abstract: The aim of this paper is to examine the long run relationship between FDI inflows and oil exports in Nigeria. Data was collected from CBN Statistical Bulletin and UNCTAD investment report from 1990 to 2016, and various diagnostic tests such as Unit Roots and Johansen conitegration were estimated. Consequently, Vector Error Correction model was employed to address the objective of this study. It was established from this study that a long-run relationship between FDI inflows, oil exports, exchange rate and inflation existed in Nigeria, while the error correction term submits that about 38% error made in the previous year was corrected in the current year in the country. However, the findings that emerged in this work necessitated the following recommendations for the policy makers, investors and future researcher. The policy makers in Nigeria should see oil exports among others as the backbone behind the inflows of FDI in the country and should be sustained. In addition, the proceeds from oil exports should be diversified and invested in the non-oil sub sector of the economy in order to stimulate a favourable exchange rate which can further encourage further inflows of FDI in the country. Finally, it is needful to ensure that the policy measures are initiated and implemented without a delay for the desired effects to be reflected on time in the country.

Keywords: FDI Inflows; Oil Exports; Cointegration VECM and Nigeria

JEL Classification: F21; F23

1. Introduction

In the last four decades, the Nigerian economy has been largely depending on revenues from oil exports. Over 80% of foreign earnings in the economy has been coming from the oil sector (CBN, 2017). This statement is further validated by Odularu (2008) who corroborated that about 83% of revenue in Nigeria came from oil exports in 2000s. The critical roles in which oil sector occupied in the economy

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has made the country to be a mono cultural economy. This sector of the economy alone accounted for 90% of FDI inflows in the country in year 2005 (UNCTAD, 2006). In other words, one could conclude that FDI inflows in Nigeria is geared towards oil and gas.

However, it has been argued in different quotas that the connection between FDI inflows and exports in propelling nation building cannot be undermined. (Goldberg and Klein (1998), Calderón, Mortimore and Peres, 1996. Giles and Williams, 2000). In Nigeria, exports is divided into oil and non-oil exports. Consequently, the recent advocacy by the policy makers and scholars to diversify the economy from the oil and gas has made the research focus about the link between these crucial economic variables to be skewed towards non-oil exports of the country. See Olayiwola and Okodua (2013), Aderemi (2018), Aderemi and Aberu (2018), and Aderemi et al (2018). Similarly, the strategic position in which oil exports occupied in the survival of the country`s economy necessitated an urgent need to empirical examine how the impact of FDI inflows has been faring on the oil exports in the country in the last 26 years.

2. Literature Review

This section presents an account of past empirical studies concerning the nexus between FDI, exports and economic growth in Nigeria and Africa.

Akanni (2004) analyzed how oil rents increment could affect economic in African oil exporting countries. The estimated results from ordinary least squares regression shows that investment, oil rents and economic growth have a significant positive relationship with one another. The author submitted that oil rents did not bring economic growth in majority of oil-rich countries in the continent. Consequently, Odularu (2009) examined the link between crude oil and economic growth in Nigeria with the application of Ordinary Least Square regression alongside Cobb-Douglas production function. It could be established that the study asserted that crude oil production have a contributory effect on economic growth of the country, but not significant. However, Aderemi (2018) analyzed the impact of FDI on non-oil exports in Nigeria between 1980 and 2016 with the application of Johansen Co integration test and dynamic ordinary least square (DOLS). The author corroborated that a significant relationship between FDI and economic growth exists but non-oil exports show otherwise.

In addition, Aderemi and Aberu (2018) used granger causality technique to examine how FDI, non-oil exports and economic growth are related in Nigeria within 1980 and 2016. It was asserted by the authors that there is an existence of one way feedback effect runing from FDI to economic growth and non-oil exports. In another perspective, Okodua (2009) analyzed how FDI and economic growth are related in

Nigeria. The estimated results from the Johansen cointegration and a vector error correction model posited that a long run equilibrium relationship exists between FDI inflows and economic growth in the country. Also, the granger causality result indicated a unidirectional feedback relationship which runs from FDI to economic growth in the country.

Similarly, Akinlo (2004) used error correction model (ECM) to examine how FDI and economic growth are related in Nigeria from 1970 to 2001. The author validated that an insignificant relationship existed between both private capital and lagged foreign capital alongside with economic growth. Also, it was concluded from the paper that an insignificant direct link existed between exports and economic growth in the country.

Moreover, in analyzing the stochastics dynamic interaction of FDI, non-oil exports and economic growth in Nigeria, Aderemi et al (2018), adopted impulse response and variance decomposition tests to prove that the interactions among FDI, non-oil exports and economic growth appeared very weak and did not follow a predictable pattern in the country.

In a nutshell, a critical look at the above reviewed literature shows that past study on FDI inflows and oil exports are very limited in Nigeria in the recent times. Therefore, this study is very crucial to fill the gap in that regards.

3. Methodology

Secondary data from 1990 to 2017 were sourced from UNCTAD database published by World Bank and the Central bank of Nigeria Statistical Bulletin on. The goal of the paper is to ascertain if exchange rate volatility enhance investment and economic growth. The study adopted Vector Autoregressive model. This model is one of the most flexible and easy models for the analysis of multivariate time series. It is a natural extension of the univariate autoregressive model to dynamic multivariate time series.

3.1 Model Specification

FDI = F (OILEX, EXRT, INFR) --- (I)

Where: EXRT = Exchange Rate

OILEX = Oil Exports

INFR = Inflation Rate

FDI= Foreign Direct Investment

Equation (1) can be linearized as follows to derive equation (II)

$$LnFDI_t = \propto_i + \beta 1 LnOILEX_t + \beta 2 EXRT_t + \beta 3 INFR_t + \varepsilon_t \text{--------------------- (II)}$$

$\propto$ $is\ an\ intercept\ and\ \beta 1, \beta 2\ and\ \beta 3\ are\ slope\ parameters$ to be estimated. ε_t denotes error term which is assumed to be stochastic and the subscripts, t stand for the dating of variables in time periods. The a priori expectations are as follows: $\beta 1\ and\ \beta 2\ >\ 0, \beta 3 < 0$

However, the long-run equilibrium relationship among the variables in model (II) would be estimated with the application of the Johansen cointegration technique. This technique is based on the vector autoregressive (VAR) models. (Brooks, 2008: 354).

The starting point for the estimation of a vector error correction model (VECM) is the examination of unit roots of the relevant variables. This is done by the application of the standard augmented Dickey Fuller test and Philips Perron test to determine the order of integration of the variables. The existence of a cointegrating relationship among the set of variables connotes the presence of a long-run equilibrium relationship among the variables. Therefore, a simple VAR model with i lags could be demonstrated below as the reference point for VECM estimation.

$$y_t = \alpha + \beta_1 y_{t-1} + \beta_2 y_{t-2} + ... + \beta_k\, y_{t-i} + \ \varepsilon_t \text{---}$$

(III)

It is important to state here that the VECM is a case of unrestricted VAR modelling which requires the same number of lags for all the variables in all equations. However, some of the recently developed econometric softwares have facility for a multivariate information criterion which makes allowance for comparison across information criteria. Akaike's information criterion (*AIC*) is utilized to determine the appropriate lag lengths for the study.

3.3 Results and Discussion

Table 2. Unit Root Test

Variables	ADF Test			PP Test		
	Level	1st Difference	Remarks	Level	1st Difference	Remarks
LFDI	-2.98104***	-2.98623***	I (1)	-2.98104***	-2.98623***	I (1)
LOILEx	-2.98104***	-2.98623***	I (1)	-2.98104***	-2.98623***	I (1)
EXCHR	-2.98104***	-2.98623***	I (1)	-2.98104***	-2.98623***	I (1)
INFL	-2.98104***	-2.98623***	I(1)	-2.98104***	-2.98623***	I(1)

*** %5 level

Source: Authors` Computation (2018)

One of the problems associated with macroeconomic time series data are non-stationarity nature of the data (Granger, 1986, Engle and Granger, 1987). Any regression estimated based on the non-stationary data would produce a nonsense result which could impair the relatability of the study. In order to overcome this problem this paper estimated standard Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests to examine the existence or otherwise of stationarity of time series data in this study. However, the results presented in the table above indicated that the variables of interest are stationary after they were first differenced. The implication of this, is that these variables possess unit roots.

Table 3. Johansen Cointegration Test (Trace Statistics) and (Maximum Eigenvalue) Johansen Cointegration Test (Trace Statistics)

Null Hypothesis	Eigenvalue	Trace Statistics	P-value**
r=0*	0.810951	60.90910	0.0019
r≤1	0.406411	19.26542	0.4740
r≤2	0.175723	6.226226	0.6688
r≤3	0.054272	1.395014	0.2376

Johansen Cointegration Test (Maximum Eigenvalue)

Null Hypothesis	Eigenvalue	Maximum Eigenvalue	P-value**
r=0*	0.810951	41.64368	0.0004
r≤1	0.406411	13.03919	0.4486
r≤2	0.175723	4.831212	0.7630
r≤3	0.054272S	1.395014	0.2376

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Authors` Computation (2018)

All the variables adopted in this study are I (1), though they diverge in the short run but it is likely they show a long run equilibrium relationship. As a result of the above, Johansen and Juselius (1990) multivariate cointegration test was estimated. Consequently, the reported results of the trace statistics and the maximal eigenvalue statistics indicate that there is at most 3 cointegrating vectors in the systems. The implication of this is that the variables are possess a long run equilibrium relationship with one another which may likely show some adjustment to short run disequilibrium via one model. In order to ensure that a long run relationship among these variables is captured, Vector Error Correction Model is utilized in this study.

Table 4. Vector Error Correction Estimates for FDI inflows and Oil Exports in Nigeria

Dependent variable: FDI

Variable	Coefficient	t-statistics	P-value
C	0.034728	0.491835	0.6285
ECM(-1)	-0.376349	2.102595	0.0491
DL(FDI(-1)	0.051881	0.258806	0.7986
DL(OILEX(-1)	0.110978	0.677383	0.5063
D(EXCR(-1)	-0.001069	0.283114	0.7802
D(INFR(-1)	0.011540	2.420618	0.0257
R-Squared	0.650031		
Adjusted R-Squared	0.505302		
F-statistic	3.109481		
B-G Serial Correlation	F =1.234640 (0.2811)		

Source: Authors` Computation (2018)

The reported results in table 4 show that all the estimated variables have the expected signs. Suffice to say, the error correction term, ECM(-1) has a negative sign and

significant with the absolute value of 0.38. This implies that there is convergence among the variables in the long run as earlier confirmed by the cointegration test. The coefficient connotes that the speed of adjustment from the short run to long-run is about 38% error committed in the previous year is corrected in the current year. This was further reinforced by the first differenced lagged value of the dependent variable-DLFDI (-1) that is positive. This indicates that the inflows of FDI in the previous year positively affects the current year, though not significant.

Furthermore, the estimated explanatory variables revealed that FDI inflows and inflation rate have a significant positive relationship in Nigeria. Also, variable FDI has a positive but non-significant relationship with oil exports in Nigeria. However, FDI and exchange rate have a non-significant inverse relationship in the country. This submission is supported by the finding of Akinkugbe (2003) Udoh and Egwaikhide (2008) who corroborated that exchange rate volatility discourages inflows of FDI in Nigeria. Despite the fact that different methodologies were employed. Similarly, the R-squared value implies that about 65 % change in the dependent variable are explained by the variations in regressors signifying that the regression has a good fit and is reliable.
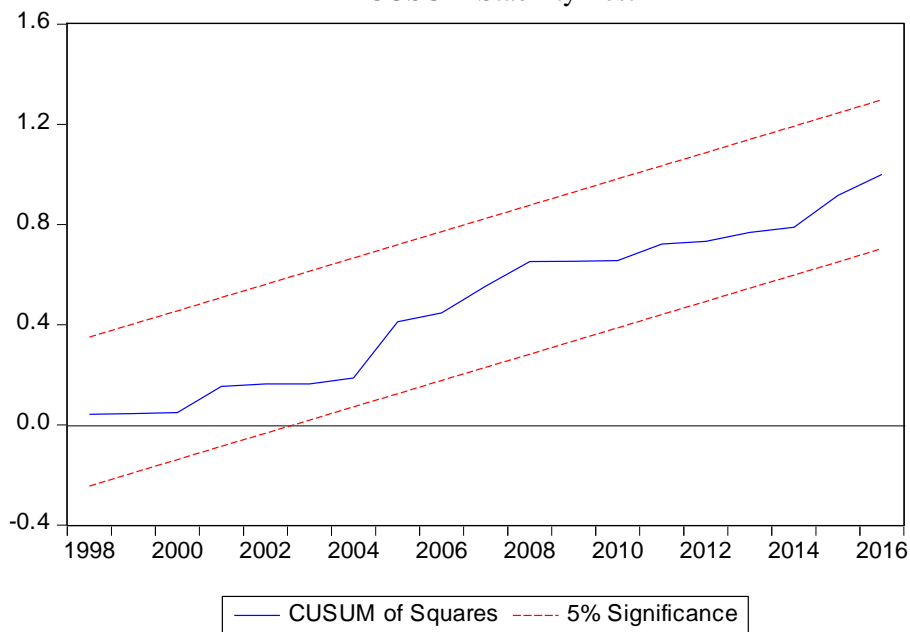
3.4 Diagnostic and Stability Tests

Table 4. Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.234640	Prob. F(1,18)	0.2811
Obs*R-squared	1.604709	Prob. Chi-Square(1)	0.2052
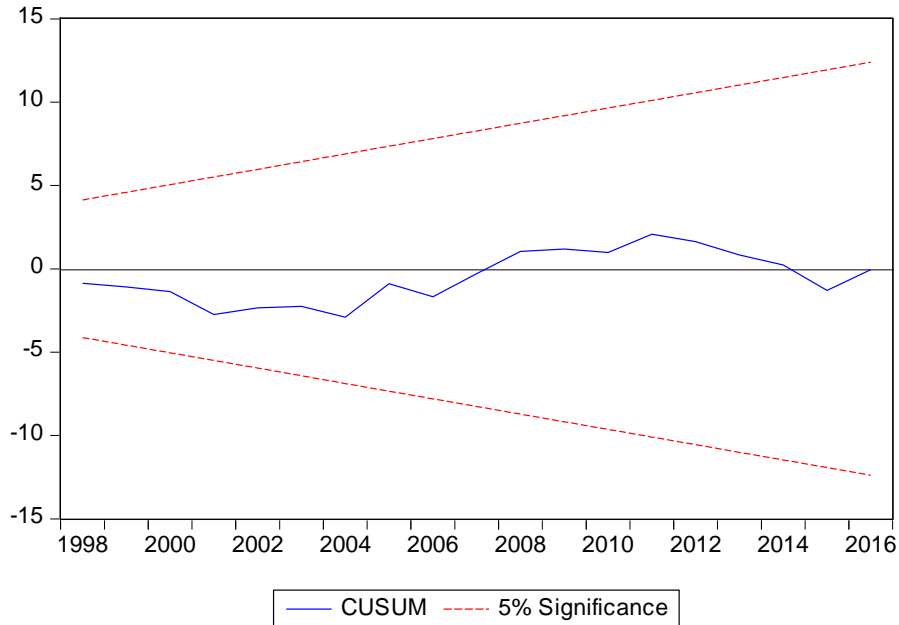
CUSUM SQUARE Stability Test

Figure 1. Stability Tests

CUSUM Stability Test

In order to establish the appropriateness of the short run (parsimonious) model, in this study further attempt was made to carry out diagnostic test (the Serial Correlation LM test) and stability tests (Cumulative Sum (CUSUM) and Cumulative Sum of squares (CUSUMSQ) on the residual of the short run model. From the results of the table 4, the F-statistics of the Serial Correlation LM test of the model was insignificant, this confirmed the absence of serial correlation in the residuals of the ECM regression estimate.

Similarly, the results of cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests in the above gap showed that the residuals of the error-correction model is within the critical bounds of five percent significant level. This connotes that the estimated parameters are stable over the period 1990-2017. Therefore, the model is considered to be reasonably specified as a result of the tests carried out above.

3.4 Conclusion and Recommendations

From the results discussed above, some crucial findings and implications could be drawn as follows: the test for cointegration establishes the existence of a long-run relationship between FDI inflows, oil exports, exchange rate and inflation in Nigeria, while the error correction term submits that about 38% error made in the previous year would be corrected in the current year in the country. Oil exports and inflation rate propel FDI inflows in Nigeria. However, FDI and exchange rate have a negative relationship in the country, though not significant. The implication of this is that exchange rate situation has not been favourable to FDI inflows in the country. Therefore, the findings that emerged in this work necessitated the following recommendations for the policy makers, investors and future researcher. The policy makers in Nigeria should see oil exports among others as the backbone behind the inflows of FDI in the country and should be sustained. However, the proceeds from oil exports should be diversified and invested in the non-oil sub sector of the economy in order to stimulate a favourable exchange rate which can further encourage inflows of FDI in the country. Finally, it is needful to ensure that the policy measures are initiated and implemented without a delay for the desired effects to be reflected on time in the country.

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The Economic-Financial Analysis for
Obtaining Repayable Funds at the Territorial Administrative Units

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Abstract: In our approach through this article we have proposed to solve some problems in relation to public budgets. We live in a world where resources are limited and authorities are looking for ways to help meet the needs of the population. Although the taxes collected from the population are the basic source of financing the public activities and services, they are not always sufficient to achieve all the proposed objectives. Therefore, the authorities need to find new sources of revenue in order to ensure the operating expenses of all public services and at the same time to achieve the proposed investment objectives. In order to obtain additional resources the territorial administrative units can obtain reimbursable funds necessary for achieving the investment objectives and the urban development as well as finding ways to make possible the execution of the budget in such a way that the economic and social life of the administrative units can be improved. The result of our approach consisted in identifying possibilities for improving the execution of budget revenues and expenditures, at the same time, allowed us to develop some conclusions about the reimbursable funds contracted by the Territorial Administrative Unit of the Galati Municipality.

Keywords: public budgets; tax; budget revenues and expenditures

JEL Classification: H61

Introduction

The public debt comprises all the amounts borrowed by the central public authorities, by the administrative-territorial units and by other public entities, from natural or legal persons on the internal market and abroad and remaining to be repaid at one time.

The public debt can be:

- governmental public debt - the totality of the internal and external financial obligations of the state, at a given time, coming from the loans contracted directly or

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guaranteed by the Government, through the Ministry of Public Finance, on behalf of Romania, from the financial markets;

- local public debt - the totality of internal and external financial obligations, of the local public administration authorities, at one point, originating from loans contracted directly or guaranteed by them from the financial markets;

- public debt - the governmental public debt to which the local public debt is added. In order to evaluate the public debt to Romania, any obligation, expressed in foreign currency, is calculated in national currency, using the exchange rate communicated by the National Bank of Romania, valid on the last day of the reporting period.

The loans contracted or guaranteed by the local public administration authorities are part of the public debt of Romania, but they are not obligations of the Government, and the payment of the public debt service related to these loans will be made exclusively from the local budgets and through loans for the refinancing of the local public debt.

The local public administration authorities can contract or guarantee internal and / or external loans in the short, medium and long term, for making public investments of local interest, as well as for refinancing the local public debt, according to the law, only with the approval of the Local Loan Authorization Commission. Reporting and recording of local public debt is done according to the methodological norms issued by the Ministry of Public Finance.

In order to achieve several investment objectives, the Territorial Administrative Unit of Galați Municipality has contracted repayable loans over a long period of time. The loans helped the municipality to ensure the availability necessary for the payment of the investment works and at the same time from the own incomes there were ensured the operating expenses of the Territorial Administrative Unit and subordinated public services.

The specialized legislation stipulated the conditions for granting loans by such units - the administrative-territorial units are not granted loans if the annual debts (due rates, interest and commissions related to them, including the loan to be contracted in that year), exceed the limit of 30% of the arithmetic average of own incomes, diminished by the incomes from the capitalization of some goods during the last 3 years prior to the year in which the request for the authorization of the repayable financing is to be contracted.

Since 2001, the Municipality of Galați has contracted reimbursable funds necessary to achieve the investment objectives. The first credit agreement amounted to 52,000,000 lei signed with BRD Galați, for a period of 16 months, grace period of 4 months, interest rate 45%, administration fee of 0.06%.

The second and third contracts were signed in December 2006 for the purchase of an ambulance and special vehicles for a period of 3 years. The contracted amount was of 782,250 lei with an interest of 8.5% per year, without administration fee.

In 2008, a loan of 33,600,000 lei was contracted from RaiffesenBank SA for a repayment period of 12 years, 24-month grace period ROBOR 6M 10.35%, administration fee 0.35%.

On the basis of G.E.O. 51/2010, the Ministry of Finance grants loans to local public administrations thus, with the exception of the provisions of articles 61 and 63 of Law no. 273/2006 regarding the local public finances, with the subsequent modifications and completions, in 2011 the Ministry of Public Finance grants to the administrative-territorial units loans from the revenues obtained from privatization, registered in the current account of the State Treasury, with an interest of 6.25%, with a repayment term of maximum 5 years, with a grace period of one year, within the limit of 1,500,000 thousand lei, for the payment of the outstanding payment obligations registered by them on December 31, 2010 towards the economic operators supplying goods , services and works, including with respect to the economic operators providing the public service for the production, transport and distribution of the thermal energy in a centralized system, not paid at the date of the loan request. The period for granting the loan is established in the loan agreements concluded with the administrative-territorial units.

At that time, the Territorial Administrative Unit had outstanding payments, which determined to accept the reimbursable financing contract in the amount of 3,033,210 lei with an interest of 6.25%, grace period 12 months, without administration fee.

In 2012 the Municipality of Galați, through the negotiation procedure, received reimbursable financing, in the amount of 60,986,599 lei, for financing some investment objectives.

The financing obtained after the approval of the Commission for the authorization of the local loans, can be used in 2012 the amount of 27,507,684 lei, and in 2013 the amount of 33,478,915 lei repayment period 120 months. Interest rate ROBOR 6M + MARGIN of 1.57% per year and management fee 0.10% applied to the credit balance. The level of indebtedness of the territorial administrative unit for 2012 is 8.35%.

In order to obtain the loan, we have analyzed the own incomes achieved during the last 3 years and we have an average of 260,467 thousand lei, in 2013 the own achieved incomes are in the amount of 277,344 thousands lei and with a debt limit 30% in the amount of 83,203 thousands lei. The rates, interest and commissions related to the loan amount to 22,491 thousand lei. The loan will run for a period of 120 months and the indicators of the local public debt service will be influenced only by the indicator - the annual service of the local public debt, which in the next 6 years

will show an increase of 50% compared to 2013, and in the next years a decrease by up to 45%.

The degree of indebtedness represents the ratio between the annual debt service and the own revenues of the territorial administrative unit. In 2013, the debt ratio is 8.11%, in 2014 it increases by 2.32 hours to 18.80%, and in the following years it bears a decrease of 0.82%.
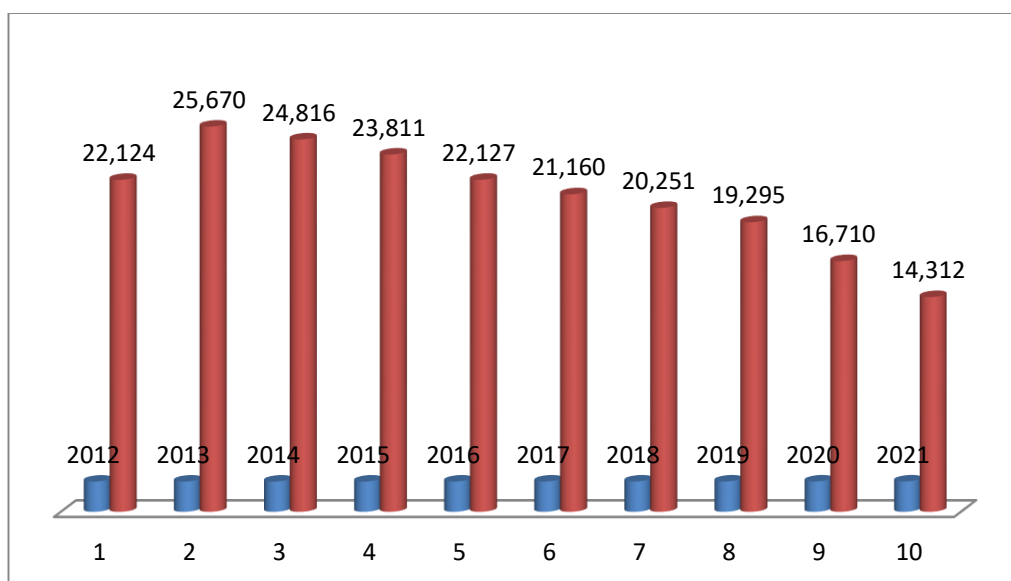

Figure 1. Situation regarding local public debt service for the years 2012-2021 - thousands lei

In 2014, by the Decision of the Local Council no. 60, it was approved the contracting of a loan from the European Bank for investments in the amount of 100,000 thousand lei, approved favorably by the Commission for authorization of the loans by the Decision no. 3572 / 03.04.2014. Grace period 3 years, reimbursement period 7 years, ROBOR 3M plus margin of 2.25% per year applied to the credit balance, commission of granting 1% of the value of the credit, commitment fee 0.50% per year - 0, 1% year applied to the defaulted amount, and early repayment commission 1% per year-2% per year applied to the capital of the anticipated loan. The draws related to the contract were approved based on the decisions issued by the Local Loan Authorization Commission.

The graph below shows the degree of indebtedness of the local budget of Galați Municipality following the contracting of repayable financing on December 31, 2014.
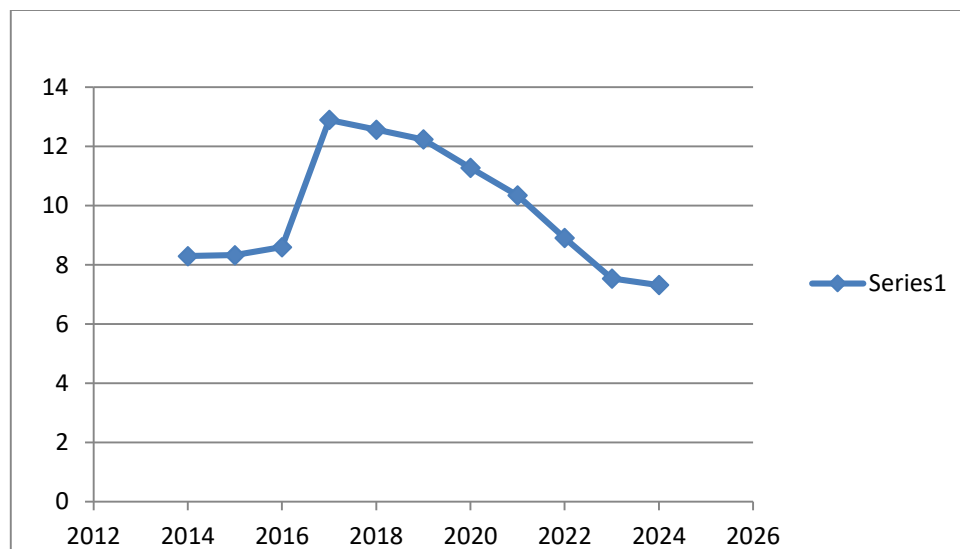
Figure 2. The degree of indebtedness during the service period local public debt for 2014-2026

Own revenues in 2014 increased by 2.61 percent compared to the achievements of 2013. The indicator The annual service of the local public debt took into account the repayments, the interest, the commissions from the previous loans. Compared to the reporting year 2013, the debt ratio in 2014 is 7.84% compared to 18.80% reported in 2013 for 2014. This decrease is due to own revenues in 2014 with 103.65% compared to the approved plan and of the grace period granted by the EBRD.

Following the loan from the European Bank for Reconstruction and Development the level of indebtedness of the Territorial Administrative Unit for the first 3 years remains recorded at 8.3%, and for the years 2017-2018-2019 it increases by 40%. It can be observed that the critical years for the unit territorial administrative for repayment of the contracted loans are 2017,2018,2019,2020. The analysis shows that the indicator - the annual service of public debt increases from 22,313 thousand lei in 2014 to 34,672 thousand lei in 2017, in 2018 to 33,775 thousand lei, in 2019 to 32,878 thousand lei, in 2020 to 30,300 thousand lei.

As we have presented above, the debt level in these years amounts to 12.57% compared to the arithmetic average of own incomes for the years 2011-2013. At the end of 2017, it can be observed that the realization of own incomes increased by 122.45% compared to the forecast from 2014 for 2017. Compared to the presented ones, we can see that the debt level estimated in 2014 for 2017 compared to the degree of debt achieved in 2017 it decreased by 3 percent.

In conclusion, the territorial administrative unit for the year 2017 was able to grant repayments, interest, commissions related to the loans contracted without having a big impact on the own achieved revenues.

Based on the Decision no.2276 / 2012 the Commission for the Authorization of Loans decided that in 2012 the territorial administrative unit can draw from the loan amounting to 27,507,684 lei and in 2013 the amount of 33,478,915 lei. The territorial administrative unit in 2012 carried out 8 draws in the amount of 26,723,796.19 lei, the amount was necessary to pay the suppliers for the investment objectives. So in 2012, the unit failed to consume all the limit granted by the authorization commission.

In 2013, a number of 17 loan withdrawals amounting to 11,465,191.20 lei were compared to the approved plan of 33,478,915 lei, the unit realized only 34.25% of the allocated funds. Given that the amounts are for the achievement of investment objectives, the unit must comply with the procurement procedures, cumbersome procedures and which often slow down the start of the work.

Compared to those presented based on decision no. 3339/2013, the Loan Authorization Commission redistributed the ceiling of the loan following the analysis of the carried out shootings, thus in 2014 the amount of 15,340,021.26 lei was transferred and in 2015 the amount of 7.456,821,73 lei.

Based on the decision in 2014, a number of 16 shootings were carried out in the amount of 15,340,021.26 lei. From the analysis carried out, the unit consumed 100% of the allocated limit. In 2015 the unit made 7 shootings in the amount of 7.456,821,73 lei. In conclusion, we note that the unit has consumed all the loan granted within the deadlines set by the Loan Authorization Commission.

Therefore, after analyzing the data we can draw some conclusions as follows:

- repayable loans can be considered as a source of income to the territorial administrative units in order to achieve investment objectives from public funds;

- repayable loans help territorial administrative units to attract non-repayable European funds. Here we can point out that it is not enough for the units to implement certain projects but they have to provide limits for their delimitation until the reimbursement of the amounts from the European Union.

- repayable loans help the communities by carrying out certain large-scale work without affecting the operating expenses necessary for public services;

- optimization of liquidity for budgetary expenses.

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The Effects of Brexit on the European Union's Economic Power and Implications on the British Economy

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Abstract: The Brexit procedure involved several scenarios, mainly because of the difficulties encountered during this process and of the disagreements between European Union and the United Kingdom. The British hesitation led to the three-fold rejection of the agreement by the United Kingdom, while the European Union remained as firm on the terms of the agreement. Also, the United Kingdom refused other scenarios, including the cancellation of Brexit, a new referendum, the remaining in the European Economic Area or within the customs union. Under these circumstances, the Brexit was postponed several times after March 2019, as originally planned, sparking numerous debates about the consequences of this process. The purpose of this study is to analyze the Brexit`s effects on the European Union`s economic power and on the British economy, using a quantitative approach. Estimates of these effects involve several variables, such as the economic environment, the investment attractiveness, trade and labor market, all depending on the future economic relations between the European Union and the United Kingdom. In any case, Brexit will generate positive and negative effects for both sides, affecting the way these two economies influence the international affairs. Also, the United Kingdom`s economy will be more affected by Brexit than the European one, as we believe.

Keywords: economic power; foreign investments; Brexit effects; investment attractiveness

JEL Classification: E22; F02; F16; F50; F53; O52

1. Introduction

There are many academic, economic and political debates about Brexit, especially after recent events. The Brexit is planned for 31st January 2020, with a transition

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period until December 2020. However, the Brexit process is far from complete, leading to numerous predictions regarding the relations between the European Union and the United Kingdom after Brexit and about the resulting effects. The Brexit risks causing economic, social and trade problems between both parties. Moreover, the United Kingdom risks facing an internal crisis, as Scotland, Wales and Northern Ireland plead for independence amid dissatisfaction with the country`s exit from the European Union. On the other side, the European Union seems to be less affected than the British economy and the European Parliament could block the withdrawal agreement due to failure of the United Kingdom to respect the rights of European citizens and due to the absence of a commercial agreement between both sides, which could affect trade, transportations and financial transactions. A Brexit without a trade agreement (HM Government, 2016, pp. 92-93) between the European Union and the United Kingdom will give more sovereignty for the British economy to negotiate its trade agreements, without obligation to respect the European economic policies or to pay contributions to the European budget. But, the British trade with the European Union could be subject to a higher number of tariff and non-tariff barriers. Also, the future trade agreements will be made under the World Trade Organization rules. On the other side, a Brexit with a trade agreement between both sides can reduce the negative effects for both economies.

The purpose of this study is to analyze the Brexit`s effects on the European Union`s economic power and on the British economy. The forecasts of these effects involve several variables, such as the economic environment, the investment attractiveness, trade and labor market, all depending on the future economic relations between the European Union and the United Kingdom. In Section 2, the negative and positive effects of Brexit on the European Union and the United Kingdom are analyzed, summarizing some of the most important studies about this theme. In Section 3, we focus on the consequences of Brexit on the European economic power in order to observe if the Brexit affects the European influence over the world economy and its competition with other economic powers, such as the United States, the BRICS countries (Brazil, Russia, India, China and South Africa), Japan, Canada, Australia and other European and Asian countries. In order to observe these aspects, we use a quantitative approach, comparing the main components of the European economic power. The conclusions of this study are presented in Section 4.

2. The Economic Effects of Brexit

The predilections regarding the consequences of Brexit on the British and European economies involve several variables, depending on the economic relations between sides, the scenarios analyzed and the techniques used to quantify losses and gains. There are numerous studies about the Brexit`s effects, but the economic ones are the most important for our analyze. The Brexit will generate positive and negative effects, but the European Union seems to have more advantages compared to the United Kingdom.

The **benefits** generate by Brexit **for the European Union** are related to financial market. After Brexit, the European Union will lose the London financial market, but could gain a greater freedom of financial regulation; an increasing importance of the Paris and Frankfurt financial markets; a higher homogeneity of the European financial system and an increase in financial stability. Also, the European Union could obtain a greater integration of community and could implement reforms in order to avoid other situations similar to those of Brexit.

On the other hand, the **main economic benefit of the United Kingdom** is the decrease in contributions to the European budget. According to Figure 1, in 2018, the British gross contributions were almost €17.5 million, from which less than 50% came back as receipts. After Brexit, the United Kingdom could benefit from all these contributions. Also, the United Kingdom could obtain some commercial benefits, but rather legislative than quantitative, which means that the British economy could gain greater freedom and control over its own economic, social and trade policies. Moreover, the British financial market will no longer be dependent on the European one.

Nevertheless, the **negative effects** of Brexit on the British economy are more numerous than positive ones.

Starting with the **Gross Domestic Product** (GDP), it is seems that, due to the Brexit, (Dhingra *et al.,* 2016a, p. 6) the United Kingdom could lose between £26 billion and £55 billion, while the European GDP will decrease between £12 billion and £28 billion. Several international institutions and banks predict a slowdown in the growth rate of the British economy.

As it can be observed in the table below, the British economy could suffer losses between 1% and 8% in the short term. In the first year, JP Morgan and HSBC estimate that the United Kingdom`s GDP will reduce between 1% and 1.5%, while

Nomura predicts a 4% loss. The loss increases as the period after Brexit increases, and the United Kingdom could suffer a decrease of GDP between 3.1% and 8% in the first five years.

Table 1. Economic Consequences over the UK`s GDP in the short term

Study	Period	Minimum loss	Maximum loss
JP Morgan	1 year	1%	1%
HSBC	1 year	1%	1.5%
Nomura	1 year	4%	4%
Credit Suisse	2 years	1%	2%
Morgan Stanley	2 years	1.5%	2.5%
Deutsche Bank	3 years	3%	3%
Citi	3 years	4%	4%
PricewaterhouseCoopers (PwC)	5 years	3.1%	5.5%
Société Générale	5 years	4%	8%

Source: HM Government (2016), Treasury analysis: the long-term economic impact of EU membership and the alternatives, p. 135.

In the long term, the growth rate of the British economy may suffer losses between 0.1% and 9.5%, according to different estimations, reflected in the table below. The most pessimistic scenario is that of the Centre for Economic Performance, which estimates a reduction of the British GDP between 6.3% and 9.5%. On the other hand, there are optimistic scenarios, which show an increase in the size of GDP from 0.6% to 4%, the most optimistic one being the study conducted by Minford Patrick. Nevertheless, there are more chances that the British economy to suffer a reduction in economic growth rather than an increase due to the Brexit.

Table 2. Economic Consequences over the UK`s GDP in the Long Term

Study	Minimum loss/gain	Maximum loss/gain
Minford, Patrick	-	+4%
Lyons, G.	-0.5%	+0.6%
Open Europe	-2.23%	+1.55%
Oxford Economics	-0.1%	-4%
PricewaterhouseCoopers (PwC)	-1.2%	-3.5%
HM Treasury	-3.8%	-7.5%
National Institute of Economic and Social Research (NIESR)	-2.4%	-9.2%
Centre for Economic Performance	-6.3%	-9.5%

Source: (Begg & Mushovel, 2016, p. 5).

A trade agreement between the European Union and the United Kingdom will reduce the negative consequences for both sides. In this situation, (Felbermayr *et al.,* 2017,

p. 69) the European real GDP could suffer a reduction, on average, of 0.11%, while the British one could reduce with 0.57%. Only Ireland and Malta could record higher losses than the United Kingdom, by 0.9% and 0.71%. On the other hand, without an agreement between the two economies, the losses are higher. The British real GDP could fall with 1.73%, while the European average could be 0.26%. In this scenario, only Ireland could have a higher loss than the British one, of almost 2%.

Despite the effects on GDP, the Brexit could lead to a reduction in the **investment attractiveness** of the British economy, especially because investors will no longer have access to the European common market across the United Kingdom territory. In the absence of an agreement between the two economies, the investors and producers will have to bear higher costs of production and marketing. It is estimates (Dhingra *et al.,* 2016b, pp. 3-4) that the foreign direct investments attracted by the United Kingdom could reduce with 22%. This reduction means that the British real income could suffer a 3.4% fall, almost £2200 of GDP per household. After 15 years, the foreign direct investment flows attracted by the United Kingdom could be reduced (HM Government, 2016, p. 131) by 18% and 26% in the case of a Brexit without a trade agreement. On the other hand, an agreement could attract smaller losses, between 15% and 20%.

From a **commercial point of view**, following the Brexit, the trade flows between the European Union and the United Kingdom could be reduced due to the changes in the population income and to the increasing prices, as an effect of new tariff and non-tariff trade barriers. The trade between the two economies could reduce between 14% and 19% in the following 15 years if a trade agreement will be signed. (HM Government, 2016, p. 128) Otherwise, the losses could be situated between 17% and 24% compared to the level that would have been achieved if the British economy remained in the European Union. The British exports to the European Union could decrease to a much greater degree. In the absence of a trade agreement, the British exports would be reduced (Felbermayr *et al.,* 2017, p. 79) by more than 40% to most of EU countries, Luxembourg (22%) and France (39%) being the only two exceptions. On the other hand, the signing of a trade agreement would reduce the British exports to the European Union by less than 25%. The exceptions are Poland, Slovakia, Slovenia and Czech Republic, to which the British exports would be reduced by 25%.

Regarding the **labor market**, (Gillham *et al.,* 2016, pp. 29-30) the Brexit could lead to a decrease by 2.9% of the British employment level if the United Kingdom and

the European Union will not sign a free trade agreement. In this situation, the British unemployment rate could increase to 8% by 2020. In case of an agreement, the employment level could fall by 1.7%, while the unemployment rate could increase to 7% compared to the 5% forecast if the United Kingdom remained in the European community. These unemployment rates mean an estimated number of unemployed people between 550.000 and 950.000 people. In the long term, by 2030, the labor market situation is improving in the way that the employment level fall between 1.1% and 1.8% depending on each scenario, while the number of unemployed people varies between 350.000 and 600.000 people.
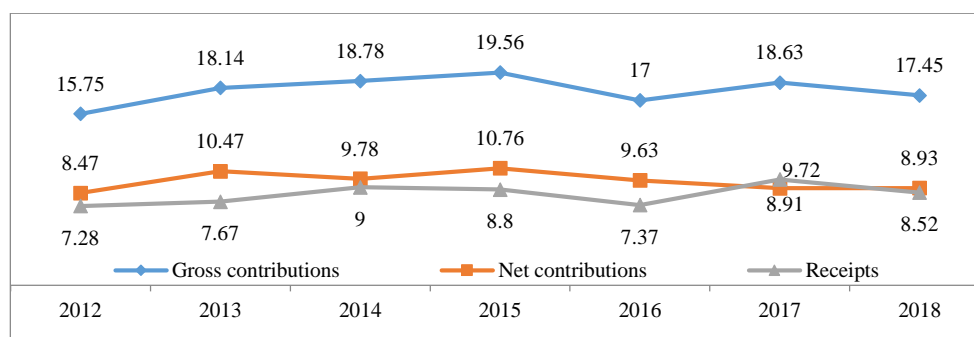

Figure 1. The British Contributions to the European Budget (€ million)

Source: Own representation based on HM Treasury (2019), European Union finances 2018: statement on the 2018 EU Budget and measures to counter fraud and financial mismanagement, June 2019, p. 14.

In terms of **costs incurred by the European Union**, Brexit could become a model for other member states, destabilizing the community and creating a precedent of anti-European sentiment, encouraging Euro-skeptic, nationalist and populist movements. In the same time, Brexit can disrupt the balance of influence within the European community. Thus, the German influence over the other member states may increase, with the risk of tensions between them, but also between Germany and France. Also, the European Union could suffer a loss on the contributions that the United Kingdom paid to the Community budget. By 2015, the gross British contributions to the Community budget increased, exceeding €19 million and the net ones €10 million, as it can be observed in Figure 1. Since 2015, the gross contributions has experienced fluctuations, while the net ones fallen below €9 million. Moreover, in 2017, the British receipts from the European Union exceeding 50% from gross contributions, while in 2018 they remained almost equal to the net contributions.

Also, the Brexit can lead to a decline in the quality of financial regulations and more protectionism. The European financial market could be affected by the loss of the London financial market, one of the Europe`s main financial centers, while the European capital markets will have to compete with it. The United Kingdom used to oppose to the European financial regulation initiative. Leaving the community by the United Kingdom will allow greater freedom of financial regulation, but this freedom can lead to a more regulated, more expensive, more protectionist market and less efficient.

Nevertheless, the Brexit could affect the European economy and the biggest loss of the European Union is about its economic power, its international credibility and its influence over the world economy. The international competition between the European Union and other great powers as the United States, the BRICS countries (Brazil, Russia, India, China and South Africa), Japan and Canada could be affected.

3. The European Economic Power after Brexit

Generally, power is seen as (Kebabdjian, 1994, p. 297) the ability of an economic or political actor to be an important player in the world economy. Also, power can be represented (Aursulesei & Topliceanu, 2019, p. 20) by an actor which imposes his own will and which (Morgenthau, 2013, p. 50) hold and maintain control over another actor, using different methods.

In order to quantify the power, different indicators can be used; most of them being economic, such as: (Morgenthau, 2013, pp. 151-189; Goldstein & Pevehouse, 2014, pp. 47-49) population, economic capabilities, industrial production, the GDP size, (Glassner & Fahrer, 2004, pp. 261-269) demographic characteristics, trade, commercial surplus and labor force. Also, other indicators can be added in terms of culture, transport, political values, communication, technology and military, all of them being intangible indicators.

For our analysis, we focus on the economic dimension, selecting only quantitative indicators in relation to the main effects of Brexit. Thus, as we shown in Section 2, the most effects of Brexit on the European economy and the British one are related to GDP, trade, investments and labor force. In order to analyze the influence of Brexit on the European economic power, we use only these indicators for 2018 from the World Bank statistical database. Our analyze is focus on the position of the European Union compared with other international economic powers, giving 10

points for the best positioned economy worldwide and then decreasing for other economies. Then, for all European indicators we will extract the British economic performances and see if the influence of the European Union is changing. For before Brexit scenario, the United Kingdom will not be scored with points. On the other hand, for after Brexit scenario, we will give 10 points for the best positioned economic power worldwide and then decreasing, take into account also the British economy. This is way, the final scores may differ and the world economy structure will suffer mutations.

In 2018, the European Union was the second economy of the world, having a GDP at purchasing power parity (PPP) of almost $22.5 trillion, behind China and before the United States. Almost $3 trillion belonged to the United Kingdom. Also, according to Table 3, the European Union was the world biggest exporter and importer, over than $8 trillion each, twice more than China and the United States. The British exports and imports was almost $900 billion. Moreover, the European Union recorded a trade surplus of $590 billion, while the Russian surplus exceeded $160 billion, and Chinese one was almost $100 billion. On the other hand, the United Kingdom and the United States recorded a trade deficit of $50 billion and $630 billion. For these performances, the European Union receives 9 points for GDP size and 10 points for each indicators related to trade.

Table 3. The European economic performances in 2018 ($ trillions) **$billion*

GDP (PPP)		Exports		Imports		Trade balance*	
China	25.40	EU-28	8.71	EU-28	8.12	EU-27	642.05
EU-28	22.45	EU-27	7.86	EU-27	7.21	EU-28	591.86
US	20.54	China	2.65	US	3.13	Russia	164.49
EU-27	19.39	US	2.50	China	2.55	China	102.92
India	10.50	Japan	0.93	Japan	0.93	S. Korea	82.13
Japan	5.42	**UK**	0.86	**UK**	0.91	Switzerland	81.19
Russia	4.05	S. Korea	0.72	India	0.64	Brazil	17.31
Brazil	3.37	Canada	0.55	S. Korea	0.64	Japan	3.98
UK	3.06	India	0.54	Canada	0.58	Israel	1.49
Mexico	2.50	Russia	0.51	Mexico	0.50	S. Africa	1.16
Turkey	2.31	Mexico	0.48	Switzerland	0.38	Turkey	-16.09
Canada	1.78	Switzerland	0.48	Russia	0.34	**UK**	-50.19
World	**136.30**	**World**	**25.14**	**World**	**24.53**	**World**	**609.87**

Source: own representation based on The World Bank, World Development Indicators, last update 20th November 2019.

Looking at data from the table above, we can observe that the leaving of the European Union by the United Kingdom will not affect too much the European

economy. The European Union could remain the biggest exporter and importer, having the highest trade surplus. Only in terms of GDP based on purchasing power parity the European Union could be surpassed by the United States with more than $1 trillion, while the European trade surplus may increase.

In these circumstances, the European Union will receive 10 points for trade indicators, while for GDP size will be scored with 8 points. Also, the United Kingdom positions worldwide will be scored with 2 points for GDP size and 6 points each for exports and imports. Even if the European Union will not be affected too much due to the Brexit regarding to GDP and trade, the big changes could happen regarding foreign direct investments.

According to Table 4, in 2018, the European FDI net inflows were almost $50 billion, less than the United Kingdom ones. In other words, the British economy attracted more foreign direct investment than the European Union, which was influenced by the negative FDI net inflows of Cyprus, Finland, Luxembourg, Belgium, Hungary and the Netherlands.

Based on the World Bank statistical databases, the last two had the biggest negative values of FDI net inflows in 2018, $73 billion for Hungary and $239 billion for the Netherlands. In this situation, the European Union receives 7 points.

Once the United Kingdom will leave the community, the European FDI net inflows could become negative at almost $8.66 billion. Practically, the European Union will disappear from the top ten world`s destinations of FDI net inflows. In the same time, the United Kingdom will be the fourth destination of FDI net inflows, for this performance being rewarded with 7 points.

Thus, in the after Brexit scenario, the United Kingdom will receive the points belonging to the European Union.

Table 4. The European Investments Indicators for 2018 ($ billions)

FDI net inflows		FDI net outflows		FDI net	
US	258.40	Japan	159.10	Japan	133.22
China	203.50	EU-28	139.42	Switzerland	114.88
Brazil	88.32	China	96.47	EU-27	90.34
UK	58.65	EU-27	96.30	EU-28	89.43
EU-28	49.99	Canada	52.59	S. Korea	24.44
Canada	45.42	Switzerland	47.20	Russia	22.59
India	42.12	**UK**	43.12	Canada	7.18
Mexico	36.87	S. Korea	38.92	**UK**	-0.92
Japan	25.88	Russia	31.38	S. Africa	-0.92
Israel	20.79	Brazil	14.06	Turkey	-9.41
S. Korea	14.48	India	11.42	Israel	-14.67
Turkey	13.04	Mexico	10.46	Mexico	-26.70
World	**1204.40**	**World**	**850.92**	**World**	**-353.58**

Source: own representation based on The World Bank, World Development Indicators, last update 20th November 2019.

But this situation is not valid for foreign direct investments net outflows, where the European Union was the world second investor after Japan with $139.4 billion, even if Estonia, Latvia, Cyprus, Malta, Belgium, Hungary and the Netherlands had negative FDI net outflows. If we cut the British FDI net outflows, the European Union could be surpassed by China, both with almost $96 billion. In this scenario, the European Union will lose $43 billion and 1 point. The last, but not the least, in 2018, the European Union was the world third economy after Japan and Switzerland regarding net foreign direct investments with $89.4 billion, receiving 8 points, while the United Kingdom recorded a negative value of almost $1 billion. Neither after Brexit, the European worldwide position will not be changed nor the points. But, the European net foreign direct investments may increase.

As regarding the European labor market, the Brexit will reduce the European labor force, but also will improve the unemployment. According to Table 5, in 2018, the European Union has almost 249 million people as labor force, about 34 million being from the United Kingdom. This makes the European Union the third world economy related to labor force and population, for these indicators being scored with 8 points. After Brexit, the European labor force could be reduced with 34 million people and the European population with almost 66.5 million. But, this scenario does not affect the European position worldwide.

In the same time, the European unemployment exceeded 17 million people, of which almost 1.35 million came from the United Kingdom. Practically, in 2018, the

European Union had the world second biggest number of unemployed people, after China, with almost 34.7 million people, according to the World Bank. These two economies are followed by Brazil (13.2 million), India (13 million) and the United States (6.49 million).

This is the reason why the European Union and these economies do not appear in the Table 5, where are presented the other economic powers in the world with one of the lowest levels of unemployed people. Among them, the United Kingdom is positioned on the fifth place, reason for why the British economy is scored with 6 points. After Brexit, the European unemployment may decrease with 1.35 million people, but it will remain among the highest levels in the world

Table 5. The European Population and Labor Market in 2018 (Million People)

Population		Labor force		Unemployment	
China	1392.73	China	785.97	Israel	0.16
India	1352.62	India	512.35	Switzerland	0.24
EU-28	513.21	EU-28	249.16	S. Korea	1.07
EU-27	446.72	EU-27	215.06	Canada	1.20
US	327.17	US	164.95	**UK**	1.35
Brazil	209.47	Brazil	105.37	Japan	1.64
Russia	144.48	Russia	73.53	Mexico	1.88
Japan	126.53	Japan	67.09	Russia	3.49
Mexico	126.19	Mexico	56.64	Turkey	3.55
Turkey	82.32	**UK**	34.11	S. Africa	6.13
UK	66.49	Turkey	32.58	US	6.49
S. Africa	57.78	S. Korea	28.30	EU-27	15.66
World	**7594.27**	**World**	**3456.04**	**World**	**171.11**

Source: own representation based on The World Bank, World Development Indicators, last update 20th November 2019.

In order to observe if the Brexit will affect the European influence on the world economy, we sum up all the points accumulated at all 10 indicators analyzed. This procedure will be applied for all the world economic powers. In this way, we can observe if the world power structure will be modified by Brexit and how the European Union is worldwide positioned compared with the other economic powers. For example, the European Union cumulates 79 points in 2018, while after Brexit its economic power will reduce. The European score after Brexit is 70 points, as it can be observed in Table 6.

Table 6. The European Points Before and After the Brexit

The European Union	Before	After
GDP-PPP	9	8
Export	10	10
Import	10	10
Trade balance	10	10
FDI inflows	7	0
FDI outflows	9	8
FDI net	8	8
Population	8	8
Labor force	8	8
Unemployment	0	0
TOTAL	**79**	**70**

Source: own calculations.

The European best scores are related to trade, where the European Union is the world leader. After Brexit, the European GDP and the FDI outflows could reduce, also the scores, while for the FDI inflows the European economy could disappear from the top ten world`s destinations of FDI net inflows and will lose all 7 points.

Table 7. The Economic Powers` Ranking

Position	Before Brexit		After		Position
1	EU-28	79	China	73	1
2	China	72	EU	70	2
3	Japan	61	Japan	60	3
4	US	50	US	50	4
5	India	42	UK	40	5
6	Russia	42	India	39	6
7	South Korea	40	Russia	38	7
8	Canada	35	South Korea	36	8
9	Switzerland	33	Canada	32	9
10	Brazil	32	Switzerland	31	10
11	Mexico	25	Brazil	31	11
12	Israel	17	Mexico	19	12
13	Turkey	13	Israel	16	13
14	South Africa	9	Turkey	9	14
-	UK	-	South Africa	6	15

Source: own calculations.

The world economy structure will be modified due to the Brexit, as it can be seen in Table 7. The economic powers` ranking was achieved taking into account only ten indicators. Thus, taking into account the GDP size, trade, investment inflows, population, labor force and unemployment, the European Union is the world leader,

having 79 points and followed by China (72 points), Japan (61 points) and the United States (50 points). In this scenario, the British economy is not taken into account because it is considered part of the European Union. After Brexit, the ranking of world economic powers changes.

China becomes the world leader with 73 points, while the European Union loses 9 points and falls on the second place. Mainly, the European Union`s fall is caused by the losses incurred regarding to FDI net inflows. In after Brexit scenario, the British economy is analyzed separately by the European Union and has 40 points, being the fifth world economic power. In these circumstances, the Russia falls two positions. Also, due to Brexit, almost all economies lose points, starting with European Union (9 points) and Mexico (6 points) and following by Russia, South Korea and Turkey with 4 points. On the other hand, China wins 1 point due to Brexit and the United Kingdom reaffirms itself as a great world power. In other words, almost all of the world economic powers will be affected by Brexit. Only for the United States the world position neither the points will not be changed due to the Brexit.

4. Conclusions

This study is focus on the analyze the Brexit`s effects on the European Union`s economic power and on the British economy, using some variables such as the economic environment, the investment attractiveness, trade and labor market. Also, the purpose of this study is to observe the Brexit effects on the European influence over the world economy and its competition with other economic powers, comparing the main components of the European economic power. We believe that we achieved these purposes. We are aware that our study can be extended to more countries and more indicators, using more up-to-date statistical information. This deficiency can be solved in future research based on the methodology developed in this study.

Brexit is capable to generate positive and negative effects for both economies, affecting the way that the European Union and the United Kingdom influence the world economy. But, we believe that the Brexit will affect the British economy more than the European one. The European Union seems to have more advantages compared to the United Kingdom. The biggest lost of the European Union is about its economic power and its influence on the world economy. As we observed from the specialized studies, the negative effects of Brexit are more numerous than the positive ones and the European Union seems to be less affected than the British

economy. The United Kingdom risks facing an internal crisis due to the Brexit and there are more chances that its economy to suffer a reduction in economic growth rather than an increase. Our quantitative analyze about the the Brexit effects on the European influence over the world economy and its competition with other economic powers shows that the European Union will be affected.

The European economy could lose the leader position. Mainly, its fall is caused by the losses incurred regarding to FDI net inflows, but also by the reduction of GDP size and FDI net outflows. On the other hand, the British economy has the chance to reaffirm itself as a great world power. Brexit will affect almost all world economies, only United States will not change its world position. Also, China is the only one benefiting from Brexit and has the chance to take the lead of world economy.

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