Determinants of Military Expenditure in Brics Countries

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Abstract: The purpose of the paper is to use econometric methods to ascertain the main determinants of rising military expenditure in BRICS countries for the period of 1970 to 2017.The empirical result of the determinant for military expenditure of BRICS countries from 1970 to 2017 employed the panel data analysis approach. Based on the detailed theoretical and empirical literature on determinant for military expenditure, the neoclassical model was considered the best to analyzed determinant of BRICS countries military expenditure. BRICS countries political economy and security factors were incorporate for model specification. The determinant for military expenditure for BRICS include income, population, government expenditure, Security web (average military expenditure of neighboring countries within BRICS countries), internal threats and external threats. The economic, political and security factors are included. The empirical result suggest that BRICS countries military expenditure is mainly determined by its income, population, exchange rate, internal threats, inflation and political regime (proxy by democracy index). In conclusion, the result reveal that BRICS policy makers if they are interested in reversing their high unemployment and poverty rate should focus their attention on these encouraging the local production of their arms/ammunition (military industries) which will create job opportunities for their teeming youthful population. This result is in line with the findings of (Tambudzai, 2011), (Brauer, 2002) and Hartley and (Sandler & Hartley, 1995).

Keywords: Military Expenditure; BRICS countries; GDP

JEL Classification: E13; 011; H56

1. Introduction

Empirical studies on determinants for military expenditure in individual countries and cross-national countries abound, however, there are few/no studies for BRICS (Brazil, Russia, India, China and South Africa) covering the period of 1970 to 2017. Furthermore, the rationale for investigating BRICS countries for this study are as

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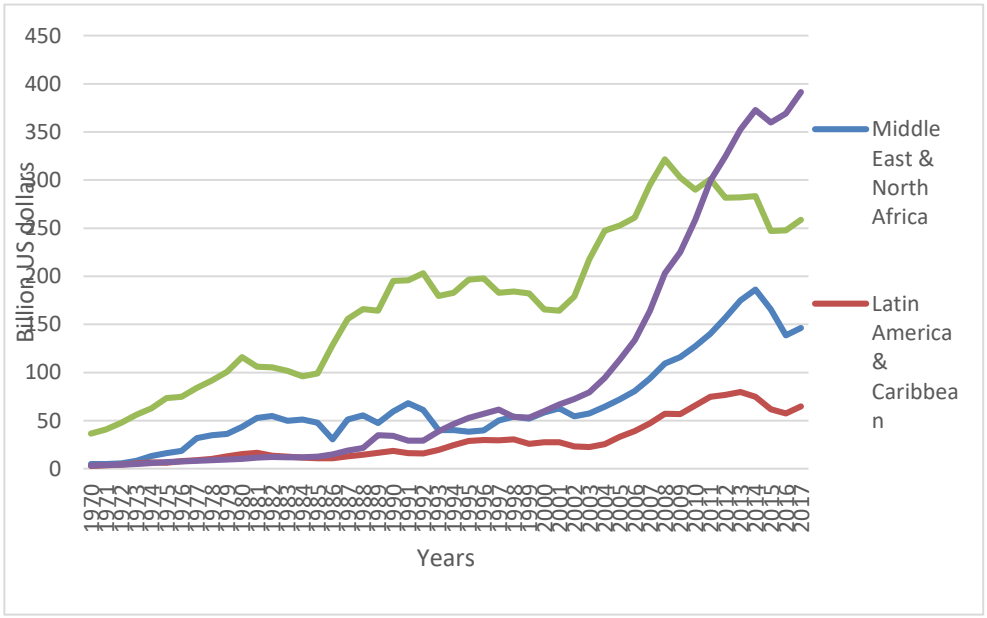
follows, one, BRICS countries accounts for about 26.11% of total world's military expenditure. The second reason is that of BRICS countries have been involved in regional peacekeeping missionaries in regional-conflicts makes this empirical investigation an interesting one to explore. For example, BRICS' countries involvement in regional and global peace keeping forces mission. Finally, on a general note, World's military expenditure has declined due to the peace dividend however; BRICS countries still assign a high percentage of their central government budgetary allocation to the military sector and industries despite witnessing harsh socio-economic inclusive growth challenges.

Figure 1.1 present BRICS countries military expenditure trend analysis covering the period of 1970 to 2017. The graph denotes that military expenditure has been rising in BRICS countries. For instance, in 1970, BRICS countries taken together spent over $3 billion on military expenditure. By 1980, the data shown that BRICS military expenditure had tripled to over $10 billion and still rising especially from 2000 to 2017. This therefore form the crux of this paper is to unravel what are the factors responsible for the rise in military expenditure in BRICS countries spanning across the periods of 1970 to 2017.

Figure 1.1. Brics Military Expenditure Trend For 1970 To 2017



Source: World Bank Database Indicator (2018)

The structure of this paper is as follows: Section 2 presents BRICS military expenditure and its ranking from 1970 to 2017, Section 3 presents theoretical models

for the determinant for military expenditure, Section 4 covers the empirical literatures, and Section 5 present the model specification and data description. In section 6, Data Analysis and Interpretation will be presented. In section 7. Conclusion

2. BRICS Military Expenditure and their Ranking

BRICS is one of the largest and most powerful economic bloc with over 500 billion people and has one of the largest combined military force in the world. The BRICS countries has combined military expenditure of USD 348942 (SIPRI, 2017, in constant 2016 prices). Table 1 present BRICS countries world country ranking and the its military expenditure by constant million USD.

Table 1. BRICS Military expenditure and their ranking

2017 Countries	World Country ranking by military expenditure	Military expenditure by Constant million USD
Brazil	11th	25751.34
Russia	4th	55327.10
India	5th	59757.10
China	2nd	228173.00
South Africa	43rd	3110.20
Total		**348942.40**

Source: SIPRI new extended database 2017

From Table 1, it denotes that BRICS countries has demonstrated a sustained increase in military expenditure and contributed to growth in World military expenditure in the recent years. BRICS countries real military expenditure has been rising for the period of 1946 to 2017. The BRICS combined military expenditure has rose from 1.0% in 1970 to 1.8 in 2017, which outweigh the average NATO members' military expenditure to Gross Domestic Product (GDP) benchmark contribution except for France, Germany and some Former Soviet Union's Countries.

2.1. Chorology of Wars Involving BRICS Countries from 1971 to Present

This section present both wars/conflicts as the main determinants for military expenditure in BRICS countries. The table 2 below provides a chorological start and finish dates, name of conflicts and BRICS countries involved consequently stimulating increased military expenditure from 1984 to 2017 has shown in above graph.

Table 2. Conflicts involving BRICS countries from 1970 to present

(1) 1970- 1979		**Name of conflicts**	**Victorious Side**	**Defeated Side**
Start	**Finish**			
1971	1971	Indo-Pakistan wars and Conflicts	India & Bangladesh	Pakistan
1974	1974	Battle of the paracel Islands	China	South Vietnam
1975	2002	Angolan Civil Wars	Russia and others	South Africa and others
1975	**Ongoing***	Cabinda war	Russia	FLEC
1977	1978	Ethio - Egyptian war	Russia	Somalia
1979	1990	Sino-Vietnamese war	China	Vietnam
1979	1989	Soviet- Afghan war	Tehran Eight	Russia
B. 1980-1989				
1983	2009	Sri-Lankan Civil war	India (1987-1990)	Tamil Tigers
1984	1987	Siachen Conflict	India	Pakistan
1989	**Ongoing ***	Insurgency in Jammu and Kashmir(part of the Kashmir conflict)	India	Harket-ul-Jihad Isau and others
C.1990	**1999**			
1991	2002	Sierra-Leone Civil war	South Africa mercenaries and Nigeria ECONOMG and others	Revolutary United Front and others
1991	1993	Georgian civil	Georgian and Russia	Zviadist
1992	1992	East Progorodry conflicts	Russian Army and others	Ingush militia
1992	1992	War of Transnistria	Russia 14th Army and others	Moldova and others
1992	1993	War in Abkhazia (1992-1993)	Russia and Others	Afghanistan
1993	**Ongoing ***	Ethic conflict in Nagaland	India and others	Rebel forces
1993	1993	1993 Russian constitutional crisis	President of Russia and others	Supreme Soviet of Russia and others
1984	**Ongoing***	Armenia-Azerbaij border conflict	Russia Support Armenia	Azerbaijan supported by Turkey
1984	1996	First Chechen	Chechen Republic of Ichkeria and others	Russia
1996	2006	Nepalese civil war	China support Communist Party of Nepal	India support Kingdom of Nepal
1996	2001	Civil in Afghanistan	India supports USA and others	Al-Qaeda and others
1999	1999	Kargi War (part of Indo Pakistan war)	India	Pakistan
1999	1999	War of Dagestan	Russia	IIPB and Shura of Dagestan
1999	2009	Second Chechen War	Russia and Republic of Chechnya	Republic of Ichker and others
1996	**Ongoing***	South Africa farm attacks	South Africans	Foreign nationals and South Africans
2000	**Till date**			
2002	2007	First Ivorian civil war	Russia support	France/UN

2002	Ongoing	Taliban Insurgency	India Coalition forces and others	Taliban
2007	2015	War in Ingushetia	Russia and others	Caucasus Emirate and others
2008	2008	Russo-Georgia	Russia and others	Georgia
2009	**Ongoing***	Insurgency in the North Caucasus	Russia	Caucasus Emirate
2011	**Ongoing***	Syrian civil war	Russia support Syria	USA support Free Syrian Army
2012	2013	M23 rebellion	South Africa and others	March 23 movement

Sources:(Posen, 1986), Correlate of Wars (2017)

1. **1984-1979**- All BRIC countries were involved in diverse forms of conflict except South Africa still under Apartheid regime. However, the Cabinda war of 1975 is still ongoing till date.
2. **1980-1989**- Only India was involved in major conflicts ranging from wars, insurgency and border disputes with Pakistan. Worthy of note is the insurgency in Jammu and Kashmir is ongoing.
3. **1990-1999**- This can be referred to as **1990's War Era**. As BRICS countries, all witnessed diverse forms of conflicts ranging from border disputes, regional and international conflicts. This period all BRICS countries experienced a surge in their respective countries has shown in the graph where both all BRICS military expenditure grew to 1.0% of its GDP and assign minimum of 4.0% of their government spending to military sector. The following wars are still in progress: Ethic conflict in Nagaland; farm attacks from South Africans on foreigner's farms.
4. **2000- Till date**- The two dominants BRICS countries experiencing conflicts are Russia and India. The following wars are still in progress Syrian civil war and Insurgency in the North Caucasus.

3. Theoretical Model of Determinants of Military Expenditure

Empirical studies on determinants for military expenditure has been explored by utilizing diverse econometric estimation techniques. Furthermore, empirical studies also explored the possibility of political, geographical and socio-economic influence on military expenditure composition and trends. The determinants of military expenditure employed for this analysis is the neoclassical model

Neoclassical model

The military neoclassical model is chiefly center on (Smith, 1995; Smith, 1980) work. It encompasses how political and economic factors influencing military

expenditure component. The neoclassical model assumes optimization of welfare. The military neoclassical model can be written as:

$$W_1 = W(S, C, N, Zw)$$

W-Welfare of the country; S- Security of lives and property from attacks; C-Consumption and Zw- Other factors.

Since, S cannot be measured but can be measured by using a proxy of military expenditure and other countries (this can be allies and rivals) denoted as$M_1, M_2, \ldots., M_n$. Thus, this can be substituted and incorporated equation 1.

$$W_1 = W(M_1, M_2, \ldots., M_n, C, N, Zw)$$

N.B. Allies military expenditure rise the country security whereas rivals military expenditure pose a threat.

The mathematically military budget constraint can be written as

$$Y = P_C C + P_m M$$

Y-nominal aggregate income; P_m-Prices of military expenditure; P_c-Prices of consumption and M- real military expenditure

$$M_1 = M\left({}^{P_m}/_{P_c}, Y, N, M_1, \ldots., M_n, Z_w, Z_s\right)$$

Welfare function is given as

$$W = \propto \log(C) + (1 - \propto)\log(S)$$

The above is premised on the country has a rival neighboring country M_1 and absence of allies. The security function is assumed as

$$S = M - M^* = M - (\beta_0 + \beta_1 M_1)$$

Where

M^*- Military expenditure a country to resist its rival neighbour attack

β_0-Fixed element not linked to rival military expenditure, it is negative if neighbouring security are natural and negative if vice versa.

β_1-Relative effectiveness of military

4. Empirical Literature Review on Determinant of Military Expenditure

Diverse researchers have examined the determinants for military expenditure across the globe, both in developed and developing countries and their empirical results have been mixed, thus it cannot be generalized for all countries. The determinant for

military in emerging countries ranges from economic factors, socio-political factors and security to mention a few.

This section provides the relevant empirical literatures on determinants for military expenditure following the above categories.

4.1. Security Threats

Provision of security for lives and properties of their citizens has been affirmed to be one the cardinal functions of the central government military and paramilitary agencies. The scope of the military and paramilitary agencies includes but not only limited to: intervening in communal clashes, inter-state boundaries disputes, national and international conflicts; Civil wars, and also participating in both regional and international peace keeping missions and ad-hoc joint task forces operations.

One of the key determinants for military expenditure identified by security/defence experts such as (Dunne & Perlo-Freeman, 2003) is external wars threat. (Dunne & Perlo-Freeman, 2003) consented that external wars is one of the major determinants if not the major driver for the rise for military expenditure in developing countries. They further explained that the rise in military expenditure is triggered and evident during wartime or crisis period via the procurement of arm ammunition and rise in voluntary enrolment/conscription of young youths during such periods.

Hewitt (1991, 1992 and 1993) a employing public-choice framework analyzing the association between military expenditure and threats for 125 Less Developed Countries (LDCs) over the period 1972-1990. The empirical result indicate that international wars positively does matter in increased military expenditure levels.

(Batchelor et al, 2000), using South Africa as a case study, explored the determinants for military expenditure. They incorporated Angolan war (1977-1993) in their estimation. The empirical result indicate a significant and positive effect of war on South Africa's increased military expenditure for the period considered.

(Dunne & Perlo-Freeman, 2003) presented a comparative analysis of a cold war (1981-1989) and post-cold war period (1990-1997) for developing countries. The result confirmed a positive impact from external wars on military expenditure. (Tambudzai, 2011) examined Zimbabwe's military expenditure determinants from 1998-2008. The external wars variable clearly indicate a positive impact on Zimbabwe military expenditure on a long run basis.

(Ball, 1983) asserted that internal threats (civil wars) is more sever and detrimental than external threats for developing countries.(Dunne & Mohammed, 1995), also examined 13 sub-Saharan countries determinants for military expenditure for the period 1967-1985. The empirical result show a significant and positive impact of civil war on military expenditure. (Collier & Hoeffler, 2002) carried out a comparative econometric analysis between civil war (internal threats) and

international wars (external threats) on military expenditure. The result indicate that civil war (internal threats) is significant and has positive impact on military expenditure than international threats (External threats).

(Collier, 2003) asserts that developing countries allocates 2.8 percent of its GDP to military expenditure during peacetime whereas during wartime assigns about 5 percent of national Gross Domestic Product to military expenditure and allied industries.

(Aziz et al, 2017) investigated the milex-growth nexus of seventy countries taking cognizance the presence of internal and external threats from 1990 to 2013 using Generalized Moments Methods (GMM) as well as fixed/random models. Their result suggests a negative relationship between military expenditure and growth for all the models.

4.2. Security Web

The concept of security web was a product of (Rosh, 1988) work. The concept refers to nation's X security web as all other countries capable of influencing country X's security both at national and regional level. (Rosh, 1988) further explained that country X's threats levels can be ascertained by average military expenditure of Gross Domestic Product of countries in the security web. (Rosh, 1988) work affirmed that security web plays significant role and positively stimulate the increased military expenditure of 63 LDCs over the period 1969-1978. (Dunne & Perlo-Freeman, 2003) and (Dunne et al, 2008) further explore the security web dynamics, by categorizing the countries in the security web into three distinct groups of Allies, neutral and rivalry/enemies. Their empirical result were mixed for all the three distinct groups. However, (Sun & Yu, 1999) depicts that China's military expenditure was significantly and positively influenced by Japanese military expenditure for the period of 1965-1993. Likewise, (Tambudzai, 2011) affirmed that Zimbabwe military expenditure was significantly and positively influenced by growth in South Africa military arsenal for the period of 1980-2003.

4.3. Economic Factors

(Barro & Sala-I-Martin, 1992) asserted that determinants of military expenditure is not affected by threat only but by host of economic, political and environmental factors. This section focus on empirically identified economic determinants of military expenditure.

(Looney, 1989) highlights that at aggregate level, economic variables such as income inequality disparity level, growth rate of GDP, budget size and Milex Industrial Complex (MIC). On a general note, GDP has been singled out as an important economic determinant of military expenditure. Other empirical studies have also used per capita and GNP to examine income on military expenditure

Other identified internal economic determinants include the presence of arms industries, Central Government Expenditure (CGE) and non-military government expenditure. For instance, (Hewitt & Van Rijckeghem, 1995) work on military expenditure-growth nexus suggest that GDP level clearly depicts real impacts of military expenditure. The empirical result indicate the existence of convex relationship. (Tambudzai, 2011) examined 12 Southern African countries determinant for military expenditure for the period 1997-2004. The empirical result indicate the significance of GDP per capita on military expenditure determinants estimation.

Conversely, in individual country studies, Gross national income variables has been suggested to have positive effect as a determinant for military expenditure. For instance, (Sun & Yu, 1999) examines the determinant for military expenditure for China. The result reveal military expenditure is significantly and positively related to its Gross National Product. In examining an African context,(Batchelor et al, 2000) find that South Africa military expenditure is related to its income level .

Central Government expenditure is the reported final budget details stated in the accounts. (Dommen & Maizels, 1988) work on military burden on developing countries use central government of GDP as one of the determinants for military expenditure. The empirical result show that Central government Expenditure is significant and positive. Likewise, (Dommen & Maizels, 1988) result was collaborated by (Hewitt, 1991). (Hewitt, 1991) further reinforce that central government expenditure is significant and positive in determining military expenditure.

(Yildirim et al, 2005) investigate government consumption effect on military expenditure for 92 countries for 1987-1997.The result found that central government expenditure is significant and positive on military expenditure. In summary, above empirical results affirmed that central government expenditure is significant and positive with military expenditure.

(Deger & Sen, 1990) included arms production as a variable to examine military expenditure on the Indian economy for the period of 1960-1985. However, the result show that arms production is insignificant in the estimation.

(Dunne & Perlo-Freeman, 2003) and (Dunne et al, 2008) included trade variable in their demand for military expenditure estimation. The empirical result show that trade does matter with a significant and positive impact on military expenditure whereas (Dunne & Mohammed, 1995) work indicate that trade is not significant in Sub Saharan Africa This may be due to low intra sub-Saharan trade activities.

4.4. Political Factors

In determining the factors that influence military expenditure, it has been suggested by (Hou, 2010), That, the political institution regimes does affect a nation's quest for

military effort. For instance, (Dommen & Maizels, 1988) has affirmed that democratic regimes tends to spend less whereas authoritarian regimes tends to invest more in military sector and allied industries to be full control of the nation. However, this above assertion cannot be generalized for all nations.

Other notable empirical works that have investigated political regimes in the milex demand debates are as follows: (Dommen & Maizels, 1988) milex demand work use political regimes (from military to democratic) for 72 countries for the period of 1978-1980. Their result revealed that two fifth of military regimes make use of military force against the public

On the other hand , (Dunne et al, 2008; Dunne & Perlo-Freeman, 2003) incorporated democracy index from POLITY 1998 in estimating determinant for developing countries covering 1981 to1997. Their result indicates that democracy do have significant and negative impact on military expenditure on developing countries.(Hou, 2010) identified the relevance of political regimes investigating India's demand for military expenditure discuss. (Sun & Yu, 1999) examined the change of China's leadership from war oriented to economic development after 1979. Their result indicate an inverse change on Chinese military expenditure level for 1965-1993. (Batchelor et al, 2000) empirical work on South Africa military demand incorporated a political dummy to capture change of leadership administration. The empirical result indicate an inverse relationship with military expenditure. (Yu, 2002) use US-China conflict and major political shock as an independent variable for determinant for Taiwan's military expenditure for 1966 to 1992. The empirical result indicate a significant and positive impact as a determinant for military expenditure.

1.4.5. Other Factors

(Dunne & Perlo-Freeman, 2003) identified population as a significant determinant for military expenditure based on "Public good" theory. They opined that a large population does make military expenditure more effective. Also, (Hewitt & Van Rijckeghem, 1995) found that population is significant and positive for developing countries. However, (Dunne et al, 2008) found that there exist an inverse relationship between population and military expenditure for countries with large population whereas countries with small population invest more on military hi technologies. They suggest that countries with large population tends to focus more on consumption demand than security matters. Other notable variables identified by empirical studies on determinant for military expenditure includes external threats. (Dunne & Mohammed, 1995) explores military participation-military expenditure nexus for 13 sub-Saharan countries. They use proportion of armed forces. The empirical result show that proportion of armed forces significantly and positively affect military expenditure level. (Yildirim et al, 2005) use ratio of armed forces per 1000 population to estimate determinant for military expenditure for 92 countries for

1987 to 1997. Their panel analysis result indicate that higher ratio of armed forces per 1000 population is linked to an increased military expenditure levels. (Dommen & Maizels, 1988) and (Dunne & Perlo-Freeman, 2003) identified geographical factor as a possible contagion effect especially in Middle East countries embodied in conflicts. Their empirical analyses attest the presence of regional factor as a significant and positive determinant for military expenditure for all Middle East countries.

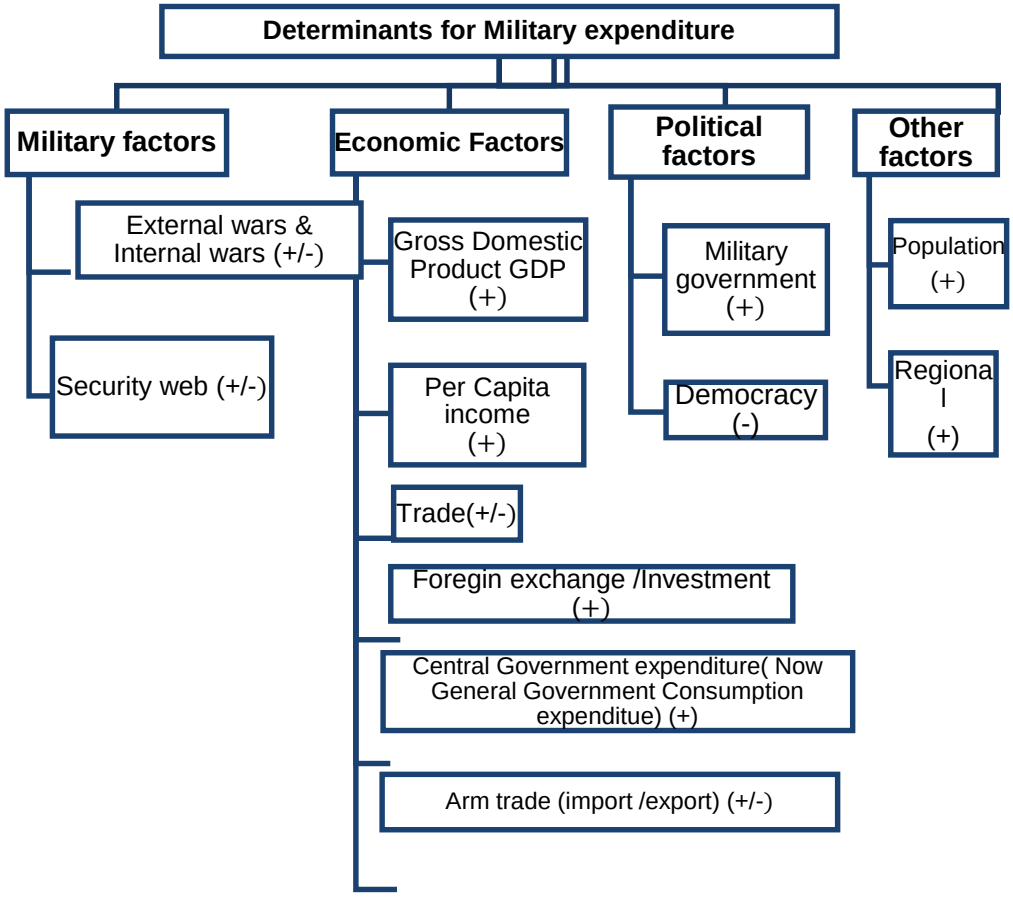


Figure 2. Determinants for Military expenditure

5. Model Specification and Data

The military neoclassical model is chiefly center on (Smith, 1995; Smith, 1980) work. It encompasses how political and economic factors influencing military expenditure component. The neoclassical model assumes optimization of welfare. The military neoclassical model can be written as:

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$$W_1 = W$$

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The mathematically military budget constraint can be written as

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Y-nominal aggregate income; P_m-Prices of military expenditure; P_c-Prices of consumption and M- real military expenditure

$$M_1 = M\left({}^{P_m}/_{P_c}, Y, N, M_1, \ldots., M_n, Z_w, Z_s\right)$$

Welfare function is given as $W = \propto \log(C) + (1 - \propto)\log(S)$

The above is premised on the country has a rival neighboring country M_1 and absence of allies. The security function is assumed as

$$S = M - M^* = M - (\beta_0 + \beta_1 M_1)$$

Where

M^*- Military expenditure a country to resist its rival neighbour attack

β_0-Fixed element not linked to rival military expenditure, it is negative if neighbouring security are natural and negative if vice versa.

β_1-Relative effectiveness of military

The Lagrange function of above budget constraint

$$L = \propto \log(C) + (1 - \propto)\log(M - M^*) + \lambda(y - P_C C - P_m M)$$

The First Order Condition (FOCs) are

$$\frac{\partial L}{\partial C} = \frac{\partial L}{\partial C} - \lambda P_C = 0 \; i.e. C = \frac{\alpha}{\lambda P_C}$$

$$\frac{\partial L}{\partial C} = \frac{1-\alpha}{M - M^*} - \lambda P_m = 0 \; i.e. M = \frac{1-\alpha}{\lambda P_m} + M^*$$

$$\frac{\partial L}{\partial C} = Y - P_c C - P_M M = 0$$

This gives

$$\frac{\partial L}{\partial C} = \frac{\partial L}{\partial C} = \frac{1-\alpha}{M - M^*} - \lambda P_m = 0 \; i.e. M = \frac{1-\alpha}{\lambda P_m} + M^*$$

$$y - P_C \frac{\alpha}{\lambda P_c} - P_m \left(\frac{1-\alpha}{\lambda P_m} + M^* \right) = 0$$

The Lagrange multiplier can be eliminated by

$$\frac{1}{\lambda} = Y - P_m M^*$$

The two linear equations = M= $\frac{1-\alpha}{\lambda P_m} + \alpha(\beta_0 + \beta_1 M_1)$

C = $\frac{\alpha}{P_C} + (Y - P_M \, (\beta_0 + \beta_1 M_1)$

Some of the (Smith, 1995) work landmark achievements includes but not limited to, one, the model distinguish between military force stock and military expenditure levels effects. Two, the impact of political regimes and how it affect military expenditure budgetary decisions. Therefore, employing neoclassical models for examining the determinant for military expenditure is ideal. The neoclassical model has ability to accommodate diverse components spanning across economic variables such as income, prices and population to mention a few as well as socio-political variables such as strategic factors and military expenditure. The neoclassical model has been suggested to be more comprehensive, well detailed and a present's reasonable economic outcome on determinants for military expenditure in an economy.

Estimating Techniques

Panel data provides regression analysis with both a spatial (a cross -section of units) and sequential (periodic observations) dimension. (Gujarati, 2009) provides an extensive list of advantages of panel data:

1. The problem of heterogeneity in panel data units is solved by estimation techniques that allows for individual-specific variables.
2. Data gives "more informative data, more variability, less collinearity and greater degrees of freedom and more efficiency".
3. Panel data are more appropriate for investigating the dynamics of change.
4. Panel data can better detect and measure effects that cannot be observed in pure time series or pure cross-section data.
5. Panel data allows us to study behavioural models that are more complicated.
6. Panel data minimizes bias caused by aggregation of micro units' data.

Yaffee 2003 discusses a number of panel data analytical models, particularly constant coefficient, fixed effects and random effect models. In the midst of these types of models are dynamic panel, robust and covariance structure models.

The Pooled Regression Model

Also known as the constant coefficient model, pooled regression models use constant coefficient (both intercepts and slopes) and is relevant when there is neither significant country nor significant temporal effects. We pool all the data and run an OLS regression model.

$$y_{it} = \beta_1 + \sum_{k=2}^{k} \beta_k x_{it} + \varepsilon_{it}$$

For N cross-section units- i= 1, 2,….,

Periods T=1, 2,…., T

K are number of the explanatory variables- k = 2,…

β_k are the slope coefficients and are assumed to be constant over countries and time.

ε_{it} is the random error term for the i^{th} country and t^{th} year.

Y is a dependent variable and X an independent variable;

x_{kit} is an observation on the k^{th} explanatory variable for the i^{th} country and the t^{th} time period.

This model has the drawback that it assumes that all parameters are the same for each country, thus ignoring country specific factors.

In addition, the cross -section variation will drown the time-series effects.

Fixed Effect Models

Fixed effect model allows the intercept to change across groups (countries in our class) but the model will have constant coefficients (slopes). There will no importance sequential impact but important countries differences. The intercepts are cross section specific and differ from country to country, but they may not differ over time.

$$y_{it} = \beta_{1i} + \sum_{k=2}^{k} \beta_k x_{it} + \varepsilon_{it}$$

Where, β_{1i} represent the country specific effects. The intercepts are assumed different for individual countries but constant over time. This type of fixed effects model is called the Least Squares Dummy Variable model.

There are four other types of fixed effects models. One type of fixed effects model could have constant slopes but intercepts that vary according to time. A third type could have coefficient that are constant, but the intercept varies over the country and time. A fourth kind has differential intercepts and slopes varying according to the country. The last type is a fixed effect models in which both the intercepts and the slopes might are over time and across the countries.

The Random Effect Models

It is a regression model with a random constant term. The constant in this model is not fixed, but is an independent random variable. The model can be presented as follows,

$$y_{it} = \beta_{1i} + \sum_{k=2}^{k} \beta_k x_{kit} + \varepsilon_{it}$$

Where β_{1i} is an independent random variable with mean, β_{1i} and σ_{μ}^2

While $\beta_{1i} = \beta_1 + \mu_i$

Equation (3) becomes

$$y_{it} = \bar{\beta}_1 + \sum_{k=2}^{k} \beta_k x_{kit} + \mu_i + \varepsilon_{it}$$

In order to permit analyze to be carried out at aggregate military expenditure, the above regression model was estimated as panel data model- random effects and fixed effect models. (Gujarati, 2009) provides an extensive list of advantages of panel data:

1. The problem of heterogeneity in panel data units is solved by estimation techniques that allows for individual-specific variables.
2. Data gives "more informative data, more variability, less collinearity and greater degrees of freedom and more efficiency".
3. Panel data are more appropriate for investigating the dynamics of change.
4. Panel data can better detect and measure effects that cannot be observed in pure time series or pure cross-section data.
5. Panel data allows us to study behavioural models that are more complicated.
6. Panel data minimizes bias caused by aggregation of micro units' data.

Table 3. Apriori expectation of military expenditure determinant variables

S/N	Variable	Expected Signs
1	**Military factors**	
	a. External/Internal wars	+ / -
	b. Security web	+ / -
2	**Economic factors**	
	a. a. Gross Domestic Product	+
	b. Per capita Income	-
	c. Trade	+ / -
	d. Foreign exchange /Investment	+ / -
	e. Central government expenditure	+
	f. Arm trade	+ / -
3	**Political factor**	
	a. Military government	+
	b. Democratic government	-
4.	**Other factors**	
	a. Population	+
	b. Regional	+

Table 4. Description of Variables and data source

Variables	Definition	Sources
Key variables		
ME	Military expenditure (Share of GDP)	World Bank and Stockholm International Peace Research Institute new extended database 1946-2017
Ext.	External threats are classified as wars involving two independent countries	International Country Risk Guide (ICRG) database 1984 - 2017
Inter threats	Internal threats include Civil war[1], insurgency crisis and communal clashes	
POP	BRICS Population growth rate	World Bank Development Database 2018 **(WDI)**
Security Web	BRICS Security Web measured by averaging of the ratio of military expenditure to GDP of BRICS neighboring countries	
GDP	GDP per capita	
TB	Trade Balance	
Pol.	Political factor proxy was Democracy Index[2]	Polity IV database

6. Data Analysis and Interpretation

The summary of statistics is important to explore the time series distribution of the data collected on each of the variables. Table 5 indicate that all the variables used as determinants for military expenditure are positive. This reveals that on the average all the determinants are positive. This is a pointer to the fact that BRICS countries determinants are positive during this periods. The mean of military expenditure from the table is 2.111923 while the standard deviation is 1.348055. The mean distribution value is an indication that across the BRICS military expenditure is still relatively on the average because the mean distribution values for in between the upper and the lower limit. Again, the variance of 1.348055 is closer to the minimum limit than the

[1] An International war is differentiated from civil war, if it involve more than one country. To be called a war it must include 1,000 battle causalities in both cases.

[2] Democracy Index is an **index** compiled by the UK-based company the Economist Intelligence Unit (EIU) that intends to measure the state of **democracy** in 167 countries, of which 166 are sovereign states and 165 are UN member states.

maximum limit thus showing the data on military expenditure is not widely dispersed.

Table 5. Summary of Descriptive Statistics for determinant of military expenditure in BRICS countries

Variable	Obs	Mean	Std. Dev.	Min	Max
Me	240	2.111923	1.348055	0	5.503756
Internal	240	5.672019	4.255748	0	11.91667
External	240	6.521458	4.726551	0	12
security web	240	2.768716	1.452574	0	9.361947
GDP	221	7.987818	1.250257	5.430738	9.385589
TB	240	8.74e+07	2.15e+09	-5.31e+09	8.56e+09
Demo Index	240	1.491667	10.67276	-88	9
Exchrate	240	8.616337	13.17995	0	58.59785
Inflation	183	2.359151	1.418705	-1.05611	7.988791

Source: Author's computation

Table 6 presents the correlation matrix of the variables used in the study. Correlation matrix shows the degree of association and direction of relationship among the variables. The dependent variable (military expenditure) as a percentage of GDP. The degree of association that exists among the independent variables reveals that all independent variables can be included in the same model without the fear of multicollinearity.

Table 6. Correlation Matrix for determinant of military expenditure in BRICS

	Me	**lnt**	**Ext.**	**Secweb**	**GDP**	**TB**	**Demo**	**Exch**	**Infl.**
Me	1.0000								
int.	-0.4740	1.0000							
ext.	-0.4273	0.9293	1.0000						
Secweb	0.1812	-0.2647	-0.2598	1.0000					
GDP	-0.1749	0.2978	0.3349	-0.0980	1.0000				
TB	0.2709	0.2137	0.1372	-0.0290	0.5324	1.0000			
Demo	0.0370	-0.1006	-0.0535	-0.2354	-0.0421	-0.0603	1.0000		
Exch	0.2283	0.0803	0.0847	-0.2737	-0.3978	0.0200	0.1646	1.0000	
Infl.	0.0998	-0.0284	0.0901	0.0501	0.2098	0.1673	0.0634	-0.1614	1.0000

Source: Author's computation

6.1. Panel Unit root test for Determinant of BRICS countries military expenditure

Various studies such as Kutu and Ngalawa, 2016; Omolade and Ngalawa, 2014 among others have advised researchers to always use more than one methods of panel unit root test in order to be sure of the order of integration of the variables to be included in a particular model. The reason behind this might not be unconnected to the fact that a non-stationary variable constitutes an outlier among other variable and the inclusion can significantly influence the outcome of the empirical analysis.

For this study both the IPS, LLC and ADF methods of Panel unit root tests are adopted for consistency sake. Their results are presented in table 7.

Table 7. Panel unit root tests for Determinant for BRICS countries military expenditure

	Levin et al. (2002)				**Im et al. (2003)**			
	Level		First Diff		Level		First Diff	
Variables	**Stat.**	**P-val**	**Stat.**	**P-val**	**Stat.**	**P-val.**	**Stat**	**P-val**
ME	-1.20247	0.1146	-10.3185	0.0000	-1.10034	0.1356	-10.4873	0.0000
INT.threat	-1.02950	0.1516	-15.9196	0.0000	0.17815	0.5707	13.4058	0.0000
EXT. Threat	-1.20438	0.1143	-16.0053	0.0000	0.11704	0.5466	-13.6685	0.0000
SECWEB	-1.39839	0.0810	-12.0931	0.0000	-1.67129	0.0473	-13.3773	0.0000
GDP	13.3771	1.0000	-1.57036	0.582	9.31774	1.0000	-3.81231	0.0001
TB	-2.67451	0.0037	-	-	-3.33891	0.0004	-	-
DEMINDEX	-1.876221	0.0303	-	-	-2.2048	0.0137	-	-
Exch	0.24073	0.5951	-12.9703	0.0000	0.15184	0.5603	-9.17874	0.0000
INF	-6.6041	0.0000	-	-	-5.80599	0.0000	-	-
Pop	1.05006	0.8532	2.88857	0.9981	2.02843	0.9787	-3.95287	0.0000

	ADF Fisher Chi Square				
	Level		First Diff		
Variables	**Stat.**	**P-val.**	**Stat**	**P-val**	**Status**
ME	14.1463	0.1664	108.814	0.0000	**I(1)**
INT.threat	6.14092	0.8033	143.486	0.0000	**I(1)**
EXT. Threat	6.31176	0.7884	145.900	0.0000	**I(1)**
SECWEB	17.5762	0.0625	141.552	0.0000	**I(1)**
GDP	4.01389	0.9467	57.9757	0.0000	**I(1)**
TB	33.3252	0.0002	-	-	**I(0)**
DEMOINDEX	22.5096	0.0041	-	-	**I(0)**
EXCh.	6.68203	0.7551	6.68203	0.7551	**I(1)**
INF	55.4634	0.0000	-	-	**I(0)**
Pop	2.26245	0.9939	34.6852	0.0001	**I(1)**

Source: Author's computation

It is evident from table 7 that all the variables are either stationary at levels or after the first difference. The implication of this is that they are suitable for all the analysis adopted in the study. The methods of panel unit root test give the same levels of integration for each variable. This speaks volume of the consistency level of the panel unit root results. Furthermore, the results indicate that apart from the trade balance, inflation, Demo index and Inf. that are stationary at levels, all other variables in the table are stationary after the first difference that is integration of order one I (1).

.2. Pool Regression Analysis for Determinant of Military Expenditure BRICS Countries

The essence of pool regression analysis is to verify if there will be need to use panel data analysis for the estimation of the equation or not. Panel data application might not be necessary if there is no problem of cross-sectional dependence. In other words, if the estimated pool regression model does not have specific effect then pool regression will suffice for the analysis but if otherwise then, panel data analysis is more suitable to be used for the estimation. One of the sort comings of the pool regression is the problems of heterogeneity which is not present in the panel data.

Table 8. Pool regression results for Determinant for BRICS countries military expenditure

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Demo_Index	0.014325	0.007229	1.981492	0.0487
Exch__Rate	0.049175	0.006123	8.031229	0.0000
External	0.079268	0.057617	1.375775	0.1702
Gdp	0.000101	2.41E-05	4.209215	0.0000
Inflation	0.000241	0.000253	0.950460	0.3429
Internal	-0.103914	0.059950	-1.733331	0.0844
Securityweb	0.434569	0.036863	11.78863	0.0000
Tb	5.13E-11	3.97E-11	1.292722	0.1974
R-squared	0.373526	Mean dependent var		2.110150
Adjusted R-squared	0.354542	S.D. dependent var		1.350604
S.E. of regression	1.085081	Akaike info criterion		3.034086
Sum squared resid	271.9794	Schwarz criterion		3.150453
Log likelihood	-354.5732	Hannan-Quinn criteria		3.080978
Durbin-Watson stat	0.348895			

Source: Author's computation

The results on table 8 is an indication that many of the variables have significant impact on ME as percentage of GDP. This is shown from the probabilities of the t statistics of each of the independent variables in the estimated model, which are significant at 5% level. Adoption of Gross Domestic Product particularly showed significant impact on Military expenditure. Notwithstanding, this approach of pool regression might not be sufficient to explain the relationship between the independent variables and the dependent variable because the results are prone to specific effects/heterogeneity influence which might undermine the reliability of the parameter estimates in the estimated model. Consequently, cross-sectional dependence test is conducted to ascertain if there is presence of specific effect in the result. The result of the cross-sectional dependence test is presented in table 9.

Table 9. Cross-sectional dependence test (Pool-ability test) for determinant for BRICS countries military expenditure

Residual Cross-Section Dependence Test			
Null hypothesis: No cross-section dependence (correlation) in residuals			
Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	72.92935	10	0.0000
Pesaran scaled LM	12.95340		0.0000
Pesaran CD	-0.831331		0.4058

Source: Author's computation

The results from table 9 show that the null hypothesis is rejected and the alternative hypothesis that there is cross-sectional dependence in the estimated panel model is accepted. The implication of this result is that it is not appropriate to pool the data. Therefore, the pool regression results are not reliable for the purposes of forecasting and empirical inferences. Consequently, panel model approach is used to reduce the problem of cross-sectional dependence. The results of panel estimation are presented as follows:

6.3. Panel Data Estimation for Determinant of Military Expenditure in BRICS Countries

Following the results of the pool regression, it is obvious that there will be need for panel data estimation in other to get reduce the implications of the problem of cross-sectional dependence. Both fixed and random effects are used in this study to be able to ascertain the level of consistency in the panel results as well as investigating the approach that is more suitable for the nature of our data. The results of the fixed and random effects are presented in tables 10 and 11 respectively.

Table 10. Fixed effects panel results for determinant of military expenditure in BRICS

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Internal	-.0845414	.0555871	-1.52	0.130
External	.0626497	.0499752	1.25	0.211
Security web	.3381968	.0463219	7.30	0.000
GDP	.000222	.0000332	6.68	0.000
TB	2.12e-10	5.07e-11	4.19	0.000
Demo Index	-.0034721	.0066425	-0.52	0.602
Exchrate	.0022599	.0070385	0.32	0.748
Inflation	.0004513	.0002169	2.08	0.039
Cons	.1566255	.2011105	0.78	0.437
sigma_u | 1.3324109 sigma_e | .89206655 rho | .69048958 (fraction of variance due to u_i) --- F test that all u_i=0: F(4, 226) = 27.00 Prob > F = 0.0000				

Source: Author's computation

Table 11. Random effects panel results for determinant of military expenditure in BRICS

Variable	Coefficient	Std. Error	t-Statistic (Z)	Prob. P>|z|
Internal	-.1307021	.0605125	-2.16	0.031
External	.0973939	.0576178	1.69	0.091
Security web	.3584819	.0491526	7.29	0.000
GDP	.000075	.0000265	2.83	0.005
TB	7.39e-11	4.05e-11	1.82	0.068
Demo Index	.0172946	.0072763	2.38	0.017
Exchrate	.0433276	.0065718	6.59	0.000
Inflation	.0002008	.0002517	0.80	0.425
Cons	.4678524	.2022761	2.31	0.021
sigma_u | 0 sigma_e | .89206655 rho | 0 (fraction of variance due to u_i)				

Source: Author's computation

From tables 10 and 11 it is clear that there are similarities in the results of the fixed and random effects. Firstly, all the variables that are significant under the fixed effects are also significant under the random effects. That is security web and GDP are all significant in both estimated models. Notwithstanding, there coefficients are different slightly. The overwhelming similarities in the two results is an evidence of consistency in the results. Notwithstanding, HAUSMAN test is conducted to know which of the two estimated panel models is more suitable for this study. The results of the HAUSMAN test is presented in table 12.

6.4. HAUSMAN Test for Determinant of Military Expenditure in BRICS

As earlier said the results of the HAUSMAN test is to determine which of the fixed or random effect model is more suitable for the analysis. The results of the HAUSMAN test is presented in table 12

Table 12. HAUSMAN test for determinant of military expenditure in BRICS

Test Summary		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random				
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
	(b) (B)	(b-B) Difference	sqrt(diag(V_b-V_B))	
Internal	-.0845414	-.1307021	.0461607	.0287306
External	.0626497	.0973939	-.0347442	.0175242
Security web	.3381968	.3584819	-.0202851	.0264584
GDP	.000222	.000075	.0001471	.0000301
TB	2.12e-10	7.39e-11	1.38e-10	4.57e-11
Demo Index	-.0034721	.0172946	-.0207667	.0033361
Exchrate	.0022599	.0433276	-.0410677	.0053624
Inflation	.0004513	.0002008	.0002505	.0000703

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic
chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 74.37
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

Source: Author's computation

The HAUSMAN test revealed that the chi square probability is significant at 5% level. This is an indication that the null hypothesis is rejected and the alternative hypothesis is accepted. The implication of the results is that fixed effect is more preferable for this study hence we go ahead to interpret the results of the fixed effects.

In conclusion, from the fixed effects results four variables have significant impacts on Military expenditure namely security web, GDP, inflation, and Trade Balance. The Security Web represents the variables that captured the possibility of arm race for each BRICS neighbours. The coefficient is significant and positive. The implication of this is that there is a positive significant relationship between activities of BRICS countries regarding arms purchase and that of their neighbouring countries.

Again, Economic growth is the most significant determinant for Military expenditure. The coefficient of Economic growth, which is proxy by GDP, is positive and significant. This indicates that BRICS countries economic growth is majorly responsible for drive to invest military expenditure. The implication is that the BRICS countries economic prosperity dicattes the levels of their investment in the military.

The third variable with significant effect on ME is the trade balance. From the results of the fixed effect the coefficient of the variable is positive and significant. It shows that there exist favourable trade transaction among the BRICS countries. This might be due to the fact that they all have active defence industries. The more positive trade balance the more effective government policies are implemented in the countries.

The fourth variable with the least significant effect on determinant of BRICS military expenditure is inflation. This indicates that rising BRICS military expenditure is inflation driven especially if military expenditure finance is through debt, this might be inflationary in nature.

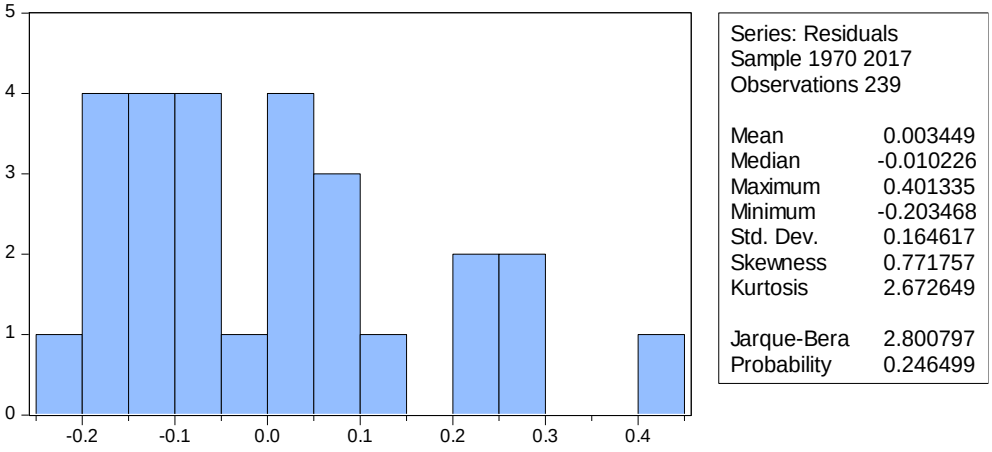
Finally, the overall results from the fixed effect reveal that four out of the eight variables considered in this study are significant. The significant variables are TB, security web and GDP. They are all significant at 1% and 5% respectively. While GDP effect on military expenditure under fixed effect is positive and significant. It is worthy of note that all variables under fixed effect have positive effect on military

expenditure. While GDP, security web, Trade balance are the major determinants of military expenditure under fixed effect, inflation is the least determinant.

6.5. Post Estimation Tests for determinant of military expenditure in BRICS

Some diagnostic tests are necessary for the panel data analysis. These tests are required to verify the validity of the parameter estimates .To ascertain the appropriateness of panel linear regression, the study conducts the normality test on the residual and the results is presented in figure 3.

Figure 3. Normality test for the determinants of Military Expenditure in the BRICS



Source: Author's computation

The result of the normality test shows that the probability value of the Jarque-Bera statistics of 0.246499 is greater than 5%, indicating that the residuals from the estimates are normally distributed. Again, the estimated panel result is re-verified for cross-sectional dependence the result is shown in table 13

Table 13. Pesaran's test of cross sectional independence

Test Statistics	Probability
-1.582	1.8862

Source: Author's Computation

The results from the table confirms the nonexistence of cross sectional dependence because the probability of the Pesaran's statistics is not significant. Therefore we accept the Null hypothesis of no cross-sectional dependence unlike what we saw in the pool regression analysis.

7. Conclusion

This section discuss the empirical result of the determinant for military expenditure of BRICS countries from 1970 to 2017 employing the panel data analysis approach. Based on the detailed theoretical and empirical literature on determinant for military expenditure, the neoclassical model was considered the best to analyzed determinant of BRICS countries military expenditure. BRICS countries political economy and security factors were incorporate for model specification. The determinant for military expenditure for BRICS include income, population, government expenditure, Security web (average military expenditure of neighboring countries within BRICS countries), internal threats and external threats. The economic, political and security factors are included. The empirical result suggest that BRICS countries military expenditure is mainly determined by its income, population, exchange rate, internal threats, inflation and political regime(proxy by democracy index).

The result reveal that BRICS policy makers if they are interested in reversing their high unemployment and poverty rate should focus their attention on these encouraging the local production of their arms/ammunition (military industries) which will create job opportunities for their teeming youthful population. This result is in line with the findings of (Tambudzai, 2011), (Brauer, 2002) and Hartley and (Sandler & Hartley, 1995).

In conclusion, non-military options should be adopted by the BRICS countries policymakers for attaining peace, which are cost-effective in ensuring peace and progress within and outside the BRICS country.

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Assessment of Inclusive Growth Performance: A Comparative Analysis of the BRICS Countries

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Abstract: In recent years, the concept of inclusive growth has moved to the top of the agenda for economic development policy advancement. The concept is relatively new within the field of development economics with limited research available. Some confusion also still exists regarding the definition of inclusive growth as a concept and the sub-research field is not as well established if compared to other similar concepts such as economic development and pro-poor growth. The study had the objective to clarify the concept of inclusive growth and also to apply an alternative inclusive growth index for the BRICS countries to assess their performance. The research methodology included a literature review and a comparative assessment of the inclusive growth performance of the BRICS countries from 1997 to 2017. Results indicated that all five the countries have achieved medium levels of inclusive growth, except for South Africa, which only achieved a low level of inclusive growth. China had the highest index of 70.3, while India had the highest rate of growth in the improvement of the index of approximately 2.0 percent per annum. The results of the comparative study indicate that governments are required to intervene through improved policy implementation to ensure that all citizens have the opportunity to participate and benefit from economic and social aspects. Good governance, with strong institutions, also assists in inclusive growth success.

Keywords: BRICS countries; country comparison; development economics; inclusive growth index

JEL classification: F43; 011

1. Introduction

Traditionally, economic prosperity of a country is measured by means of its gross domestic product (GDP) and the year-on-year economic growth reported for this indicator. One of the main debates regarding the measurement of GDP is that it does not incorporate critical aspects such as human development, equality and social cohesion (OECD, 2005), and therefore may not always be a true reflection of a country's growth and development. In addition, Keszi Szeremlei and Magda (2015) mention that a sustainable and inclusive economy is able to mobilise new resources,

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and therefore it is possible to expand the resources and potentially improve inclusiveness. However, especially over the last decade, several additional concepts have come to light, measuring the economic prosperity of a country in different ways and in some cases providing a more realistic measure of growth and development. These measurements fall within the broader research field of development economics and include concepts such as "jobless growth", pro-poor growth and local and regional economic development (Meyer, Masehla & Kot, 2017; Meyer, 2018a; Meyer, 2018b; Onyusheva, Thammashote & Kot, 2018).

One of the most important and recent measurement concepts to emerge over the decade is the concept of inclusive growth (IG).

The concept has been described as a solution to the debate between economic growth and redistribution (Fourie, 2014) and that it should be the predominant goal of economic development policy (George, McGahan & Prabhu, 2012). As some scholars have different definitions and explanations of exactly what inclusive growth is and how it is measured, it has been defined, and the measurement process has been improved or amended by several researchers during the past decade (McKinley, 2010; Anand, Mishra & Peiris, 2013; Ramos, Ranieri, Lammens, 2013; WEF, 2017; Meyer, 2018a; Ahmad et al., 2018; Klieštik et al., 2018; Oláh et al., 2018). As the concept of inclusive growth is more relevant to less developed and developing countries, as these countries are most affected by socio-economic challenges, the purpose of this study is to use the index developed and tested by Meyer (2018a) to analyse and compare inclusive growth achieved by the BRICS (Brazil, Russia, India, China and South Africa) countries from 1997 to 2017. Since the official establishment of the BRIC (Brazil, Russia, India and China) in 2009, when the first Summit was held, and the inclusion of South Africa in 2010, this group of emerging countries have showcased their economic power in global economic development (BRICS, 2018).

The BRICS countries account for approximately 41 percent of the world population and had a combined GDP of approximately $18 trillion in 2017, contributing approximately 25 percent of global output. The group of countries contributed to around 50 percent of global economic growth over the last decade (Zulu, 2018). Table 1 provides a summary of a few key economic indicators for the BRICS countries. Russia has the largest geographical area, while South Africa has the smallest area. Russia also has the highest GDP per capita, the highest GNI and has the highest HDI ranking of the five countries. India has the lowest unemployment levels, while South Africa has by far the highest unemployment levels. India, on the other hand, has the lowest GDP per capita, but also lowest income inequality. The country also has the lowest HDI ranking and lowest GNI. China has the largest population, the largest GDP and also the highest economic growth levels. Of the five BRICS countries, South Africa is the smallest regarding area size, population and

total GDP. The country also has the lowest economic growth and the highest level of income inequality. In terms of the UN income classification system, Brazil, China and South Africa are upper middle income countries, while Russia is classified as a high income country and India a lower middle income country (UN, 2017).

Table 1. BRICS country economic indicators summary

Indicators	Brazil	Russia	India	China	South Africa
Area in sq km	8 516 000	17 125 000	3 287 000	9 600 000	1 221 000
Population	206 million	147 million	1 269 million	1 379 million	56 million
Unemployment	9.6%	5.5%	2.2%	4.0%	26.7%
GDP in US$	1 796 billion	1 286 billion	2 273 billion	11 203 billion	295 billion
GDP growth	0.7%	1.8%	6.7%	6.8%	0.7%
GDP per capita	8 713 US$	8 768 US$	1 750 US$	8 127 US$	5 279 US$
Gini coefficient	0.49	0.41	0.36	0.46	0.64
HDI (ranking)	0.759 (79)	0.816 (49)	0.640 (130)	0.752 (86)	0.699 (113)
GNI in US$	13 755	24 233	6 353	15 270	11 923
UN income classification	Upper middle	High	Lower middle	Upper middle	Upper middle

Sources: CIA (2016); IEconomics (2016); Trading Economics (2016) World Bank (2016); CIA (2018); United Nations, 2017; World Bank, 2017

2. Literature Review

Measuring the economic performance of countries has taken place for centuries. The most well-known and mostly used measure of economic growth and performance is the economic measure referred to as gross domestic product (GDP) and likewise measuring the wealth or prosperity level of a country's residents is done through calculating the GDP per capita (Bate, 2009). GDP calculates the value of all goods in the country's economy consumed by governments, private households and business industries and is, therefore, considered by most economists as a useful single measurement of a country's well-being (Masoud, 2014). The concept of economic growth is to a large extent based on models developed by traditional economists such as Solow (1956), Myrdal (1957) and Rostow (1959), and can further be explained as a cumulative increase of output, or the accumulation of production factors reflecting a quantitative measurement of a country's progress or growth (Meyer, 2018c).

Although still considered as one of the most useful measurements, GDP is not without its criticism. Bate (2009) lists some of the shortcomings linked to the calculation of GDP as the lack of existing prices, subjective evaluations and not providing a true reflection of the actual prosperity of a country. For example, if a country provides free healthcare services, there will not be a price for this service so statisticians have to impute prices, which could lead to subjective evaluation. In addition, the OECD (2005) states that GDP does not incorporate aspects such as human development, equality and social cohesion. Ali and Son (2007) mention that

growth alone does not guarantee improved and equal living conditions for all and in many cases bypasses marginalised and poor communities, increasing the inequality gap. Iyer, Kitson and Toh (2005) and Todaro and Smith (2011) suggest that following a multidimensional measuring approach could provide a more comprehensive impression of a country's prosperity and progress, especially considering and including social development aspects. This outlook has led to many economists and academics re-looking the way a country's growth, development and prosperity are measured. From this, a new concept, namely economic development was coined. While an increase in the traditional way growth is measured is clearly necessary to reduce poverty and other related social issues, the evidence is strong that growth alone is not an adequate condition for sustained and all-inclusive growth (Ali & Son, 2007).

Economic development involves an all-inclusive improvement of people's living standards through the growth of all sectors (e.g. education, health, technology and infrastructure) within the economy, impacting the overall reduction of poverty and unemployment (Carlson, 1999; Magda, 2013). In essence, economic development is the balance between the economic and social measurements of a country (Huq, Clunies-Ross & Forsyth, 2009; Toma, Grigore & Marinescu, 2014). However, as a multidimensional process, the development progress that societies have made has proven challenging to measure (Stiglitz, Sen & Fitoussi, 2009; Meyer, de Jongh & Meyer, 2016). Nonetheless, in the development of its conceptualisation from narrow to broader views, the concept of economic development (versus that of economic growth) has been refined by the introduction of various composite indices attempting to measure progress in a more holistic manner (Meyer *et al.*, 2016). Well-known indexes such as the Human Development Index (HDI), the Weighted Index of Social Indicators (WISP), the South African Development Index (SADI) and the Composite Regional Development Index (CRDI) have all contributed to measuring the development progress in a more rounded manner (Greyling, 2013; Naudé, Rossouw & Krugell, 2009; Meyer et al., 2016). These measurements fall within the broader research field of development economics and include additional concepts such as "jobless growth", pro-poor growth and one of the more recent measurement methods to emerge is the concept of inclusive growth (Meyer, 2018a; Meyer 2018b).

Inclusive growth has drawn much attention in recent years as it is considered a more comprehensive way to reduce inequality compared to only focusing on economic growth (Ali & Son, 2007). While no precise definition or measurement of inclusive growth has been developed and adopted within the literature, it can simplistically be defined as providing similar or equal opportunities for all of the population to prosper (Ali & Son, 2017; WEF, 2017a), and the measurement thereof is by means of an index including several indicators or variables (Meyer, 2018a). The United Nations Development Programme (UNDP) describes inclusive growth as both an outcome and a process. Firstly, it guarantees that all members of society can participate in the

growth process (decision-making and participating in growth itself), and secondly, it shares economic benefits fairly. Inclusive growth therefore implies participation and benefit-sharing (Boarini, Murtin & Schreyer, 2015). Ramos *et al.* (2013) define inclusive growth as an economic progression that fairly distributes benefits and provides opportunity to all of society. Ngepah (2017) adds by stating that inclusive growth is more focused on the actual outcome of economic growth versus the levels of growth. This implies that only actual reduction in unemployment, poverty and inequality will lead to inclusive growth. Vellala, Madala and Chhattopadhyay (2014) define inclusive growth as being broad-based, including the poorer section of society to also benefit through economic opportunities. However, Klasen (2010) defines inclusive growth as more than broad-based growth and that it should add value and benefits to all sectors of society, from very poor to rich, and should include non-discriminatory participation, including benefits to women, children and other minority or disadvantaged groups. Veneri and Murtin (2016) state that inclusive growth can be explained as a situation where economic growth produces opportunities for all groups of society and leads to an overall improved standard of living not only in materialistic terms, but also quality of life. When inclusive growth is achieved, a variety of overall improvements within a country and its society should be visible. These include, for example, lower occurrence of poverty, broad-based and significant improvement in healthcare services, access to basic education and higher education, improved skills development, increased opportunities for wage employment and improved basic services such as water, electricity, roads, sanitation and housing (Government of India, 2011). In summary, inclusive growth can be defined as a broad-based economic process including all sectors of society to benefit while ensuring non-discriminatory participation and redistribution of economic opportunities.

The Government of India (2011) opines that the progress towards achieving inclusive growth is more complicated to measure due to its multidimensional character. As a result of the complicate nature of measuring inclusive growth, several economists and academics have over the years attempted to develop an all-inclusive index measuring this phenomenon. These indexes typically include an array of different indicators such as GDP growth per capita, inequality, poverty ratio and employment to population ratio (EPR). In some indexes, the selected indicators were used equally weighted and some attempted to provide weights to prioritise the importance of them (McKinley, 2010). Some inclusive growth indexes developed over the last decade include:

- The "*Inclusive Growth Criteria and Indicators",* which were developed by the Asian Development Bank (ADB), are a composite country-level index. This index is equally weighted, comprising clusters of variables, which include employment, GDP growth, poverty, inequality, infrastructure, health, education services and social protection. Criticism surrounding this index is that some

indicators are not easily quantifiable and are equally weighted (McKinley, 2010).

- The *"Mapping Inclusive Growth"* index, developed by the International Policy Centre for Inclusive Growth, is based on benefit-sharing. It comprises 43 countries and includes indicators such as Gini coefficient, EPR and poverty headcount ratio. Major critique around this index is also the use of limited indicators that are equally weighted and that it is not a combined index (Ramos et al., 2013).
- The *"Inclusive Growth Measurement and Determinants"* was developed by the International Monetary Fund (IMF) and includes a combined index using time series regression. The index is only applied to developing countries and includes economic growth and distribution of income as its indicators. Once again, the critique includes that indicators are equally weighted (Anand et al., 2013).
- The *"Multidimensional Living Standards"* (MDLS) index, developed by the OECD, provides a summary measure of welfare, which is conveyed in monetary terms. It is calculated by combining the disposable income for various household clusters in a region (for example income quintiles) to the monetised prices of health and employment outcomes. This index makes it possible to identify differences in prosperity levels among areas within a specific country or broader region (Veneri & Murtin, 2016). This index builds on previous measurements designed and work done by the OECD on, for example, well-being, income equality and economic growth (OECD, 2011; 2014; 2015a; 2015b).
- The *"Inclusive Development Index (IDI)",* developed by the Word Economic Forum (WEF), reports on inclusive growth on a global scale and identifies 15 areas of institutional strength and structural economic policy that can contribute to not only higher growth but also greater social participation. Indicators incorporated in this index include employment, productivity, income, savings, dependency ratio, health, GDP per capita, poverty, inequality and carbon intensity (WEF, 2017b).
- The *"Alternative Inclusive Growth Index (AIGI)",* developed by Meyer (2018a), includes eight indicators that are weighted according to importance and significance. These indicators are EPR, GDP per capita, poverty, income equality, infrastructure, education, health and dependency ratio.

The IDI 2018 rankings place the BRICS countries among various development stages resulting in mixed performance levels. Russia (ranked 19th) received the highest ranking in the emerging economy section with an overall IDI score of 4.20

and a 0.48 percent overall 5-year trend. China ranked 26th with a 4.09 score for 2018 and 2.94 percent overall 5-year trend. Brazil stood at 37th place with a 3.93 IDI score and -3.26 percent overall 5-year trend. India and South Africa ranked 62th and 69th respectively and can therefore be considered some of the worst performing countries in this index. What is interesting is that India ranked first among emerging economies regarding GDP per capita growth (6.8%) and labour productivity growth (6.7%) for the past five years, but achieved a ranking in the bottom 15 countries of the IDI rankings (WEF, 2018a). This is a clear indication that measuring growth, development and prosperity by only using economic growth (GDP) or even GDP per capita as an indicator is not sufficient. To achieve inclusiveness in all dimensions of society, a multidimensional approach is required, which can ultimately lead to the development and introduction of new and improved government intervention policies.

Several other researchers listed empirical results, testing some of the relationships between inclusive growth indicators. According to Stuart (2011), requirements for inclusive growth include a redistributive agenda, for example, cash transfers and a progressive tax system; macro-economic policy, for example, moderate levels of inflation and debt with continued spending on pro-poor components; and incentives for pro-poor investment in labour-intensive sectors and small business development (De Jongh, Meyer & Meyer, 2016; Stefko & Steffek, 2017). Anyanwu (2013) established that relative increased levels of income inequality could lead to high levels of poverty, while high levels of education can assist in poverty reduction. Ulriksen (2012), in his final results, found that GDP per capita has a positive impact on poverty. Vellala *et al*. (2014) list some guidelines for comprehensive inclusive growth strategies: rapid economic growth is required to create employment opportunities and leading to inclusive growth. Economic growth also needs to be pro-poor; poverty reduction leads to improved income inequality and policies need to ensure access to economic and social opportunities. Human development is required to improve IG; basic needs must be provided, including safe water, electricity, housing and transport; and lastly, good governance with effective policy management and implementation.

3. Methodology

This study made use of a quantitative research design, including a literature review with a focus on definitions, concepts and an assessment of some of the most important inclusive growth indexes. Secondly, an alternative inclusive growth index, developed by Meyer (2018a), was applied in a comparative analysis of the BRICS countries. Data for all countries were obtained from the World Bank database (World Bank, 2017). The time frame used in the analysis is from 1997 to 2017, allowing for 21 years of assessment.

Table 2 is a summary of the indicators included in the index. All negative indicators (such as the Gini-coefficient, poverty head count and dependency ratio) were reverse scored or inverted to represent a positive score for the indicator.

Table 2. Summary of indicators of the alternative inclusive growth index

Component/ indicator	**Description of indicator**	**Weight allocation**
Employment to population ratio (EPR)	Measures employment environment improvements in relation to population changes. As a ratio, the data is from 0 to 100. The higher the ratio, the higher the contribution to inclusive growth. A ratio below 60 indicates a malfunctioning labour market (ILO, 2015).	25.0
GDP per capita annual growth (GDPC)	Measures economic growth and labour productivity (McKinley, 2010). The higher the growth, the higher the contribution to inclusive growth.	15.0
Poverty (POV)	Measures the percentage of the population above the poverty line based on $2 per day income. The higher the percentage, the higher the contribution to inclusive growth.	15.0
Income equality (GINI)	Measured by the Gini coefficient. The data are inverted (100 minus the original value) to indicate an increasing value as improved income equality. The higher the ratio, the higher the contribution to inclusive growth.	10.0
Infrastructure (INFRA)	Measures percentage of population with access to electricity and percentage of population with access to the internet. The final indication is an equal combination of the two indicators as a ratio. The higher the ratio, the higher the contribution to inclusive growth.	10.0
Education (EDU)	The indicator is represented by the percentage of total government budget spend on education as percentage of GDP. The higher the ratio, the higher the contribution to inclusive growth.	10.0
Health (HEALTH)	The indicator is represented by the percentage of total government budget spent on health as a percentage of GDP. The higher the ratio, the higher the contribution to inclusive growth.	10.0
Dependency ratio (DEPEN)	Measured by the number of dependents as percentage of the working population. The raw data are inverted as the percentage of the population that is not dependent to indicate a higher value as a decrease in dependency. The higher the ratio, the higher the contribution to inclusive growth.	5.0

Source: Meyer, (2018a)

The alternative index, as utilised, is user-friendly, as data are available for most countries over a period of time from the World Bank database, allowing for diagnostic analysis of problematic components and to assess progress (improvements or stagnation) over time. The results of the index could also be used for policy formulation purposes. The index also has a weighting system, as indicated in Table 2. As with the original study (Meyer, 2018a), a two-step weighting system

is used in the assessment of inclusive growth for all of the BRICS countries. Firstly, all indicators were allocated equal weights, while in the second step, indicators were allocated different weights as indicated in Table 2. The final result of the analysis therefore provide two overall indexes per country. In this study, an amended index classification system was added based on previous work by Meyer (2018a), Ramos *et al.* (2013) and McKinley (2010). The amended classification system is listed in Table 3. The main change in this classification system is that more classification categories were added to allow for improved classification of countries.

Table 3. Inclusive growth index classification system

Index score	Index classification	Description
0-10	Very poor	Very low level of inclusive growth, unacceptable index.
11-20	Poor	Low level of inclusive growth, unsatisfactory index.
21-30	Low-low	Low level of inclusive growth, unsatisfactory low index.
31-40	Low-medium	Low level of inclusive growth, still not satisfactory but improving.
41-50	Low-high	Low level of inclusive growth, below average.
51-60	Medium-low	Lower medium inclusive growth index, above average.
61-70	Medium-medium	Medium inclusive growth index, satisfactory index.
71-80	Medium-high	Medium high inclusive growth index, moving towards the ideal situation.
81-90	High-medium	High levels of inclusive growth, highly satisfactory index.
91-100	High	Very high level of inclusive growth, close to the ideal situation, superior index.

Source: Amended from Meyer (2018a)

4. Results and discussion

In this section, the BRICS countries are compared and discussed regarding their performance in achieving inclusive growth. An attempt was also made to compile a world inclusive growth index, as indicated in Table 4.1. The world index is used as a base line in the assessment of the countries. The global index, as calculated, is between 55.7 and 57.7 in 2017, indicating a medium-low inclusive growth index. On an annual basis, the global index has improved by between 0.78 and 1.04 percent since 1997. It should also be mentioned that, since 2007, the global inclusive growth index has stagnated. A major concern from a global point of view is that EPR has declined over time, an indication of the difficulty to create employment.

Table 4.1. World overall: Inclusive growth index

Year	EPR	GDP per cap growth %	POV index	GINI index	INFRA	EDU	HEALTH	DEPEN RATIO	Equal weighted score	Weighted score
1997	61.1	2.2	29.2	70	38.9	4.0	4.6	62.4	46.1	49.9
2002	60.5	0.9	25.6	68	44.7	4.0	5.1	58.6	45.3	47.8
2007	60.4	3.0	18.1	63	51.1	4.2	5.4	55.3	53.9	57.0
2012	58.9	1.3	12.8	62	59.7	4.6	5.8	54.1	52.5	54.2
2017	58.5	2.0	11.5	61	67.2	4.9	5.8	54.4	55.7	57.5

Source: Own compilation from World Bank, 2017

Table 4.2 contains the results of the inclusive growth analysis for Brazil. In the Brazil case, there is a difference in the results of the equally weighted and individually weighted index. The index for the equally weighted index has increased from 49.0 in 1997 to 54.6 in 2017, with an annual average growth rate of 0.57 percent, while the individually weighted index also had a final score of 54 in 2017, but with a low annual growth of only 0.19 percent. The components of the index that have improved are poverty, GINI index, infrastructure, education, health, and dependency ratio, while EPR and GDP per capita growth have shown negative growth since 1997. The overall index of approximately 54 in 2017 indicates low medium levels of inclusive growth. The index has been declining since the financial crises in 2007 up to 2017. Of the five BRICS countries, Brazil is ranked fourth in terms of the inclusive growth index and annual growth of between 0.19 percent and 0.57 percent.

Table 4.2. Brazil: Inclusive growth index

Year	EPR	GDP per cap growth %	POV index	GINI index	INFRA	EDU	HEALTH	DEPEN RATIO	Equal weighted score	Weighted score
1997	59.2	1.8	14.0	59.8	47.1	4.6	3.5	57.7	49.0	52.0
2002	60.0	1.7	10.3	58.1	52.9	3.8	3.7	52.6	50.1	52.9
2007	61.4	4.9	6.8	54.9	64.5	5.0	3.5	48.4	62.4	66.1
2012	59.7	1.0	3.8	50.9	74.1	5.9	3.4	45.1	55.9	56.7
2017	55.2	0.2	6.8	51.3	81.0	6.0	3.8	43.5	54.6	54.0

Source: Own compilation from World Bank, 2017

Table 4.3 contains the results of the inclusive growth index analysis for Russia. The equal and individually weighted indexes had similar results. The individually weighted index has increased from 52.3 in 1997 to 59.0 in 2017 with an annual average growth rate of 0.64 percent, while the equal weighted index had a score of 57.9 in 2017 with an annual growth rate of 0.73. The components of the index that have improved are EPR and infrastructure, while most other indicators have been stagnant. The overall index of approximately 59.0 indicates low-medium levels of inclusive growth. The index peaked in 2007 at 77.9, but has been declining since

then. Of the five BRICS countries, Russia is ranked second in terms of the inclusive growth index and annual growth of between 0.64 percent and 0.73 percent.

Table 4.3. Russia: Inclusive growth index

Year	EPR	GDP per cap growth %	POV index	GINI index	INFRA	EDU	HEALTH	DEPEN RATIO	Equal weighted score	Weighted score
1997	52.7	1.6	1.1	38.4	50.2	2.5	3.2	48.1	50.5	52.3
2002	56.4	5.2	0.7	37.3	52.0	3.8	3.5	43.0	63.1	66.2
2007	58.8	8.7	0.1	42.3	62.4	3.9	3.2	39.7	73.0	77.9
2012	60.0	3.5	0.5	40.7	81.9	3.8	3.4	40.1	62.8	64.7
2017	60.2	1.4	0.7	37.7	88.0	3.8	3.4	46.6	57.9	59.0

Source: Own compilation from World Bank, 2017

Table 4.4 contains the results of the inclusive growth analysis for India. The equal and individual weighted indexes had similar results. The individually weighted index has increased from 43.0 in 1997 to 58.9 in 2017 with an annual average growth rate of 1.81 percent. The components of the index that have improved are GDP per capita growth, poverty, infrastructure and the dependency ratio, while EPR and income inequality have shown negative growth since 1997. The overall index of between 55.1 and 58.6 indicates low-medium levels of inclusive growth. The index peaked in 2007, but has since declined and is on a negative trend. Of the five BRICS countries, India is ranked third in terms of the inclusive growth index and annual growth of between 1.80 percent and 2.0 percent.

Table 4.4. India: Inclusive growth index

Year	EPR	GDP per cap growth %	POV index	GINI index	INFRA	EDU	HEALTH	DEPEN RATIO	Equal weighted score	Weighted score
1997	57.7	2.1	45	47	27.4	3.4	0.9	67.1	38.9	43.0
2002	57.0	2.1	39	48	31.9	3.7	0.8	62.8	40.8	44.5
2007	56.0	8.2	33	49	37.0	3.2	0.7	58.7	56.9	63.4
2012	52.0	4.1	22	52	46.3	3.9	0.9	54.7	50.0	53.5
2017	51.9	5.4	23	51	57.5	3.8	1.0	51.0	55.1	58.6

Source: Own compilation from World Bank, 2017

Table 4.5 contains the results of the inclusive growth analysis for China. The equal versus individually weighted indexes for China have resulted in differentiated results. The individually weighted index has increased from 67.5 in 1997 to 70.3 in 2017 with an annual average growth rate of 0.21 percent, while the equally weighted index had a 2017 score of 65.4 at an annual growth of 0.48 percent. The components of the index that improved over time are poverty, infrastructure, health spending and the dependency ratio, while the EPR, GDP per capita, Gini index have shown negative growth since 1997. The overall index of between 65.4 and 70.3 indicates

medium levels of inclusive growth. The index peaked in 2007, but has since steadily declined up to 2017. Of the five BRICS countries, China is ranked highest in terms of the inclusive growth index and annual growth of between 0.21 percent and 0.48 percent.

Table 4.5. China: Inclusive growth index

Year	EPR	GDP per cap growth %	POV index	GINI index	INFRA	EDU	HEALTH	DEPEN RATIO	Equal weighted score	Weighted score
1997	74.7	8.1	41.0	46	47.6	1.9	1.0	48.7	59.7	67.5
2002	72.3	8.4	31.9	53	50.8	1.9	1.3	43.1	61.9	69.3
2007	69.6	13.6	15.6	54	57.3	1.9	1.7	36.4	78.6	88.0
2012	67.4	7.3	6.5	52	71.1	1.9	2.7	35.9	67.0	72.5
2017	65.7	6.3	2.5	55	77.2	1.9	3.2	39.5	65.4	70.3

Source: Own compilation from World Bank, 2017

Table 4.6 contains the results of the inclusive growth analysis for South Africa. A significant difference was revealed between the equal and individually weighted indexes. The individually weighted index has increased from 40.5 in 1997 to 41.8 in 2017 with an annual average growth rate of 0.16 percent, while the equally weighted index had a 2017 score of 44.2 with an annual growth rate of 0.54 percent. The components of the index that have improved over time are infrastructure and health spending, while EPR, GDP per capita growth, poverty and the dependence ratio have shown negative growth since 1997. The overall index of between 41.8 and 44.2 indicates low levels of inclusive growth. The index has been relatively stagnant with a peak in 2007 before the financial crises, but since then has shown a sharp decline. Of the five BRICS countries, South Africa is ranked last (fifth) in terms of the inclusive growth index and annual growth of between 0.16 percent and 0.54 percent.

Table 4.6. South Africa: Inclusive growth index

Year	EPR	GDP per cap growth %	POV index	GINI index	INFRA	EDU	HEALTH	DEPEN RATIO	Equal weighted score	Weighted score
1997	41.0	0.9	33.8	63.0	37.8	5.6	2.7	64.1	39.9	40.5
2002	38.5	2.3	34.7	66.0	41.9	5.1	2.3	58.8	42.6	43.4
2007	42.2	4.3	44.1	65.0	45.1	5.0	3.2	55.3	48.9	50.3
2012	39.6	0.8	46.4	64.0	63.2	6.4	4.3	53.4	45.3	43.3
2017	39.8	0.1	46.2	63.0	69.8	5.9	4.5	52.8	44.2	41.8

Source: Own compilation from World Bank, 2017

Figure 1 is a graphical presentation of the changes in the inclusive growth indexes for the five BRICS countries as well as for the global index. A clear trend is seen with strong improvement in inclusive growth towards 2007, but since the financial crises all of the countries have struggled to create positive inclusive growth except for India. This is mostly due to factors such as declining EPR or employment

creation, declining income inequality and slow economic growth. Some convergence is experienced between the five countries under investigation with India for example having improved its inclusive growth index at a rapid rate if compared to the other countries.

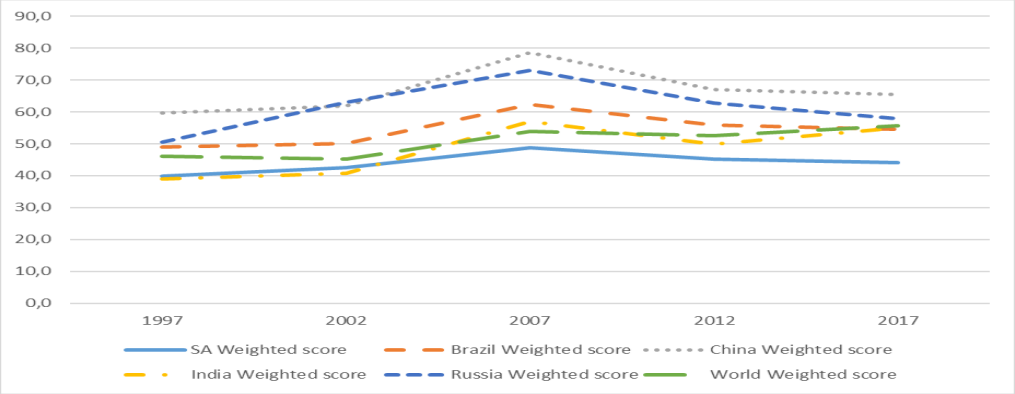

Figure 1. BRICS country comparison from 1997 to 2017

5. Conclusion

The study had the objective to analyse current definitions of the concept of inclusive growth and to assess inclusive growth performance of the BRICS countries. The "*Alternative Inclusive Growth Index*" (Meyer, 2018a) was used in the assessment and comparison of the countries. In terms of this study, inclusive growth could be defined as the process to aspire facilitation and improved participation and benefit-sharing through the gains of economic growth for all citizens. Other outcomes from the study include an improved inclusive growth classification index and a comprehensive comparative analysis of the progress of the BRICS countries in achieving inclusive growth. The overall results of the index indicated that all of the countries have shown rapidly improving inclusive growth indexes up to 2007, before the global financial crises. But since the crises, none of the countries have managed to turn the situation around and all of the countries have experienced a declining index. India is the only country that has been able to improve its index since 2007 to some degree. China has achieved the highest index in 2017 of 70.3, followed by Russia with 59, India with an index of 58.9, Brazil with 54 and South Africa the lowest index of 41.8. Of the five countries, India had the highest average per annum growth regarding improvements in the index from 1997 to 2017 with an average annual growth of just below 2 percent, while South Africa had the lowest annual improvements in the index. What is interesting to note is that the countries with high levels of economic growth such as China and India have increased their inclusive

growth index successfully, but in recent years, even China, with its high growth levels, has seen a decline in inclusive growth.

The strength of the index, as utilised in this paper, is that it is multidimensional and data are available for most countries. Future research on the topic of inclusive growth could include more country and regional comparisons, the testing and inclusion of other indicators in the index and econometric analysis of trust series data. This study contributed to the body of knowledge by adding more clarity on the definition of inclusive growth, adding an improved classification system to the index and also the assessment of inclusive growth for the BRICS countries. The results of the index are of a strategic nature and provide economic development policy practitioners with an analysis of strengths and weaknesses of factors that can contribute to improved inclusive growth of countries and regions. Government development policy should have a strong focus on inclusive growth and the following recommendations are listed: a balanced development approach with a strong pro-poor implementation plan such as cash transfers and spending on infrastructure, health and education; macro-economic policy that promotes stable inflation with high levels of economic growth; incentives for small business development and labour intensive investment; ensure equal access to social and economic opportunities for all citizens; and lastly good governance with effective institutions.

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Import Competition and Unemployment in Nigeria

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Abstract: The paper examines the effect of import competition on unemployment in Nigeria during the period from 1981 to 2017. The ARDL (Bounds) test approach to cointegration and error correction modeling was employed for the analysis. Among other findings, the study finds negative and significant short run effect and, positive and significant long run effect of import competition on unemployment in the country. These suggest that though import competition may mitigate unemployment in the short run, yet it exacerbates the unemployment problem in the long run. Based on the empirical evidence, the study recommends *inter alia* efforts by the government to invest massively in the productive sectors of the economy with the potentials for job-creation, and encourage private sector participation therein (by way of development of infrastructure, favourable tax regimes and reduction of cost of doing business). These could engender increase in economic activities, expansion of product quantities and upgrade of quality of outputs which have the potentials to reduce import dependence, enhance product competitiveness in both domestic and foreign markets, thereby leading to creation of more jobs.

Keywords: Import Dependence; Import Penetration; Unemployment; Import Penetration

JEL Classification: F16; J64; P33

1. Introduction

Import competition (also referred to as import penetration or import dependence) is the extent to which imports account for 'apparent consumption' in an economy. High import penetration rate implies high degree of dependence on imports for satisfaction of domestic demand. Several factors are responsible for high import dependence. From a macroeconomic perspective, high import dependence in less developed countries (LDCs) could be as a result of low level of domestic output. This necessitates increased demand for imports to meet excess demand for goods and services. However, in highly industrialised and developed countries, high import penetration could result from intensification of intra-industry trade. Intra-industry trade, which is trade in differentiated products such as automobile, textile, mobile phones, etc. occurs mainly between developed or industrialised countries, and it

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accounts for the largest share of global trade (UNCTAD, 2014). High import competition or import penetration could transpire if a country exports significant share of its output while importing large amounts of products of its trading partner(s). Thus high import penetration is not peculiar with LDCs only (WTO, 1984).

Global trade volumes and values have increased with the intensification of the new wave of globalization characterized by increased trade liberalisation (removal of barriers to cross-border trade flows). While some countries have benefit by it, others have not been able to absorb the presumed benefits, owing *inter alia*, to low their competitive advantage in international trade (Aigheyisi, 2013). A key feature of the recent wave of globalization is increased import competition which has had mixed effects in importing countries. While importation has engendered access to foreign goods, technology and services not available locally, and enhanced consumption as a result of decrease in prices of consumption (final) goods brought about by competitive pressures, the effects of import penetration or import competition on employment and wages in various sectors of the economy have been largely adverse as seen in recent studies by various researchers (Herath, Cao & Cheng, 2013; Autor, Dorn & Hanson, 2013; Acemoglu, Autor, Dorn, Hanson & Price, 2014; Herath, 2014; Ashournia, Munch & Nguyen, 2014).

Nigeria's economy has been highly import-dependent. The country's imports include basic raw materials, intermediate and final goods, technology and services. The high import-dependence is reflected by the country's non-oil balance of trade which has been predominantly negative, owing to preponderance of imports over exports. However, the government has begun to take some steps towards enhancing its non-oil exports.

Though several studies have investigated the effect of import penetration on employment/unemployment in various countries (including the United States and Canada) and regions, to the best of our knowledge, this is yet to be done using Nigeria as the focus country. Admittedly, several studies have been conducted to investigate the factors explaining unemployment in Nigeria, but the potential unemployment effect of import competition has not been empirically explored. The objective of this study is to examine the effect of import competition on unemployment in Nigeria. This study is imperative considering that Nigeria is a net importer of most tradable products, apart from crude-oil. It was recently reported that Nigeria is the largest importer of refined petroleum product among member countries of the Organisation for Petroleum Exporting Countries (OPEC). Unemployment and underemployment rates in the country have maintained upward trends, with its attendant economic, social and psychological effects. According to the country's National Bureau of Statistics, the country's unemployment rate which was 18.1% in 2017 rose to 23.1% by September 2018 (NBS, 2018). Examining the effects of import competition on unemployment in the country will therefore provide

some guides in formulation of policy targeted at reducing unemployment in the country.

2. Literature Review

Some of the previous studies that examine the effect of import competition on unemployment are reviewed in this section.

Herath, *et al*. (2013) investigated the effect of trade liberalisation on employment levels in Sri Lanka in the period from 1990 to 2012 using OLS technique for estimation of a multiple linear regression model. The study found that import penetration adversely affect employment in the country. Specifically, a 1% rise in import penetration ratio resulted to decrease in total employment by 0.52%. Further evidence from the study were that export intensity positively and significantly affects employment as a1% rise in export intensity was found to be associated with about 0.61% rise in total employment in the country. The policy implication of the empirical evidence is that for the country to raise its employment level, it should articulate and implement policies that favour exports and discourage dependence on imports.

Labour market reaction to rising Chinese import penetration in the U.S. during the 1990-2007 was investigated in Autor, Dorn and Hanson (2013) using the two-stage least squares estimation technique. The study found that rising imports had been associated with lower labour force participation rate and higher unemployment in the country. It was also found to have been associated with lower wages in local labour markets housing import-competing manufacturing industries.

Acemoglu, *et al*. (2014) examined the contribution of rapid rise in import competition from China to the slow growth of employment in the U. S. in the period from 1999 to 2011. The study found that increase in imports from China was a major contributor to the reduction in manufacturing employment in the country, and through input-output linkages, import penetration tended to adversely affect the growth of U.S. jobs. The magnitude of the job loss effect was found to be greater in the local labour market.

In a study to investigate the effect of international trade on employment generation in Sri Lanka, Herath (2014) examined the effects of import penetration rate, export intensity and weighted tariff rate on employment while controlling for the effects of GDP, capital labour ratio, real wage rate and FDI. The OLS estimator was employed for estimation of a multiple linear regression model specified for the study. The study found, *inter ali*a, a significant negative effect of import penetration and a significant positive effect of export intensity on employment generation in the country. Hence import penetration adversely affects employment in Brazil. Considering the theorized positive relationship between employment and economic growth, increase

in import penetration rate could also adversely affect economic growth in the country.

Ashournia, *et al*. (2014) investigated the impact of Chinese import penetration at firms level on the Danish firms and workers' wages using panel dataset for the period 1997 to 2008. Fixed effect instrumental variable and OLS techniques were employed for analysis of the data. The study found a negative relationship between Chinese import penetration and firm-level demand shock particularly in low-skilled intensive products. Thus, increase in Chinese import penetration rate engenders lower wages for low-skilled workers.

Edwards and Jenkins (2015) examined the impact of Chinese import penetration on production and employment in South Africa's manufacturing sector in the period from 1992 to 2010 using percentage and trend analyses. The study found that import penetration from the Asian country (China) engendered reduction in South Africa's manufacturing output and manufacturing sectors' employment by 5% and 8% respectively in 2010 than in the previous years.

The impact of import penetration on employment in manufacturing sector of 12 OECD countries was investigated in Kollner (2016) using various model specifications and alternative estimation techniques. The empirical evidence showed that import penetration positively, but weakly affected manufacturing employment growth. The study also found that importation of intermediate inputs from China and new member countries of the European Union substitute (adversely affects) employment in manufacturing sectors of highly developed countries, while imports from EU-27 members complemented (favoured) employment in domestic manufacturing sector.

The effect of Chinese import penetration on employment levels in Canada in the period from 2001 to 2011 was investigated in Murray (2017) using the instrumental variable-two stage least squares (IV-2SLS) estimation technique. The study found that the "China Shock" which is the phrase used to refer to rising inflows of China's export in the country caused huge job losses in the country and much of the job losses was in the manufacturing sector. Specifically, a percentage point increase in exposure to Chinese import was associated with a 1.36 percentage point reduction in annual employment growth in the country (Canada).

Nguyen, Van, Nguyen and Tran (2017) investigated the effect of import penetration on firms' employment in Vietnam in the period from 2000 to 2009 using differenced and instrumental variables approach. In the study, increased import penetration was used as a proxy for competitive pressure that may induce technical changes (which is a key determinant of economic growth) or a crowding out effect which affect firm employment positively or negatively. The model specified for the investigation is estimated using the OLS technique. The empirical result indicated negative and statistically significant impact of increased import penetration on employment in the

country. This was attributed to the fact that Vietnam economy was dominated by SMEs which were less developed and characterized by limited technology. These enterprises accounted for over 96% of total number of enterprises in the country, and were exposed to intensified competition which adversely affected their production and employment levels as a result of cheap imports with similar technology especially from China.

3. Theoretical Framework and Methodology

The Okuns Law postulated by Okun (1962) which relates unemployment to economic growth provides the theoretical framework for this study. According to this law, Economic growth serves to reduce the rate of unemployment in a country, *ceteris paribus*. Economic growth is theorized to be job-creating.

$UN = f_1 (RGDP); \Delta UN = f_1(\Delta RGDP)$ [1], $f_1 < 0$, Δ stands for 'change'.

Building on this law, with some modification by incorporating import competition, and other macroeconomic variables (such as investment, government expenditure, trade openness, inflation hypothesized as factors affecting unemployment in line with theory (such as the Philips Curve rule) and empirical literature (Aigheyisi, 2015; Oaikhenan and Aigheyisi, 2015; Aigheyisi and Ebiaku, 2016) we specify our model to investigate the effect of import competition on unemployment rate in Nigeria as:

$$UN = f (RGDP, imcom, infl, gfcf, gfcexp, EXRT, lintr) \quad [2]$$

Where UN = unemployment rate, measured as unemployed population (aged 15-64) as a percentage of the labour force (aged 15-64); RGDP = Real GDP (proxy for the economy); imcom = import competition; measured as ratio of imports value (M) to apparent consumption or domestic demand (GDP – X + M), where GDP = gross dometic product at current market price, X = Exports value; gfcf = gross fixed capital formation as a percentage of GDP. This measure of import penetration is prescribed by the WTO (1984); gfcexp = government final consumption expenditure as a percentage of GDP; EXRT = Nominal (₦/$) exchange rate; lintr = lending interest rate.

The empirical specification of the long run model is represented as:

$$UN_t = \beta_0 + \beta_1 \ln(RGDP_t) + \beta_2 imcom_t + \beta_3 infl_t + \beta_4 gfcf_t + \beta_5 gfcexp_t + \beta_6 EXRT_t + \beta_7 lintr_t + \xi_t \quad [3]$$

The *a priori* expectations are: $\beta_1 < 0$, $\beta_2 > 0$, $\beta_3 < 0$, $\beta_4 < 0$, $\beta_5 < 0$, $\beta_6 < 0$, $\beta_7 > 0$. The variables are as defined above. ξ is the error term.

The Okun's law provides justification for the expected negative sign on the coefficient of RGDP. Increase in real GDP is expected to bring about decrease in unemployment rate. Based on evidence from previous empirical studies as seen in

the review of literature section of this study, we expect high import competition to worsen the unemployment problem in Nigeria. This is as a result of its effect on economic activities of domestic producers and employers in various sectors including primary (agriculture, mining, etc.), secondary (manufacturing, etc.) and tertiary (services) sectors, which are less competitive in the global market. High import competition in the domestic market could force firm closure or firm downsizing with the attendant consequence of job loss resulting in increase in the unemployment rate especially in the long run. However, in the short run, import competition could be beneficial, creating job opportunities for those involved in importation activities. This may be transient.

The short run Phillips curve justifies the expected negative sign on coefficient of inflation variable. A trade off exists between inflation and unemployment. However, the long run Phillips curve predicts no trade-off between the variables. All things being equal, capital formation or investment serves to boost the level of economic activities, engendering job creation, thereby reducing unemployment. Hence the coefficient of gross fixed capital formation as a percentage of GDP is expected to be negatively signed. Government final consumption expenditure is expected to reduce the rate of unemployment in an economy if the bulk of government expenditure on consumption goods and services go into patronage of locally made goods. Where this transpires, the expenditure is said to be productive. This will encourage local producers and enhance economic activities, leading to job creation in the private sector of the economy.

The expected negative sign on exchange rate variable is based on international trade theory which predicts that currency depreciation (increase in the exchange rate) boosts exports as a nation's exports commodities become cheaper in foreign markets (depending on the elasticity of demand for the country's export items and their competitiveness in foreign markets), and curbs importation since imported items become more expensive in domestic market (this also depends on the elasticity of demand for imports and their competitiveness in the domestic or home or local market). The boost in exports is expected to create more jobs in the economy.

Lending interest rate is expected *a priori* to be positively related to unemployment as high interest rate implies increase in cost of borrowing for investment, which may discourage domestic investment, leading to loss of jobs as result of firms' closures or downsizing.

Equation [3] models the long run relationship between unemployment and the explanatory variables. The short run effects of import penetration and other explanatory variables on the dependent variable (unemployment) can be represented by an error correction model specified as:

$$\Delta \mathrm{UN}_t = a_0 + a_1 \Delta \mathrm{UN}_{t-1} + \sum_{h=0}^{l} \left(\lambda_h \, \Delta \ln(\mathrm{RGDP}_{t-i} \;)\right) + \sum_{i=0}^{m} \left(\theta_i \, \Delta \mathrm{imcom}_{\mathrm{t-i}} \;\right) + \sum_{j=0}^{n} \left(\chi_j \, \Delta \mathrm{inf}_{t-j} \;\right) + \sum_{r=0}^{d} \left(\varphi_r \, \Delta \mathrm{gfcf}_{t-r} \;\right) + \sum_{k=0}^{P} \left(\partial_k \, \Delta \mathrm{gfcexp}_{t-k} \;\right) + \sum_{v=0}^{r} \left(\pi_v \, \Delta \ln(\mathrm{EXRT}_{t-v} \;)\right) + \sum_{c=0}^{q} \left(\phi_c \, \Delta \mathrm{lintr}_{t-c} \;\right) + \Omega \mathrm{EC}_{t-1} + \mu_t \qquad [4]$$

The variables are as previously defined. EC_{t-1} is the one-year lagged residual from the estimated long run model. It is referred to as the error correction term. Its coefficient is expected to be negative signed, and statistically significant for it to play the role of error correction in the model. *i, m, n, d, p, r, q* represent the optimal lags of the respective variables. λ_h, θ_i, χ_j, φ_r, ∂_k, π_v, ϕ_c, represent the short run effects of the respective explanatory variables on the dependent variable. μ is the error term.

The variables were tested for unit root to ascertain their stationarity properties using the augmented Dickey-Fuller (ADF) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests. The ARDL (Bounds) test approach to cointegration and error correction modeling methodology proposed by Pesaran and Shin (1999) was thereafter employed for the cointegratio and error correction analysis. The choice of this methodology was informed by the fact that it is applicable in cases of small finite data sample size, it is applicable in cases of variables that are of mixed order of integration, it yields consistent and efficient long run parameter estimates even in the presence of regressor endogeneity peculiar with cointegrated regressors (Pesaran Smith & Shin, 2001).

Data used for the study are annual time series data spanning the period from 981 to 2017. The data were sourced from the World Bank's World Development Indicators database (2018).

4. Results and Discussion

4.1. Unit Root and Cointegration Tests

The summary of the results of the unit root test is presented in Table 1. The test involves the ADF and the KPSS tests for unit root.

Table 1. Unit Root Test Results

Augmented Dickey Fuller (ADF) Unit Root Test							
Level				First Difference			d^*
Variables	ADF test stat.	Critical Value (5%)	Inference	ADF test stat.	Critical Value (5%)	Inference	
UN	-2.54	-3.54	NS	-7.72	-3.54	S	1
ln(RGDP)	-1.49	-3.55	NS	-3.67	-3.54	S	1
imcom	-2.41	-3.54	NS	-7.30	-3.54	S	1
infl	-3.89	-3.54	S	-	-	-	0
gfcf	-3.65	-3.54	S	-	-	-	0
gfcexp	-2.56	-3.55	NS	-5.36	-3.54	S	1
Ln(EXRT)	-1.73	-3.54	NS	-4.14	-3.55	S	1
lintr	-2.11	-3.54	NS	-5.44	-3.55	S	1
Kwiatkowski-Phillips-Schmidt-Shin (KPSS) Unit Root Test							
Level				First Difference			d^*
Variables	KPSS test stat.	Critical Value (5%)	Inference	KPSS test stat.	Critical Value (5%)	Inference	
UN	0.09	0.15	S	-	-	-	0
ln(RGDP)	0.20	0.15	NS	0.13	0.15	S	1
imcom	0.43	0.46	S	-	-	-	0
infl	0.11	0.15	S	-	-	-	0
gfcf	0.15	0.15	NS	0.08	0.15	S	1
gfcexp	0.12	0.15	S	-	-	-	0
ln(EXRT)	0.20	0.15	NS	0.06	0.15	S	1
lintr	0.16	0.15	NS	0.06	015	S	1

Source: Author's Estimation using EVIEWS 9

d^* = order of integration; NS = Non-stationary; S = Stationary; ln = natural logarithm

ADF and KPSS tests yield same results for ln(RGDP), infl, ln(EXRT) and intr, but different results for other variables. Broadly speaking, the unit root test results indicate that the variables are of mixed order of integration. While some variables are stationary at levels (integrated of order 0, others are stationary at first difference (integrated of order 1). In view of the mixed order of integration of the variables, we opt for the ARDL (Bounds) test to test for cointegration relationships among the variables. The result of the cointegration test is presented in Table 2.

Table 2. Bounds Test for Cointegration

ARDL Bounds Test		
Sample: 1983 2017		
Included observations: 38		
Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	K
F-statistic	5.03	7

Critical Value Bounds		
Significance	Lower (I0) Bound	Upper (I1) Bound
10%	2.03	3.13
5%	2.32	3.5
2.5%	2.6	5.84

Source: Author's Estimation using EVIEWS 9

K= Number of explanatory variables

The Bounds test for cointegration indicates that the variables are cointegrated, as the null hypothesis of no long run relationships is rejected by the F-statistic which is greater than the upper bound critical value even at the 1% level. In view of this, we proceeded to estimate the ARDL-based error correction and long run models.

4.2. Model Estimation

The results of estimations of the short run and the long run models are presented in Table 3.

Table 3. Short Run (Error Correction) and Long Run Estimates

Dependent Variable: UN			
Selected Model: ARDL(1, 0, 2, 2, 0, 2, 0, 0)			
Sample:1981 2017			
Included observations: 35			
Cointegrating Form			
Variable	Coefficient	t-Statistic	Prob
d(ln(RGDP)	-15.46	-2.29	0.033
d(imcom)	0.001	0.01	0.995
d(imcom(-1))	-0.58	-2.51	0.021
d(inf)	-0.11	-2.01	0.058
d(inf(-1))	0.13	2.06	0.053
d(gfcf)	-0.11	-0.66	0.514
d(gfcexp)	0.55	0.80	0.430
d(gfcexp(-1))	-1.61	-2.06	0.053
d(ln(EXRT)	0.72	0.37	0.714
d(lintr)	-0.07	-0.26	0.800
EC_{t-1}	-0.86	-5.34	0.000
Long Run Coefficient			
Variable	Coefficient	t-Statistic	Prob.
ln(RGDP)	-17.92	-2.17	0.04
imcom	0.74	2.43	0.02
infl	-0.22	-3.06	0.006
gfcf	-0.13	-0.69	0.50
gfcexp	2.53	3.22	0.004
ln(EXRT)	0.83	0.37	0.72
lintr	-0.08	-0.25	0.80
C	465.00	2.20	0.04

Source: Author's Estimation using EVIEWS 9.

The Okun's law is verified in both the short run and the long run as unemployment is found to be inversely related to real GDP at the 5% significance level. Thus economic growth (increase in real GDP) will engender reduction in unemployment in the short run and also in the long run in Nigeria. This corroborates evidence from previous studies such as Aigheyisi (2015), Aigheyisi and Ebiaku (2016), Adeleye, Odeleye and Aluko (2017). The contemporaneous short run effect of import competition on unemployment is positive, but statistically not significant. However, the one-year lagged effect of import competition on unemployment is negative and significant at the 2.5% level in the short run. This short run negative effect of import competition could be attributed to employment or jobs created in the importing sectors of the economy. However this is only transient or temporary as the long run coefficient of import competition variable which is negative and significant at the 2.5% indicates that import competition will engender increase in unemployment rate in the long run.

The contemporaneous effect of inflation on unemployment rate is negative and significant at the 10% level. This validates the short run Phillips Curve which posits an inverse relationship (trade-off) between inflation and unemployment in the short run. However, prior year inflation tends to push current unemployment rate upwards. This could be attributed to inflation expectation where employers tend to downsize their workforce as a result of previous period inflation, and on the expectation that it may be sustained in the current year. However, contrary to the expectation of the long run Phillips Curve which posits no trade-off between inflation and unemployment in the long run, the estimated long run coefficient of inflation is negative and statistically significant at the 1% level, suggesting that trade-off exists between inflation and unemployment also in the long run.

Though the coefficient of gross fixed capital formation (investment) is negatively signed as expected, yet it is not statistically significant. This is observed for both the short run and the long run models. It suggests that the level of investment in the economy has not been substantial enough to reduce the rate of unemployment therein. The contemporaneous effect of government final consumption expenditure on unemployment is also not statistically significant at conventional levels of significance in the short run. However its one-year lagged effect on unemployment is negative and significant at the 10% level in the short run. Thus government final consumption expenditure serves to reduce unemployment rate in the short run in Nigeria, albeit, with a lag of one-year. However, in the long run, increase in government final consumption expenditure drives up unemployment in the long run in Nigeria. This is indicated by the positive long run coefficient of the variable which is significant even at the 1% level. This tends to suggests that this class of government expenditure goes mainly into imported consumer items, and this adversely affects local investors and worsens the unemployment situation in the country.

The long run and short run effects of exchange rate and lending interest rate on unemployment are statistically not significant. This suggests that exchange rate and lending interest rate are not significant determinants of the rate of unemployment in the country.

The error correction term is negatively signed and statistically significant, as expected. Thus it will rightly act to restore equilibrium in the system in the event of short run deviation therefrom. The absolute value of the coefficient of error correction term implies that 86% of the sort run deviation from equilibrium is corrected annually to restore the equilibrium position. Thus the speed of adjustment to equilibrium is quite high.

5. Recommendation and Conclusion

5.1. Recommendations

Based on the empirical evidence from this study, the following are recommended for policy considerations:

i. The government of Nigeria must focus on achieving sustainable economic growth, as this is a key factor for reducing unemployment in the country as indicated by the negative and significant short run and long effects of real GD on unemployment rate. To this end, efforts must be channeled into ensuring that factors and conditions favourable to growth (such as infrastructural development, human capital development, investment and business friendly policies, favorable tax regime, tight security, etc.) should be put in place to set the economy on the path of sustainable economic growth.

ii. The observed long run positive and significant effect of import competition on unemployment rate which implies that import competition will worsen the unemployment problem in the long run calls for effort to address the import-dependence nature of the economy. There is need to revamp the nation's productive sectors so as to enhance the quality and quantity of output therefrom. This will enhance the competitiveness of the nation's output in both domestic and foreign markets, and dampen import competition and its adverse effect on employment in the country.

iii. Some level of inflation is required to reduce unemployment rate in the country. This suggests that deflation must be guarded against. However, high inflation must be prevented. It therefore behooves the monetary authority to target inflation rates that are compatible with investment and economic growth so as to reduce unemployment in the country.

iv. There is need for Nigeria's government to cut down on its consumption expenditure as this drives up the rate of unemployment in the long run, and consider channeling more of its resources into capital projects with the potentials to boost job creation in the long run.

5.2. Conclusion

The study examined the effects of import competition on unemployment in Nigeria. The ARDL bounds test approach to cointegration and error correction modeling was employed for the analysis. The study found import competition serves to reduce unemployment in the short, but increases it in the long run. The Okun's law was validated as economic growth was found to be associated with reduction in unemployment rate in the short- and long-run. The short run Philips curve relation was also validated as inverse relationship (trade-off) was found between inflation and unemployment. The trade-off is sustained in the long run, thus invalidating the long run Phillips curve which posits no trade-off between inflation and unemployment in the long run. Government final consumption expenditure was found the inversely related to unemployment in the short-run, though the relationship was significant at the 10% level. This suggests that government consumption expenditure serve to reduce unemployment in the short-run. However, its long run effect on unemployment is positive and highly significant. This implies that increased government expenditure on goods and services for direct consumption and satisfaction of individuals in the economy serves to worsen the unemployment situation in the long run. Though the effects of exchange rate and lending interest rate on unemployment rate were respectively positive and negative in the short- and long-run, yet they were not statistically significant.

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Appendix

Table A1. ARDL Model for Unemployment

Dependent Variable: UN
Method: ARDL
Date: 04/08/19 Time: 02:13
Sample (adjusted): 1983 2017
Included observations: 35 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)

Dynamic regressors (2 lags, automatic): LOG(RGDP) IMCOM INFL GFCF GFCEXP LOG(EXRT) LINTR
Fixed regressors: C
Number of models evalulated: 2187
Selected Model: ARDL(1, 0, 2, 2, 0, 2, 0, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
UN(-1)	0.137454	0.161434	0.851452	0.4046
LOG(RGDP)	-15.45919	6.756661	-2.287992	0.0332
IMCOM	0.001417	0.229096	0.006184	0.9951
IMCOM(-1)	0.053511	0.227568	0.235141	0.8165
IMCOM(-2)	0.584522	0.233067	2.507952	0.0209
INFL	-0.110303	0.054772	-2.013861	0.0577
INFL(-1)	0.049665	0.064940	0.764779	0.4533
INFL(-2)	-0.127810	0.061999	-2.061505	0.0525
GFCF	-0.113408	0.170716	-0.664306	0.5141
GFCEXP	0.552499	0.686544	0.804753	0.4304
GFCEXP(-1)	0.025031	0.934228	0.026794	0.9789
GFCEXP(-2)	1.608128	0.780107	2.061418	0.0525
LOG(EXRT)	0.719719	1.933025	0.372328	0.7136
LINTR	-0.068591	0.266833	-0.257055	0.7998
C	401.0824	173.9413	2.305849	0.0320

R-squared	0.842483	Mean dependent var	10.18000
Adjusted R-squared	0.732221	S.D. dependent var	7.184074
S.E. of regression	3.717568	Akaike info criterion	5.761543
Sum squared resid	276.4062	Schwarz criterion	6.428121
Log likelihood	-85.82701	Hannan-Quinn criter.	5.991646
F-statistic	7.640747	Durbin-Watson stat	2.184338
Prob(F-statistic)	0.000030		

*Note: p-values and any subsequent tests do not account for model selection.

Source: Estimation output using EVIEWS 9

Tax Reforms, Social Inequality and Automatic Stabilizers

Alina Georgeta Ailincă[1]

Abstract: Numerous studies address the issue of tax reforms and their relationship to social inequality. However, the results are ambiguous or contradictory. Therefore, this article aims to bring more light to this issue by analyzing theoretically and practically, econometrically, the link between the subjects analyzed: fiscal reforms, automatic stabilization and social inequality in EU with 28 countries. In addition, the idea of tax reform has been simplified by analyzing the evolution of personal income tax rates in EU-28 countries, with only those with a higher progressivity to surprise the idea of automatic stabilization. However, the outcomes for selected countries from EU-28, although modest in terms of linkage intensity, confirm the starting hypothesis: increasing progressivity may support reducing social inequality and boosting economic growth.

Keywords: EU-28; fiscal reforms; smoothing the economic cycle; stabilization instruments

JEL Classification: E63; H11; P11

1. Introduction

When politicians and the media launch the idea of fiscal reform, the population, companies and even public institutions are suspicious about their possible positive effects. Part of the tax reforms are aimed at better balancing the public budget and implicitly reducing budget deficits. Noteworthy, lower government deficits reduce interest rates in the face of the possibility of not materializing the risk that the government may incur tax increases and taxes in the future, so it can provide predictability. Moreover, in the case of countries with major fiscal imbalances, in order to reduce the risk premium for interest rates in the economy and to restore liquidity and the solvency of the public budget, tax adjustments and reforms are considered indispensable. They are perceived as fiscal stabilization reforms in order to mitigate the macroeconomic instability generated by rising inflation, increased interest rates and undesirable effects of trade imbalances as well as the accumulation of public debt. For example, in the 1980s, the implementation of fiscal reforms that

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drastically reduced government spending in Ireland (1987-1989) and Denmark (1984-1986) led to a reduction in private consumption to a lesser extent than expected. Thus, businessmen have also acted to boost the economy by rebuilding and upgrading production units, featuring this kind of tax reform as a government commitment to lower taxes and duties in the future. Other successful episodes of fiscal reforms aimed at consolidating public finances (e.g. Belgium - 1987, Sweden - 1987, Norway - 1986, United States - 1977, Australia - 1987, 1988, New Zealand - 1992, Japan - 1987) also indicates the need that the amplitude of the fiscal consolidation reform to be high (over 4% of GDP) (McDermott & Wescott, 1997). Another example, in the Netherlands, a cut in spending (of 15% of GDP) over the period 1982-2000 has created a fiscal space for reduced taxes and has stimulated job creation and private sector investment, avoiding an unfavourable effect on income inequality (IMF, 2015).

At the same time, revenue-side reforms have lower chances of success (except for emerging and low-income countries, according to Akitoby, 2015) than those targeting the expenditure side (e.g. a reduction in budget expenditures - namely of the primary structural deficit - up to about 4% of GDP over two years can lead to a 50% success of the consolidation reform) (McDermott & Wescott, 1997).

Concerning compromise or trade –off between equity/equality and efficiency, we can see that things are not quite straightforward when switching from direct taxation to indirect taxation (which aims at promoting economic growth and reducing distortions); process associated usually with the increase of social inequality and the reduction of fiscal system progressivity.

Therefore, the article aims to address the issue of tax reforms through its relationship with social inequality. In the context of reforms, it will be of interest to promote non-discretionary character reforms, so that will outline the use of automatic stabilizers.

2. Description of the Problem in the Context of Literature Overview

Tax reforms can pose serious shocks to the economy, especially if social equity is aggravated by the reduction in social transfers, of which the initial purpose was to boost labour participation. For example, tax reforms in the 1980s are thought to have created a wider dispersion of wages and greater social inequality. Between 1980 and 2000, Caminada, Goudswaard and Wang (2012) noted that income inequality increased, being only partly offset by complementary measures to increase redistribution. At the same time, Ball and others (2013) note that inequalities are often generated by fiscal consolidation measures, especially when they are based on spending.

Reducing inequality can include providing well-targeted budget transfers, health services and education in less-favoured areas (areas with poor industrial networks,

rural areas, etc.), increased spending on education and health (Martinez-Vazquez, Moreno-Dodson & Vulovic, 2012), provision of technical training for better labour mobility from non-productive activities to higher value-added activities (Akitoby, 2015).

However, Acosta-Ormaechea, Komatsuzaki and Correa-Caro (2017) state that, analyzing nine tax reform episodes in seven high-income countries and using the synthetic control method for the 1975-2010 period, less developed countries following fiscal reforms experienced higher levels of economic growth, and reforms have not generated major changes in aggregate societal inequalities. Moreover, in cases where the reform periods coincided with the increase in income inequality, there was insufficient evidence to indicate a causal link between a more uneven distribution of income and tax reforms. Because of the multitude of studies often with contradictory results, the present study aims to address the issue of fiscal reforms and adjustments (implicitly non-discretionary) from the perspective of connection with social inequality.

3. Methodology and Data Sources

In the context in which tax reforms target the progressive taxation, the latter is associated with the reduction of social inequalities (when it does not generate greater tax evasion and inappropriate use of incomes). This is all the more relevant if we consider that taxation is used to support government spending on social security and social transfers. At the same time, it is interesting to analyze the extent to which a single tax rate (now on named flat tax rate) leads or not to increase social inequality, acting, according to de facto theory, sometimes as a regressive tax. In addition, it is of interest to analyze the extent to which income inequality responds to fluctuations in the economic cycle, knowing that aggregate demand and implicitly economic growth is higher when income inequality is reduced and vice versa. To quantify the income inequality, we used the Gini coefficient of equalized disposable income - EU-SILC survey according to Eurostat methodology and data.

From the theoretical point of view, in order to better connect tax reforms with the automatic stabilization mechanism, but also with the issue of social equity, simplifying Dinga and al. results (2011, p. 119, fig. 36), we can say that automatic stabilizers aim in particular at a progressive tax regime, that is to say, greater social equity achieved through taxation. At the same time, the fiscal reforms with an automatic nature in addition to progressivity imply a regime of stimulating the economy and a good capillarity, both of the bases and of the rates of taxation. Therefore, the article will look at the extent to which these elements are present at the level of EU countries (e.g. progressivity or single quota/flat tax rate, number of thresholds or brackets number, Total general government revenue % GDP, Total general government expenditure % GDP, Top statutory personal income tax rates

(including surcharges) and Top statutory corporate income tax rates, including surcharges) and the extent to which they can connect to the issue of social inequality (the Gini coefficient of equalized disposable income - EU-SILC survey). Econometric processing, using panel data, will use Eurostat statistics as well as statistics from the European Commission and other international bodies.

4. Results Obtained

According to economic theory, fiscal reforms can affect economic growth through four main transmission channels: labour supply, total factor productivity, investment in human and physical capital (IMF, 2015).

With regard to labour supply, the tax system (e.g. by reducing labour tax rates) and social transfers can substantially influence decisions on labour market participation and working time, especially for specific groups such as workers elderly and women (OECD, 2011) and may stimulate or inhibit long-term economic growth. At the same time, through reforms with provisions on tax cuts, the youth unemployment issue can be interfered, an indicator that is extremely high in Europe after the crisis (Banerji et al., 2014).

In this regard, a possible link between tax reforms, which are transmitted via the labour supply channel and automated stabilizers, is unemployment aid. It, designed in an effective tax reform, can protect the income of people struck by structural or transitional unemployment. However, when they return to work, it can work as a tax on labour income, creating obstacles to work. Unemployment benefits play an essential role in advanced economies through programs designed to protect people from loss of income due to unemployment. However, these programs, if not well designed, can adversely affect incentives and employment outcomes (Meyer, 2002; Abbring et al., 2005; OECD, 2006).

In advanced economies, calling for social benefits, with clear eligibility criteria and conditional on participation in active labour market integration programs are effective tools designed in the framework of tax and labour market reforms. For example, in the Netherlands, before the mid-1980s, almost one fifth of the working-age population benefited from unemployment and disability benefits, increasing access to labour market participation (Watson et al., 1999), and in Germany widespread reform to improve job search efficiency and encourage labour demand led to an increase in the labour force participation rate at 74% from 66% over the period 2000-2013, as well as a reduction in the unemployment rate at 5.2% in 2013 (OECD, 2014).

It should be noted that there are major differences between advanced economies and emerging economies in the sense that if in advanced economies the labour tax is

negatively correlated with employment; in the developing economies the link is less obvious, on the background of narrower base revenue and a more limited social protection network (IMF, 2014).

From the perspective of total factor productivity, tax reforms can target direct and indirect measures to increase R & D expenditure in the public sector and provide tax incentives to encourage private R & D spending. Also, public spending on building and strengthening the transport infrastructure and offering high quality public services can have an immediate effect on the productivity of the private sector and lead to technological progress. At the same time, public investment in a high-performance education system can help improve the absorption of innovative technologies at the level of companies and increase the capacity to integrate young people into the labour market. Thus, public investment can help increase overall factor productivity and ensure long-term economic growth.

At the same time, tax reforms regarding capital taxes can influence the investment or savings decisions. At company level, corporate tax may reduce return on investment projects. In this respect, in the model proposed by Devereux and Love (1994) it is argue that the cuts in capital tax rates encourage investment and support long-term economic growth.

If we refer to the human capital, recognized in literature (Barro, 2001) as a driver of long-term economic growth through participation in production activities and the promotion of technical progress, tax reforms can contribute by investing in education and health to the accumulation of human capital. For example, some studies (e.g., Pecorino, 1993) show that reductions in income tax rates can contribute to increasing human capital stock and contribute to long-term economic growth.

Therefore, the role of fiscal policies is to achieve as much as possible economic priorities: ensuring the best possible tax compliance, stimulating employment, facilitating the investment phenomenon, and reducing social inequalities. The link between these priorities is extremely tight.

Fairness and fair competition in the business environment is related to the elimination to the greatest possible extent of discrepancies, irregularities and abuses, while encouraging better tax compliance. Fiscal compliance allows for the provision of public funds to reduce social inequalities and to ensure the growth of jobs, as well as the funding of social conversion and mobility programs. Reducing social inequalities and increasing the number of jobs and possibly the quality of the workforce can provide a healthier basis for business support and boosting investment. At the same time, supporting investment can help increase employment and reduce social inequalities and poverty. In this sense, through the proposed objectives, tax reforms and related reforms can conjugate as appropriate as possible to these economic and social priorities and can increase the effectiveness of their achievement.

Thus, in the context of analyzing the link between automatic stabilizers and tax reforms, according to EY (2018), a series of elements of recent tax reforms aim at greater transparency, a better harmonization of differences between countries' tax systems and an and an increasingly internationally combined policy in order to combat tax evasion, but also to harmonize tax systems.

With regard to personal income tax in OECD countries, the "Tax Policy Reforms 2018: OECD and Selected Partner Economies" (OECD, 2018) highlights the trend towards implementing reforms aimed at reducing labour income tax rates, possibly leading to the reduction of tax revenues on short-term to reduce.

In order to improve labour market participation, these reforms aim at increasing the progressiveness of personal income tax rate at the same time as shaping the trend of increasing personal income tax revenues and extending tax exemptions for certain financial incomes. Thus, in 2018, according to this report, the most significant reforms in the EU were implemented by Latvia, which introduced a progressive regime on personal income tax and France, which introduced a new single tax on personal capital gains. Compared with previous years, in 2018, in OECD countries, the reduction in corporate tax rates has accelerated, amid a reduction in the rates of some countries that traditionally had high rates of corporate income tax, generally at the same time as measures to extend corporate tax bases. Although they have increased investment incentives, measures on R & D tax incentives have remained limited (OECD, 2018).

If we strictly refer to Europe, in the European Commission's 2018 report "Taxation Trends in the European Union, Data for the EU Member States, Iceland and Norway" at the beginning of 2018, the maximum personal income tax rate was 39% for EU28, with no significant change since 2013, while the average personal income tax rate rose slightly in 2018 for the euro area to 42.6%. As the OECD report mentioned above, Latvia and France have increased their maximum rates of personal income tax, while countries such as Portugal, Romania and Finland have lowered their rates. Thus, asymmetries in personal income tax rates remain considerable in the EU28, ranging from a minimum of 10% in Bulgaria to over 55% in Denmark and Sweden.

Turning to a qualitative and quantitative approach, if we analyze at the level of the countries of the European Union the fulfilment of criteria that reflect on the one hand the idea of fiscal reform and on the other hand the automatic stabilization (which implies progressive and capillary rate) we can see (see Table 1) that, out of the many EU28 countries, only 13 of them meet the required criteria at the same time.

Thus, although tax adjustments occurred in all member countries, for the idea of tax reform we only considered the change in the higher personal income tax rate for the considered analysis period (2007-2017) according to the European Commission's 2018 report, "Taxation Trends in the European Union, Data for the EU Member States, Iceland and Norway". Thus, we excluded from the calculation countries such

as Germany, Malta, the Netherlands, Austria and Romania.

Table 1. The classification of the countries of the European Union with 28 countries according to the criteria: reform, progressivity and capillarity according to the higher rate of the personal income tax rate for the period 2007-2017

Country Code	Reforms considered taking into account the change in the top rate of personal income tax for the period 2007-2017, Yes (1) / No (0)	Progressive tax rates (1) or flat tax rate (0)	Capillarity	
			Yes (1) / No (0). We considered "Yes" if there are ≥ 3 thresholds/brackets	Number of brackets
BE	1	1	1	5
BG	1	0	0	0
CZ	1	0	0	0
DK	1	1	0	2
DE	0	1	1	4
EE	1	0	0	0
IE	1	1	0	2
EL	1	1	1	4
ES	1	1	1	5
FR	1	1	1	5
HR	1	1	1	3
IT	1	1	1	5
CY	1	1	1	5
LV	1	0	0	0
LT	1	0	0	0
LU	1	1	1	8
HU	1	0	0	0
MT	0	1	1	5
NL	0	1	1	4
AT	0	1	1	7
PL	1	1	0	2
PT	1	1	1	5
RO	0	0	0	0
SL	1	1	1	5
SK	1	1	0	2
FI	1	1	1	5
SE	1	1	1	4
UK	1	1	1	4

Source: European Commission (2018) and Eurostat data. Author's conception and processing

Notes: BE - Belgium, BG - Bulgaria, CZ - Czech Republic, DK - Denmark, DE - Germany, EE - Estonia, IE - Ireland, EL - Greece, ES - Spain, FR - CY - Cyprus, LV - Latvia, LT - Lithuania, LU - Luxembourg, HU - Hungary, MT - Malta, NL - Netherlands, AT - Austria, PL - Slovakia, FI - Finland, SE - Sweden, UK - United Kingdom.

At the same time, to take into account only those reforms based on the tax system progressivity, for personal income tax, we exclude all countries with a flat tax rate: Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania and Hungary. Romania,

during the analysis period, had a flat tax rate but was already excluded from the previous criterion of the fiscal reform, considering in this study that the fiscal adjustments were of a small scale and did not fit into the concept of reform.

In order to better capture the part of automatic stabilization, we also excluded those countries that, although having progressive rates of personal tax, have a small number of tax thresholds or brackets (under 3). By this criterion we have given up Denmark, Ireland, Poland and Slovakia. Thus, the remaining 13 countries simultaneously meet the three criteria for reform, progressivity and capillarity of personal income tax rates. At the same time, for the period 2007-2017, if we also take into account the change or not of the higher corporate income tax, according to the same report of the European Commission, we have to exclude from the analysis countries such as Belgium, Bulgaria, Ireland, Malta, Austria, Poland and Romania. Except, Belgium, these are already found in the exclusions made to the criterion on the higher rate of personal income tax. Therefore, we will only analyze 12 countries to see the connectivity between income inequality, the concept of tax reform and automatic stabilization. These countries are Greece, Spain, France, Croatia, Italy, Cyprus, Luxembourg, Portugal, Slovenia, Finland, Sweden and the United Kingdom.

Thus, for the period 2007-2017, using a correlation matrix between the economic growth rate, the Gini coefficient, used in the literature to capture social inequality, the number of personal income tax thresholds, Top statutory personal income tax rates and respectively Top statutory corporate income tax rates and Total general government revenue % GDP and Total general government expenditures % GDP for Greece, Spain, France, Croatia, Italy, Cyprus, Luxembourg, Portugal, Slovenia, Finland, Sweden and the UK, we can draw a series of empirically relevant conclusions on the link between the gradual increase in personal income tax rates, social inequality and economic growth. We recall that according to Eurostat, the Gini coefficient is defined as the relationship of cumulative shares of the population (arranged according to the level of equalized disposable income) to the cumulative share of the equalized total disposable income received by them. Theoretically, the relationship between the elements analyzed should be in the idea that increasing progressiveness can lead to a decrease in social inequality and an increase in the rate of economic growth. The correlation matrix cannot identify the causality, but only the existence of the link by revealing its strength and the meaning/sign of the link (see Table 2).

Table 2. Correlation matrix between real GDP growth rate, Gini coefficient, personal income tax rate brackets number, top statutory personal income tax rates, top statutory corporate income tax rates as well as total general government revenues and expenditures (%GDP) for Greece, Spain, France , Croatia, Italy, Cyprus, Luxembourg, Portugal, Slovenia, Finland, Sweden and the United Kingdom for 2007-2017

	RGDPGR (%)	*Gini coef*	*BN*	*TSPITR (%)*	*TSCITR (%)*	*TGGR (%GDP)*	*TGGE (%GDP)*
RGDPGR (%)	1						
Gini coef	-0.202	1					
BN	0.158	-0.146	1				
TSPITR (%)	-0.004	-0.140	-0.315	1			
TSCITR (%)	-0.036	0.237	0.238	0.345	1		
TGGR (%GDP)	0.035	-0.488	-0.005	0.562	0.317	1	
TGGE (%GDP)	-0.362	-0.179	-0.248	0.521	0.365	0.731	1

Source: European Commission (2018) and Eurostat data. Author's conception and processing

Notes: RGDPGR (%) - real GDP growth rate, Gini coef - Gini coefficient of equalized disposable income - EU-SILC survey, BN - number of personal income tax rate brackets, TSPITR – top statutory personal income tax rate, TSCITR – top statutory corporate income tax rate (% of GDP), TGGE (% GDP) - total general government revenue (% of GDP), TGGE (% GDP) – total general government expenditures (% of GDP).

It can be seen that although there are negative correlations at least in the first columns of the table, the bonds are generally extremely weak without requiring a development of the analysis by regression equations. A higher Gini coefficient signifies the increase in social inequality, so its negative connection with the economic growth rate supports the theory and the starting hypothesis. The same can be said of the fact that the number of thresholds is positively correlated, albeit extremely weak, with the economic growth rate. It is also supportive of the theory that higher income and profit tax rates (TSPITR and TSCITR) are negatively correlated with economic growth, suggesting that reforms should always aim at adjusting higher rates of taxation. At the same time, the significance of the negative correlation between the higher rates of personal income tax and profit versus the Gini coefficient might suggest that their growth would reduce social inequalities, considering that the tax systems analyzed are progressive. Equally, it should be noted that both general government expenditure and revenue are negatively correlated with the Gini coefficient, suggesting that it contributes significantly to reducing social inequalities. This is more evident in the case of revenue, suggesting that the increase in the progressivity of tax rates contributes to reducing social inequalities.

5. Conclusion

In the context of contemporary economic imbalances, reforms in general and tax reforms in particular play an important role in bringing the world's economies to normal. Often viewed as having a negative social impact, tax reforms can be designed to increase the progressiveness of tax rates. Increasing the progressivity of tax rates is considered both theoretically and in practice as having a beneficial impact on reducing social inequalities. Thus, this study addresses the link between tax reforms, social inequalities and automatic stabilizers.

Using data from the European Commission (European Commission, 2018) and Eurostat for the EU28 for the period 2007-2017 and based on a series of hypotheses and simplifications, we selected data for 12 countries (Greece, Spain, France, Croatia, Italy, Cyprus, Luxembourg, Portugal, Slovenia, Finland, Sweden and the United Kingdom) with a high rate of progressive tax. With 132 statistical observations using panel data, the results can be considered as credible as possible. In theory, the increase in progressivity should be correlated negatively with social inequality and positive with the rate of economic growth. The matrix of correlation between selected elements, though extremely weak, reflects and confirms these correlations. Therefore, the results of the study confirm once again the theoretical statements that the increase in the progressive rate of personal income tax rates contributes to the reduction of social inequalities.

6. Future Directions to Be Approached

Where there is sufficient information, the same type of analysis could be extended to the tax base. In addition, since countries such as Germany, Malta, Belgium, the Netherlands and Austria have highly progressive personal income tax rates with a high degree of granularity or capillarity, other authors resuming the analysis on other periods and, after other systematization, may have reintroduce them in their attention. At the same time, to see if the flat tax rate has a regressive effect, which could theoretically increase social inequalities, it would be interesting to analyze all the EU-28 countries that have a flat tax rates: Bulgaria, Romania, Czech Republic, Estonia, Latvia, Lithuania and Hungary. Equally, countries such as Denmark, Ireland, Slovakia and Poland, considered in this study as having personal income tax rates with low capillary, could be reintroduced into an analysis that better captures the valences of reduced versus high capillarity.

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Impact of Monetary Policy on Exchange Rate in Nigeria: Bound Test and ARDL Approach

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Abstract: The aim of this study is to examine the relationship between monetary policy and exchange rate in Nigeria. The results of past empirical studies have not shown a clear direction about the nature of relationship between these variables in the country and these studies have failed to utilize the methodology in this work, which has created a gap in the literature. Data was collected from the Central Bank of Nigeria Statistical Bulletin from 1990– 2016 and various diagnostic tests such as Unit Roots and Bound Tests were carried out. Consequently, ARDL model was utilized to address the objective of this study. It was discovered in this study that credit reserve requirement and Treasury bill rate have a negative relationship with exchange rate. However, monetary policy rate and broad money supply have a positive relationship with exchange rate in the country. Furthermore, due to these important findings, this paper makes the following vital policy recommendations for the monetary authorities, policy makers, financial institutions regulators and future researchers. Due to the high volatility in exchange rate in Nigeria currently, the monetary authorities should increase the credit reserve requirement of the commercial banks. Also, the Central bank should increase that rate at which it sells Treasury bill to the commercial banks. The multiplier effect of this policy will reduce the level of high powered money and consequently stabilize the exchange rate.

Keywords: Exchange Rate; Monetary Policy Variables; Bound Test; ARDL and Nigeria

JEL Classification: E5; F31

1. Introduction

One of the critical factors that determines the stability or otherwise of external balance of a country is the value of the country's currency vis-à-vis the global

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currency. This value is usually measured through exchange rate mechanism. In Nigeria, a cursory examination of exchange rate history shows that in 1960s, the country adopted a fixed exchange regime by fixing its currency at par with the British pound which was later changed to American dollar. Consequently, the monetary authorities in their own wisdom pegged the country`s currency to a basket of 12 currencies of major trading partners of Nigeria in 1978. However, the implementation of the Structural Adjustment Programme (SAP) in 1986 marked the emergency of a flexible exchange rate in Nigeria. Since then exchange rate has been persistently depreciating in the country. The value of a US dollar was equivalent to 2 naira in 1986. The same dollar in 2018 was averagely valued at 365 naira. This implies that from 1986 to 2018, the country`s currency has been worsened by 18150%. It is worth of note that the multiplier effect of this continuous dwindling of currency value has manifested in the economy in the form of sharp declining in investment, rising in the cost of production, high unemployment rate and persistent fall in the standard of living of the masses in the last decade. Moreover, the various efforts of the Nigerian government to ensure a stable exchange rate in the economy has not been successful in the last few decades. This assertion is further reinforced by the submissions of Benson and Victor, (2012) and Aliyu, (2011) who argued that in spite of different measures adopted by the government of Nigeria to stabilize exchange rate, the currency has lost its value through out 80s to 2010.

However, the exchange rate management is one of the critical macro-economic policy functions of the central monetary authorities championed by the Central Bank of Nigeria. One of the most effective policies of the Central Bank to stabilize any disequilibrium in macroeconomic variables such as interest rate, inflation rate and exchange rate is the monetary policy. The policy is applied based on the discretion of the CBN to regulate the stock of money and the cost of capital in tune with the prevailing economic circumstances of the country with a view to ensuring the stability of the country`s macro-economic variables including exchange rate. It has been established that the monetary policy in Nigeria is primarily geared toward maintaining the stability of price and exchange rate since these variables are very germane to the achievement of sustainable economic growth and external sector competitiveness (Sanusi, 2012). Due to the sensitivity of exchange rate in determining the global competitiveness of economic activities of the country, this has been the issue of concern among the policy makers and scholars in the country.

In the recent time, despite the fact that several attempts have been made to examine the impact of monetary policy on exchange rate stability in Nigeria, the results from the past studies have not shown a clear direction about the relationship between these important variables in the country. See Michael (2010), Nanna (2001), Ullah and Rauf (2013), Ahmed and Rafar (2009). Also, this study is particularly unique in the area of methodology in which the previous studies have failed to explore. Therefore,

this paper will contribute to the existing bulk of studies by examining the impact of monetary policy on exchange rate after the adoption of SAP in Nigeria.

The rest of the paper is organized as follows; in addition to the introductory aspect, the section two addresses relevant theoretical and empirical literature review. Meanwhile, section three presents methodology, empirical results and policy recommendation.

2. Literature Review

The section critically reviewed past studies on nexus between exchange rate and monetary policy.

While advancing an empirical modeling between monetary policy and exchange rate, Coneri and Ziba (2001) sampled 42 middle-income developing countries. The authors argued that not only monetary policy effects but also open trade policies were necessary condition for the stability of exchange rate. It was further established that demand shocks on crude oil and agricultural exports negatively impacted exchange rate stability. In another work, Ahmed and Rafar (2009) utilized cointegration test, Ordinary Least Square (OLS) and Granger causality test to investigate the determinants of exchange stability in Nigeria from 1990 to 2007. The results from the estimated model indicated that a long-run relationship existed among the selected variables. The influence of money supply and cash reserve ratio was significant on exchange rate in the country. Also, the study asserted that there was an existence of a unidirectional causality between exchange rate and other variables of interest. Similarly, Masha (2011) applied Johansen co-integration technique to estimate the link between monetary policy actions and exchange rate determination in Ghana with the annual data of 1982 to 2009. It was concluded from the study that prompt monetary action resulted into a short-term and long-term stability of exchange rate in the country. Therefore, the paper recommended that the government of the country should employed policy tools like interest rates, liquidity, money supply and cash reserve ratios to stabilize exchange rate. While examining how monetary policy impacts exchange rate and growth in Zambia within the period of 1992 and 2006, Zulu and Paul (2008) used multiple regression model to establish the existence of a direct impact of money supply and liquidity ratio on exchange rate. Meanwhile, reverse was the case of minimum rediscount rate, exports and periodic policy changes on exchange rate. In the same vein, Hameed et al (2012) analyzed the impact of monetary policy on macro-economic variables such as money supply, GDP, exchange rates, interest rates, and inflation with the application of Ordinary least square OLS. The authors submitted that a tight monetary policy (in term of increase interest rate) contributed a significant adverse effect to output. But increase in money supply caused a noticeable direct impact on inflation which consequently

contributed to a negative influence on output. Exchange rate and output had an inverse relationship with each other.

However, Umar (2013) employed Granger causality test and Error Correction Model (ECM) to examine how monetary policy determines exchange rate in Nigeria ranging from 1980 to 2011. The findings that emerged from the paper posited that money supply had a significant direct impact on exchange rate whereas monetary policy rate and liquidity ratio had a reverse effect on exchange rate. Consequently, Chukuigwe and Abili (2008) adopted Ordinary Least Squares technique to investigate the impact of monetary and fiscal policies on non-oil exports in Nigeria between 1974 and 2003. It was discovered from the study that both interest rate and exchange rate exerted a negative impact on non-oil exports. Ditto for fiscal policy. While estimating the connection between exchange rate regimes and international business cycles, Oliver and Thepthida (2005) embraced a general equilibrium model to establish two sources of real exchange rate fluctuations as relative interest rate changes and movement in the relative price of imports across countries. It was further concluded that monetary growth had significant effects on exchange rate. In addition, Zafar and Sabo (2013) utilized multiple regression model to analysis the nexus between monetary policy and exchange rate between 1980 and 2010. The researchers discovered from the estimated model that the effects of money supply, monetary policy rate, Treasury bill rate and cash reserve ratio were negative and significant on exchange rate. The paper submitted that the implementation of monetary policy decisions on timely and effective manner would be the best solution to the issues of exchange rate management. Meanwhile, Ajisafe and Folorunsho (2002) estimated the relative effectiveness of monetary and fiscal policy on macroeconomic variables in Nigeria between 1970 and 1998 with the aid of co-integration and error correction model. The study corroborated that monetary policy exercised greater impact on the Nigerian economic variables than fiscal policy. It was therefore concluded that the past advocacy by the government to embark on fiscal measures has resulted into greater distortion in the economy. Furthermore, Amassoma et al (2011) utilized Ordinary Least Squared approach to evaluate how monetary policy affects macroeconomic variables in Nigeria ranging from 1986 to 2009. The results originated from the work concluded that monetary policy exerted a significant influence on both money supply and exchange rate while reverse was the case on price stability.

Finally, it could be pinpointed from the above reviewed literature that studies on nexus between monetary policy and exchange rate are still on going and there is not yet a consensus about their relationship. Hence, the relevance of this work.

3. Methodology

Secondary data from 1990 to 2016 was utilized for the analysis of this work. Effort was made to extract data on exchange rate, broad money supply, monetary policy rate Treasury bill rate and cash reserve requirement from CBN Statistical Bulletin. Consequently, the paper employed E-Views software to run the data.

3.1. Model Specification

The model for this study can be specified in the general form as follows:

EXR = F (BMS, CRR, MPR, TBR) …….…. (I)

Model (I) could be written in an explicit form as follows.

$LEXR_t = \beta_1 + \beta_2 LBMS_t + \beta_3 CRR_t + \beta_4 MPR_t + \beta_4 TBR_t + \mu_i$ .....(II)

3.2. ARDL Model Specification

The motivation behind the choice of ARDL model for this work is as a result of various diagnostic tests such as unit root test and Bound Test performed on the variables of interest in this paper. Due to different orders of integration of the variables i.e. I(1) and I(0), it is pertinent that the paper considers an autoregressive lag model to address its objective (Pesaran & Pesaran, 1997; Pesaran, Shin & Smith, 2001).

In a general form, ARDL model can be specified as follows:

ARDL (1, 1) model: $Y_t = \mu + \alpha_1 Y_{t-1} + \beta_o X_t + \beta_1 X_{t-1} + U_t$ .....(III)

Meanwhile, Y_t and X_t are stationary variables, and U_t is a white noise.

Therefore, in an explicit way the model to capture the analysis of this work could be stated thus:

$$EXR_t = \alpha_0 + \alpha 1 EXR_{t-1} + \alpha 2 BMS_{t-1} + \alpha 3\, CCR_{t-1} + \alpha 4\, MPR_{t-1} + \alpha 5\, TBR_{t-1} + \varepsilon_{1t} \text{---------- (IV)}$$

$$\Delta EXR_t = \beta_0 + \sum_{i=1}^{p} \beta_1\ \Delta\, EXR_{t-1} + \sum_{i=0}^{p} \beta_2\, \Delta BMS_{t-1} + \sum_{i=0}^{p} \beta_3 \Delta\, CCR_{t-1} + \sum_{i=0}^{p} \beta_4 \Delta\, MPR_{t-1} + \sum_{i=0}^{p} \beta_5 \Delta\, TBR_{t-1} + \varepsilon_{2t} \text{---------- (4)}$$

Where EXR proxies exchange rate, BMS denotes broad monetary supply, CCR is used to capture cash reserve requirement, MPR is used to represent monetary policy rate, TBR means Treasury bill rate, ε_i is error term. t =1990-2016. Meanwhile, term β_1- β_5 is parameters/ coefficients: β_1 β_2 β_3 β_4 β_5 <0

Table 1. Descriptive Statistics of Annual Data Series (1990-2015)

Descriptive Statistics	EXR	BSM	CCR	MPR	TBR
Mean	4.243069	7.471481	7.425662	18.76926	13.19889
Median	4.795544	8.000000	7.577082	12.22000	12.95000
Maximum	5.535333	14.00000	9.980804	72.84000	26.90000
Minimum	2.084156	1.000000	3.967591	5.380000	6.130000
Std. Deviation	1.036382	3.918285	1.872430	17.75316	4.783067
Skewness	-0.755576	-0.211443	-0.222786	1.914774	0.742558
Kurtosis	2.006515	1.764428	1.798574	5.424036	3.776881
Jargue-Bera	3.679418	1.918656	1.847204	23.10906	3.160252
Probability	0.158864	0.383150	0.397086	0.000010	0.205949
Sum	114.5629	201.7300	200.4929	506.7700	356.3700
Sum. Sq. Deviation	27.92630	399.1769	91.15587	8194.537	594.8211
Observation	27	27	27	27	27

Source: Authors` computation (2019)

Before the estimation of the econometric model, an effort was made to examine the statistical features of the selected variables in this paper. However, the table above shows the descriptive statistics with the average values of 4.24%, 7.47%, 7.43%, 18.77%, and 13.19% for exchange rate, broad money supply, cash reserve requirement, monetary policy rate and Treasury bill rate concurrently between 1990 and 2016. The Jarque-Bera estimates indicate that all the variables are fairly distributed across the period because the values of their kurtosis are not far from 3. Also, the mean and median values of the selected variables for the analysis tend to converge which justified the submission of Karmel and Polasek (1980).

Table 2. Unit Root Test

Variables	ADF Test			PP Test		
	Level	1st Diff.	Remarks	Level	1st Diff.	Remarks
EXT	-2.981038**	-2.986225**	I (1)	-2.981038**	-2.986225**	I (1)
BSM	-2.981038**		I(0)	-2.981038**		I(0)
CCR	-2.981038**	-2.986225**	I(1)	-2.981038**	-2.986225**	I(1)
MPR	-2.981038**		I(0)	-2.981038**		I(0)
TBR	-2.981038**	-2.986225**	I (1)	-2.981038**	-2.986225**	I (1)

Source; Authors` Computation (2019)

** %5 level

The table above shows the result of unit root test carried out through the estimation of the standard Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. This test is very pertinent due to the problem of spurious regression which could emanate from the analysis of time series data if such data is not stationary. Succinctly to put, the estimated results in the above table clearly confirmed that the data are a mixture of I (0) and I (1).

Table 3. ARDL Bounds Test

Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	k
F-statistic	2.644090	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
5%	2.86	4.01

Due to the mixture of stationarity and non-stationarity of the adopted data for this work, it is expedient to examine the existence or otherwise of the long run equilibrium relationship among these variables with the application of Bound Test. (Pesaran & Pesaran, 1997; Pesaran, Shin & Smith, 2001). Therefore, the result presented in the above table indicates that the Null hypothesis of no long run relationship could not be rejected because the upper and lower Critical Value Bounds at all level of significance is greater than the value of F-Statistic. Hence, there is no presence of cointegrating relationship among the variables in the model. The outcome of this test warrantees the estimation of short run relationship with adoption of ARDL model.

Table 4. Short Run Relationship

Dependent Variable:

Selected Model: ARDL(1, 1, 0, 1, 1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LEXR(-1)	0.645359	0.147948	4.362055	0.0004
MPR	0.010524	0.035242	0.298635	0.7688
MPR(-1)	0.141363	0.055125	2.564436	0.0201
LBMS	0.261780	0.112112	2.334992	0.0321
CRR	0.069700	0.032137	2.168821	0.0446
CRR(-1)	-0.062878	0.034440	1.825725	0.0855
TBR	0.034811	0.028329	1.228798	0.2359
TBR(-1)	-0.113073	0.039487	2.863579	0.0108
C	-1.452117	0.842309	1.723973	0.1028
R-squared	0.955189			
Adjusted R-squared	0.934101			
Durbin-Watson stat	2.011637			

Source: Authors` computation (2019)

The ARDL result of the short run relationship between monetary policy and exchange rate in Nigeria is presented in the above table. The estimated result shows that monetary policy rate has a significant positive impact on exchange rate in the short run. This result is line with the submission of Michael (2010) despite the

adoption of different methodology. But it contradicts the argument of Umar (2013) with Nigerian data and Zulu and Paul (2008) with Zambian data. Similarly, broad money supply has a positive and significant impact on exchange rate. This finding corroborates the assertions of Umar (2013) and Zulu and Paul (2008), meanwhile Paul, Kalu and Paul (2017) found opposite result. Credit reserve requirement at lag 1 has an insignificant negative impact on exchange rate. This result is line with Zafar and Sabo (2013). However, Treasury bill rate at lag 1 has a negative and significant relationship with exchange rate. This result confirms the propositions of Zafar and Sabo (2013), Ahmed and Rafar (2009), Zulu and Paul (2008). But Paul, Kalu and Paul (2017) reported an insignificant result. Consequently, it is worth of note to pinpoint that credit reserve requirement and Treasury bill rate have expected relationship with exchange rate in this study.

Furthermore, the monetary policy variables explained about 96% of total variation exchange rate in Nigeria. This means the model for this work is good.is influenced by the monetary policy variables. This implies a good fit. In the same vein, the DW statistic is approximated to 2. This shows there is absence of both serial and auto correlation in the model.

3.4. Conclusion and Recommendations

This paper has examined the relationship between monetary policy variables and exchange rate in Nigeria between the periods of 1990 and 2016 using Bound Test and ARDL model. The findings originated from this work could be summarized as follows: credit reserve requirement and Treasury bill rate have a negative relationship with exchange rate. Conversely, monetary policy rate and broad money supply have a positive relationship with exchange rate in the country. The implication of this result is that when exchange rate stability is the target of policy makers in Nigeria, manipulating the monetary policy variables will induce exchange rate accordingly in the short run. However, due to this important findings, this paper makes the following vital policy recommendations for the monetary authorities, policy makers, financial institutions regulators and future researchers.

1. Due to the high volatility in exchange rate in Nigeria currently, it is a matter of urgency that the monetary authorities should increase the credit reserve requirement of the commercial banks. Also, the Central bank should increase that rate at which it sells Treasury bill to the commercial banks. The multiplier effect of this policy will reduce the level of high powered money and consequently stabilize the exchange rate in the short run.

2. The monetary authorities should embark on contractionary monetary policy. This will cause declining in the level of broad money supply and monetary policy rate and eventually lower exchange rate depreciation in the country.

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Global Commodity Prices and Stock Market Nexus: Sub-Sahara African Perspective

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Abstract: Many SSA countries are exports dependent and rely heavily on global price of their primary commodities to make rational economic decisions. It is against this background this study investigates the level of interdependence between global commodities prices and stock market returns in selected SSA countries. For the purpose of this empirical investigation, two largest stock markets were selected based on market capitalization namely Johannesburg Stock Exchange (JSE) and Nigerian Stock Exchange (NSE). Specifically; we examined the relationship between global commodities prices and Stock market returns and the direction of causality between the variables following Eagle Granger causality procedures. In addition, we determined the effect of global commodities' prices movement on stock market returns using ARDL estimation technique. The results of our analyses show that there is significant long-run relationship between global commodities prices and stock market returns. Also, there exist a bi-directional causal relationship between global commodities prices and Stock market returns in the two markets. Furthermore, the results of ARDL estimation reveal that global commodities prices have short-run and long-run effects on stock market returns in the two markets.

Keywords: Market Capitalization; Causality; ARDL

JEL Classification: G1; C2; C5

1. Introduction

Almost half of sub-Saharan countries are net exporters of commodities. To these set of countries, commodities, raw or partially processed, have been considered as the most important exports (Page & Hewitt, 2001). More importantly, global commodity prices change and fluctuation has been regarded as crucial element of external macroeconomic environment they have to constantly contend with. The global commodity prices dictate the revenue generated from the export of commodities and possibly, the macroeconomic environment in these countries. Based on this, it is convenient to argue that rational economic decisions including decision to invest in

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stocks maybe meaningfully influenced by the movement in global commodities price.

The entire world has become a global village and this influences the rate at which information moves from one market to another including Sub-Saharan stock markets. Globally, there is increasing attention on the nexus between global commodity prices and stocks performances. However, the preponderance of these studies had their focus on stocks from developed countries (Sadorsky, 1999; Hamilton, 2003; Choi & Hammoudeh; 2010; Killian & Vigfusson, 2011). In recent time, studies with focus on emerging stock markets are also springing up (Iscan, 2015; Chebbi & Derbali, 2015; Arfaoui & Ben Rejeb, 2016). Similarly, in sub-Saharan Africa, country specific studies also exist (Mongale & Hinaunye Eita, 2014; Musawa & Mwaanga, 2017).

Generally, many of these studies mostly determine the co-movement or otherwise between the global commodities price and stocks performances without examining the issue of causality. Supposedly, if relationship exists between commodity prices and stocks performances, is it a short-term relationship or long-term relationship. More importantly, various types of commodities exist in the market namely hard commodities and soft commodities. The nature of commodity price index includes in the study may influence the outcomes of the empirical investigation.

To ensure the uniqueness of this study in particular and enrichment of literature in this direction in general, we investigated the causal relationship between global commodity prices using different commodities indices and stocks performances in two selected sub-Sahara African countries. We also determined if the relationship exists either in short-run or long-run. While doing this, we also investigated the effect of global commodity prices index on stocks market returns in the sub-region. This is very crucial as more information will be provided to potential investors and market analysts as regard the two variables. Apart from this introductory section, the study is basically divided in four sections. Section two focuses on global commodity prices and financial variables in the two selected countries and section three presents extant literature review. Methods and empirical analyses are presented in section four and section five which the last section focuses on results and its discussion.

2. Global Commodity Prices and Stock Market Performances in Nigeria and South Africa

According to World Bank 2018 reports, growth in Sub-Saharan Africa is estimated to have rebounded to 2.4 percent in 2017, after slowing sharply to 1.3 percent in 2016. The rise is anchored on recovery in Angola, Nigeria, and South Africa the region's largest economies supported by an improvement in commodity prices.

Based on this, we casually observe the dynamics of global commodity prices and stock market performances in the selected countries.

Figure one shows the graphs of annual percentage change in NSE index and global prices indices of fuel and non-fuel commodities between years 2000-2017 in Nigeria. Majorly, there is evidence of cyclical movement and it is common to the three variables. It is also noticeable that the expansion phase of NSE index predates that of fuel commodity price index but it coincides with non-fuel commodity index in years 2002-2007. However, 2008 financial crisis seems to exert so much pressure that the three variables experienced contraction simultaneously. Subsequently, the three variables display higher level of co-movement. In summary, Nigeria being an oil producing economy, stocks performance seems to move together with fuel commodity price index than non-fuel commodity price index.

In figure two, the graphs show annual percentage change in JSE index and global prices indices of fuel and non-fuel commodities between years 2000-2017 in South Africa. Just like situation in Nigeria, there is discernible evidence of cyclical movement in JSE stock index and global commodity prices for fuel and non-fuel. By expectation, South Africa being a net importer of fuel, should not ordinarily has its stock price index moving together with price of fuel commodity index but this seems to be the case in years 2002 -2007. In year 2008, Fuel and non-fuel commodity prices index experienced simultaneous contraction with JSE stock price index and they face expansion in the year 2009. This co-movement seems to be persistent till 2012 when there is a bit of divergence in their movements. However, there is still evidence of shocks and reactions among the three variables in the figure. Expectedly, non-fuel price index and JSE stock prices index show better evidence of co-movement than fuel price index.

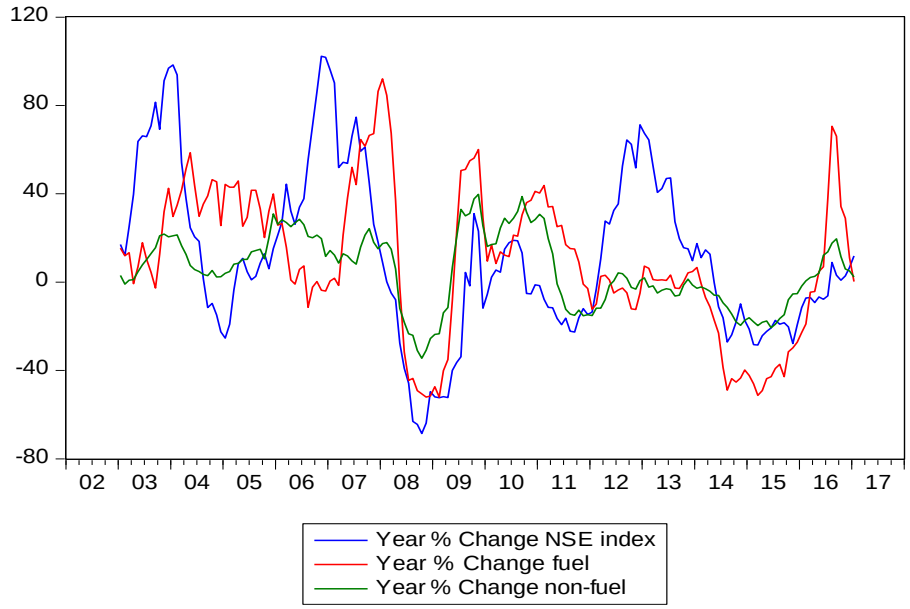

Figure one. NSE Index and Global Commodity Prices

Sources: Author's computation based on IMF data

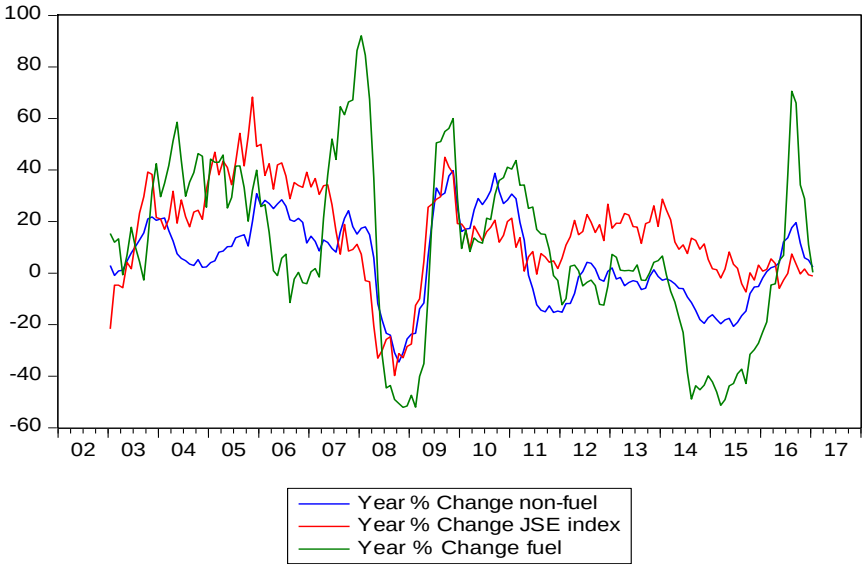

Figure two. JSE Index and Global Commodity Prices

Sources: Author's computation based on IMF data

Table one shows selected key indicators of NSE and JSE market. Looking at the first column, the two markets have considerable number of listed companies. However, the number of listed companies has been declining continuously this may be due to increasing in transparency and stringent conditions attached to listing in these two markets. In the second and third column, the total value of stocks traded and market capitalization as a percentage of GDP are reported. The figures as reported show that there are remarkable differences between NSE and JSE based on these two indicators. JSE total value of stocks traded as percentage of GDP of 136.2% in 2016 indicate high level of liquidity within the economy compared to 0.37 in NSE. JSE market capitalization as a percentage of GDP in 2016 is 321.98%. This shows high financial Deeping within South African economy unlike Nigeria that posts 7.36% during the same period.

Table 1. Stock Market Indicators

Listed domestic companies, total					**Stocks traded, total value (% of GDP)**			**Market capitalization of listed domestic companies (% of GDP)**		
Year	**2004**	**2008**	**2016**	**2017**	**2004**	**2008**	**2016**	**2004**	**2008**	**2016**
NSE	206	212	169	166	1.91	8.03	0.37	18.06	23.09	7.36
JSE	369	367	303	294	36.59	70.58	136.2	193.29	168.12	321.98

2. Literature Review

The issue of relationship between global commodity prices and stocks performance has been given serious attention in the literature. However, the important positions these variables occupy in any economy and lack of consensus in the literature have necessitated the need to continuously revisit the link between these variables. Several authors have examined this link using different methods and markets both in developed and developing economies.

Starting with developed countries, Sadorsky (1999) examined the effect of oil price shocks on stock returns in OECD countries using vector autoregression. After rigorous analysis, the study concluded that oil price movement contributes a huge fraction of the forecast error variance in real stock returns. The study further argued that oil price shocks are more important to stock returns than interest rate in OECD countries. Papapetrou (2001) adopting similar technique on monthly data for Greece concluded that oil prices drive stock price dynamics. These finding downplays the assertion of Adelman (1993, p. 537*).* However, most of these studies only singled out the oil price from the available commodity prices without examining what the impact of other commodity prices could be on stock returns.

Another study by Park and Ratti (2008), using multivariate VAR analysis, reported that oil prices shocks have significant effect on real stock returns for US and 13

European countries over the period of 1986 to 2005 using monthly data. In separately study by Malik and Ewing (2009) employing bivariate GARCH models to investigate the volatility transmission between weekly WTI oil prices and equity sector returns from 1992 to 2008 reported evidence of spillover effect. Moving away from oil price, study by Choi and Hammoudeh (2010) examined the relationship between commodity prices comprises of Brent oil, WTI oil, copper, gold and silver, and the S&P 500 index with the conclusion that global commodity prices has effect on portfolios in stock markets.

In developing countries, study by Johnson and Soenen (2009) investigated the interaction between global commodity market and stock markets of South and North American countries adopting Geweke feedback measures. They reported the exist of contemporaneous relations between the commodity prices and stock markets after controlling for changes in exchange rates and interest rates. According to them, there is no indication of a lead or lag relationship. Similarly, Chebbi and Derbali (2015) using Dynamic Conditional Correlation established high correlation between commodity returns and QE Al Rayan Islamic index. To the contrary, study by Ildırar and Iscan (2016) using panel data from 10 countries for the period 2012 to 2015 examined the interaction between stock prices and commodity prices of East Europe and Central Asian countries. They argued that no relationship exists between commodity prices and stock markets. Another study by Iscan (2015) also provided evidence of no relationship having employed multivariate Johansen test to investigate the relation between commodity prices and the stock market in Turkey.

In SSA, study by Mensah and Owusu-Antwi (2016) employing Bi-variate VAR-GARCH-BEKK model analyzed the effect of prices of oil and gold on stock market performance in Ghana and the study found evidence of a bi-directional linkage between the Ghana equity market, gold and oil prices. Similar study in South Africa by MONGALE and Eita (2014) used quarterly data cover the period 1994 to 2013. With the aid of Engle-Granger two steps econometric technique, the study reaffirmed that increase in commodity prices is associated with improved stock market performances in South Africa. Recent study by Musawa &Mwaanga (2017) for Zambia arrived at similar conclusion. This study is adding value to the existing studies fundamentally by investigating the issue of causality between global commodity prices and stocks performances and also determine nature of interdependence that exist between these variables. Is it a long-run relationship or short-run relationship?

4. Data and Methodology

4.1. Data

To carry out empirical investigation required for this study, we obtained monthly data for global commodity prices index for fuel and non-fuel from IMF global commodity price index. Also, data on stocks specifically market all share indices were sourced from Security and Exchange Commission in the case of Nigerian Stock Market (NSE) and Bloomberg in the case of Johannesburg Stock Exchange (JSE). Per capita Income data used as control variables for the two markets were obtained from WDI database. All the data were obtained on monthly basis except Per Capita Income which was converted to monthly series using quadratic polynomial.

4.2. Model Specification

To empirically estimate the relationship between Global Commodity Price and stock performances in JSE and NSE, we estimated the following models within the framework of ARDL using monthly data between 2002 and 2017.

$$\Delta \ln NINDEX_t = \lambda_0 + \sum_{j=1}^{n1} a_{j_i} NINDEX_{i,t-j} + \sum_{j=1}^{n2} b_{j_i} \Delta FUEL_{t-j} + \sum_{j=1}^{n3} c_{j_i} \Delta NFUEL_{t-j} + \sum_{j=1}^{n4} d_{j_i} \Delta PNGDP_{t-j}$$

$$\phi_1 NINDEX_{i,t-j} + \theta_1 FUEL_{t=1} + \theta_2 NFUEL_{t=1} + \theta_3 PGDP_{t=1} + \varepsilon_t$$

…..(1)

$$\Delta \ln JINDEX_t = \lambda_0 + \sum_{j=1}^{n1} g_{j_i} JINDEX_{i,t-j} + \sum_{j=1}^{n2} h_{j_i} \Delta FUEL_{t-j} + \sum_{j=1}^{n3} i_{j_i} \Delta NFUEL_{t-j} + \sum_{j=1}^{n4} j_{j_i} \Delta PGDP_{t-j}$$

$$\phi_1 JINDEX_{i,t-j} + \varphi_1 FUEL_{t=1} + \varphi_2 NFUE_{t=1} + \varphi_3 PGDP_{t=1} + \varepsilon_t$$

….(2)

Each equation includes both short-run (first-differenced) and long-run (one-period-lagged level) variables. For the short-run coefficients, each lag length n is chosen by minimizing the Akaike Information Criterion (AIC), and each model is estimated at the optimum lags. In the equation one, $NINDEX$ stands for returns on equity and it is a proxy for stock market performances in NSE. It serves as the dependent variable in the model. Also, *FUEL* and *NFUEL* represent Fuel and non-Fuel global commodity price index which are the independent variables in the model. Similarly, PNGDP represents Per Capita Income which is introduced as control variable in the model also serves as one of the independent variable in the model.

In equation two, all the variables in equation one are repeated except JINDEX and PSGDP. While equation one focuses on NSE variables and global commodity prices index, equation two focuses on JSE variables and global commodity prices index. This implies that the only difference is the introduction of JINDEX and PSGDP as

dependent variable and control variable respectively. JINDEX has introduced represents returns on equity and it is a proxy for stock market performances in JSE.

4.3. Econometric Properties of Data

In an attempt to base this study on sound econometric foundation, an investigation into econometric properties of data was carried out to ascertain their suitability for ARDL method of analysis. To this effect, unit root and co-integration tests were performed and results are reported in table 2 and 3.

The results of Phillips-Peron (PP) unit root test are presented in table 2 both at level and first difference. From the results, the hypotheses of unit root presence can be accepted for all the variables. However, all the variables are stationary at first difference indicating that they are integrated of order one I (1). Based on criticism offered by schwert (1989) on traditional unit root tests Phillips-Peron (PP) inclusive, we performed a robustness check on these results obtained from Phillips-Peron (PP) unit root tests using one of the modified unit root tests. Specifically, Dickey-Fully GLS (ERS) proposed by Elliot et al. (1996) was employed and the results are presented in table 3. The results show that the hypotheses of unit root presence can be accepted for all the variables. As obtained in Phillips-Peron (PP) unit root test, all other variables are stationary at first difference. This basically confirms the results obtained in the earlier tests.

Table 2. Phillips-Peron (PP) unit root test

	Level			**First Difference**			
Variables	**constant**	**Constant and Trend**	**None**	**Constant**	**Constant and Trend**	**none**	
JSE-Index	-0.177	-2.521	2.362	-14.87***	-14.84***	-14.34***	
NSE-Index	-2.232	-2.120	-0.406	-10.89***	-10.90***	-10.95***	
Fuel	-2.094	-1.772	-0.534	-8.173***	-8.236***	-8.192***	
Non-Fuel	-1.964	-1.627	0.199	-8.137***	-8.195***	-8.128***	
PNGDP	-2.105	-0.961	2.041	-9.330***	-9.632***	-8.812***	
PSGDP	-2.401	-0.391	2.704	-8.161***	-8.933***	-6.851***	
CV 1%	**-3.4907**	**-4.0436**	**-2.5861**	**-3.4907**	**-4.0436**	**-2.586**	
CV 5%	**-2.88790**	**-3.45118**	**-1.9437**	**-2.8879**	**-3.4511**	**-1.943**	
CV 10%	**-2.58090**	**-3.15098**	**-1.6148**	**-2.5809**	**-3.1509**	**-1.614**	

Table 3. Dickey-Fully GLS (ERS)

	Level		First Difference	
Variables	**Constant**	**Constant and Trend**	**Constant**	**Constant and Trend**
JSE-Index	1.428	-2.021	-2.295**	-4.677***
NSE-Index	-1.119	-2.021	-2.295**	-4.677***
Fuel	-1.274	-1.767	-8.033***	-8.232***
Non-fuel	-0.673	-1.575	-7.662***	-8.229***
PNGDP	0.396	-1.493	-2.354**	-3.110**
PSGDP	0.371	-1.040	-3.096**	-3.276**
CV 1%	**2.577**	**-3.484**	**2.577**	**-3.484**
CV 5%	**-1.942**	**-2.950**	**-1.942**	**-2.950**
CV 10%	**-1.615**	**-2.660**	**-1.615**	**-2.660**

4.3.1. Bound tests Co-integration

Sequel to non-stationary of our data at level, it is imperative to carry out co-integration tests to determine their long term equilibrium behaviour. To this end, we employed a bound co-integration test. Basically, bounds test can be considered as test that is based on the joint F-statistic with the null hypothesis of no co-integration. According to Pesaran et al. (2001), two sets of critical values for a given significance level can be established in bounds test. The first level is estimated with the assumption that all variables in ARDL model are integrated of order zero, while the second one is estimated with the assumption that the variables in ARDL model are integrated of order one. The rule of tomb is that, null hypothesis of no co-integration is rejected when the value of the test statistic is greater than the upper critical bounds value, while it is accepted if the F-statistic is lower than the lower bounds value.

In an effort to get the best out of ARDL model estimation, we investigated optimal lag length for all the models estimated. The optimal lag lengths were selected based on Akaike Information Criterion (AIC). Based on these criteria, optimum lag of two were selected for all the models. Subsequently, co-integration tests were carried using bound test approach with the stock markets variables as dependent variables. The results are reported in table 3. Following the rule of tomb, the hypotheses of no co-integration can be rejected in the two cases. This provides evidences to support the fact that there is long-run equilibrium between stock returns and global commodity prices in the two markets.

Table 3. Bound Tests

Product	F-Statistics	lower critical value5%	Upper critical value 5%	Cointegrated
JSE-Index	85.21	3.79	4.85	Yes
NSE-Index	18.77	3.79	4.85	Yes

4.4.1. Granger Short Run and Long Run Causality Tests

Generally, the establishment of co-integration indicates the existence of at least one long-run equilibrium relationship among the variables. Thus, it is convenient to say that Granger causality exists among these variables in at least one way but it does not show the direction of causality (Engle & Granger, 1987). Similarly, Engle and Granger (1987) argue that if two nonstationary variables are co-integrated, specifying a vector autoregression (VAR) in first differences will amount to misspecification. In line with the work of Narayan and Smyth (2006), we specify the following dynamic error correction representation for NSE and JSE

$$\Delta \ln NINDEX_t = \theta_{1i} + \sum_p \theta_{11ip} \Delta \ln NINDEX_{it-p} + \sum_p \theta_{12ip} \Delta \ln FUEL_{it-p} + \sum_p \theta_{13ip} \Delta \ln NFUEL_{it-p} + \sum_p \theta_{14ip} \Delta \ln NGDP_{it-p} + \sum_p \theta_{15ip} \psi ECT_{t-1} \quad \text{……..……..(3)}$$

$$\Delta \ln FUEL_t = \theta_{1i} + \sum_p \theta_{11ip} \Delta \ln FUEL_{it-p} + \sum_p \theta_{12ip} \Delta \ln NINDEX_{it-p} + \sum_p \theta_{13ip} \Delta \ln NFUEL_{it-p} + \sum_p \theta_{14ip} \Delta \ln NGDP_{it-p} + \sum_p \theta_{15ip} \psi ECT_{t-1} \quad \text{……(4)}$$

$$\Delta \ln NFUEL_t = \theta_{1i} + \sum_p \theta_{11ip} \Delta \ln NFUEL_{it-p} + \sum_p \theta_{12ip} \Delta \ln NINDEX_{it-p} + \sum_p \theta_{13ip} \Delta \ln FUEL_{it-p} + \sum_p \theta_{14ip} \Delta \ln NGDP_{it-p} + \sum_p \theta_{15ip} \psi ECT_{t-1} \quad \text{……(5)}$$

$$\Delta \ln NGDP_t = \theta_{1i} + \sum_p \theta_{11ip} \Delta \ln NGDP_{it-p} + \sum_p \theta_{12ip} \Delta \ln NINDEX_{it-p} + \sum_p \theta_{13ip} \Delta \ln FUEL_{it-p} + \sum_p \theta_{14ip} \Delta \ln FUEL_{it-p} + \sum_p \theta_{15ip} \psi ECT_{t-1} \quad \text{…….(6)}$$

$$\Delta \ln JINDEX_t = \theta_{1i} + \sum_p \theta_{11ip} \Delta \ln JINDEX_{it-p} + \sum_p \theta_{12ip} \Delta \ln FUEL_{it-p} + \sum_p \theta_{13ip} \Delta \ln NFUEL_{it-p} + \sum_p \theta_{14ip} \Delta \ln SGDP_{it-p} + \sum_p \theta_{15ip} \psi ECT_{t-1} \quad \text{……..(7)}$$

$$\Delta \ln FUEL_t = \theta_{1i} + \sum_p \theta_{11ip} \Delta \ln FUEL_{it-p} + \sum_p \theta_{12ip} \Delta \ln JINDEX_{it-p} + \sum_p \theta_{13ip} \Delta \ln NFUEL_{it-p} + \sum_p \theta_{14ip} \Delta \ln SGDP_{it-p} + \sum_p \theta_{15ip} \psi ECT_{t-1} \quad \text{……(8)}$$

$$\Delta \ln NFUEL_t = \theta_{1i} + \sum_p \theta_{11ip} \Delta \ln NFUEL_{it-p} + \sum_p \theta_{12ip} \Delta \ln JINDEX_{it-p} + \sum_p \theta_{13ip} \Delta \ln FUEL_{it-p} + \sum_p \theta_{14ip} \Delta \ln JGDP_{it-p} + \sum_p \theta_{15ip} \psi ECT_{t-1} \quad \text{……..(9)}$$

$$\Delta \ln SGDP_t = \theta_{1i} + \sum_p \theta_{11ip} \Delta \ln SGDP_{it-p} + \sum_p \theta_{12ip} \Delta \ln JINDEX_{it-p} + \sum_p \theta_{13ip} \Delta \ln FUEL_{it-p} + \sum_p \theta_{14ip} \Delta \ln FUEL_{it-p} + \sum_p \theta_{15ip} \psi ECT_{t-1} \quad \text{……..(10)}$$

All the variables remained as defined earlier under ARDL specification, Δ represents the difference of the variable while p stands for the lag length selected based on Akaike Information Criterion (AIC). Furthermore, first differenced variables give evidences on direction of short-run Granger causality and the t-statistics on the one-period lagged error correction term gives evidence on long-run Granger causality. The results for JSE and NSE markets are reported in table 4 and table 5.

The results as presented in table 4 show that there is a long-run causality running from global commodity prices of fuel, non-fuel and per capita income to stock market returns in JSE at 10% significant level. However, in the short-run only global commodity prices of non-fuel has a strong causal relationship with stock market returns in JSE. Also, there is evidence of weak causality running from per capita income to stock market returns in the market. As expected, the two global commodities prices of fuel and non-fuel show evidence of bi-directional causality in the short-run at 1% significant level. Similarly, stock market returns and global commodity prices of non-fuel show evidence of bi-directional causal relationship at 5% significant level.

In addition, the results in table 5 show of evidence of causal interaction between stock market returns in NSE and global commodity prices. The results show that there is a long-run causality running from global commodity prices of fuel and non-fuel to stock market returns in NSE at 10% significant level. Also, in the short-run there exists a strong causality running from global commodity prices of fuel and non-fuel to stock market returns in NSE at 5% significant level. There seems to be a stronger causality in the short-run than long-run. Similarly, there is evidence of feedback causality running from stock market returns to global commodity prices. This implies that there is bi-directional causal relationship between Stock market returns and global commodities prices (fuel and non-fuel) in NSE.

Table 4. Granger causality for JSE

Source of causation	**Δ lnJindex**	**Δ lnFuel**	**Δ lnNFuel**	**Δ lnSGDP**	**$ECT_{(t-1)}$**
Δ lnJindex		0.06(0.22)	0.28(0.030)**	2.60(0.09)*	-0.03(0.08)*
Δ lnFuel			1.40(0.00)***		-0.06(0.03)***
Δ lnNFuel	0.08(0.05)*	0.23(0.00)***			-0.03(0.18)
Δ lnSGDP					

Table 5. Granger causality for NSE

Source of causation	**Δ lnJindex**	**Δ lnFuel**	**Δ lnNFuel**	**Δ lnNGDP**	**$ECT_{(t-1)}$**
Δ lnNindex		0.19(0.02)***	0.38(0.06)**		-0.03(0.08)*
Δ lnFuel	0.13(0.03)***		1.2(0.00)***		-0.06(0.00)***
Δ lnNFuel	0.05(0.04)*	0.23(0.00)***			-0.03(0.11)
Δ lnSGDP					

4.5. Effect of Global Commodity Prices on Stock Market Returns

The need to investigate the effect of global commodity prices index (fuel and non-fuel) on stock market returns is principally to determine the degree of responsiveness of stock market returns to movement in global commodity prices index. Also, it presents an opportunity to determine the relative importance of global commodity prices index of fuel and global commodity prices of non-fuel on stock market returns. To this effect, table 6 shows the results of estimated ARDL model stated in equation one and two for NSE and JSE markets respectively.

The results in table 6 show that in NSE market; global commodity prices have statistically significant effect on stock market returns at 10% and 5% significant level in the short-run and long-run respectively. This implies that global commodity prices have weak effect on stock market returns in the short-run but the effect is much stronger in the long-run. In the short-run, a unit movement in global commodity prices index of fuel contributes 14% to stock market returns performance while

similar movement in global commodity prices index of non-fuel contributes 35% in NSE. In the long-run, the contributions increase to 30% and 36% for global commodity prices index of fuel and non-fuel respectively. Contrary to expectation in this market, global commodity prices index of non-fuel has more impact on stock market returns in NSE both in the short-run and long-run.

The results in table 6 show that in JSE market; global commodity prices have statistically significant effect on stock market returns at 10% and 5% significant level in the short-run and long-run respectively. This implies that global commodity prices have weak effect on stock market returns in the short-run but the effect is much stronger in the long-run. In the short-run, a unit movement in global commodity prices index of fuel contributes 9% to stock market returns performance while

	dlnFuel	dlnNfuel	dlnNGDP	dlnSGDP	CointEq(-1)	InFuel	InNfuel	InNGDP	InSGDP
Market Variables									
NSE-INDEX	0.14 (0.09)*	0.35(0.08)**	0.43(0.45)		-0.98(0.00)***	0.30(0.00)***	0.36(0.05)**	0.44(0.43)	
JSE-INDEX	0.09(0.06)*	0.37(0.00)***		1.63(0.24)	-1.21(0.00)***	0.07(0.05)**	0.31(0.00)***		1.35(0.24)

similar movement in global commodity prices index of non-fuel contributes 37% in NSE. In the long-run, the contributions increase to 7% and 31% for global commodity prices index of fuel and non-fuel respectively. As expected in this market, global commodity prices index of non-fuel has more impact on stock market returns in JSE both in the short-run and long-run.

5. Conclusion and Policy Implications

Consequence upon thorough econometric investigation of the nexus between global commodity prices and stock market performances in SSA, the following conclusions can be inevitably arrived at. There is a long-run relationship between global commodity prices index (fuel and non-fuel) and stock market returns in SSA. To a large extent, this study is in line with studies by (Chebbi & Derbali, 2015; Arfaoui & Ben Rejeb, 2016) outside SSA and (Gyasi, 2016; Musawa & Mwaanga, 2017a) in SSA. Also, global commodity prices index (fuel and non-fuel) has both short-run and long-run effects on stock market returns in NSE and JSE. Similar study in SSA by Musawa and Mwaanga (2017b) arrived at the same conclusion using Lusaka Stock Market. Thus, it is safe to conclude that global commodity prices index has effect on stock market performance in SSA.

Most important conclusion from this study is that there is bi-directional causal relationship between global commodity prices and stock market returns in NSE and

JSE. This conclusion confirms that SSA stock markets are integrated to global markets and they are part of global interdependencies and the financialization process of commodity markets. Thus, it is important for private investors in the region to take cognizance of this established relationship in their investment decisions especially portfolio diversifications. Government in the region can as well leverage on this relationship to propel growth and design mechanism to absorb global shocks.

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Factor Analysis of the Constraints that Female Entrepreneurs Face in South East of Nigeria

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Abstract: The purpose of this study is twofold namely to investigate the constraints that female entrepreneurs in Akwa Ibom State of Nigeria face, and ascertain the institutional framework that enhance or hinder female entrepreneurship development. A positivist philosophy and a quantitative research design were instituted to determine the degree of the constraints to the development of female-owned SMEs. The instrument for data collection was a semi-structured questionnaire tested for reliability and administered to the participants. The primary data were analyzed using IBM SPSS version 25, which produced a set of descriptive and inferential statistics. Factor analyses show good reliabilities and internal consistencies (ranging from 0.60 to 0.80) for the instrument in relation to the sample. The findings indicate that female entrepreneurs are subjected to economic, administrative, legal, social, and structural constraints (varying in proportions) typical of women in other developing economies. These impact negatively on daily business operations. The study presents new insights into the constraints experienced by female-owned SMEs and therefore enhances the knowledge base for academics, financial institutions, governments and other stakeholders interested in the advancement of female entrepreneurship in this part of Nigeria.

Keywords: Entrepreneurship; small and medium-scale enterprises (SMEs); female entrepreneurs; Nigeria

JEL Classification: L26; L32; L53; C38

1. Introduction

In sub-Saharan Africa (SSA), literature (for instance Nxopo & Iwu, 2014; GEM 2012; Ekpenyong, 2015; Vossenberg, 2013; Mandipaka, 2015; Campos & Gassier, 2017) is awash with constraints faced by female entrepreneurs as they initiate and develop businesses. Most of these constraints are institutional, legal, administrative and uniquely common to developing economies. There are equally writers (such as

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Murrithi, 2017; Iwu et al, 2016; Kehinde et al., 2016; Mwarari & Ngugi, 2013) who have suggested ways of dealing with these constraints. The argument generally expounded, is that finding solutions to the constraints would lead to the enhancement of the entrepreneurial activities of female entrepreneurs.

Generally, sub-Saharan Africa women account for about 70 percent of the informal economy and 33 percent of small and medium scale enterprises (SMEs) in the formal sector. (The Guardian, 2017). Female entrepreneurship is responsible for about 50 percent of the GDP in most economies and thereby impacts the socio-economic development of nations through employment generation, poverty alleviation, wealth and human capital development (Ojo, 2006).

Unfortunately, female entrepreneurship is saddled with high risks, challenges and obstacles relative to their male counterpart, which significantly contributes to their underperformance (Campos & Gassier, 2017; Nxopo & Iwu, 2014; Etim & Iwu, 2018). The MIWE Report (2018) posits that female entrepreneurs "are driven by grit and determination" in developing economies solely on the basis of providing for their families, and hence act as "powerful engines of growth and development as well as financial inclusion" in Africa.

With the prospects of participation in formal wage employment lower for women than men (Hallward-Driemeier, 2011; Vossenberg, 2013) because of lower educational status and job experiences (relative to men), self-employment becomes a compelling option. Female-owned businesses (SMMEs) in Africa are growing more than other regions of the world according to the MasterCard Index of Women Entrepreneurship (MIWE, 2018, Campos & Gassier, 2017). Interesting though, cultural and traditional perceptions of female entrepreneurs in Africa are increasing positively according to MIWE (2018), with the notion that female entrepreneurship is an important driver of prosperity for a country (Gender-GEDI Report, 2013). However, global limitations on women's access to education, non-financial inclusion, limited political and entrepreneurial participation, impede the drive towards enterprise ownership by women in developing countries. At the same-time, culture, gender bias, and stereotyping impact negatively on the ability of female entrepreneurs to grow and expand their businesses (Nxopo & Iwu, 2014).

1.1. Importance of Small and Medium-Scale Enterprises (SMEs)

Small and medium-scale enterprises can be viewed as independent ventures which have a certain number of employees; and are known to play a substantive role in the modernization of the economies of both developed and developing countries. The EU acknowledges that the number of personnel in employment for any SME should be 250 persons with annual turnover of EUR 50 million, or a balance sheet total of EUR 43 million (EU Commission, 2003).

SMEs account for 99 percent of all businesses in developing countries (Fjose, Grunfeld & Green, 2010); 52 percent of private labour force and 51 percent to the gross domestic product (GDP) of the United States (Longenecker et al., 2012). In the United Kingdom (UK), small and medium-scale enterprises provide 62 percent of total workforce and 25 percent of GDP (Burns, 2001; Day, 2004); while in China, SMEs provide 80 percent employment contributing 60 percent of GDP (Sham, 2014). In Italy, France and Germany, SMEs provide 70, 63, and 60 percent respectively of the total labour force (Burns, 2001).

A number of authors such as Billion *et al.,* (2009); Iwu, *et al.*, (2016); Berry *et al.*, (2002), have contextualized the relevance of SMEs to the economic growth and development of several countries. According to Oni and Daniyan (2012), Onwukwe and Ifeanacho (2011), Terungwa (2012), SMEs are the "engines of growth" for developing economies. In the views of Obiwuru, Oluwalaiye and Okwu (2011), SMEs acting as avenues for innovation and employment increase the rate of availability of goods and services bringing about better options for the citizens. This then leads to accelerated growth and increased economic wellbeing.

Industrial activities within SMEs include all forms of industrial development (Muriithi, 2017), ranging from mining, construction, manufacturing, service and hospitality industry to agriculture, fishing and handicrafts. Kamunge *et al.*, (2014) contend that most SMEs are in the service industry, where the level of employment is two-thirds of the total labour force. SMEs due to their importance generate inputs for larger conglomerates, as they integrate into the supply chain for complex and larger developed industries (Muriithi, 2017), as well as providing the platform for Africa's development. Fjose *et al*., (2010) opine that SMEs provide goods and services to customers by acting as the 'engine for sustainable growth and economic development' to African states.

Table 1. SMEs contribution to employment and GDP in some African Countries.

Countries	**GDP (% contribution)**	**Employment (% contribution)**	**Source**
Ethiopia	3.4 percent	90 percent	Central Statistics Agency (CSA) 2003; Gebrehiwol, 2006
Ghana	70 percent	49 percent	Ghana Bank Doing Business Report, 2013; World Bank; 2006; Abor & Quartery, 2010.
Kenya	40-50 percent	80 percent	Mwarari & Ngugi, 2013
Nigeria	50 percent	70 percent	Ariyo, 2011; Kolasinski, 2012.
Rwanda	20.5 percent	60 percent	Mukamuganga, 2011
South Africa	50-60 percent	60 percent	DTI, 2012; Willemse, 2010.
Tanzania	60 percent	20 percent	Echengreenh & Tong, 2005; Ngasongwa, 2002

Uganda	18 percent	90 percent	Uganda Ministry of Trade, Industries and Cooperatives (MTIC), 2015.
Zambia	8 percent	30 percent	Mbuta, 2007
Zimbabwe	40 percent	15 percent	Katua, 2014; Zwinoira, 2015.

Furthermore, across different regions of the world, there is enough evidence [see Table 2] to show that SMEs are equally relevant in terms of employment shares. According to Ayyagari, Beck and Demirgu-kunt (2011), the importance of SMEs correlates with the Gross National Product (GDP).

Table 2. SMEs in the global economy.

Median Across Regions	**SMEs 100**	**SMEs 150**	**SMEs 200**	**SMEs 250**	**SMEs 300**	**SMEs 500**
Africa	54.77	63.79	68.15	76.85	80.58	85.11
East Asia and Pacific	56.79	61.59	67.42	65.70	71.34	71.34
Europe and Central Asia	44.71	53.08	59.46	66.32	67.48	75.47
Latin America	53.72	56.71	64.36	67.77	70.99	78.26
Middle East and North Africa	31.20	48.10	36.63	57.31	58.56	62.30
North America	41.73	39.34	41.99	-	59.27	56.58
South Asia	56.68	65.29	73.61	78.00	80.26	88.56

Source: Ayyagari et al., 2007

SMEs contribution to Employment shares by Region—Median

In Nigeria, SMEs are acknowledged as the foundation for economic development and technological innovation (SMEDAN/NBS, 2013), and provide about 70 percent of the manufacturing base for the economy. With innovative technology, internalization into foreign markets becomes possible and supporting SMEs to make them viable and competitive, improves the wellbeing of the citizens together with improving the economies of sub-Saharan countries (Folabi. 2015).

1.2. Definition of SMEs

SMEs connote small and medium-scale enterprises (Ward, 2018; SMEDAN, 2013). These enterprises are the backbone of most businesses in developed and developing economies. Globally, there is no acceptable and generalized definition for SMEs,

rather it is country and industry specific (Harjula, 2008; Ward, 2018), determined by the status of socio-economic development of any country (Ayyagari, Beck & Demirguc-Kunt, 2007; Mutula & Brakel, 2006). Despite being country and industry specific (Ward, 2018; Harjula, 2008), classification is based on a number of criteria which includes the number of personnel employed, yearly turnover, annual balance sheet; production volume, and assets, either individually or a combination of these criteria (Ward, 2018).

1.2.1. Classification of Micro-, Small- and Medium-Scale Enterprises in Nigeria

The Small and Medium Enterprises Development Agency of Nigeria (SMEDAN/NBS 2013), classifies enterprises into micro, small and medium-scale based on the criteria of employment and assets according to Table 3 below.

Table 3. Classification of micro-, small, and medium-scale enterprises

S/N	Size Category	Employment	Assets (N million) excluding land and buildings
1	Micro enterprise	Less than 10	Less than 5 million
2	Small enterprise	10 to 49	5 to less than 50
3	Medium enterprise	50 to 199	50 to less than 500

Source: SMEDA/NBS, 2013

Uniquely to Nigeria, other institutions such as Bank of Industries (BoI), have a different classification for SMEs as shown in Table 3.1 below.

Table 3.1. Classifications of SMEs (Source: Bank of Industries, 2018)

Enterprise Category	No of employees	Total Assets (N' Million)	Annual Turnover (N' Million)	Loan Amount (N' Million)
Micro	≤ 10	≤ 5	≤ 20	≤ 10
Small	$\geq 11 \leq 50$	$\geq 5 \leq 100$	≤ 100	$\geq 10 \leq 100$
Medium	$\geq 51 \leq 200$	$\geq 100 \leq 500$	≤ 500	$\geq 100 \leq 500$

1.3. Female Entrepreneurship

Entrepreneurship, succinctly, is the mental urge to take risks as well as the potential to be amenable to risk exposure in situations of market uncertainties, and the skill and capacity for predicting things which might prove true, breaking with established norms and conditions, and innovatively responding to the needs and dictates of the market or environment (Etim, 2019).

Women who are induced into productive activities through self-employment are empowered socio-economically. Self-employment then enhances significantly their overall development (Wube, 2010). Self-employment can be through several media running from microenterprises, to small or medium-size productive businesses. These enterprises (both within the formal or informal sectors), provide a means for

economic survival and social benefits for the women, communities and social environments (UNIDO, 2001).

Female entrepreneurs according to Manerkar (2015) represent a group of women or individuals intent on business initiation and creation. They are involved with initiation, planning and control of business operations. Okafor and Mordi (2010:44) are of the consensus that "women entrepreneurs are simply women who participate in total entrepreneurial activities, taking the risks involved by combining resources together in a unique way so as to take advantage of the opportunity identified in their immediate environment through the production of goods and services"

The upward growth in women self-employment has a positive impact on socio-economic development of most economies (Nieman & Nieuwenhuizen, 2009; Pofeldt, 2015; MIWE, 2018) However, several studies point to the fact that experiences of female entrepreneurs are in contrast to those of men, gender constructs being a significant contributor to the disparity in consideration of enterprise ownership and operation (Carter & Shaw, 2006; Nxopo, 2014; Etim & Iwu, 2018; MIWE, 2018).

Female entrepreneurship in the views of Carter and Shaw (2006) represents the ability of women to engage in opportunity recognition, resource access and acquisition, business initiation and creation, together with having the appropriate skills for the management of the enterprise. In the same vein, female entrepreneurs are a group of women or women who have the propensity to identify gaps in the market place, gathering the necessary resources or input of production, ultimately incorporating an enterprise (Adebayo, 2015, p. 3). Businesses with more than 51 percent financial capital or investment, managed solely by women and with over 51 percent employable positions allocated to women are characterized as women entrepreneurship (Vijayakumar & Jayachiyra, 2013).

Gender constructs become important when considering the participation of women in enterprises formation and operation. Vossenberg (2013) opines that women can be found in certain business type; while the Global Entrepreneurship Monitor (GEM 2012) posits that on a global perspective, women are absent in construction and manufacturing sectors, but over-populate hospitality and retailing outfits. Additionally, starting from a very low base without enough capitalization, they resort to using their homes for business initiation and creation. This has a negative impact on how customers view these businesses (Marlow, 2002).

1.3.1. Gender Gaps in Enterprise Formation

There is equal representation for both male and female entrepreneurs in sub-Saharan African (Hallward-Driemeier, 2013) representing about 50 percent of non-farm labour force participation helping to increase livelihood and wellbeing for women (Campos & Gassier, 2017). This is in contrast to other regions globally, especially

in Middle East and North Africa (MENA) where the gender gap to participation is large (Hallward-Driemeier, 2013; Kelley et al., 2015)

The average sales for female-owned businesses in Africa are 13 percent lower than those that are male-owned after factoring in country and sector of operations (Bardasi et al., 2011). In considering Swaziland, Brixiova and Kangoye (2015) emphasized monthly sales and number of employees lower than men-owned enterprises. In Ethiopia, there are large differences in size between female and male-owned businesses (Costa & Rijkers, 2012), while about 28 percent lower for value-added in Madagascar (Norman & Vaillant, 2014) between male and female-owned businesses after factors of firm and entrepreneur characteristics have been taken in account. McKenzie and Woodruff (2015) posit that there is a positive correlation between male entrepreneurs and the sales and profits of businesses even after the control of variables acting against gender, while according to Hallward-Driemeier (2013) average value-added for each worker for female-owned enterprises in Africa were 6 percent lower than firms owned and operated by men after control of firm's characteristics is taken into account.

Hence, it can be argued that gender constructs inherently affect choices that women make in their inclinations to be entrepreneurs and due to these constraints, they end up running smaller, non-profitable enterprises (Carter & Shaw 2006; Vossenberg 2013). That is why most female entrepreneurs gravitate towards retail outfits and the informal sector where entry requirements are miniscule, eventually ending up with "survival-mode" enterprises in sub-Saharan Africa and other developing economies (Vossenberg, 2013; Mushtaq, 2012).

1.4. Statement of the Research Problem

The intent of women to be part of economic activity is reported by several authors (ADB, 2014; Kehinde et al., 2016; Anga, 2014, Nxopo, 2014; UNCTAD, 2014; Mandipaka, 2015). These reports indicate that female entrepreneurship is beneficial to the development of the sub-Saharan economy, despite the notion that their participation is confined to micro-enterprises, small and medium-scale ventures interlaced with low-end technologies, low productivity, management deficiencies, with lower capitalization and turnover. Nonetheless, male-owned enterprises outperform those that are female owned (Bardasi et al., 2011; Costa & Rijkers, 2012).

Pertinent problems which beset the Nigerian female entrepreneur as outlined by Amuchie *et al.* (2015, p. 91) include "poor access to finance or capital, low level of educational achievement, family perceptions about self-employment for women, cultural beliefs and tradition, high competitive environments, male-dominated society, handicaps in mobility, low risk-bearing ability and low achievement expectation". Equally, Ekpenyong (2014) holds the view that more than 50 percent of female-owned businesses in Akwa Ibom State, Nigeria, are subjected to gender-

related constraints when starting or expanding existing businesses. Typically, women "face a range of challenges that arise from the socio-cultural, economic, legal, political, and technological environments in which they live or operate" (USAID KSC, 2010). They experience impeding conditions in locally regulatory, normative, and cognitive systems which discourage them from taking up entrepreneurship as a career or even expanding their existing businesses (USAID Knowledge Services Center (KSC), 2010, p. 1). Unfortunately, female entrepreneurs face additional social, cultural, educational and technological challenges than men when it comes to establishing and developing their own enterprises, together with problems of accessing economic resources (Mayoux, 2001). Additionally, child birth and care giving, extra burdens in raising the family, have a detrimental or negative impact upon their ability to generate income outside the home (ILO, 2004).

Although literature has information in respect of constraints experienced by female entrepreneurs on a global scale including sub-Saharan Africa (USAID KSC 2010; Amuchei et al., 2015; Ekpenyong, 2014; Adebayo, 2015; Vossenberg, 2013; Nxopo, 2014; Kyalo et al., 2014; Mandipaka, 2014; ADB, 2014, UNCTAD, 2014); it is relatively sparse (Ekpenyong, 2015; Akpan, 2015) for Akwa Ibom State (AKS). Thus, there is paucity of information in respect of constraints that female entrepreneurs' in AKS North East Senatorial District (NESD), Nigeria, experience in the creation, growing and expanding of small and medium scale enterprises. On record are schemes and incentives instituted by the government at national, state and local levels (SMEDAN, 2013; Etim, 2019) for the enhancement of female-owned businesses, but generally female entrepreneurs are subjected to several constraints in the daily operations of their venture in other regions of Nigeria. Therefore, this study was initiated to try to ascertain the constraints female entrepreneurs face in this part of Nigeria - Akwa Ibom North East Senatorial District.

1.5. Research Objectives

This research set out to determine:

1 The main constraints for female-owned small and medium scale businesses in AKS North East Senatorial District, Nigeria, and

2. The prospects for female-owned business in AKS.

1.6. Research Question

The research question that this study addressed was: What are the constraints confronting female entrepreneurs in AKS NESD, of Nigeria?

1.6.1. Sub Research Question

The attainment of the above-named objectives, necessitate exploring sub-research questions:

- What factors constraint female entrepreneurship in AKS NESD?
- What is the future outlook for female –owned businesses in AKS NESD?

1.7. Significance of the Research

In sub-Saharan Africa, women form part of the work force powering the economy to new heights, selling all types of products and providing services (World Bank Blog, 2017). However, embedded in the statistics, are limitations that the average female entrepreneur faces daily in business operation. (Amine & Staub, 2009; Singh et al., 2010)

Across Africa, key constraints impede female entrepreneurs (Mandipaka, 2014; Vossenberg, 2013) and despite the fact that gender gap is closing, women still possess lower educational qualifications and fewer skills than men. Generally, women are without capital or assets, and are less likely to access credit without the consent of their spouses. In Malawi, 23 percent of female entrepreneurs use savings of spouses for enterprise formation as opposed to 2 percent for men (Campos, Goldstein & McKenzie, 2015). Regulatory laws against women are eroding fast, but cultural and traditional norms are stacked against women who do not have access to land or property, key collateral components for bank loans. (Brixiova & Kangoye, 2015; Esty, 2014; World Bank, 2017)

Ekpenyong (2014), Akpan (2015), and Amuchei *et al. (*2015), exploring the role of female-owned SMEs in AKS in relationship to economic growth and poverty alleviation noted: "improvements to family income; improved standard of living, more employment opportunities, improved family nutrition, availability of more goods, decrease in unemployment statistics and improved family health (Ekpenyong, 2014, pp. 8-12) as key contributing economic development factors to AKS" However, key militating factors to daily business operation include "poor access to finance, cultural, religious or traditional barriers, high levels of competition, poor motivation, legal problems, lack of supporting infrastructure (Ekpenyong, 2014; Amuchei et al., 2015); inability in balancing life-work interface, minimal turnover from subsistent faming, lack of adequate power supply to sustain perishable goods, poor transportation, and low risk bearing propensity" (Akpan, 2015).

Given the fact that women in Africa resort to self-employment because of the absence of formal employment opportunities, or limited access to wage employment (Hallward-Driemeier, 2013), and considering the underperformance of female-owned businesses in comparison to their male counterparts, tackling these constraints will bring about better performance by female-operated enterprises. More so it is vital to assist female entrepreneurs build enterprises that support employment and poverty reduction in their respective communities for this action encourages employment of other women (Cirera & Qasim, 2014). The thrust of this study is a

quantitative one aimed at determining the constraints facing female entrepreneurs in AKS NESD.

1.8. Delineation of the Study

Delineation in research becomes important to limit the scope of the study area. Akwa Ibom State [latitudes 4^{o} 32' N and 5^{o} 33' N] and longitudes [7^{o}25' E and 8^{o}25' E] (AKS Government Website, 2016) is one of the southeastern states in Nigeria, bounded by Bight of Biafra (Atlantic Ocean) in the south, Rivers State in the west and Cross River on the east. Farming consist of maize, yams, rice, cowpeas, and cassava for subsistence, while cash crops include palm oil, rubber, and cocoa are the main stay for the inhabitants of the state. Shrimping and deep-sea fishing is important for the coastal communities, while mineral deposits are lignite, offshore oil and gas deposits (AKS Gov. Website, 2016). The study area consisted of nine (9) local government areas (LGAs), including Uyo, the state and financial capital.

2. Methodology

The research adopted a positivist research philosophy and a quantitative design for data generation and collation.

2.1. Questionnaire Development

To elucidate the pertinent question raised in section (1.6), a descriptive survey was instituted, for it forms the core fundamental steps in business research process (Zikmund, 2003). Additionally, the semi-structured questionnaire delivered to female entrepreneurs was such that, owners/operators/managers of businesses indicated their agreement or disagreement with the content (Nxopo, 2014). The items in the semi-structured questionnaire included demographic properties, ascertaining the business type, number of years in business operation, and other items on a 5-point Likert scale (scoring 1 to 5).

2.2. Sampling

In research, any sample is a representation of a subset of a population. Essentially, the challenges of time, finance, and manageability imposed on the population (Taylor, 2017; Andale, 2015), necessitated sampling. A probabilistic sampling procedure became necessary to increase equal chances of inclusion in the sampling process. The study employed the Raosoft Sample Size Calculator (2004; Krause in DataBlog, 2012), with an acceptable 5 percent error margin, as well as 95 percent confidence level on a population size of 1000 female entrepreneurs in AKS. Based on the response distribution of 50 percent, 278 became the acceptable sample size and this number (278) is therefore the allowed respondents necessary for any accommodative amount of uncertainty in the study. The sample was purposively obtained due to absence of a database containing names and addresses of female

entrepreneurs in AKS, NESD. Additionally, the respondents came from the service, agriculture and hospitality sectors. Female entrepreneurs are typically absent from mining, construction and manufacturing sectors. This is the domain of male operated businesses and multi-nationals.

2.3. Ethical Considerations

The study took into account ethical considerations for the respondents and ethics here refers to philosophical considerations revolving around decision making dynamics as to what is right or wrong (Fouka & Mantzarou, 2011). In cognizance that research work, involves individuals, communities, and social values, it is necessary to protect the dignity of the subjects (Fouka & Mantzarou, 2011). Research ethics represents the "codification of ethics of science in practice" (NCRAN 2006), thus informed consent, beneficence, respect for anonymity and confidentiality, and publication of pertinent information to research were taken into consideration. Furthermore, to limit coercion and duress the Drop-Off/Pick-Up [DOPU] (Trentelman, Irwin, Peterson, Ruiz & Szalay, 2016) method was introduced for data collation.

3. Data Analysis

A total number of 210 respondents took part in the study and the primary data was generated using IBM SPSS version 25.

3.1. Measurement of Variables

The profile for the dependent variable [female entrepreneurs], was obtained through age, educational and marital status, number of children and years in business operation, number of employees and legal status of their enterprises (Etim & Iwu, 2018). The independent variables are the constraints experienced by female entrepreneurs in this part of Nigeria. These variables were measured with a semi-structured questionnaire as the research instrument.

A 5-point Likert-type scale [1=strongly agree; 2=agree; 3=neutral; 4=disagree, 5=strongly disagree] was introduced into the set of questions to ascertain the social, economic, administrative and legal constraints that impede female entrepreneurship development in AKS NESD, Nigeria.

3.2. Research Findings and Interpretation

A review of literature indicates that there are demographic, environmental, organizational, and legal constraints (Startiene & Remeikiene, 2009; Mathew, 2010) impeding the growth of SMEs in developing countries. Additionally, there are interrelated social problems that confront female entrepreneurs in their quest to

provide for their families by way of self-employment. The findings by way of descriptive statistics have been documented (Etim, 2019; Etim & Iwu, 2018).

3.2.1. Factor Analysis

Generally, factor analysis (FA) can be employed for data analysis to enhance the emergence of causal relationships and patterns, for rationale understanding and better interpretations (Yong & Pearce, 2013). It therefore becomes necessary for constructs and concept development for complicating concepts including socioeconomic status (Rahm, n. d.). Furthermore, it may be seen as a statistical reduction methodology for correlational mapping of a number of variables (Cattel, 1973; Jolliffe, 2002) with the sole purpose of establishing underlying constructs or patterns between existing variables.

In the view of Child (2006), FA employs mathematical models to simplify interrelated measure enabling existing patterns in a set of variables to emerge or according to Harman (1976), factor analysis is an attempt in trying to ascertain simplified methods for interpreting data and parsimony is its primary aim.

Output

The established range for Cronbach's alpha reliability coefficient is from 0 to 1.0 (Gliem & Gliem, 2003). Fortunately, it is acceptable not to impose a lower limit on alpha reliability coefficient. The norm is that the closer the value of alpha (α) is to 1.0, the greater the value for internal consistency of the items in the scale.

Using the formula:

$$\text{‘}_{-} = r\frac{k}{[1+(k-1)r]}$$

Where: k = number of items under consideration

r= mean of the inter-item correlation (Gliem & Gliem, 2003).

According to Gliem and Gliem (2003) the size of alpha is a result of the mean and number of items in the scale.

The rule of thumb is given by George and Mallery (2003) as:

_.9 = Excellent; _> .8 = Good; _.7 = Acceptable; _>.6 = Questionable; _.5 =Poor; and _<.5 = Unacceptable.

The general consensus is that _.8 is a reasonable goal to aim at.

Some questions used in the study, are shown in Table 4 below:

Table 4. Cronbachs' alpha and emergent clusters

S/N	Items in the questionnaire	Cronbach's alpha (α)/reliability	CLUSTERS
1	Business taxes NOT reasonable and no effect on business	.795	α=.705; ADF
2	NO more support from government	.754	
3	Female entrepreneurs in AKS supported by government	.499	
4	Business registration is not complicated	.394	
5	Government policy not important in informal economy	.336	
6	Collateral hurdle to obtaining finance		
7	Employees' attitude positive	.770	α=.705; SF
8	Socially responsible and accepted by community	.743	
9	Better contact with business partners	.650	
10	Have enough legal support from government	.634	
11	Do not suffer discrimination	574	
12	Access to business training	.662	α=.654; EF
13	Technological access is adequate	.639	
14	Financial inheritance sufficient for business	.618	
15	Continuous access to information	.547	
16	Good access to loans/finance	.527	
17	Can obtain managerial skills	.523	
18	Infrastructural problems	-.380	α=. 800; PVF
19	Use of home supports business	.302	
20	Sexual harassment in market	.848	
21	My business more than survival-mode	.849	
22	Discrimination in market place	.783	
23	Pregnancy, childcare affect business	695	
24	Emotional satisfied with work-life	.481	

ADF= Administrative factors; SF= Social factors; EF = Economic factors; PVF = Personal factors.

In summation, Gliem and Gliem (2003) propose that:

"When utilizing Likert-type scales, it is important to make calculations and then report Cronbach's alpha coefficient for internal consistency reliability for the scales or subscales one may be using. The analysis of the data then must use these summated scales or subscales and not individual items. If one does otherwise, the reliability of the items is at best probably low and at worst unknown. Cronbach's alpha does not provide reliability estimates for single items" (p. 88).

3.3. Administrative Factors

Table 5.1. FA for Administrative factors

Component Matrix [(a)]	Component 1
Administration 8: business taxes NOT reasonable and no effect on business	.795
Administration 7: more support from government to improve businesses NEEDED	.754
Administration 6: female entrepreneurs in AKS supported by government	.499
Administration 3: business registration in AKS NOT complicated	.394
Administration 2: government policy NOT important in the informal economy	.338
Administration 4: collateral hurdle to obtaining financing	
Administration 1: have support from government	
Administration 5: interest rate charges are high	

Extraction method: Component Factor Analysis (CFA) [a] ; 1 component extracted

Factor loading analysis for the administrative constraints consisted of 8 items, and of these only administrative factors 7 and 8 with (α=.754 and α=.795 respectively), representing Cronbach's alpha reliability coefficients for internal consistency (Gliem & Gliem, 2003) were accepted.

Given that _> 0.7 is acceptable (George & Mallery, 2003) leading to the number of items in the reliability statistics being reduced to two (2).

Scale: Administration

Reliability Statistics

Cronbach's alpha (α)	Number of items
0.705	2

Table 5.2. Item-total statistics (Administration)

	Scale Mean if item Deleted	Scale Variance if item Deleted	Corrected item-total Correlation	Cronbach's alpha if item Deleted
Administration 7: no more support from government to improve business NEEDED	4.86	.349	.600	
Administration 8: business taxes NOT reasonable and no effect on business	4.65	.861	.600	

It follows that from Tables (5.1 and 5.2), Cronbach's alpha valuation of 0.705 represents the reliability statistics. More so, the alpha (α) values (2 subset) were .794 and .754 respectively. The results indicate an acceptable level of construct validity, as well as the acceptable consistency of the modified questionnaires, resulting from a study for 210 respondents in the determination of institutional support for female

entrepreneurship. Additionally, results from the reliability statistics indicate that the items which form the 8-point scale, had satisfactory discriminating power (Lin et al., 2015, pp. 454-455).

3.4. Social Factors

Table 5.3. FA for Social factors

Component Matrix [a]	Component
Social factor 6: employees attitude positive and helpful to growth	.770
Social factor 5: socially responsible and accepted by community	.743
Social factor 4: better contact/network with business partners	.650
Social factor 12: have enough legal support from government	.634
Social factor 9: do not suffer from discrimination	.574
Social factor 11: my products/services are accepted by customers	.454
Social factor 7: business plays a supporting role in my community	.452
Social factor 3: positive relationship with male entrepreneurs	.428

Extraction Method Principal Component Analysis (PCA) [a] 1 Component Extracted.

Scale: Social factors

Reliability Statistics

Cronbach's alpha (α)	No of Items
.705	7

Table 5.4. Item-total statistics

	Scale Mean if item Deleted	Scale variance if item Deleted	Corrected item-total Correlation	Cronbach's alpha it item Deleted.
Social factor 3: positive relationship with male entrepreneurs	14.62	8.542	.317	.695
Social factor 4: better contact/network with business partners	13.59	5.506	.487	.670
Social factor 5: socially responsible and accepted by community	14.62	7.261	.552	.640
Social factor 6: employees attitude positive and helpful to growth	14.85	7.823	.602	.648
Social factor 7: business plays a supporting role in my community	14.93	8.656	.250	.706
Social factor 9: do not suffer from discrimination	14.87	7.685	.392	.678
Social factor 12: have enough legal support from government	12.30	6.797	.491	.651

The above calculations indicate that Cronbach's alpha (α) for the 7 items resulted in an internal consistency of 0.70 (acceptable) from questionnaires administered on 210 respondents in the determination of social constraints, which contributed to the performance of female entrepreneurs in AKS NESD [see Tables 5.3; and 5.4 above] (Lin et al., 2015)

A Cronbach's alpha (α) value of 0.70 is acceptable (George & Mallery, 2003 cited in Gliem & Gliem, 2003).

3.5. Economic Factors

Table 5.5. FA for Economic factors

Component Matrix [a]	Component 1
Economic factor 3 increase access to business training	.662
Economic factor 8 technological access is adequate	.639
Economic factor 7 financial inheritance sufficient for business	.618
Economic factor 4 continuous access to information	.547
Economic factor 1 good access to loans/finance	.527
Economic factor 5 can obtain managerial skills to run business	.523
Economic factor 10 infrastructural problems undermine business	-.380
Economic factor 6 use of home supports business activities	.302
Economic Factor 11 outlook for business in AKS is good	
Economic factor 2 access to market/limited competition	
Economic factor 9 raw materials for business are expensive.	

Extraction Method: Principal Component Analysis (PCA) [a] 1 Component Extracted

Scales: Economic factors

Reliability Statistics

Cronbach's alpha (α)	No of items
.654	6

Table 5.6. Item-total Statistics

	Scale Mean if item Deleted	Scale variance if item Deleted	Corrected item-total Correlation	Cronbach's alpha if item is Deleted
Economic factor 1, good access to loan/finance	20.26	4.843	.311	.643
Economic factor 3, access to business training	21.08	4.195	.408	.610
Economic factor 4, continuous access to information	21.07	4.474	.373	.628
Economic factor 5, can obtain managerial skills to run business	21.14	4.257	.362	.627

Economic factor 7, financial inheritance sufficient for business	21.07	4.325	.427	.606
Economic factor 8, technological access is adequate	20.79	3.324	.486	.583

The internal consistency for economic factors consisting of 6 items in the subset is 0.65 [The reliability statistics table 5.5 above] (Gardner, 1995, p. 285), consequently "the value of _alpha (α) is maximized when every item in a scale shares common variance with at least some other items on the scale"

In the views of George and Mallery (2003), an alpha value of _0.6 is questionable.

Gardner (1995, p. 285) opines that: a scale may be composed of several clusters of items each measuring a distinct factor, as long as every item correlates well with some other item, the scale will demonstrate internal consistency,' and researchers should guard against conflating internal consistency with uni-dimensionality (Taber, 2016), for a high value for Cronbach's alpha (α) for any particular instrument is measuring the same thing (Taber, 2016).

Hence, a low internal consistency is observed with the economic factors

3.6. Personal Views

Table 5.7. FA for Personal views

Component Matrix	1 Component
Personal view 6: sexual harassment in market affects business activities	.848
Personal view 4: my business more than a 'survival mode" and am happy	.840
Personal view 7:discrimination in market affects mu business	.783
Personal view 5: my business is more than "survival mode"	.753
Personal view 3; pregnancy, childcare affect business venturing	.695
Personal view 2: emotionally satisfied with work-life relationship	.481
Personal view 1: business climate in AKS good for start-up	.395

Extraction Method Principal Component Analysis [(a)] 1 Component Extracted.

Scale: Personal view

Reliability Statistics

Cronbach's alpha	No of items
.796	7

Table 5.7. Item-total Statistics

	Scale Mean if item Deleted	Scale Variance if item Deleted	Correct item-total Correlation	Cronbach's alpha if item Deleted
Personal view 1, business climate in AKS good for start-up	14.20	20.493	.270	.807
Personal view 2, emotionally satisfied with work-life relationship	14.38	20.093	.358	.800
Personal view 3, pregnancy, childcare affects business venturing	13.09	12.473	.565	.793
Personal view 4, my business is _survival-mode' and am happy	13.37	13.099	.745	.720
Personal view 5, my business is more than _survival-mode	13.78	15.490	.611	.753
Personal view 6, sexual harassment in market affects business	14.16	16.518	.727	.744
Personal view 7, discrimination in market place affects business	14.34	16.600	.675	.750

The reliability statistics for the total of 7 items gives a value of 0.796 or [∞ 0.8], relatively good (George & Mallery cited in Gliem & Gliem, 2002) for the personal views. This value shows that the internal consistencies for personal views among the sample respondents are acceptable.

Table 6. FA frequency

	Economic factors	Administrative and legal	Social factor	Personal factors
N Valid	210	210	210	210
Missing	0	0	0	0
Mean	4.180	4.755	2.376	2.319
Median	4.167	5.000	2.571	2.429
Mode	4.2[(a)]	5.0	2.7	2.9
Standard Deviation	0.3983	0.6834	0.4446	0.6621
Minimum	3.3	1.0	1.3	1.0
Maximum	4.8	5.0	3.1	3.6

(a) Multiple modes do exist. The smallest value is shown

A review of Table 6 (FA Frequency) indicates that the mean represents the central location of a random variable, and for the sample (210 respondents) purposively selected, the sample mean will remain a random variable (Salkind, 2010). It should also be noted that sample mean would vary with each sample taken from the population (Salkind, 2010). The mean values vary from 4.18 (economic factors), to 4.76 (administrative and legal factors), to 2.38 (social factors) and 2.31 for personal views.

From the FA frequency, it can be interpreted that a mean value varying from 3.50 to 5.00 denotes a major challenge confronting female entrepreneurs in AKS NESD; a range of 2.00 to 3.45 would denote a minor challenge; and less than or equal to (≤ 2.00) indicates minimal challenge that the sample is subjected to. Therefore, utilizing this premise, FA results show that economic factors (mean=4.180), together with administrative and legal factors (mean = 4.755) are major challenges to female entrepreneurship in AKS. At the other end of the spectrum, social factors (mean = 2.376) and personal factors (mean = 2.319) are minor challenges to female entrepreneurship.

4. Discussion

The demographics of respondents indicate the age for active participation and productivity in entrepreneurship to be 25-44 (59%) and 45-55 (41%). This is in line with the findings of Reynolds *et al.*, (2000), and studies from Kauffman Foundation, Duke, MIT (Deeb, 2014), reporting average age for entrepreneurial activities as 40 years. Adeyemi (2007) contends that a typical Nigerian female entrepreneur is 41 years old, married with children, have been groomed from an entrepreneurial home, has 8 years of experience and runs a business where she is the major owner with family members as employees. Marital status equally plays a role in self-employment considering that married women (64%) constitute a greater share of women in enterprise formation. It could be argued that marriage provided the emotional stability and financial resources needed to be a successful businesswoman. The proportion of single women (16.2%), widowed (14.8%) and divorced (4.3%) also contributed to female-owned SMEs in AKS.

Access to loan for start-up and expansion was a major constraint given that female entrepreneurs'. (96%) were in disagreement with the item— "Do you have access to loans/finance for business operation?" A mean (4.82), mode (5.0) showed access to loan acting as a major constraint (UNCTAD, 2014; ADB, 2014; Akpan, 2015; Mandipaka, 2016; KSC, 2010; Adebayo, 2015; Ekenyong, 2014). Competition in the market place also became a major constraint (95%; mean = 4.33; mode = 4) and inability to be actively involved in skill training and development. (79%, mean=4.00; mode=4). Technology support and use in daily business operation was a major constraint (89.5%, mean=4.29; mode=4.0). Business processes have been reported to be catalyzed by ICT adoption and use (UNCTAD, 2014; ADB, 2014; Genpact, 2014).

In summation, the results show that four (4) factors derived through factor analyses, are responsible for the slow pace of development of female entrepreneurs in AKS. These factors are - Economic, Administrative, Social and Personal. The core economic factors include technological access; access to loans, access to training;

and financial inheritance for business operation. The administrative factors include business taxes, and support from government. Social factors are employees' attitude necessary for the growth of businesses; social networks and contacts with business partners, discrimination in the market place, and female-owned businesses playing a supporting role in community.

5. Study Limitations

Unfortunately, during the pilot study, the instrument was pre-tested with 20 respondents (2 per local government area). Perhaps a larger number of respondents during the pilot run could have increased reliability However due to cost constraints this was not possible. More-so, the study concentrated in one senatorial district in AKS. It is necessary to carry out subsequent studies in other parts of the State before generalization could be made.

6. Conclusion, Implications and Recommendations

The constraints experienced by female entrepreneurs do mirror those reported in other developing economies. Female entrepreneurs in AKS NESD are beset with funding difficulties from lack of collateral. Funding or access to credit is a determinant factor for business venturing, and without credit, female entrepreneurs experience some form of limitations in their entrepreneurial activities. Secondly, high cost of inputs, infrastructural challenges leading to more overheads, unstable power supply, unpredictability of customer demands, high interest rate, absence of information relevant to their line of trade, improper training in business management, lack of policy regarding information and communication technology and not being aware or inability to access incentives from government, were the major constraints facing female entrepreneurship in AKS NESD.

This study has some serious implications for government, financial institutions (banks, lenders) and other stakeholders (NGOs) interested in the development and enhancement of female-owned SMEs. We contend that these stakeholders should painstakingly design policies, programmes, and projects that address the core issues that continue to impede the growth of female entrepreneurship in Nigeria. It must not be superficial but sustained action taken for considerable number of years targeted to gender-related constraints.

Recommendations include government subsidizing or providing guaranteed loans (about 40-50%) to female entrepreneurs in the state. Reports (Esty, 2014; Admin, 2015) from other developing economies show female entrepreneurs are more creditworthy than their male counter-parts.

High cost of utilities can be circumvented by guaranteed steps from government for improved infrastructure in the state. Improvement in infrastructure leads to reduction in costs of input for manufacture and operating costs for these businesses. Social capital in relevant for business venturing, therefore women are encouraged to maintain quality social networks (Aldrich, 1989).

Leveraging of information and communications technology have been reported to catalyze female-owned businesses (UNCTAD, 2014; ADB, 2014), and it is therefore recommended that women receive proper training on adoption and use of technology to drive business processes.

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Effect of Company Performance on Earning Per Share with Dividend Payout Ratio as Intervening Variable in LQ 45 Companies

Marlina Widiyanti[1], Mohamad Adam[2], Isnurhadi Isnurhadi[3]

Abstract: The purpose of this study is to look at the effect of company performance on Earning per share with dividend payout ratio as an intervening variable in LQ 45 companies. Company performance is seen from the current ratio, debt to equity, total asset turnover and return on equity. This study uses path analysis techniques. The research data used is the period from 2013-2017. The results showed that not all company performance had a significant positive direct effect on Earning per share in companies LQ 45 during the period 2013-2017 listed on the Indonesia Stock Exchange.

Keywords: Current Ratio; Debt to Equity; Total Asset Turnover; Return on Equity; Earning per Share; Dividen Payout Ratio; dan LQ 45 Indonesia

JEL Classification: G1; M2

1. Introduction

Successful companies are companies that often use good ideas to create good value for shareholders. Factors that influence company value are company size, company growth, company uniqueness, asset value, dividend, electricity savings, capital structure, exchange rate fluctuations, company receivables, total assets, and capital market conditions (Kushartono & Nurhasanah, 2017).

In investing their capital, the company sets a profit policy to follow up on the profit that can be allocated with two gains, namely dividend distribution and retained earnings. Dividends are part of shareholder profits usually in the form of cash while retained earnings (earnings retaining) are available profits held for shareholders.

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The company's growth indicates the company's ability to maintain its business continuity. In general, fast-growing companies have positive results in terms of strengthening their position on the competitive map, enjoying sales that have increased significantly and accompanied by an increase in market food. Fast-growing companies also enjoy the benefits of the positive image obtained, but the company must be extra careful because the success that is obtained causes the company to be vulnerable to negative issues.

Thus, the higher the value of earnings per share the better the performance of the company. However, in predicting the value of earnings per share in the future, an analytical tool is needed to find out whether the financial information produced is useful and useful to determine the progress of earnings per share. One popular analysis tool is financial ratio analysis, the ratio in financial statement analysis is a number that shows the relationship between the elements of financial statements stated in a simple mathematical form (Jurningan, 2011).

The theory used to simplify this research information is theory according to the bird-in-the-hand theory, shareholders prefer high dividends compared to dividends to be distributed in the future and capital gains. This theory assumes that dividends are more certain than capital income. There are various considerations which believe that earnings per share are influenced by the company's financial performance. Besides, the company's growth and development is also reflected in the company's financial performance. Management and investors make the company's financial performance the basis for monitoring the company's financial condition. Company performance can be seen through financial ratios in the company's financial statements. The theory used to simplify this research information is theory according to the bird-in-the-hand theory, shareholders prefer high dividends compared to dividends to be distributed in the future and capital gains.

Company financial statements are the results of financial statements during a certain period that are used as information for prospective investors before investing their capital. Information on financial statements issued by companies is the easiest type of information to obtain. Financial statements are very useful for investors to determine the best and profitable investment decisions (Tandelilin, 2010).

2. Literature Review

2.1. Signaling Theory

Based on Signal Theory, rational investors will see that the increase in the value of the company comes from the use of high debt, so investors may offer a higher share price after the company issues debt to buy back the outstanding shares. Investors view debt as a signal of company value (Sudana, 2011).

Judging from investor relations and dividends, unexpected changes in dividend payments are an indication for investors about changes in profits earned by the company which in turn will trigger changes in stock prices. The condition of asymmetric information investors tends to interpret changes in dividends as a change in management's views on the prospects of corporate profits.

2.2. Bird-in-the-hand Theory

Bird in the hand theory is one of the theories in dividend policy, this theory was developed by Myron Gordon and John Lintner. Gordon and Lintner stated that there is a relationship between firm value and dividend policy, the company's own capital costs will rise if the Dividend Payout Ratio is low because investors prefer to receive dividends rather than capital gains, dividend yields are considered to be more secure and safer.

2.3. Earning Per Share (EPS)

According to Fabozzi (2011) Earning per share is a comparison between the profits available to ordinary shareholders (after-tax earnings minus preferred stock dividends) with the weighted average number of shares outstanding during the calculation period do. Formula to determine the number of EPS is:

$$EPS = \frac{NIAT - Devidend\ Preferred\ Stock}{Number\ of\ Share\ Outstanding}$$

2.4. Dividend Payment Ratio

The ratio of dividend payments determines the amount of profit that can be held as a funding source. The greater the retained earnings, the less the amount of profit allocated for dividend payments. According to Munawir (2012), this ratio can be searched by the following formula:

$$Dividend\ Payout\ Ratio = \frac{\text{Dividen}}{\text{net profit}} \text{ X } 100\%$$

2.5. Liquidity Ratio

Liquidity ratio is the ability of a company to measure how liquid a company is. the measurement of the liquidity ratio used is the Current Ratio (CR). CR is a current ratio to measure the ability of a company to pay short-term liabilities or debts that are immediately due at the time of collection. The formula used for CR is:

$$CR = \frac{Current\ Assets}{Current\ Liabilities} \text{ X } 100\%$$

2.6. Solvency Ratio

Solvency ratio is a ratio used to measure efficiently where a company's activities are financed by debt. The proxy used is Debt to equity (DER). DER is a comparison between total company debt to total equity held by the company. According to the formula, the formula used for DER is:

$$DER = \frac{Total\ Liabilities}{Total\ Equity}$$ Kali

2.7. Activity Ratio

Total turnover assets is a ratio to measure the turnover of all company assets and measure the number of sales generated from each of these assets. The greater the TATO ratio, the more income the company gets, so it will indirectly increase the number of dividends that can be given to shareholders. The formula used for TATO is:

$$\text{TATO} = \frac{Sales}{Total\ Asset} \text{x}100\%$$

2.8. Return on Equity (ROE)

According to Diaz & Jufizen (2014), ROE is a measurement of income available to company owners (ordinary shareholders and preferred shareholders) for the amount of capital they invest in the company. In general, capital profitability is analyzed using the formula:

$$\text{ROE} = \frac{\text{net profit}}{\text{Capital/ Total Aktiva}}$$

3. Research Methodology

The scope of this study is to discuss the effect of company performance on dividend payout ratio and return on assets as a variable intervening for companies registered in LQ 45 for the period 2013-2017. The company performance uses the variables Current Ratio, Return on Equity, Return on Assets, Debt to Equity Ratio and Total Asset Turnover. This research data was obtained from the internet (www.idx.co.id and http://www.idx.co.id/id-id/beranda/publikasi/lq45.aspx). The data analysis method used is path analysis with structural equation models as follows:

Sub-structural Equations I:

$$\mathbf{EPS = \alpha + \rho_1 CR + \rho_2 DER + \rho_3 TATO + \rho_4 ROE + \rho_5 DPR + e_2 \ldots\ldots\ldots 1}$$

Sub-structural Equations II:

$$\mathbf{DPR = \alpha + \rho_6 CR + \rho_7 DER + \rho_8 TATO + \rho_9 ROE + e_1 \ldots\ldots\ldots\ldots\ldots\ldots 2}$$

Where EPS is Earning Per Share, DPR as Dividend in Payout Ratio, CR as Current Ratio, DER as Debt to Equity Ratio, TATO as Total Asset Turnover, ROE as Return on Equity, α as Constants, $\rho_{1\text{-}9}$ as Regression Coefficient, and e_1- e_2 as an Error of Term.

4. Results and Discussion

The results of path analysis show the total influence, direct influence, and indirect influence, regarding the role of ROA as an intervening variable. This can be seen from the following table:

Table 1. Direct Effect (DE), Indirect Effect (IE), Total Effect (TE)

PENGARUH	Bobot DE	Bobot IE	Bobot TE
CR → EPS	0,37	0,00	0,37
DER → EPS	1,37	0,00	1,37
TATO → EPS	-0,50	0,00	-0,50
ROE → EPS	0,16	0,00	0,16
DPR → EPS	0,02	0,00	0,02
CR → DPR	0,43	0,08	0,05
DER → DPR	0,39	0,29	0,07
TATO → DPR	0,36	-0,01	0,03
ROE → DPR	0,29	0,03	0,03

Sumber : Output, data diolah peneliti (2018)

The CR path analysis model of EPS in table 1 shows that CR has a direct effect on EPS of 0.37 and indirect effect on EPS of 0.0086. While the total effect of CR on EPS is 0.3786. The magnitude of the regression coefficient direct effect is greater than the regression coefficient of indirect influence (0.37> 0.0086), it can be concluded that the DPR can mediate the effect of CR on EPS.

The DER path analysis model of EPS in table 1 shows that EPS has a direct effect on the DPR of 1.37 and indirect effect on EPS of 0.0078. While the total effect of DER on EPS is 1.3778. The magnitude of the regression coefficient direct influence is greater than the regression coefficient of indirect influence (1.37> 0.0078), it can be concluded that the DPR can mediate the influence of DER on EPS.

The TATO path analysis model for EPS in table 1 shows that TATO has a direct effect on EPS of -0.50 and an indirect effect on EPS of 0.0072. While the total effect of CR on EPS is -0.4928. The small regression coefficient direct effect is smaller

than the regression coefficient of indirect influence (-0.50 <0.0072), it can be concluded that the DPR cannot mediate the effect of TATO on EPS.

The ROE path analysis model for EPS in table 1 shows that ROE has a direct effect on EPS of 0.16 and an indirect effect on EPS of 0.0058. While the total effect of CR on EPS is 0.1658. The magnitude of the regression coefficient direct influence is greater than the regression coefficient of indirect influence (0.16> 0.0058), it can be concluded that the DPR can mediate the effect of TATO on EPS.

Structural equation from table 1 can be formed as follows:

Structural Equation I:

EPS = 0,37CR + 1,36DER – 0,50TATO + 0,16ROE + 0,346e_1

Structural Equation II:

DPR = 0,043CR + 0,039DER + 0.036TATO + 0,029ROE + 0,271e_2

Structural Equation III:

EPS = 0,39CR + 1,36DER – 0,50TATO + 0,16ROE + 0,346e_1

Based on the results of the study stated that directly Debt to Equity Ratio has a direct and significant effect on Earning Per Share (EPS). This result is in line with the Signaling Theory that rational investors will view debt as a signal from the company to repurchase outstanding shares. As a result, the amount of debt that continues to grow makes the influence received and mediated by the company.

Current Ratio has a significant effect on Earning Per Share (EPS). This result is in line with Bird-in-the-hand theory. One theory in dividend policy is that cash in the form of dividends is more valuable than wealth in other forms or with the term "Investors view one bird in the hand as more valuable than a thousand birds in the air." This statement makes Total Asset Turnover accepted and not mediated by the company.

The implications of the results of this study consist of two implications, namely the theoretical implications and practitioners' implications which will be explained in more depth as follows:

a. For investors

The results of this study indicate that the Current Ratio has a significant positive effect on Earning Per Share (EPS), so in setting the percentage of profits in dividend-paying companies. With the increase in the CR and ROE ratios indicate that the addition of profit for shares can gain investors' operational trust in order to increase the presentation of profits in companies in LQ 45.

b. For the company

For companies to make decisions, they consider the use of debt as measured by the Debt to Equity Ratio (DER). This is because of the greater the ratio, the greater the company's profits as measured by Return on Equity (ROE). Companies whose cash and total assets are in line with high levels of profitability will certainly reduce the amount of debt caused by the company's sales tax so that the profit percentage will increase and corporate debt will be reduced in LQ 45. This can attract companies to increase profits as high as high by means of the use of debt that is limited and increase the company's cash sufficiently.

5. Conclusion

Debt to Equity Ratio (DER) has a significant positive (+) direct effect on Dividend Payout Ratio and Return On Asset Turnover (ROE) which has a significant positive (+) direct effect on the Dividend Payout Ratio (DPR). Current Ratio (CR) has a positive direct effect (+) and Total Asset Turnover (TATO) has a direct negative (-) significant effect on Earning Per Share (EPS) and in LQ 45 companies during the 2013-2017 period listed on the Indonesia Stock Exchange. Debt to Equity Ratio (DER) has a significant positive (+) direct effect on Earning Per Share (EPS) which has a positive (+) direct effect on the Dividend Payout Ratio (DPR). Total Asset Turnover (TATO) does not have a direct positive effect (+) not on the Dividend Payout Ratio (DPR) in LQ 45 companies during the 2013-2017 period listed on the Indonesia Stock Exchange. Total Asset Turnover (TATO) has an indirect effect on Earning Per Share (EPS) and is not mediated through Dividend Payout Ratio (DPR). Debt to Equity Ratio (DER) has a direct effect on Dividend Payout Ratio (DPR) mediated by Return On Equity (ROE) in LQ 45 companies during the period 2013-2017 which is listed on the Indonesia Stock Exchange.

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The Effectiveness of Self-Assessment System on Tax Revenue

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Abstract: This paper aimed at determining the influence of knowledge of the taxpayers and penalties to the effectiveness of Tax Self-assessment System in Indonesia. A system applied by a region in tax collection must be effective to support the running of the system used in the taxation of a region. Self-assessment System is one approach for a national and local tax collection system that can be implemented with the aim to help increase the tax income. Self-assessment system gives trust to the taxpayer to calculate, calculate, pay, and report his own tax payable. This study uses the Ttheory of Planned of Behavior (TPB). The samples in this study amounted to 37 taxpayer and the data analyzed using multiple regression. The result show that knowledge and penalties have positive influence to the effectiveness of Self-assessment System implementation. This conclusion is in line with the theory which forms the basis of this hypothesis which the theory reveals that the behavior of an individual arises because of the intention to behave.

Keywords: Tax, Knowledge; Penalties; Self-assessment System

JEL Classification: H20; M48

1. Introduction

Tax is the contribution of the people to the state treasury under the Act (which can be enforced) with no direct (counter achievement) lead services that are used to pay general expenses. The increase of the tax sector as one of sources are still possible and open where as general government revenue from the tax sector continues to increase from year to year. Tax revenue have been targeted by governments will be achieved depending on public awareness of the citizen's order. Public awareness in paying taxes is strongly influenced by the efficiency and effectiveness of government

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activities to socialize awareness of paying taxes through its authority (Supadmi, 2012; Yunianti et al., 2019).

Self-assessment System is a tax collection system that gives authorizes, trusts, and responsibilities to the taxpayer to calculate, pay, and self-report the amount of tax to be paid (Waluyo, 2011). The weakness of the Self-assessment system that gives trust to the taxpayer to calculate, pay, and report his own tax payable in practice is difficult to walk as expected, even abused (Tarjo & Kusumawati, 2006). The system aimed to increase the effectiveness in tax collection, while that is a very important concept because it is able to provide an idea of the success organization in achieving its goals. In an attempt to teaching the notion of abstract effectiveness, it becomes more concrete (and measurable) than some organizational analysis seeks to identify more prominent features associated with this concept. This paper aimed to determine the influence of knowledge of the taxpayers and penalties to the effectiveness of Tax Self-assessment System in Indonesia. This study uses the Theory of Planned of Behavior (TPB). The samples in this study amounted to 37 taxpayer and the data analyzed using multiple regression.

2. Literature Review

Taxation in Indonesia

Effectiveness is a very important concept because it is able to provide an idea of the success organization in achieving its goals. In an attempt to teaching the notion of abstract effectiveness, it becomes more concrete (and measurable) than some organizational analysis seeks to identify more prominent features associated with this concept. Fadzilah et al. (2017) find that tax understanding, awareness to pay taxes, tax services quality and tax penalties have positive and significant effect on SMEs tax compliance.

Steers (Makmur, 2008, p. 125) suggested the most used criteria for looking at the aspects of effectiveness are adaptability, productivity, job satisfaction, and resource search. These variables have been identified with various alternatives, that are as a measure of effectiveness itself and as a variable that re-enfore or helps to increase the likelihood of achieving effectiveness.

According to Marihot (2010, p. 43), in the dimension of taxation there are four functions inherent in the implementation of collection, that are the function of acceptance, regulate, redistribution of income and democracy, which can be described as follows: a. Budgetary Function; b. The Regulated Function; and c. Income retribution Function.

The definition of tax is the contribution of the people to the state treasury under the Act (which can be enforced) with no direct (counter achievement) lead services that

are used to pay general expenses (Mardiasmo, 2013, p. 1).The tax has the following elements (Mardiasmo, 2011, p. 1):

a. Contribution from the people to the state;

The only entitled to collect is the state, the fee is in the form of money (not goods).

b. Under the law;

Taxes are collected on the basis of or with the force of the law and its implemented rules.

c. Without lead or counter achivement services from a country that can be directly appointed. In the tax payment cannot be indicated the existence of individual counter achievement by the government;

d. Used to finance the households of the country, namely expenditures that have benefit the wider community.

Taxes also have a very important role in the life of the state, especially in the implementation of development, because the tax is a source of state revenue to finance all development expenditures. Tax is divided into two main functions namely:

a. Budgetary Function;

Taxes as a source of funds for the government to finance its expenditures.

b. Regulated Functions.

Taxes as a tool to regulate or implement government policies in the social and economic fields.

Meanwhile, taxes in Indonesia are grouped into 3 (three) sections, namely:

a. Tax by Group;

b. Tax by The Characteristic;

c. Taxes Based on the Collecting Agencies.

In order for tax collection does not cause obstacles or resistance, and then tax collection must meet the following requirements:

a. Tax collection must be fair (Terms of Justice);

b. Tax collection should be by law (Juridical Requirements);

c. Does not disrupt the economy (Economic Terms);

d. Tax collection should be efficient (Terms of Financial);

e. Tax collection system should be simple.

The Unitary State of the Republic of Indonesia in the framework of governing the administration is divided into provincial and provincial areas comprising of regency and municipal areas. Each region has the right and obligation to regulate and manage its own government affairs to improve the efficiency and effectiveness of government administration and service to the community. Regions in carrying out government activities are entitled to impose levies on the public.

There are three tax collection systems in Indonesia that can be outlined:

a. Self-Paid by Taxpayers;

b. Stipulated by the Regional Head;

c. Collected by Tax Collector.

Theory of Planned Behavior (TPB) states that in addition to attitudes toward behavior and subjective norms, individuals also consider the behavioral control they perceive i.e. their ability to perform such actions. This theory states that the decision to display certain behaviors is a rational process directed at a particular goal and follows the sequence of thinking. While the appearance of behavior intention is determined by three determinants: a. normative beliefs; b. behavioral beliefs; c.control beliefs.

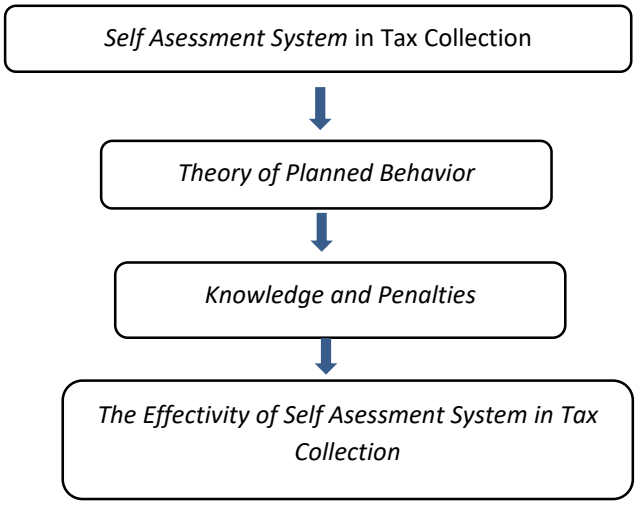

Figure 1. Research Model

Knowledge

The taxpayer's knowledge is related to the taxpayer's discipline in clearing his taxes, because the discipline is based on the degree of disobedience in accordance with the

tax law adopted by a country and the accompanying subordinate sanctions. How much science or insight about taxes owned by the taxpayer. Knowledge of taxation measures the perception of taxpayers related to the knowledge of the system in the embrace, tax rates, obligations and rights, tax regulations in effect, taxation sanctions, as well as tax calculations and reporting.

Penalties

The concept of tax penalties states that the tax penalties is a guarantee that the provisions of legislation taxation (taxation norms) will be obeyed or with words another tax penalties is a preventive tool for Taxpayers not violating the taxation norm.

Hypothesis

The implementation of Self-assessment System can be influenced by the taxpayer knowledge and/or penalties that applied, whether the tax payers know how to calculate, how to deposit tax, and how much tax to be paid. So the hypotheses in this reasearch are as follows:

H_1: Knowledge has significance influence to the effectively of Self-assessment System in application of tax collection.

H_2: Penalties has significance influence to the effectively of Self-assessment System in application of tax collection.

3. Research Method

Method and Sampling

In this study used survey research method using a quantitative approach. Through quantitative approaches, it allows authors to understand a phenomenon more deeply by how each of the things studied should be identifiable, categorized, and clearly identified to then be measured by appropriate means.

The respondent of this research are taxpayers which use Self-asessment system in their tax calculation and tax collection. Considering the research will be aimed to find out the implementation of Self-assessment System for fulfillment of effectiveness indicators and development of social capital components that exist among taxpayers. A series of questionnaire used to collect the data. Questionnaire is a data collection technique that is done by giving a set of written statements to the respondent for the answer (Sugiyono, 2003, p. 199). The samples of this research 37 taxpayers, where the samples are seleted using convinience random sampling method.

Operational Definition

Here is the operational definition for the variables that use in this study:

a. Knowledge

According Rusmana et. al. (2016), knowledge of tax is a unity that cannot be separated in the discussion of the tax system that embraces Self-assessment System. This is due to the strong tendency that an important factor affecting the taxpayers' compliance to a taxation policy depends on how well its understanding of taxation. So the indicators questions in the questionnaire are:

- Knowledge and understanding of rights and obligations;
- Knowledge and understanding of tax rates;
- Knowledge of tax laws can be obtained through teaching and training and through socialization conducted by the government.

b. Penalties

Mardiasmo (2009) explains that tax sanction is a guarantee that the provisions of taxation legislation (taxation norms) will be obeyed, in other words tax sanction is a preventive tool for taxpayers do not violate the taxation norms (Mardiasmo, 2009).

Indicator question:

- Implementation of penalty sanction against tax payers by the tax officer on time;
- The calculation of the implementation of interest penalty sanction against the tax payer who fails to pay taxes is done by the relevant tax payers;
- It is appropriate that late paying taxes is not pardoned and should be fined.

C. Implementation of Self-assessment System

Self-assessment System is a system implemented where the Taxpayer is given trust by the government in calculating, depositing, and reporting tax payable that must be paid. The indicator questions for these variables are:

- Taxpayers pay their own taxes;
- Restaurant taxpayers calculate their own taxes;
- Taxpayers report their own taxe;s
- The tax payable is paid according to the appropriate amount.

Data Validation Method

A measuring instrument is said to be valid if the instrument measures what should be measured or can deliver results as expected by the researcher (Umar, 2003).

Reliability is an index number that indicates the consistency of a measuring device in measuring the same phenomenon. To calculate the reliability is done by using coefficient Cronbach Alpha (Umar, 2003).

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Multiple Regression Analysis

Here is the model of the research that examined using multiple regression analysis:

$$\mathbf{Y = a + \beta_1.X_1 + \beta_2.X_2 + \varepsilon}$$

Where:

Y	= Self -asessment System	X_1	= Knowledge
a	= Constants	X_2	= Penalties
β_1, β_2	= Double correlation coefficient	e	= error

To perform multiple linear regressions with significance test, that is with t-test, while if $p > 5\%$, meaning there is no significant influence between independent variables to the dependent variable. And if $p \leq 5\%$, meaning there is a significant influence between independent variables to the dependent variable (Umar, 2003).

4. Analysis and Discussion

Validation Test

Based on the summary of the validity test results can be seen that the value of r_{count} Product Moment Correlation each item questionnaire question on the variable Knowledge (X_1) has a coefficient greater than the critical value (r_{table}) of 0.312 at a confidence level of 95 percent. Thus, each item of question is declared valid and can be used as a data collection tool.

Table 1. Summary of Validity Test Results for Knowledge Variable

No.	r count	r table	Result
1	0.435	0.312	Valid
2	0.672	0.312	Valid
3	0.627	0.312	Valid
4	0.744	0.312	Valid
5	0.695	0.312	Valid
6	0.703	0.312	Valid
7	0.564	0.312	Valid
8	0.723	0.312	Valid
9	0.808	0.312	Valid

Based on the summary of the validity test results can be seen that the value of r_{count} The Product Moment Correlation of each questionnaire item in the Penalties variable (X_2) has a coefficient greater than the critical value (r_{table}) of 0.312 at the 95 percent confidence level. Thus, each item question is declared valid and can be used as a data collection tool.

Table 2. Summary of Validity Test Results for Penalties Variable

No.	r_{count}	r_{table}	Result
1	0.830	0.312	Valid
2	0.712	0.312	Valid
3	0.730	0.312	Valid
4	0.800	0.312	Valid
5	0.867	0.312	Valid
6	0.713	0.312	Valid
7	0.629	0.312	Valid
8	0.805	0.312	Valid

Based on the summary of the validity test results can be seen that the value of Product Moment Correlation count each question item questionnaire on the variable Effectivity of Self-assessment System (Y) has a coefficient greater than the critical value (r_{table}) of 0.339 at a confidence level of 95 percent. Thus, each item of question is declared valid and can be used as a data collection tool.

Table 3. Summary of Validity Test Results for Effectivity of Self-assessment System Variable

No.	r_{count}	r_{table}	Result
1	0.748	0.312	Valid
2	0.773	0.312	Valid
3	0.578	0.312	Valid
4	0.831	0.312	Valid
5	0.794	0.312	Valid
6	0.635	0.312	Valid
7	0.692	0.312	Valid
8	0.793	0.312	Valid

Reliability Test

Test reliability in this study using Cronbach's Alpha formula. A research instrument can be expressed reliably if the value of r_{count} is greater than 0.60.

Table 4. Summary of Reliability Test

Variables	Coefficient of Cronbach Alpha	Result
X_1	0.844	Reliable
X_2	0.864	Reliable
Y	0.885	Reliable

Multiple Regression Analysis Test

Multiple linear regression is performed to test the influence of independent variables (*Knowledge, and Penalties*) to the dependent variable (*Effectivity of Self-assessment System*). Based on multiple linear regression test, obtained result as follows:

Table 5. Summary of Multiple Regression Test

No	Variable	Regression Coefficient	Sig	t-count
1	Knowledge (X_1)	0.051	0.635	0.479
2	Penalties (X_2)	0.695	0.000	4.482
Constant	=	8.101		
R	=	0.694		
R Square	=	0.482		
Adjust. R Square	=	0.456		
F – count	=	18.614 (Sig. 0.000)		

Based on the tests obtained the regression model as follows:

$$\mathbf{Y = 8.101 + 0\ ,051\ X\ 1 + 0{,}695\ X\ 2 + e}$$

The constant value of 8.101 indicates if the Knowledge and Penalties variables do not change or constant, so that the variable increase in effectivity of Self-asessment System is the value of the regression coefficient of 0,051 indicates that the knowledge variable has a positive influence in effectivity of Self-assessment System.

Table 6. Statistical t Test Results

Model	t	Sig
Constant	1.943	0.059
Knowledge (X_1)	0.479	0.635
Penalties (X_2)	4.482	0.000

While the Penalties variable has $t_{statistic} > t_{table}$ for 4.482 > 1, 683 and *sig* 0,000 ≤ 0,05. This means that the second hypothesis H_2 in receipt. Which means Penalties

significantly influence the effectiveness of dependent variable Self-assessment System.

Based on the results of F test results obtained that states that Knowledge and Penalties have a significant effect on effectiveness of Self-assessment System (Sig. = 0.000). This conclusion is in line with Theory of Planned Behavior (TPB) which forms the basis of this hypothesis which the theory reveals that the behavior of an individual arises because of the intention to behave. Where in TPB 3 determinants (normative beliefs, behavioral beliefs, control beliefs) influence in taxpayer action to make tax payments. Which knowledge and fines will be implemented in conducting Self-assessment System in paying taxes.

However, when testing between each independent variable on the dependent variable it is known that the Knowledge (X_1) variable does not *statistically significantly* influence the effectiveness of Self-assessment System, but in positive influence. But in Istato (2010) knowledge has a significant positive effect on taxpayer compliance in fulfilling its tax obligations. In research conducted by Hendri (2016) states that the knowledge of taxpayers affect taxpayer compliance. However, this study is in line with Damajanti (2015) which in his research revealed that the knowledge of taxpayers has no significant effect on taxpayer's compliance. They suggest socialization provided by the government should not only provide understanding of taxpayers on the implementation of tax regulations, but also provide information that allows taxpayers to voluntarily comply with their tax obligations (Damajanti, 2015).

While the variable Penalties (X_2) significantly influence the effectivity of Self-assessment System. Which means when the penalties, the taxpayer more obedient in calculating and deposit the tax honestly where the system used in the collection of taxes is Self-assessment System which means taxpayers are given the trust and authority in calculating, paying and reporting own tax payable to be paid in accordance with the laws and regulations. This research is in line with Fraternesi (2001) research, states that taxpayers will comply with tax payments when viewing penalties will be more harmful. The more the remaining tax arrears to be paid taxpayers, it will be more severe for taxpayers to pay it off. This research is also in line with research by Hendri (2016) and Rahayu (2017).

5. Conclusions

This paper aimed to determine the influence of knowledge of the taxpayers and penalties to the effectiveness of Tax Self-assessment System in Indonesia. This study uses the Theory of Planned of Behavior (TPB). The samples in this study amounted to 37 taxpayer and the data analyzed using multiple regression. The result show that knowledge and penalties have positive influence to the effectiveness of Self-assessment System implementation. This conclusion is in line with the theory which

forms the basis of this hypothesis which the theory reveals that the behavior of an individual arises because of the intention to behave.

Based on results conclusions above there are some advice that the goverment should give an intensive socialization to the taxpayers to be more aware of their rights and obligations as tax payers. Tax payers also should increase their knowledge about Self-assessment System in taxation in Indonesia.

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