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The relative effect of monetary and fiscal policy on economic development in Africa: a GMM approach to the St. Louis equation

Abstract

With the aid of the St. Louis equation and the general method of moments (GMM) approach, this study investigates the relative effect of monetary and fiscal policy on economic development in Africa within the period 1995–2016. The study shows that money supply has significant positive relationship with GDP per capita while interest rate has significant negative effects. Government spending has significant negative relationship with GDP per capita while taxation has significant positive effects. Other macroeconomic variables such as primary enrolment and openness to trade have significant positive effects while inflation has negative effects. The environmental variable, carbon emissions, has significant negative effects. Among the institutional variables, corruption has significant negative effects. The results therefore support both Keynesian and monetarist positive policy assertions: Money supply, interest rate, government spending and taxation are viable instruments to stabilize output. However, this study shows that utilizing monetary policy and interest rate as policy tools is more powerful than using government spending and taxation. This is in line with the predictions of Milton Friedman and Schwartz (1963) and other advocates of the St. Louis equation. Therefore, in order to attain higher economic development, African economies should rely more on monetary policy as compared to fiscal policy.

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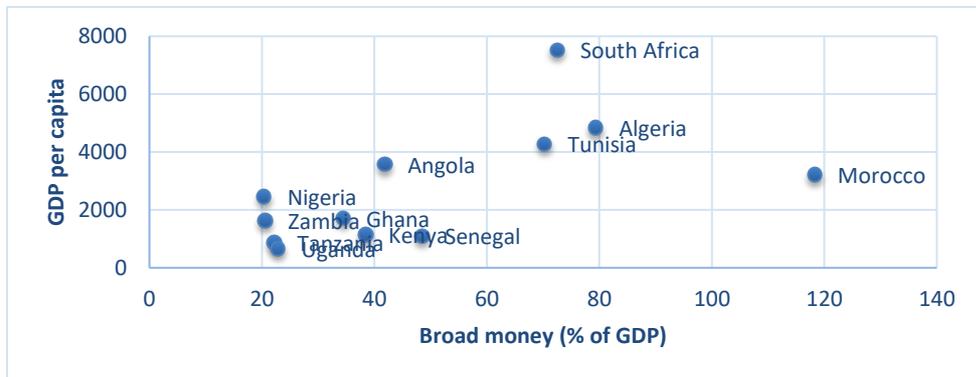
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1. Introduction

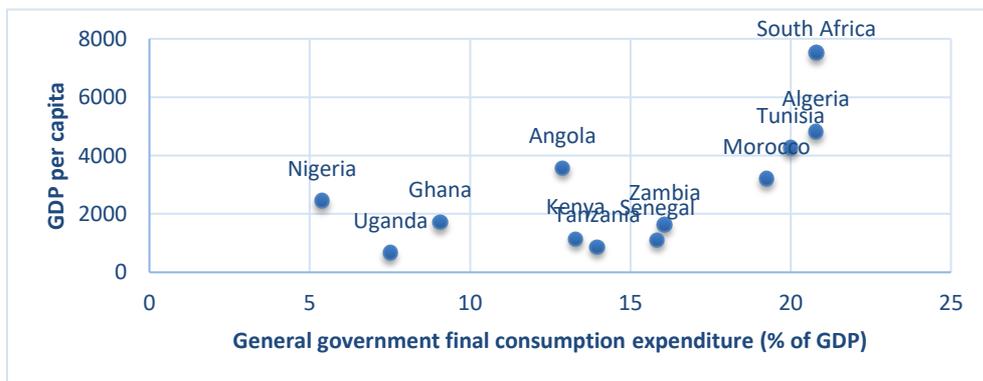
What is the relative effect of fiscal and monetary policy on economic development? The issue of the efficacy of monetary and fiscal policy has over the years sparked controversies among scholars, policymakers and the media based on varying findings (e.g., Adefeso and Mobolaji, 2010; Senbet, 2011; Chowdhury and Afzal, 2015; Nakamura and Steinsson, 2015; Nwaogwugwu and Evans, 2016; Adeniji, Obansa and Okoroafor, 2018; Akinyemi, Ogbuji and Adedokun, 2018; Ramey and Zubairy, 2018; Sims and Wolff, 2018; Evans, 2019a). A strand of the literature has suggested that monetary and fiscal policy have positive effects on economic growth and development (e.g., Nwaogwugwu and Evans, 2016). This is buttressed by Figure 1 and 2 which show the correlation of monetary and fiscal policy with GDP per capita in some selected African countries. Countries with higher money supply and government spending also have higher GDP per capita (e.g., South Africa, Algeria, Morocco and Tunisia). However, the efficacy of both monetary and fiscal policy still remains widely debated and complicated as there exists a division among economists (monetarists and Keynesians) as regards this assertion. Moreover, most of the studies in the literature are in advanced economies, with little empirical attention to Africa. This study fills the gap.

Figure 1. Money Supply and GDP per capita in Africa (2016)



Data Source: World Bank (2017)

Figure 2. Government Spending and GDP per capita in Africa (2016)



Data Source: World Bank (2017)

This study deals with a contemporary issue and is of special relevance to Africa, corresponding with a period when African economies are confronted with a number of growing and extraneous challenges that constitute threats to economic development. The region is confronted with several global and domestic economic challenges: slowdown in growth; rising inflation; weakening global demand; restrictions in capital flows; increased exchange rate volatility; rising debt levels; and depleting external reserves (Adaramola and Wale-Awe, 2017; Amankwah-Amoah, Osabutey and Egbetokun, 2018; Clark, 2018; Evans, 2018; Mamabolo, 2018; Olusoji and Odeleye, 2018; Rogerson, 2018). Confronted with these challenges, policymakers across the continent have made frantic efforts to keep African economies afloat through proactive and at times effective combination of conventional and innovative monetary and fiscal policy to no avail (Evans and Kelikume, 2019; Mesagan, Unah, Idowu and Alamu, 2019; Olasubomi, 2019). To better apply monetary and fiscal policy, research on the relative effect in African economies is clearly called for.

Hence, the objective of this paper is to empirically analyze the relative effect of monetary and fiscal policy on economic development in Africa using the Louis equation and the general method of moments (GMM) approach. The African countries in this study include Algeria, Angola, Botswana, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Democratic Republic of the Congo, Republic of the Cote d'Ivoire, Djibouti, Egypt, Equatorial Guinea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia and Zimbabwe.

The rest of the paper is organized as follows: Section 2 presents the theory and review of literature, while section 3 deals with the data and methodology. Section 4 provides the empirical results while section 5 discusses the results. Section 6 concludes with policy recommendations.

2. Theory and Review of Literature

2.1 Theory

With the great depression in the 21st century, the Keynesian economists led by John Maynard Keynes was of the opinion that lower aggregate expenditures in the economy contributed to a massive decline in income and to employment that was well below the average which made the economy to reach equilibrium at low levels of economic activity and high unemployment (Kaldor, 2015; Tily, 2016). Therefore, to keep people fully employed, governments have to run deficits when the economy is slowing, as the private sector would not invest enough to keep production at the normal level and bring the economy out of recession. Keynesian economists called on governments during times of economic crisis to pick up the slack by increasing government spending and/or cutting taxes (Klein, 1947). Also, the monetarist, including Milton Friedman, argues that the Great Depression was mainly caused by monetary contraction, the

consequence of poor policy-making by the American Federal Reserve System and continued crisis in the banking system, (Krugman, 2007). In this view, the Federal Reserve, by not acting, allowed the money supply as measured by the M2 to shrink by one-third from 1929–1933, thereby transforming a normal recession into the Great Depression. Friedman argued that the downward turn in the economy, starting with the stock market crash, would have been just another recession (Bernanke, B.S. 2000).

In respect of the relationship between money and output, a seminal paper by Milton Friedman and Schwartz (1963) is very important and influential. Their study, as mentioned by Walsh (1998), indicates that variation in the rate of money growth cause variations in real economic activity. However, some economists e.g., Benjamin Friedman and Kuttner (1992), Tobin (1970) have challenged the prediction of Milton Friedman and Schwartz (1963). They argued that the causation from money to output, as claimed by Milton Friedman and Schwartz, might not be the case.

2.2 Conceptual Review

Governments are preoccupied with the responsibility of economic management which is fundamental to the management of the macroeconomic variables such as output, inflation, money supply, aggregate demand, and interest rate which are essential variables that influence the growth path and development of every economy (DeLong, Summers, Feldstein and Ramey, 2012; Dzorgbo, 2017). Economic management is an amalgam of two complementary tools namely: monetary policy and fiscal policy (Nakamura and Steinsson, 2015; Nwaogwugwu and Evans, 2016). Monetary policy is the process by which the monetary authority of a country controls the supply of money, often targeting a rate of interest for the purpose of promoting economic growth and stability. It can either be expansionary or contractionary, where an expansionary policy increases the total supply of money in the economy more rapidly than usual, and contractionary policy expands the money supply more slowly than usual or even shrinks it. Empirical researches show that in order to make accurate assessment of the magnitude, timing and duration of monetary policy, the policymakers need to understand the mechanisms through which monetary policy affects the economy (Nwaogwugwu and Evans, 2016; Stojanović and Stojanović, 2017; Hamza and Saadaoui, 2018; Lin and Ye, 2018).

On the other hand, fiscal policy is a policy instrument that relies on public revenue and public expenditure management to produce the desired effects in an economy. This involves the manipulation of government expenditure, or taxes, or both for the purpose of influencing the level of economic activity, inflation and economic growth (Amacher and Ulbrich, 1986; Nakamura and Steinsson, 2015; Carnot and De Castro, 2015; Nwaogwugwu and Evans, 2016). Fiscal policy can be neutral (when an economy is in equilibrium); government spending is fully funded by tax revenue and overall the budget outcome has a neutral effect on the level of economic activities. Expansionary fiscal policy occurs when government spending exceeds tax revenue, and contractionary fiscal policy occurs when government spending is lower than tax revenue, and is usually undertaken to pay down government debt. The two main

instruments of fiscal policy are changes in the level and composition of taxation and government spending in various sectors. These changes affect the macroeconomic variables such as: aggregate demand and the level of economic activity, income distribution, the pattern of resource allocation within the government sector and relative to the private sector (Higgins and Pereira, 2014; Nwaogwugwu and Evans, 2016; Ramey and Zubairy, 2018; Sims and Wolff, 2018).

2.3 Empirical Review

The issue of the efficacy of monetary and fiscal policies has over the years sparked controversies among researchers based on varying findings (see Adefeso and Mobolaji, 2010; Senbet, 2011; Chowdhury and Afzal, 2015; Nakamura and Steinsson, 2015; Nwaogwugwu and Evans, 2016; Adeniji et al, 2018; Akinyemi et al, 2018; Ramey and Zubairy, 2018; Sims and Wolff, 2018). For example, Benjamin Friedman and Kuttner (1992) examined the postwar evidence of significant relationship between money and income using time-series approach on extended data through the 1980s for the U.S. economy. The empirical findings do not indicate a close or credible relationship between money and income. Their paper, however, has one strong finding that the spread between the commercial paper and Treasury bill rate has very significant information about the movements in real income. In the concluding section of their paper, they expressed their concern about the difficulty of using this spread as an intermediate policy target of the Federal Reserve System because of the continuously changing relationship between policy target and its outcome.

Gramlich (1971) summarized some of the important papers on monetary-fiscal debate. He points out that a paper by Friedman and Meiselman (1963) predicts more stable and statistically significant relationship between output and money than that of output and autonomous spending. Anderson and Jordan (1968) used various measures of monetary and fiscal policy actions and shows that monetary policy has greater, faster and more predictable impact on economic activities. Gramlich (1971) also reports the findings of some other papers such as Ando and Modigliani (1965), DePrano and Mayer (1965) against the monetarist claim. His own study, however, indicated that both monetary and fiscal policy have impact on real economic activity with the indication that money matters greatly.

Friedman (1977) used the St. Louis equation in his paper and claimed that the St. Louis equation now 'believes in' fiscal policy. In response to Friedman's (1977) claim, Carlson (1978) re-estimates the St. Louis equation and argues that Friedman's equation suffers from heteroscedasticity problem. The evidence from the new and corrected estimation does not support Friedman's claim that fiscal policy is more important than monetary policy. His findings suggest that only monetary policy has significant impact on economic activity and fiscal policy does not have any impact on real output.

Likewise, the empirical evidence for developing countries regarding the relative effect of monetary and fiscal policy on economic activities is also mixed. Studies of Jayaraman (2002) for the South Pacific Island Countries, Masood and Ahmed (1980)

for Pakistan, Saqib and Yesmin (1987) for Pakistan and Upadhyaya (1991) for developing countries support the monetarists' view that monetary policy is important for economic activity. Some other studies on developing countries, such as Hussain (1982) for Pakistan, and Darrat (1984) for five Latin American countries found that fiscal policy is more effective than monetary policy in altering real output.

Using a modified version of St. Louis equation, Latif and Chowdhury (1998) for Bangladesh found that fiscal policy is more effective over monetary policy in Bangladesh. This study used the OLS technique based on nominal data for the period 1974-1993. The study suffered from all the limitations indicated by Stein (1980) and Ahmed et al. (1984). They estimated six different equations, out of which 4 have a single explanatory variable. One study on Bangladesh by Hasan (2001) based on the modified version of St. Louis equation predicted that both monetary as well as fiscal policies are important for economic growth. This study used various econometric techniques based on nominal data for the period 1974-1996. The prediction of the paper, however, changes if real variable for income is used instead.

Senbet (2011) investigated the relative effect of monetary and fiscal policy on the U.S. real economic activity, using quarterly data between 1959 and 2010, Granger causality tests and vector autoregressive (VAR) models. The results showed that monetary policy is relatively better than fiscal policy in affecting real output. Jawaid, Arif and Naeemullah (2010) investigated the comparative effect of fiscal and monetary policy on economic growth in Pakistan using annual data from 1981 to 2009. The results showed that both monetary and fiscal policy have significant and positive effect on economic growth. "The coefficient of monetary policy is much greater than fiscal policy which implies that monetary policy is more concerned with economic growth than fiscal policy in Pakistan. The implication of the study is that policymakers should focus more on monetary policy than fiscal to enhance economic growth" (p. 1).

Adefeso and Mobolaji (2010) investigated the relative effect of fiscal and monetary policy on economic growth in Nigeria using annual data from 1970 to 2007. Their results showed that the effect of monetary policy is much higher than fiscal policy and even the exclusion of the degree of openness fails to weaken the higher effects. Chowdhury and Afzal (2015) examined the effect of fiscal and monetary policy on the level of economic activity in Bangladesh using annual data for the period 1980-2012. Their results showed that both monetary and fiscal policy are equally effective in simulating economic growth in Bangladesh. Moreover, there is long run relationship with cointegrated impact on economic growth. Nwaogwugwu and Evans (2016) investigated the effect of fiscal and monetary policy on the sectors of the Nigerian economy using the VAR technique. They showed that the elasticity of sectoral output with respect to monetary policy actions are significant for only three sectors of the Nigerian economy: agriculture, services and wholesale, though the significance differs from sector to sector, subject to the strength and the configurations of the institutional factors in each sector. Fiscal policy actions have no significant impact on any of the sectors.

Therefore, it can be deduced that the literature suggests that both monetary and fiscal policy could influence the pace of aggregate economic activities. However, the relative effect of both still remains widely debated and complicated as there exist a division among economists (monetarists and Keynesians) as regards this assertion. The group that believes in monetary policy actions argued that monetary policy is more powerful than fiscal policy in achieving various economic goals. For example, Milton Friedman and Meiselman, (1963), Anderson and Jordan (1968), Carlson (1978) and Hasan (2001) used the St. Louis equation to provide empirical evidence in favor of their stand. The other group led by Keynes (1964), followed by some noteworthy works, such as Leeuw et al. (1969), Schmidt and Waud (1973), Blinder and Solow (1974) provided basic theoretical and practical ground for the effectiveness of fiscal policy. Though more recent studies such as Adefeso and Mobolaji (2010), Jawaid et al (2010), Senbet (2011), and Nwaogwugwu and Evans (2016) have shown the relative effects of both monetary and fiscal policy, overall, the findings in the literature are ambiguous. Moreover, most of the studies are single country studies, with little empirical attention to the African region. This study fills the gap.

3. Data and Methodology

3.1 Data

The annual panel data used in this study covers the period from 1995 to 2016 for 48 African countries¹. The data on GDP per capita, broad money (% of GDP), lending interest rate, individuals using the internet (% of population), mobile cellular subscriptions (% of population), primary school enrollment, gross fixed capital formation (% of GDP), general government final consumption expenditure (% of GDP), tax revenue (% of GDP), consumer price index, total trade (% of GDP) are sourced from World Bank (2017) database. Data on corruption, and political stability and absence of violence are collected from Economist Intelligence Unit (2016).

3.2 Model Specification

The St. Louis equation has gotten considerable attention from policymakers. For more details about the St. Louis equation, see Andersen and Jordan (1968), Carlson (1978) and Hasan (2001). The St. Louis equation is given as:

$$\Delta Y_t = \text{constant} + m_i \Delta M_{t-i} + e_i \Delta E_{t-i} \quad (1)$$

Where ΔY is change in GNP; ΔM is the change in the money stock; and ΔE is the change in full-employment government expenditures. m and e are regression coefficients of money and government expenditure.

Schmidt and Waud (1973) argued that the constrained Almon lag procedure imposed on the St. Louis equation for estimation purposes may lead to biased and inconsistent estimates and to invalid tests. In order to preclude this criticism, equation 1 is re-written as:

¹ The list of countries is in the appendix.

$$Y_t = \text{constant} + m_i M_t + e_i E_t \quad (2)$$

In line with the objectives of this study, the baseline model is formed from equation (2) as:

$$Gr_t = \tau_0 + \tau_1 Mo_t + \tau_2 Ra_t + \tau_1 Go_t + \tau_2 Ta_t + \epsilon_t \quad (3)$$

Where *Gd* is GDP per capita, *Mo* is broad money (% of GDP), *Ra* is lending interest rate; *Go* is government spending (% of GDP); and *Ta* is tax revenue (% of GDP). Broad money (% of GDP) and lending interest rate are monetary policy variables while government spending (% of GDP) and tax revenue (% of GDP) are fiscal policy variables (Uhlig, 2005; Bernanke, Boivin and Elias, 2005; Nwaogwugwu and Evans, 2016; Evans, 2016; Evans, 2017; Evans and Saibu, 2017; Evans, 2019b; Evans, 2019c).

Further, in the literature, the St Louis equation is criticized for omitted variable bias (Younus, 2012). In other to address these criticisms, other variables that are considered as important drivers for the growth of an economy are included in the model. For example, the literature has established that physical and human capital, and other macroeconomic variables such as inflation and openness to trade are important drivers of the economy (Cuaresma, Doppelhofer and Feldkircher, 2014; Teixeira and Queirós, 2016; Odior and Arinze, 2017; Kelikume and Evans, 2015; Ho, 2018; Evans, 2019b). Therefore, the second model of this study is stated as:

$$\Delta Gd_t = \tau_0 + \tau_1 Mo_t + \tau_2 Ra_t + \tau_3 Go_t + \tau_4 Ta_t + \tau_5 Ph_t + \tau_6 Hu_t + \tau_7 In_t + \tau_8 Tr_t + \epsilon_t \quad (4)$$

Where *Ph* is physical capital (proxied by gross capital formation [% of GDP]); *Hu* is human capital (proxied by primary enrollment); *In* is inflation (consumer price index); *Tr* is trade openness (proxied by total trade [% of GDP]). The identification and proxy of the variables are in line with the literature (see Baldacci, Clements, Gupta and Cui, 2008; Muibi, Osi, Evans and Seun, 2016; Evans and Kelikume, 2018; Evans, 2019b; Evans, 2019c).

However, recent literature has discovered other variables that are, as well, important for the growth of the economy. Examples are environmental, institutional and ICT variables (see Tabellini, 2010; Evans and Alenoghena, 2015; Evans, 2018a; Evans, 2018b; Evans, 2019a, Evans, 2019d). Therefore, the third model of this study is stated as:

$$\Delta Gd_t = \tau_0 + \tau_1 Mo_t + \tau_2 Ra_t + \tau_3 Go_t + \tau_4 Ta_t + \tau_5 Ph_t + \tau_6 Hu_t + \tau_7 In_t + \tau_8 Tr_t + \tau_9 Ca_t + \tau_{10} Co_t + \tau_{11} Po_t + \tau_{12} Ic_t + \epsilon_t \quad (5)$$

Where *Ca* is carbon emissions (metric tons per capita); *Co* is corruption; *Po* is political stability and absence of violence; and *Ic* is ICT (proxied by an index developed from a principal component analysis of internet users [% of population] and mobile subscriptions [% of population]). The identification and proxy of the variables are in line with the literature (see Tabellini, 2010; Evans and Alenoghena, 2015; Evans and Alenoghena, 2017; Adeola, Boso and Evans, 2018; Evans, 2018a; Evans, 2018b;

Evans, 2018c; Mesagan and Adeniji-Ilori, 2018; Mesagan, Isola and Ajide, 2018; Evans 2019a).

3.3 Econometric Technique

The system GMM approach is used in this study. Arellano and Bover (1995) and Blundell and Bond (1998) proposed a system GMM estimator which combines differences with the regression in levels and using the lagged values of the dependent and other explanatory variables as the instruments for the regression in differences and the lagged differences of the explanatory variables as the instruments for the regression in levels. The advantage of the system GMM is that it precludes the problems of heteroscedasticity, autocorrelation, causality inverse and biasedness from omission of explanatory variables.

4. Estimation and Empirical Results

The literature suggests the impropriety of the use of estimation techniques without a unit root test (Adeola and Evans, 2017). The reason is some of the variables maybe non-stationary at level, thus signifying the likelihood for spurious regressions. Therefore, before the estimations, the unit root properties of the variables are examined. The potency of panel-based unit root test is dramatically higher, compared to using a separate unit root test for each individual time series. Table 1 shows the results for two panel unit root tests. The two tests have slightly different alternative hypotheses. The most popular panel unit root test follows from Levin, Lin and Chu (2002) [LLC]. The null hypothesis is that the series contains a unit root, and the alternative is that the series is stationary. The LLC test assumes a common autoregressive parameter for all panels; it restricts the coefficient around the lagged dependent variable to become constant across all units with the panel. As shown in Table 1, the LLC test confirms that all variables are stationary at first difference.

Table 1. Unit Root Tests

Variable	LLC		IPS	
	I(0)	I(1)	I(0)	I(1)
Gd	2.88	-6.78*	6.58	-9.14*
Mo	0.22	-14.36*	3.44	-12.98*
Ra	-7.72*	-14.29	-0.89	-12.02*
Go	-1.63***	-11.75*	-1.92**	-13.25*
Ta	-1.75**	-9.33*	-0.57	-6.42*
Ph	-3.59*	-6.95*	-0.65	-12.01*
Hu	-5.33*	-4.88*	-0.14	-4.19*
In	-40.91*	-52.77*	-19.02*	-31.27*
Tr	-3.43*	-12.47*	-1.43***	-14.06*
Ca	-0.68	-11.40*	2.15	-10.22*

Co	-3.01*	1.07	-1.31***	-3.04*
Po	-15.97*	-9.41*	-3.32*	-7.06*
Ic	0.82	-6.47*	6.82	-8.16*

Notes: All tests assume asymptotic normality. *, ** and *** indicate statistical significance at 1, 5 and 10 percent level of significance.

For robustness we re-estimate the unit root tests following Im, Pesaran and Shin (2003) [IPS]. The IPS test is different from the LLC test because the IPS test allows the coefficient on the autoregressive parameter to be heterogeneous across panels. The IPS test has an alternative hypothesis that enables unit roots test for individual panels. All the tests confirm that the variables are all stationary at first difference (Table 1).

Having established that all the variables are integrated of order one, Kao residual co-integration test is used to determine the co-integrating relationships among the variables. As shown in Table 2, the results indicate the presence of long-run co-integrating relationships among the set of variables.

Table 2. Kao Residual Cointegration Test

	t-Stat.
ADF	2.11**
Residual variance	0.10
HAC variance	0.08

Note: ** indicates indicate 5% level of significance. Newey-West automatic bandwidth selection and Bartlett kernel. For the formulas used in the panel co-integration test statistics, see Kao (1999)

Having established the presence of cointegrating relationships, we proceed to the GMM estimations. The results for the GMM estimations are shown in Table 3. Money supply has significant positive relationship with GDP per capita while interest rate has significant negative effects, implying that increase in money supply is associated with increase in GDP per capita while increase in interest rate is associated with decrease in GDP per capita. Government spending has significant negative relationship with GDP per capita while taxation has significant positive effects, suggesting that increase in government spending is associated with decrease in GDP per capita while increase in taxation is associated with increase in GDP per capita. Other macroeconomic variables such as primary enrollment and openness to trade have significant positive effects while inflation has negative effects. The environmental variable, carbon emissions has significant negative effects. Among the institutional variables, corruption has significant negative effects.

Table 3. GMM Estimates (1995-2016)

Variable	Dependent Variable: GDP per capita (<i>Gd</i>)					
	I		II		II	
	Est.	Err.	Est.	Err.	Est.	Err.
C	5.83	(0.28)	7.39	(0.58)	7.19	(0.54)
Broad money [(% of GDP) (<i>Mo</i>)	0.02*	(0.00)	0.02*	(0.00)	0.01**	(0.00)
Lending interest rate (<i>Ra</i>)	0.01	(0.01)	-0.02***	(0.01)	-0.04*	(0.01)
Government spending [% of GDP] (<i>Go</i>)	0.01	(0.01)	-0.06*	(0.02)	-0.09*	(0.02)
Tax revenue [% of GDP] (<i>Ta</i>)	0.03*	(0.01)	0.05*	(0.01)	0.02	(0.01)
Gross capital formation [% of GDP] (<i>Ph</i>)			0.01	(0.02)	0.02	(0.02)
Primary enrollment (<i>Hu</i>)			0.02*	(0.01)	0.01	(0.01)
Consumer price index (<i>In</i>)			-0.12*	(0.03)	-0.11*	(0.03)
Total trade [% of GDP] (<i>Tr</i>)			0.01*	(0.00)	0.01*	(0.00)
Carbon emissions [metric tons per capita] (<i>Ca</i>)					-0.14*	(0.04)
Corruption (<i>Co</i>)					-2.03*	(0.56)
Political stability and absence of violence (<i>Po</i>)					0.19	(0.59)
ICT (<i>Ic</i>)					0.01	(0.01)
R ²	0.73		0.65		0.85	

Notes: *, ** and *** indicate statistical significance at 1, 5 and 10 percent level of significance.

To ensure that the results are robust to different specifications, the models are re-estimated for the 2005-2016 period as a sub-sample. As shown in Table 4, the results are identical to the full sample in Table 3. Moreover, the R² for all the estimations are satisfactory. This indicates that the variations in GDP per capita are well-explained by the variables. The implication of this is that the estimated equations can be relied upon in making valid inference about the relative effect of monetary and fiscal policy on economic development in Africa.

Table 4. GMM Estimates (2005-2016)

Variable	Dependent Variable: GDP per capita (<i>Gd</i>)					
	I		II		II	
	Est.	Err.	Est.	Err.	Est.	Err.
C	5.72	(0.30)	7.27	(0.61)	7.06	(0.58)

Broad money [(% of GDP) (<i>Mo</i>)	0.03*	(0.01)	0.02*	(0.01)	0.01	(0.01)
Lending interest rate (<i>Ra</i>)	-0.01	(0.01)	0.02***	(0.01)	-0.04*	(0.01)
Government spending [% of GDP] (<i>Go</i>)	0.01	(0.02)	-0.07*	(0.02)	-0.09*	(0.02)
Tax revenue [% of GDP] (<i>Ta</i>)	0.02*	(0.01)	0.04**	(0.01)	0.02	(0.01)
Gross capital formation [% of GDP] (<i>Ph</i>)			0.02	(0.02)	0.02	(0.02)
Primary enrollment (<i>Hu</i>)			0.02*	(0.01)	-0.01	(0.01)
Consumer price index (<i>In</i>)			-0.12*	(0.03)	-0.12*	(0.03)
Total trade [% of GDP] (<i>Tr</i>)			0.01*	(0.00)	0.01***	(0.01)
Carbon emissions [metric tons per capita] (<i>Ca</i>)					0.12**	(0.05)
Corruption (<i>Co</i>)					-2.25*	(0.61)
Political stability and absence of violence (<i>Po</i>)					0.31	(0.64)
ICT (<i>Ic</i>)					0.01	(0.01)
R ²	0.45		0.38		0.52	

Notes: *, ** and *** indicate statistical significance at 1, 5 and 10 percent level of significance.

5. Discussion of Results and Implications

The results of this study have shown that money supply has significant positive relationship with GDP per capita while interest rate has significant negative effects. This means that increase in money supply is associated with increase in GDP per capita while increase in interest rate is associated with decrease in GDP per capita. In other words, monetary policy has significant effect on economic development. This finding is consistent with Lee and Werner (2018) who showed that interest rates follow GDP growth and are consistently positively correlated with growth. However, this finding contrasts with Twinoburyo and Odhiambo (2018) who found no impact of monetary policy on economic growth in the long term – “irrespective of the proxy used to measure monetary policy. However, the short-term results confirm the existence of monetary policy neutrality - but only when the interest rate is used as a proxy for monetary policy. When money supply is used to measure monetary policy, a negative relationship between monetary policy and economic growth is found to predominate” (p. 207).

Interestingly, government spending has significant negative relationship with GDP per capita while taxation has significant positive effects. This means that increase in

government spending is associated with decrease in GDP per capita while increase in taxation is associated with increase in GDP per capita. The significant negative effects of government spending may be as a result of crowding out (Mahmoudzadeh, Sadeghi and Sadeghi, 2017; Ahmed and Alorbi, 2018; Bahal, Raissi and Tulin, 2018; Evans, 2019e). When governments raise taxes in order to expand welfare programs, individuals and businesses are left with less discretionary income. In this respect, government spending for social welfare can reduce private sector giving, offsetting the government's spending on those same causes. In fact, increasing government spending through higher taxes can lead to a more inefficient allocation of resources as governments tend to be less effectual in spending. In line with this finding, Bernardini and Peersman (2018) found significant crowding-in of private spending in periods of debt overhang, “resulting in multipliers that are much larger than one. In high private debt episodes, more government purchases even reduce the ratio of government debt to gross domestic product” (p. 485). In contrast, Dawid, Harting and Neugart (2018) found that fiscal transfers have a positive short- and long-run impact on per-capita consumption. Ali and Harvie (2015) found that fiscal policy responses exert a crucial impact on the macroeconomic adjustment process.

From the results, it can be seen that monetary policy has greater impact than fiscal policies on the said economies. This is in line with Friedman and Meiselman (1963) who predicts more stable and statistically significant relationship between output and money than that of output and autonomous spending. It is, as well, in accord with Anderson and Jordan (1968) who used various measures of monetary and fiscal policy actions and showed that monetary policy has greater, faster and more predictable impact on economic activities. This finding is also in line with Nwaogwugwu and Evans (2016) who showed that the elasticity of sectoral output with respect to monetary policy are significant for only three sectors of the Nigerian economy: agriculture, services and wholesale, though the significance differs from sector to sector, subject to the strength and the configurations of the institutional factors in each sector. They however showed that fiscal policy has no significant impact on any of the sectors.

Other macroeconomic variables such as primary enrollment and openness to trade have significant positive effects on GDP per capita while inflation has negative effects. This shows that a conducive macroeconomic environment is important for any economy. These findings are in line with Barro (2013), Kelikume and Evans (2015), Leon-Gonzalez and Vinayagathan (2015), Bonnal and Yaya (2015), and Ogundari and Awokuse (2018) and Evans, Nwaogwugwu and Odior (2019). For example, Barro (2013), and Kelikume and Evans (2015) who have shown that inflation is detrimental for any economy.

This study has also shown that the environmental variable, carbon emissions, has significant negative effects on GDP per capita, implying that environmental pollution is deleterious for any economy. Carbon emissions contribute to climate change, which can have serious consequences for the environment and thereby lead to decline in human welfare. This finding is consistent with studies such as Chang (2010), Sbia,

Shahbaz and Hamdi (2014) and Weng, Dai, Ma, Xie and Wang (2018) who have also found significant negative effects of carbon emissions.

This study also shows that among the institutional variables, corruption has significant negative effects on GDP per capita. This implies that corruption has deleterious effects on any economy. This finding is corroborated by studies such as Bawa, Ani and Nuhu (2010) and Alenoghena and Evans (2015). For example, Alenoghena and Evans (2015) showed that corruption affects most significantly agriculture, services, wholesale and retail sectors in Nigeria.

6. Conclusion

With the aid of the St. Louis equation and the system GMM approach, this study has investigated the relative effectiveness of monetary and fiscal policy in African within the period 1995–2016. The study has shown that money supply has significant positive relationship with GDP per capita while interest rate has significant negative effects, implying that increase in money supply is associated with increase in GDP per capita while increase in interest rate is associated with decrease in GDP per capita. Also, government spending has significant negative relationship with GDP per capita while taxation has significant positive effects, suggesting that increase in government spending is associated with decrease in GDP per capita while increase in taxation is associated with increase in GDP per capita. Other macroeconomic variables such as primary enrollment and openness to trade have significant positive effects while inflation has negative effects. The environmental variable, carbon emissions have significant negative effects. Among the institutional variables, corruption has significant negative effects.

The results support both Keynesian and monetarist positive policy assertions. Money supply, interest rate, government spending and taxation are viable instruments to stabilize output. Moreover, this study suggests that utilizing the monetary policy and interest rate as a policy tool is more powerful than using government spending and taxation. This is in line with the predictions of Milton Friedman and Schwartz (1963) and other advocates of the St. Louis equation. Therefore, in order to attain higher output growth, African economies should rely more on monetary policy as compared to fiscal policy.

Policy implications are important. The empirical evidence has shown that monetary policy and interest rate as a policy tool is more powerful than using government spending and taxation. In line with this finding, the monetary authorities should influence interest rates by expanding or contracting the money supply, which consists of currency in circulation and banks' reserves on deposit at the central bank. The primary way that the central bank can affect the monetary supply is by open market operation or sales and purchases of second hand government debt, or by changing the reserve requirement. If the central bank wishes to lower interest rates, it can purchase government debt, thereby increasing the amount of cash in circulation or crediting banks' reserve accounts. Alternatively, it can lower the interest rate on discounts or

overdrafts (loans to banks secured by suitable collateral, specified by the central bank). If the interest rate on such transactions is sufficiently low, commercial banks can borrow from the central bank to meet reserve requirements and use the additional liquidity to expand their balance sheets, thus increasing the credit available to the economy.

However, policymakers must fully understand that monetary policy alone is not sufficient to bring about desired economic growth. There is need to carefully balance monetary and fiscal policy measures to regulate the macroeconomic environment. Active co-ordination of fiscal and monetary policies is needed to enable governments to achieve their macroeconomic objectives effectively. This study therefore underscores the need for the harmonisation of monetary and fiscal policies to enhance economic development.

The study has several limitations. There are different significance levels regarding the effects of monetary and fiscal policy on economic development in individual countries. The different significance levels are not unexpected as monetary and fiscal policy, and levels of economic development are not evenly distributed in the continent. Additionally, the study was limited to only 48 countries within Africa. Extending this study to all the developing countries in Asia, the Caribbean and South America may provide a better understanding of the way monetary and fiscal policy influence economic development and the implications for economic development in other contexts. Notwithstanding the limitations, the findings of this study are enriching.

7. REFERENCES

- Adaramola, A., & Wale-Awe, O. (2017). The relevance of value added reporting in assessing the financial soundness of deposit money banks in Nigeria. *BizEcons Quarterly*, 1, 3-18.
- Adefeso, H. A., & Mobolaji, H. I. (2010). The fiscal-monetary policy and economic growth in Nigeria: Further empirical evidence. *Pakistan Journal of Social Sciences*, 7(2), 137-142.
- Adeniji S. O., Obansa, S. A. J., & Okoroafor, O. K. (2018). Monetary policy shocks and stock market prices volatility in Nigeria, *BizEcons Quarterly*, 3, 3–26.
- Adeola, O., & Evans, O. (2017). The impact of microfinance on financial inclusion in Nigeria. *The Journal of Developing Areas*, 51(4), 193-206.
- Adeola, O., Boso, N., & Evans, O. (2018). Drivers of international tourism demand in Africa. *Business Economics*, 53(1), 25-36.
- Ahmed, I., & Alorbi, G. (2018). Crowding out of Government Health Spending: Evidence from Bangladesh. *The Journal of Developing Areas*, 52(3), 73-83.
- Akinyemi, A. K., Ogbuji, A. I., & Adedokun, A. S., (2018). Manufacturing Sector Performance in Africa: The Role of Monetary Policy Instruments, *BizEcons Quarterly*, 2, 36-47.

- Ali, I. & Harvie, C. (2015). Oil production rehabilitation, fiscal policy and economic development in Libya: a future view. *Energy Economics Letters*, 2 (1), 2308-2925.
- Amankwah-Amoah, J., Osabutey, E. L., & Egbetokun, A. (2018). Contemporary challenges and opportunities of doing business in Africa: The emerging roles and effects of technologies. *Technological Forecasting and Social Change*, 131, 171-174.
- Andersen, L. C., & Jordan, J. L. (1968). Monetary and fiscal actions: a test of their relative importance in economic stabilization. *St. Louis Federal Reserve Bank Review*, 50(1), 0-20.
- Arellano, M. and Bover, O. (1995), Another look at the instrumental variable estimation of error component models, *Journal of Econometrics*, Vol. 68 No. 1, pp. 29-51.
- Bahal, G., Raissi, M., & Tulin, V. (2018). Crowding-out or crowding-in? Public and private investment in India. *World Development*, 109, 323-333.
- Baldacci, E., Clements, B., Gupta, S., & Cui, Q. (2008). Social spending, human capital, and growth in developing countries. *World development*, 36(8), 1317-1341.
- Barro, R. J. (2013). Inflation and economic growth. *Annals of Economics & Finance*, 14(1).
- Bawa, D. B., Ani, A. O., & Nuhu, H. S. (2010). Challenges of greed and corruption in agricultural extension development and practice in Nigeria. *Agricultural Journal*, 5(01), 25-30.
- Bernanke, B. S., Boivin, J., & Elias, P. (2005). Measuring the effects of monetary policy: a factor-augmented vector autoregressive (FAVAR) approach. *The Quarterly Journal of Economics*, 120(1), 387-422.
- Bernanke, B.S. (2000). *Essays on the Great Depression*. Princeton University Press. p. 7. ISBN 0-691-01698-4.
- Bernardini, M., & Peersman, G. (2018). Private debt overhang and the government spending multiplier: Evidence for the United States. *Journal of Applied Econometrics*, 33(4), 485-508.
- Blundell, R. and Bond, S. (1998), Initial conditions and moment restrictions in dynamic panel-data models, *Journal of Econometrics*, Vol. 87 No. 1, pp. 115-143.
- Bonnal, M., & Yaya, M. E. (2015). Political institutions, trade openness, and economic growth: new evidence. *Emerging Markets Finance and Trade*, 51(6), 1276-1291.
- Carlson, K.M. (1978), Does the St. Louis Equation Believe in Fiscal Policy? *Federal Reserve Bank of St. Louis Review*, pp. 13-19.
- Carnot, N., & De Castro, F. (2015). The discretionary fiscal effort: an assessment of fiscal policy and its output effect. European Commission, Directorate-General for Economic and Financial Affairs.

- Chang, C. C. (2010). A multivariate causality test of carbon dioxide emissions, energy consumption and economic growth in China. *Applied Energy*, 87(11), 3533-3537.
- Chowdhury, L. S., & Afzal, M. N. I. (2015). The Effectiveness of Monetary Policy and Fiscal Policy in Bangladesh. *The Journal of Applied Business and Economics*, 17(1), 78.
- Clark, J. F. (2018). The challenges of political reform in Sub-Saharan Africa: a theoretical overview. In *Political reform in francophone Africa* (pp. 23-39). Routledge.
- Cuaresma, J. C., Doppelhofer, G., & Feldkircher, M. (2014). The determinants of economic growth in European regions. *Regional Studies*, 48(1), 44-67.
- Dawid, H., Harting, P., & Neugart, M. (2018). Fiscal transfers and regional economic growth. *Review of International Economics*, 26(3), 651-671.
- DeLong, J. B., Summers, L. H., Feldstein, M., & Ramey, V. A. (2012). Fiscal policy in a depressed economy [with comments and discussion]. *Brookings Papers on Economic Activity*, 233-297.
- Dzorgbo, D. B. S. (2017). *Ghana in search of development: The challenge of governance, economic management and institution building*. Routledge.
- Economist Intelligence Unit (EIU, 2016) Democracy Index, <https://www.eiu.com/topic/democracy-index>
- Evans, O., & Alenoghena, O. R. (2017). Financial Inclusion and GDP Per Capita in Africa: A Bayesian VAR Model. *Journal of Economics & Sustainable Development*, 8(18), 44-57.
- Evans, O. & Alenoghena, R., (2015). Corruption Effects on Nigeria: Aggregate and Sectoral Estimates Using VAR. *Journal of Economic & Financial Studies*, 3(02), 18-26.
- Evans, O. & Kelikume, I., (2015). Inflation Targeting As A Possible Monetary Framework For Nigeria. In *Global Conference on Business & Finance Proceedings* (Vol. 10, No. 1, p. 420). *Institute for Business & Finance Research*.
- Evans, O. & Saibu, O. (2017) Quantifying the Impact of Monetary and Exchange Rate Policies on Economic Diversification in Nigeria, *Nigerian Journal of Economic and Social Studies*, 59(1), 131-152.
- Evans, O. (2016). The Effectiveness of Monetary Policy in Africa: Modeling the Impact of Financial Inclusion. *Iranian Economic Review*, 20(3), 327-337.
- Evans, O. (2017) Threshold Effects in the Relationship between Interest Rate and Financial Inclusion in Nigeria. *Journal of Economics and Business Research*, 23(1), 7-22.
- Evans, O. (2018a). Connecting the poor: the internet, mobile phones and financial inclusion in Africa, *Digital Policy, Regulation and Governance*, <https://doi.org/10.1108/DPRG-04-2018-0018>.
- Evans, O. (2018b). Digital Agriculture: Mobile Phones, Internet & Agricultural Development in Africa, *Actual Problems of Economics*, 7-8(205-206), 76-90.

- Evans, O. (2018c). Repositioning for Increased Digital Dividends: Internet Usage and Economic Wellbeing in Sub-Saharan Africa, *Journal of Global Information Technology Management*, 22(1), pp.47-70.
- Evans, O. (2018d). Improved Financial Performance Without Improved Operational Efficiency: The Case of Nigerian Firms. *Forum Scientiae Oeconomia*, 6(3), 25-39
- Evans, O. (2019a). Digital Politics: Internet and Democracy in Africa, *Journal of Economic Studies*, 46, 1.
- Evans, O. (2019b). Money, Inflation and Output in Nigeria and South Africa: Could Friedman and Schwartz Be Right? *Journal of African Business*. <https://doi.org/10.1080/15228916.2019.1581012>.
- Evans, O. (2019c). Information and Communication Technologies and Economic Development in Africa in the Short and Long Run, *International Journal of Technology Management & Sustainable Development*.
- Evans, O. (2019d). Blockchain Technology and the Financial Market: An Empirical Analysis. *Actual Problems of Economics*, 1.
- Evans, O. (2019e). The effects of US-China trade war and Trumponomics. *Forum Scientiae Oeconomia*, 7(1), 47-55.
- Evans, O., & Kelikume, I. (2018). The Effects of Foreign Direct Investment, Trade, Aid, Remittances and Tourism on Welfare under Terrorism and Militancy. *International Journal of Management, Economics and Social Sciences*, 7(3), 206-232.
- Evans, O., & Kelikume, I. (2019). The impact of poverty, unemployment, inequality, corruption and poor governance on Niger Delta militancy, Boko Haram terrorism and Fulani Herdsmen attacks in Nigeria. *International Journal of Management, Economics and Social Sciences*, 8(2).
- Evans, O., Nwaogwugwu, I. C., & Odior, E. S. (2019). The distributional effects of fiscal policy on consumption and employment in Nigeria: A Bayesian DSGE Approach, *Journal of Economics and Policy Analysis*, 4(1), 77-91.
- Friedman, Milton and D. Meiselman (1963). The Relative Stability of Monetary Velocity and the Investment Multiplier in the United States, 1897-1958, In *Stabilization Policies*, 1963, pp. 165-268, Englewood Cliffs, NJ.
- Gramlich, E. M. (1971). The Usefulness of Monetary and Fiscal Policy as Discretionary Stabilization Tools, *Journal of Money, Credit and Banking*, 3: 506-532.
- Hamza, H., & Saadaoui, Z. (2018). Monetary transmission through the debt financing channel of Islamic banks: Does PSIA play a role?. *Research in International Business and Finance*, 45, 557-570.
- Hausman, J. A. (1978). Specification Tests in Econometrics. *Econometrica* 46 (6): 1251–1271.
- Higgins, S., & Pereira, C. (2014). The effects of Brazil's taxation and social spending on the distribution of household income. *Public Finance Review*, 42(3), 346-367.

- Ho, S. Y. (2018). Determinants of economic growth in Hong Kong: The role of stock market development. *Cogent Economics & Finance*, 6(1), 1-19.
- Im, K. S., M. H. Pesaran, and Y. Shin. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics* 115: 53–74.
- Jawaid, S. T., Arif, I., & Naeemullah, S. M. (2010). Comparative analysis of monetary and fiscal Policy: a case study of Pakistan.
- Jordan, J. L. (1986). The Andersen-Jordan Approach after Nearly 20 Years. Federal Reserve Bank of St. Louis Review, 68: 5-8.
- Kaldor, N. (2015). Keynesian economics after fifty years. In *Essays on Keynesian and Kaldorian Economics* (pp. 27-74). Palgrave Macmillan, London.
- Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. *Journal of econometrics*, 90(1), 1-44.
- Keynes, J. M. (1964). *The General Theory of Employment, Interest, and Money*, Harcourt Brace & Company: First edition, 1964.
- Klein, L. R. (1947). *The Keynesian Revolution*. New York: Macmillan. pp. 56–58, 169, 177–79.
- Krugman, P. (2007). Who Was Milton Friedman?. *The New York Review of Books*. Retrieved 2008-05-22.
- Latif, Ehsan and M. H. Chowdhury (1998). Relative Effectiveness of Monetary and Fiscal Policy, *Bank Parikrama*, 23: 1&2, 97-105.
- Lee, K. S., & Werner, R. A. (2018). Reconsidering monetary policy: An empirical examination of the relationship between interest rates and nominal GDP growth in the US, UK, Germany and Japan. *Ecological Economics*, 146, 26-34.
- Leon-Gonzalez, R., & Vinayagathan, T. (2015). Robust determinants of growth in Asian developing economies: A Bayesian panel data model averaging approach. *Journal of Asian Economics*, 36, 34-46.
- Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of econometrics*, 108(1), 1-24.
- Lin, S., & Ye, H. (2018). The international credit channel of US monetary policy transmission to developing countries: Evidence from trade data. *Journal of Development Economics*, 133, 33-41.
- Mahmoudzadeh, M., Sadeghi, S., & Sadeghi, S. (2017). Fiscal spending and crowding out effect: a comparison between developed and developing countries. *Institutions and Economies*, 31-40.
- Mamabolo, M. A. (2018). Management and Leadership Development Needs: The Case of South Africa. In *Business and Society* (pp. 229-249). Springer, Cham.
- Mesagan, E. P., Isola, W. A., & Ajide, K. B. (2018). The capital investment channel of environmental improvement: evidence from BRICS. *Environment, Development and Sustainability*, 1-22.

- Mesagan, P. E., & Adeniji-Ilori, O. M. (2018). Household Environmental Factors and Childhood Morbidity in South-Western Nigeria. *Fudan Journal of the Humanities and Social Sciences*, 11(3), 411-425.
- Mesagan, P. E., Unah A. A. & Idowu J. O., & Alamu, A. S. (2019). Oil Resource Abundance in Nigeria and Iran: Contrapuntal Effect on Social and Economic Welfare, *BizEcons Quarterly*, 4, 3-22.
- Muibi, S. O., Osi, A. R., Evans, O., & Seun, T. (2016). Determinants of Stock Trading Volume in Nigeria: Money Demand Approach. *Journal of Empirical Economics*, 5(2), 74-89.
- Nakamura, E., & Steinsson, J. (2015). Assessing the effects of monetary and fiscal policy. NBER Reporter, (1), 22-25.
- Nwaogwugwu, I., & Evans, O. (2016). A sectoral analysis of fiscal and monetary actions in Nigeria. *The Journal of Developing Areas*, 50(4), 211-230.
- Odior, E., & Arinze, S. (2017). The Dynamics of Inflation, Public Debt and Exchange Rate in Nigeria. *BizEcons Quarterly*, 1, 19-34.
- Ogundari, K., & Awokuse, T. (2018). Human capital contribution to economic growth in Sub-Saharan Africa: Does health status matter more than education?. *Economic Analysis and Policy*, 58, 131-140.
- Olasubomi, A. L. (2019). Currency Devaluation and Trade Balance Nexus: A Test of Marshall-Lerner Condition in Nigeria, *BizEcons Quarterly*, 4, 23-43.
- Olusoji, M. O., & Odeleye, A. T. (2018). Service sector potentials in the transformation of the Nigerian economy. *BizEcons Quarterly*, 2, 24–35.
- Ramey, V. A., & Zubairy, S. (2018). Government spending multipliers in good times and in bad: evidence from US historical data. *Journal of Political Economy*, 126(2), 850-901.
- Rogerson, C. M. (2018). Towards pro-poor local economic development: the case for sectoral targeting in South Africa. In *Local Economic Development in the Changing World* (pp. 75-100). Routledge.
- Rosenof, T. (1997). *Economics in the Long Run: New Deal Theorists and Their Legacies, 1933–1993*. Chapel Hill: University of North Carolina Press. ISBN 0-8078-2315-5
- Sayera. Y. (2012). Relative Effectiveness of Monetary and Fiscal Policies on Output Growth in Bangladesh: A Co integration and Vector Error Correction Approach Policy Analysis Unit, Research Department, Bangladesh Bank, Bangla
- Sbia, R., Shahbaz, M., & Hamdi, H. (2014). A contribution of foreign direct investment, clean energy, trade openness, carbon emissions and economic growth to energy demand in UAE. *Economic Modelling*, 36, 191-197.
- Senbet, D. (2011). The relative impact of Fiscal versus Monetary actions on output: A Vector Autoregressive (VAR) approach. *Business and Economics Journal*.
- Sims, E., & Wolff, J. (2018). The output and welfare effects of government spending shocks over the business cycle. *International Economic Review*, 59(3), 1403-1435.

- Stojanović, D., & Stojanović, D. (2017). Monetary policy transmission mechanisms in Serbia: evidence from the fully-fledged inflation targeting regime. *Post-Communist Economies*, 29(1), 117-137.
- Tabellini, G. (2010). Culture and institutions: economic development in the regions of Europe. *Journal of the European Economic Association*, 8(4), 677-716.
- Teixeira, A. A., & Queirós, A. S. (2016). Economic growth, human capital and structural change: A dynamic panel data analysis. *Research policy*, 45(8), 1636-1648.
- Tily, G. (2016). *Keynes's General Theory, the Rate of Interest and Keynesian Economics*. Springer.
- Twinoburyo, E. N., & Odhiambo, N. M. (2018). Can Monetary Policy Drive Economic Growth? Empirical Evidence from Tanzania. *Contemporary Economics*, 12(2), 207-221.
- Uhlig, H. (2005). What are the effects of monetary policy on output? Results from an agnostic identification procedure. *Journal of Monetary Economics*, 52(2), 381-419.
- Weng, Z., Dai, H., Ma, Z., Xie, Y., & Wang, P. (2018). A general equilibrium assessment of economic impacts of provincial unbalanced carbon intensity targets in China. *Resources, Conservation and Recycling*, 133, 157-168.
- World Bank (2017) World Development Indicators, <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>

Appendix

Figure 3. Map of Africa



Source: <https://www.mapsofworld.com/africa/>



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