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Causal Nexus among Fiscal Policy, Economic Growth and Income Inequality in Sub-Saharan African Countries (1995-2016)

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Abstract

This paper investigates the causality among fiscal policy, economic growth and income inequality in some twenty six selected sub- African countries with a view to identifying the direction of causation among these variables; thus aiding the identification of policy choice variables whose impact could predict the behaviour of some other variables. This approach would ultimately provide solutions to income inequality and economic growth problems in sub-Saharan African countries. To achieve this objective, the sub-Saharan African countries were divided into three–low income countries, lower middle income countries and upper middle income countries. The methodology of multivariate Granger causality was applied to investigate the causality among fiscal policy, economic growth and income inequality variables. The findings show that in low income countries and lower middle income countries, no designable causality could be established among the three variables probably suggesting lack of effective policy cordination in SSA countries. However, a uni-directional causality running fron economic growth to income inequality was found in upper middle income countries.

Key Words : Causality, Sub-Saharan Africa, Vector Error Correction, Upper-Middle Income, Lower-Middle Income, Low Income Countries.

JEL Codes : F21, F23, F26, H24.

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1. Introduction

The increasing rate of inequality among the countries of the world with its significant implications on growth and macroeconomic stability are of serious concern to policy makers and academics. The demand for more equitable redistribution of resources stems from the realisation that more poor individuals live in the world today than in the past decades. As income inequality becomes more prominent, the citizens who are disadvantaged from the growth process felt short-changed because economic growth created fewer job opportunities leaving many of them unemployed. In 1981, about 75 percent of those living in the developing countries spent less than $2 a day (Alvaredo & Gasparini, 2015). With global concerted efforts, there are a few people who live on about $1.8 per day compared with what was obtainable about thirty years ago. This is despite significant rise in the number of people in the world today. With 2.47 billion people still living in poverty, the number of people in this economic category is still significant and demands urgent attention from all the stakeholders across the world.

Extreme poverty coupled with income inequality across nations have been declining gradually since the early 1980s. Improvement in the economies of the developing countries particularly those located within the Sub Saharan Africa, contributed to the fall in inequality across the world in the last fifty years. After Latin America, Africa is ranked second in income inequality as captured by the portion of the wealth to go to the poor in African societies. The situation becomes more worrisome as the urban rural divide aggravated the degree of poverty between the poor in the urban and rural areas of African societies (AfDB, 2012). Between US$742 in 1993 when measured by purchasing power parity (PPP), the average annual income per capita of economies in SSA increased to $762 in 2008. The trend shows a decline from US$608 to $556 over the same period aside from South Africa and Seychelles. In Mozambique, the lowest 20 percent in the country had a share of 5.3 percent of the national resources while 51.5 percent of that nation's income was accounted for by 20 percent of Mozambique's population. The Gini coefficient of the Southern African region was 53 percent from 1980 to 1989. Between 1990 to 1999, the Gini coefficient increased to 53.3 percent but later decreased to 48.5 percent between 2000 and 2009. In South Africa and the CAR, their Gini coefficients rose from 57 to 68, from 2000 to 2006, and from 43 to 56 between 2003 and 2008 respectively (AfDB, 2012). Gini coefficient averaged 43.3 percent in Burkina Faso from 1995 to 2016. It was 38.1 percent in Burundi during the same period. In Cote d'Ivoire, Gini coefficient was 41.3 percent. Cameroon in Central Africa had its Gini coefficient at 43.4 percent, and in Tanzania and Zambia, Gini coefficients were 43.6 per cent and 53.3 per cent correspondingly. In Nigeria and South Africa, the two biggest economies in Africa, Gini coefficients were 42.7 percent and 58.2 percent during the reference period respectively.

During the same period, Nigeria recorded 8.8 percent GDP growth rate from 2000 to 2010. Further, economic growth rate steadied at about 5 percent from 2011 to 2015. Ghana grew by 5.5 percent between 2000 and 2010, and further maintained a 7.7 percent between 2011 and 2015. The Ugandan economy grew at 7 percent and 5.42 percent during the two periods. Tanzanian economy grew steadily at 6.5 percent from 2000 to 2010, and by 6.86 percent in the next five years. The Ethiopian economy was rose by 8.5 percent from 2000 to 2010, and by 10 percent between 2004 and 2008. Mauritius grew at 4.3 percent and by 3.6 percent during the same periods. The Malawian economy grew at about 5 percent on the average from 2000 to 2010. Between 2011 and 2015, its GDP growth rate maintained a mean value of 4.1 percent. In Kenya,

economic momentum from 2000 to 2010 recorded an average of 4 percent growth rate. The performance of the Kenyan economy subsequently improved as it grew at 5.5 percent between 2011 and 2015.

Between 2000 and 2010, Cameroon's GDP maintained a 3.5 percent growth rate. Better economic performance at 5.2 percent growth rate was recorded from 2011 to 2015. Also, at an average growth rate of 4 percent, Congo Democratic Republic was not left out of the progress made in SSA from 2000 through 2010 in spite of the crisis in that country. Economic performance was better in the subsequent period as between 2011 and 2015; it further grew at 7.7 percent. The Republic of Congo grew at 6 percent between 2000 and 2010, and by 4 percent from 2011 to 2015. The economy of the Central African Republic maintained a steady of 2.11 percent from 2000 to 2010. On the other hand, economic growth rates were negative from 2011 to 2015. With a growth rate of 3.6 percent, South Africa's growth rate of 3.6 percent between 2000 and 2010. The momentum reduced to about 2.1 percent between 2011 and 2015. The GDP of Swaziland grew by 3.4 percent from 2000 to 2010 and by 2.9 percent from 2011 to 2015. The trend was similar in Rwanda which economy grew on the average by 8 percent between 2000 and 2010. Its GDP further grew by 7.1 percent between 2011 and 2015.

The immediate impact of the steady GDP growth rates among countries in SSA was the return of the middle class group. It was noted during this period that the middle class population increased to 350 million individuals by 2010 as against 220 million individuals in 2000, an increase of 34.3 percent during the period (AfDB, 2012). The purchasing power of Africa's middle class is estimated at about $680 billion, which is about 25 percent of Africa's GDP according to the 2008 purchasing power parity (PPP). Two-thirds of the middle class on the African continent, about 180 million individuals are hardly out of the poor income group because their countries rely on the export of commodities which are highly susceptible to external shocks.

Fiscal policy on the continent, based on the portion of government spending to GDP, was 112.1 percent within the reference period, with the minimum rate being 67.91 percent in Nigeria and the maximum rate of 220.72 percent in Lesotho. Thus there is a prevalence of fiscal policy expansion, an increase in economic growth and a heightened income inequality.

Extant literature has examined the relationship between income inequality and economic growth and found mixed results. Some scholars have found that inequality could spur economic growth arising from the morale boosting of workers that provokes them for higher productivity; thus reducing the gaps in income inequality (Forbes, 2000; Li and Zou, 1998) . The alternative position of negative relationship is held by some other scholars (Cingano, 2014; Wahiba and E-Weriemmi, 2014). Mixed results have also been found by other scholars (Fawaz, Rahnama and Valcercel, 2014; Halter, Oechslin and Zweimuller, 2014). The present study examines this relationship by bringing the three variables together as a unified whole for empirical analysis.

The major contribution of this study is that extant empirical studies have focused attention on developed economies with no or little attention paid to developing economies of the world in analysing the relationship between fiscal policy, economic growth and income inequality. The present study focuses on the SSA economies which are predominantly developing economies. This study to the best of our knowledge is the first to extensively examine the causal links among

fiscal policy, economic growth and income inequality focusing on SSA economies. Also, our study considers the homogeneity characteristics of the SSA economies for the purpose of empirical analysis. Thus SSA economies are divided into three on the basis of income groupings. The econometric analytical advantage of this is considerable because failure to consider the unique homogenous characteristics of the countries involved will largely affect the consistency and validity of our results. To obviate the problem, SSA economies are so divided into homogenous groups on the basis of income grouping as suggested by World Bank Atlas classifications. In addition, we applied the panel causality methodology capable of capturing the three principal dimensions of causality characterising the three identified income groupings of SSA economies.

The rest of the paper is organised into four sections. Section 2 focuses on the literature review. Section 3 presents the methodology, while section 4 reports and discusses the empirical results and Section 5 concludes the paper.

2. Empirical Literature

Adolph Wagner (1835-1917) contributed to public expenditure theories by postulating that state activity increases as the level of government activities tends to raise the level of economic development due to increased demand placed on government services and for control of externalities. There is an inherent tendency for government activities at different tiers and levels to increase both intensively and extensively (Peters, 2009; Sideris, 2006 and Amaghi Onyeodiwe, 1991).

He postulated that the 'law of increasing public spending' manifested through increasing patterns in the growth of government spending as well as the magnitude of the public sector. Wagner opined that as economy increases, allocation to welfare of the citizenry would increase especially with respect to health, education, consequently. A surge in public expenditure would produce much more rise in the national income. The immediate effect would be a comparative expansion of the government sector, resulting in bigger size of government as the economy continues to grow.

Wagner (1870) opined that the growth of an industrialised economy has some functional cause and effect relationship. He found out that social progress was responsible for the growth of the government in industrialising countries. Musgrave (1988) supported the proposition with the position that as progressive nations industrialised, public sector size in such economy increases. Wagner's law stated further that government needs to manage some economic services for progress to be made in technology (Cooray,2009).

Examining the relationship between fiscal policy and economic growth

The empirical relationships between economic growth and fiscal policy have been extensively examined in the past two decades. The diverse nature of their findings aroused the desire of researchers to investigate the relationship among fiscal policy, economic growth and income inequality in SSA which is the focus of this study.

Kakar (2011) found that no causality exists between what the government spends and the growth of the economy in Pakistan when he examined the effect of the fiscal policy on economy growth

using error correction and Granger causality techniques for the period 1980-2009. In a panel study, Wu *et al* (2016) appraised the interaction between governmental spending and the growth of the economy when they conducted the panel Granger causality test as adopted by Hurlin (2004, 2005) utilising panel data set covering 182 countries between 1950 and 2014. The finding indicates that a bi-directional relationship exists between government activities and economic growth for different sub groups of countries, apart from poor countries. Hussain *et al* (2012) applies a dynamic-panel analysis on the economic growth of Asian economies between 1985 and 2010 while evaluating the impact of fiscal policy variables. The result shows that health, education and aggregate expenditure could positively impact economic growth, while defense expenditure, taxation of distortionary nature as well as balance budget could impede economic growth. Jha, *et al.* (2014) examines whether tax cuts or higher spending, stimulates future economic growth especially in the presence of business cycles in 10 emerging Asian countries during 1977-2009 period. They find that fiscal policies with tax cuts resulted in countercyclical effects on output as opposed to those policies with increased government spending. By selecting 21 advanced and 41 less developed economies for a period covering 1980 to 2000, Alcantar-Toledo and Venieris (2014) studied fiscal policy effects on economic growth in the presence of socio-political instability (SPI). They discover that uncertainty generated by SPI makes adverse effects on investment and saving decisions, which in turn retards economic growth.

Ebaidalla (2013) examined the causality between the expenditure of the government and national income in Sudan. He adopted the traditional Granger causality test supported by error correction model on economic data spanning 1970 to 2008. His findings indicate that causality transmit to national income from government expenditure at different time horizons. This therefore corroborates the Keynesian proposition on the importance of government spending as a factor that could be used to stimulate national income. In Algeria, Chibi *et al* (2014) using Markov switching Vector Autoregression (MSVAR) model on data that covered 1970 to 2011, established that fiscal policy distortions created a a lasting effect during economic pressure than the expansionary period of an economy. Further, the impact of government spending was stronger than the impact of public revenue in recession periods. They therefore concluded that the policy on deficit-spending appears more reliable and efficient in economic stabilisation in the short run than that of the policy on tax-cut.

Rosoiu (2015) in his study found bidirectional causality while evaluating government expenditure alongside the growth of the government using VAR estimation on the Romanian economy between 1998 and 2014. Similarly, there was also a bidirectional causality running from government revenue to the growth of the economy in the same country. Masca *et al* (2015) evaluated the fiscal policy relationship within the growth stages of an economy by analysing data collected on 27 European countries from 1995 to 2011. The result of the Feasible Generalization Least Squares revealed that wages and salaries in the public sector and rise of the public investment enhance the growth of an economy. Using different estimation technique, Alex and Ebieri (2014) with the aid of ARDL technique found that governmental capital and recurrent expenditures exerted some level of significant impact on the growth of the economy, whereas non-oil tax and government total debt hindered economic growth. Similarly, Abdulrauf (2015) examined the impacts of fiscal policy on Nigeria's economic development by employing the Vector Error Correction Model (VECM) methodology spanning 1981-2013 and found that in short and long runs, recurrent expenditures and investments stimulate economic growth.

Osinwo (2015) in his study, examined the fiscal policy impact on the growth of different sectors of the Nigeria by employing the Autoregressive Distributed Lag(ARDL) approach for the period 1970-2013 and established that government spending exerts a positive impact on output of all sectors with the exception of Agricultural sector. Contrarily, Abubakar (2016) utilized Structural Vector Autoregression (SVAR) methodology in examining effects of fiscal policy fluctuations on productivity and unemployment in Nigeria between the period of 1981-2015. He discovered that shock in public expenditure has an increasing and long-lasting impact on output. Further, the effect of revenue shock on unemployment was found to be negative but short-lived.

Ogundajo and Onakoya (2017) investigated the association between taxation and the growth of some economies in Africa based on data collected from 2004 to 2013. They found out that tax revenue enhanced economic growth in Africa while taxation by collected through high and weak institutions was favourable to economic growth. In SSA region, Kimaro et al (2017) examined the effect of public expenditure on the efficiency of economic growth in 25 low income SSA countries from 2002 – 2015. The result of the GMM technique disclosed that government expenditure accelerates the development processes of low income SSA countries whereas the interaction of government expenditure with government efficiency show no evidence for government efficiency to boost government expenditure on economic growth

While studying the relationship between fiscal policy and economic growth in Nigeria, Ndubuisi (2017) applied Error Correction mechanism on data collected from 1985 to 2015 in his analysis. The study found that growth rate was significantly influenced by fiscal policy. Morakinyo, David and Alao (2018) found that recurrent expenditure and domestic debt retard economic growth while capital expenditure and external debt stimulate economic growth in Nigeria when they appraised the role of fiscal policy on the growth of the economy between the period of 1981-2014. Recently, Mahmah and Kandil (2018) focused on the effect of fiscal consolidation on the growth of non-energy in the economy of UAE between 1980-2015 using OLS technique. They found that consistent reduction in government spending when the crude oil prices experienced significant volatility led to a fall in the growth of non-energy sectors.

The discrepancies in outcomes from the diverse studies may be as a result of differences in sample sizes, the methods adopted, the scope or the different variables used to capture fiscal policy.

Channels of interaction between Economic Growth and Income Inequality

Rubin and Segal (2014) investigated the interactive effects of inequality and growth in USA. They appraised income sources along different income groups in the US in addition to the interaction among those income sources and economic growth. For better understanding of their findings, they categorised workers into two distinct categories. The first group earned a sizeable part of their income from wealth. The wealth can be regarded as interest, dividend, rent and capital gains. The second group received their reward for their labour, by means of equity related compensation such as restricted shares or stock options. The researchers opined that whether economic growth aggravates income inequality is a matter of which of the sources of incomes of the two groups affected the growth path which may be income from wealth or labour by the rich or the income the poor earn through labour.

The nature of wealth is that it can be converted into cash relatively easy because of its nature whereas converting human capital into cash is not that easy. Rubin and Segal (2014) thus posited that the earnings from income are more responsive to economic growth than labour income, and this could manifest in an upward connection between GDP growth and inequality.

Wahiba and Weriemmi (2014) focused on the Tunisian economy before and after the country joined the World Trade Organisation (WTO). They found that trade liberalisation was a hindrance to growth whereas trade openness was a crucial factor in the aggravation of inequality. Their findings showed that trade openness, financial sophistication and human capital have positive effects on economic growth. The Gini coefficient showed an inverse association between inequality and growth. By splitting the coverage period, the nature the coefficient in the first subset changed which transformed into negative signs in the second sub-set, and this was interpreted to mean the acceleration of commercial economic liberalization process.

Kodongo and Ojah (2016) evaluated what effects access to infrastructure and infrastructure quality might have on growth and development in SSA. They found a positive association which implied that the expenditure on infrastructure and increasing infrastructure access boosted economic growth positively. When measured by export diversification by means of trade competitiveness and cross border capital flows, the influence of infrastructure access and infrastructure quality on growth was found to be indirect. They found out infrastructure development correlated with the income level and not with economic growth. In addition, increase in infrastructure quality moved in the same direction with economic development, albeit insignificantly.

The above proved that human capital and institutions to a very large extent have positive effects and coefficients on growth while financial development was found to be related to economic development negatively. Put differently, the infrastructure expenditure and access were found to promote the growth of the economy in the region. It was suggested the available resources in the region would not make the desired impact on the economy because they were not sufficient.

Turnovsky (2015) investigated the interaction between private capital as well as labour in the production process and found out that expenditure had a direct impact on wealth and income distributions. Public investment directed towards public transportation could reduce inequality. On the other hand, public investment for the promotion of high speed communication could favour the rich; hence have little impact on reducing inequality.

Dmitriev *et al* (2016) were interested in how innovations and economic growth affect income inequality. Their position was that across the countries disparities in economic growth, innovations and educational accomplishment were responsible for rising inequality in income distribution among countries and within countries. These scholars argued that the inequality gap existed as the national income in different countries and income inequality were found to be increasing.

From the empirical literature surveyed above, emphasis was on interactions between fiscal policy and growth, as well as between growth and inequality while those on the three variables are largely non-existent especially for the case of Sub-Saharan African region. Also, due to paucity of data, the past studies on the subject matter restricted the variables to a combination of two from fiscal policy, growth and inequality. This study combined the three variables to evaluate their impact on one another among SSA countries. In the light of this, this study intends to fill the missing link by examining the relationship amongst fiscal policy, growth and inequality in selected SSA countries

3. Model Specification

The existence of a long-run cointegrating vector necessitates the exploration of Granger causality. To define the direction of Granger causality among the variables in both the long-run and short-run, we employed a panel-based error correction model, following the two steps of Engle and Granger (1987) a Vector Error Correction (VEC) model which is used for testing the Granger causality among fiscal policy, economic growth and inequality can be expressed as:

$$\begin{bmatrix} \Delta INQ_{i,t} \\ \Delta InFIS_{i,t} \\ \Delta InY_{i,t} \end{bmatrix} = \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \end{bmatrix} + \sum_{m=1}^{p} \begin{bmatrix} \alpha_{1m} & \beta_{1m} & \delta_{1m} \\ \alpha_{2m} & \beta_{2m} & \delta_{2m} \\ \alpha_{3m} & \beta_{3m} & \delta_{3m} \end{bmatrix} \begin{bmatrix} \Delta INQ_{i,t-m} \\ \Delta InFIS_{i,t-m} \\ \Delta InY_{i,t-m} \end{bmatrix} + \begin{bmatrix} \varpi_1 \\ \varpi_2 \\ \varpi_3 \end{bmatrix} ECT_{i,t-1} + \begin{bmatrix} \varepsilon_{1,it} \\ \varepsilon_{2,it} \\ \varepsilon_{3,it} \end{bmatrix} \quad (1)$$

In model 1, Δ stands for the 1st difference operator. The p represents the length of the lag whereas i stands for country i in the panel ($i=1,2,....N$); t denotes the year in the panel ($t=1,2,.....T$); ε_{it} is a normally distributed random error term for all *i* and *t* with a zero mean and a finite heterogeneous variance. The *ECTs* are Error-Correction Terms, derived from the co-integrating equations. Sources of causation can be identified by testing for significance of the coefficients on the lagged variables in Equation (3.12). First, by testing for all *i* in Equation (3.12), we evaluate Granger weak causality. Masih and Masih (1996) and Asafu-Adjaye (2000) interpreted the weak Granger causality as 'short run' causality in the sense that the dependent variable responds only to short-run shocks to the stochastic environment.

Another possible source of causation is the Error correction term (*ECT)* in Equation (1). In other words, through the *ECT*, an error correction model offers an alternative test of causality. The coefficients on the *ECTs* represent how fast deviations from the long run equilibrium are eliminated following changes in each variable. Furthermore, it is also desirable to check whether the two sources of causation are jointly significant, that is, testing for joint Granger causality. The joint Granger causality test indicates which variable(s) bear the burden of short run adjustment to re-establish long run equilibrium, following a shock to the system (Asafu-Adjaye, 2000). This fashion of causality is also referred to as strong Granger causality test.

Data and Variables

The scope of the research covers 26 countries in SSA whose data on the key variables are readily available. The countries are Burkina Faso, Burundi, Cote d'voire, Cameroon, Djibouti, Niger, Nigeria, Rwanda, Senegal, Gambia, Mauritania, Tanzania, Ghana, Namibia, Guinea-Bissau, Lesotho, Madagascar, Malawi Sierra Leone, Mauritius, Uganda, Zimbabwe, South Africa, Mozambique, Guinea and Zambia. The SSA is among the regions having the highest poverty rates in the world which is one of the reasons this study focuses on the Sub Sahara African region.

Source of Data

Data used in this study was extracted from World Bank African Development Indicators (2017) edition and the frequencies of the data are annual between 1996 and 2016. Data on inequality was acquired from the Standardized World Income Inequality Database (SWIID) while data on fiscal policy (FIS) proxied by gross national expenditure (% of GDP), economic growth measured by GDP per capita (constant 2010 US$), financial development measured by domestic credit to private sector (% of GDP), trade openness proxied by Trade (% of GDP) and human capital measured by secondary school enrollment rate was sourced from World Development Indicators (2017).

4. Empirical Findings

Trend of Fiscal policy in Selected Sub-Sahara African Countries

Figure 1 illustrates the trend of fiscal policy proxied by government spending in selected sub-Saharan Africa between 1995 and 2016. SSA countries recorded a negative growth in government spending from 1995 to 1996. Government spending growth rate stood at -0.94 per cent in 1996 but increase to 0.82 percent in 1998. Government spending growth rate declined from 0.82 per cent in 1998 to -0.45 per cent in 1999 and further decline to -0.657 in 2001. This negative growth in government spending could be attributed to fiscal crisis and stumpy revenue from tax (IMF Regional Economic Outlook, 2004). However, selected SSA countries experienced a positive growth rate in government spending from 2002 to 2007. Government spending growth rate stood at an average of 0.52 percent in 2002 and increased significantly from 1.45 percent in 2003 to reach a peak of about 7 percent in 2007. This may be due to the sustainable fiscal policy and better institution as a stabilization tool used in these countries.

From 2008 to 2011, growth rate of government spending in selected SSA countries declined sharply. It declined from 6.96 per cent in 2007 to -0.45 percent in 2011 probably due to the Global financial crises that occurred in 2008 to 2010 and the political instabilities that happened in Rwanda, Ethiopia and other countries in the region. Selected SSA countries experience a positive growth rate in government spending in 2012. Government spending growth rate declined from 2.19 percent in 2012 to -0.98 in 2014 and declined tremendously to -9.48 in 2016. This can be attributed to oil shocks and poor economic performance of most of the countries in the region.

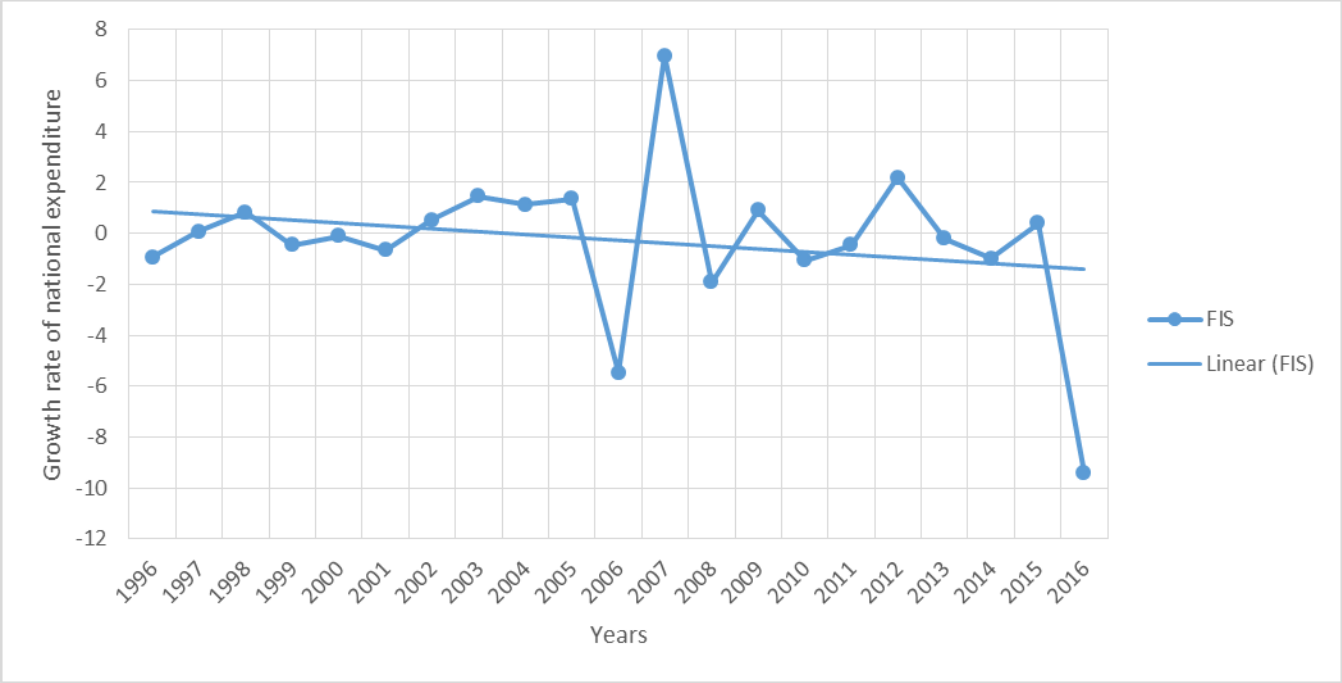

Figure 1: Trend of Fiscal policy (government expenditure) in Selected Sub-Sahara Africa countries (1995-2016)

Source: Author's Computation.

Trend of Economic growth in Selected Sub-Sahara Africa Countries

Figure 2 illustrates the trend of economic growth in selected sub-Saharan Africa between 1995 and 2016. The GDP growth rate of the selected SSA stood at 2.58 per cent in 1996 but decline 0.78 per cent in 1999. However, significant improvement in the growth rate was recorded in the year that followed as the growth rate in Figure 2 presents an increase in the growth rate of GDP per capita from 1.83 per cent in 2000 to 5.04 per cent in 2004. This improvement can be linked to debt relief supported by an improvement in commodity prices, favorable global financing conditions and slowing inflation that helped to lift household demand. GDP per capita thereafter declined from 5.04 per cent in 2004 to 1.83 per cent in 2005. In 2006, SSA experienced a rise in GDP growth rate. The value stood at an average of 4.54 percent and decline to about 0.66 percent in 2009. This sharp decrease could be attributed to global financial crisis.

Beyond 2009, GDP growth rate thereafter increased from 0.66 per cent in 2009 to 3.24 per cent in 2010 and thereafter declined slightly to 2.93 per cent in 2012. It declined further to about 2.44 percent in 2014 and 1.65 in 2015. However, selected SSA countries recorded a negative GDP growth rate in 2016. It declined from 1.65 in 2015 to -2.63 per cent in 2016. This negative growth rate in GDP in 2016 could be attributed to oil price collapse, weak investment and decline in productivity growth

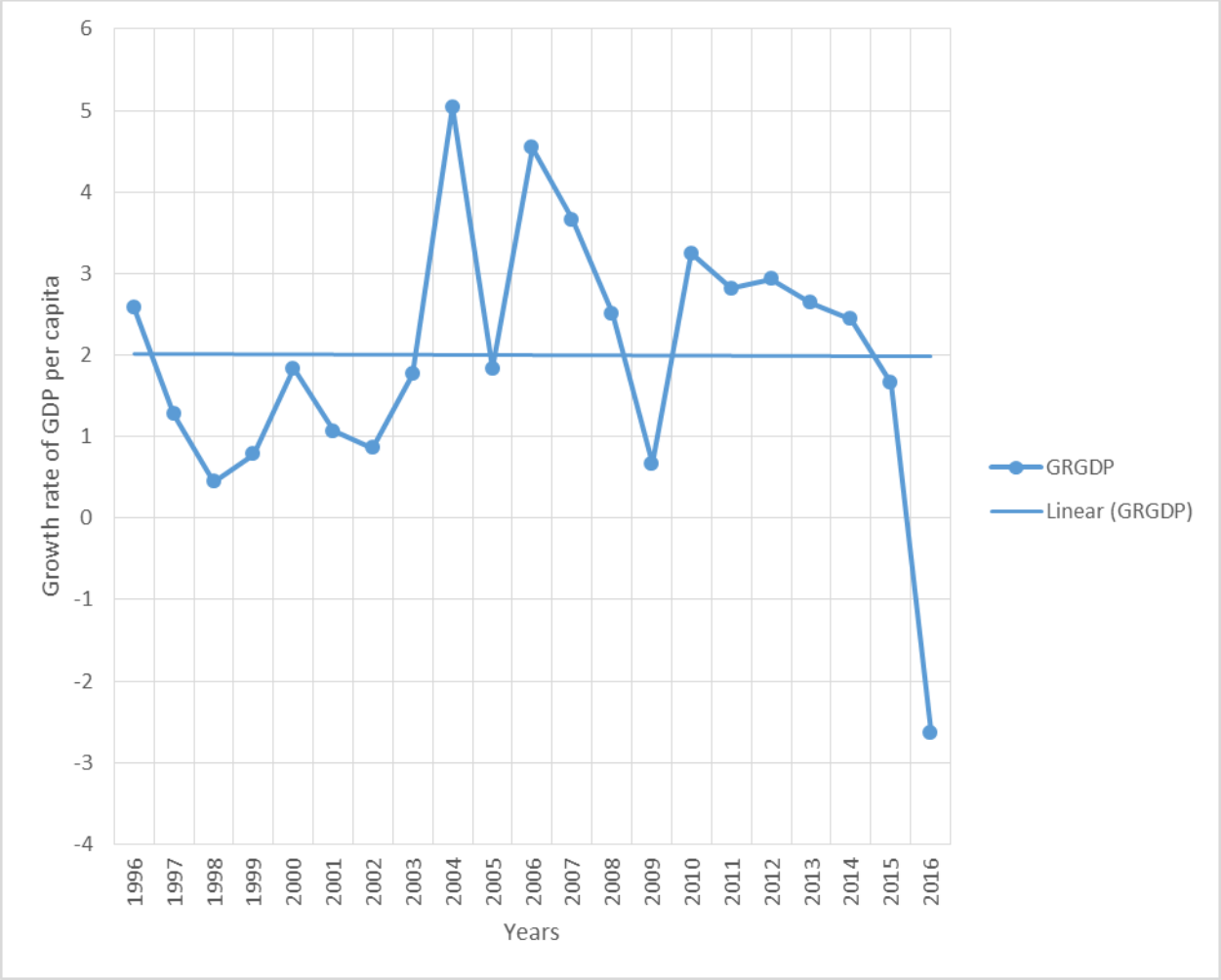

Figure 2 Trend of economic growth in selected SSA countries (1995-2016)
Source: Author's computation.

Trend of Inequality in Selected Sub-Sahara Africa Countries

Figure 3 presents the trend of income inequality in the selected sub-Saharan Africa between 1995 and 2015. Income inequality stood at 39.8 percent in 1995 and rose to 48.83 percent point in 1996 as a result of famines, backward production system which led to low agricultural productivity, low non-farm income, low level of education and poor health, high population growth rate and weak institutional structures. Between 1997 and 2010, income inequality slight change. This could be as a result of the regressive taxes, unresponsive wage structures and inadequate investment in education, health and social protection for vulnerable and marginalized groups (UNDP, 2017). In 2011, level of income inequality fell to 38.58 per cent and 29.28 percent in 2013. Selected SSA countries experienced a decrease in inequality from 29.42 per cent in 2013 to 21.25 per cent in 2014 and fall tremendously to 11.62 percent in 2015.

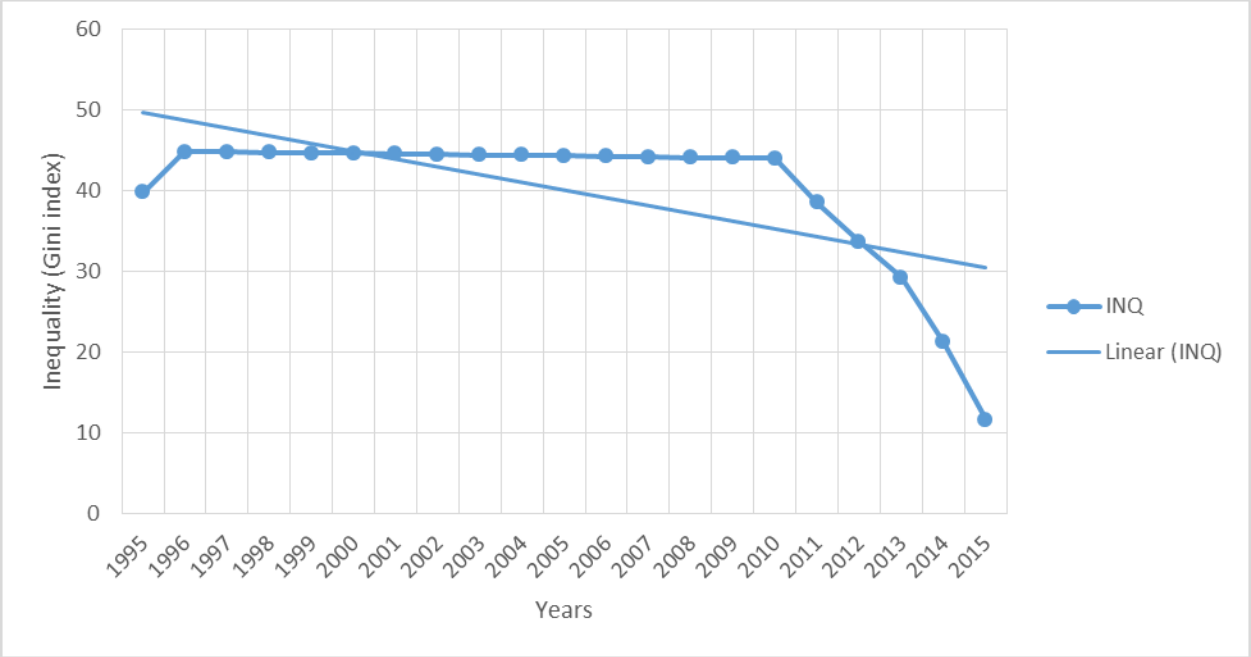

Figure 3: Trend of inequality in selected SSA countries (1995-2016)
Source: Author's computation.

Panel Unit Test Estimation

Panel data that display non-stationary features poses some challenges to researchers when employing regression analysis tool. Ideally, two panel unit root tests of Breitung and IPS panel unit roots are recommended at level and first difference form to check the integrated properties of the variables. These two tests assume that in the null hypothesis there is a unit root, whereas the alternative hypothesis is that variables are stationary. After estimation, both unit root techniques yielded similar results as shown in Table 1. The results established that financial development *(FD)*, human capital *(HUM)* and trade openness *(TOP)* does not have unit root i.e. they are I(0) at 5% significance level whereas Fiscal policy *(FIS)*, Inequality (*INQ)*, and GDP per capita *(Y)* and are only stationary at first difference at 5% significance level. The foregoing result lends credibility to the adoption of panel ARDL methodology as there are no integrated of order two [I (2)] variables in the model.

Table 1 : Panel Unit Root Test

	Breitung Test			IPS Test		
Variables	**Level**	**First Diff**	**Status**	**Level**	**First Diff**	**Status**
LINQ	2.4428	-7.8930	I(1)	-0.4904	-2.5617	I(1)
	[0.9927]	[0.0000]*		[1.0000]	[0.0000]*	
FIS	2.1755	-9.0218	I(1)	-0.8219	-3.1033	I(1)
	[0.9852]	[0.0000]*		[0.9999]	[0.0000]*	
LY	10.3861	-7.2045	I(1)	-0.7810	-2.8634	I(1)
	[1.0000]	[0.0000]*		[1.0000]	[0.0000]*	

Note 1: INQ, FIS, Y, HUM, FD and TOP represent income inequality, fiscal policy, GDP per capita, human capita, financial development and trade openness respectively. Note 2: The values in the square bracket [ ] are the probability values; (*) indicates significant at 1% level, (**) indicates significant at 5% and (***) indicates significant at 10%.

Panel Co-Integration Result

The results show that inequality *(INQ)*, fiscal policy *(FIS)* and economic growth *(LY)* are integrated of order 1 that is stationary at first difference based on the results of the panel unit root test, we thus proceed to examine whether there exists a long run relationship among them. The study adopted Pedroni test (1999, 2004) and the result is presented in Table 2. The results indicate that 4 out of the 7 results indicate the rejection of the null hypothesis of absence of co-integration in support of the existence of long run relationship among the variables at 5% significance level. Thus, it is concluded that there exists a long run relationship among fiscal policy, growth and inequality in selected SSA countries.

Table 2: Pedroni co-integration Test Result

Method	Series: INQ, FIS, Y, FD, HUM and TOP			
Pedroni	**(within-dimension)**		**Weighted**	
	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	7.0329	0.0000	1.5488	0.0607
Panel rho-Statistic	3.2397	0.9994	3.8006	0.9999
Panel PP-Statistic	-2.4782	0.0066*	-2.4452	0.0072*
Panel ADF-Statistic	-2.1291	0.0166**	-2.4367	0.0074*
(between-dimension)	Statistic	Prob.		
Group rho-Statistic	6.2814	1.0000		
Group PP-Statistic	-3.7782	0.0001*		
Group ADF-Statistic	-1.6695	0.0475**		

Notes: *, ** indicate the rejection of the null hypothesis at 1%, 5%, where the null hypothesis is that the variables are not co-integrated.

Direction of causality among economic growth, fiscal policy and income inequality in SSA countries

The presence of co-integration among the variables confirms that there is causality in a least least one direction among the variables. This relationship was investigated within the Vector Error Correction Model (VECM) framework. Tables 3, 4, 5 and 6 show the results of the direction of causality among the variables. The data was disaggregated using income groupings of countries in SSA. Table 3 shows the causality among fiscal policy, economic growth and income inequality in all the countries in sub-Saharan African (SSA) countries. Table 4 presents the causality results of countries categorised as upper middle income countries in SSA. Table 5 presents the causality results of countries regarded as lower income group while table 6 shows the results of SSA countries grouped as lower middle income countries.

The VECM results in Table 1 shows there is neither a unidirectional nor bidirectional causality among the variables in the short run, long run and when joint causality were considered when all the countries in SSA were collectively appraised. The results imply that there is no causality or feedback between economic growth, income inequality and poverty. Also, no causality or feedback between fiscal policy, economic growth and poverty; and no causality between poverty, economic growth and income equality.

Table 3: Panel Multivariate VECM Causality (For all panels of countries)

Dependent	Short run		Long run[1]		Joint
Variables	∆ INQ	∆ FIS	∆ LY	ECM	Causality
INQ	--------	0.01463	0.08234	-0.671	0.0916
		[0.9037]	[0.7741]	[0.06]	[0.9552]
FIS	0.13086	-------	0.0069	-0.567	0.1353
	[0.7175]		[0.9336]	[0.032]	[0.9346]
LY	0.8363	1.6652	------	- 0.765	2.4494
	[0.3605]	[0.1969]	[0.342]	[0.03]	[0.2938]

Note 1: INQ, FIS, and Y represent income inequality, fiscal policy and GDP per capita respectively. Notes 2: *Figures in the squared parentheses "[ ]" represent probabilities values of the Chi-square. Note 3:* *, **, and *** indicate causality at 1%, 5% and 10% level of significance respectively

Table 4 presents the causality results of countries in SSA which belong to the upper middle income group. There is no causality between fiscal policy and economic growth on one hand. This finding is inconsistent with the position of Yanng and Greaney (2017) who found that fiscal redistribution measures reduced inequality in Japan. However, there exists unidirectional causality between economic growth and income inequality. This implies that past economic growth in upper middle income countries can explain the present state of income inequality. This result is consistent with Dustin (2007) who found that past economic performance is positively related to current income inequality. The factors that could make economic growth to worsen income inequality in SSA could be attributed to poor economic performance manifested in fiscal

[1] In all the adjustment parameters, we observe quick convergence to equilibria as all the adjustment parameters are statistically significant and are negative .

crisis, foreign exchange shortage, mounting debt and high rate of unemployment in the SSA countries. This result is consistent with the finding of Risso *et al.* (2013) in Mexico and Risso and Sánchez-Carrera (2012) in China but differs from those of Obradović (2016) and Akanbi (2016) who reported a bi-directional causality between economic growth and income inequality in 22 OECD countries and South Africa respectively. The finding is contrary also to that of Yanng and Greaney (2017) who found reverse causality from income inequality to economic growth for Cina, Japan and the USA.

Table 4: Panel Multivariate VECM Causality (Upper Middle Income)

Dependent		**Short run**	**Long run**		**Joint**
Variables	**∆ INQ**	**∆ FIS**	**∆ LY**	**ECM**	**Causality**
INQ	--------	0.0504	1.0202	-0.994	1.0262
		[0.8225]	[0.3125]	[0.02]	[0.5986]
FIS	0.9001	-------	0.8868	.-0.629	1.5819
	[0.3428]		[0.3463]	[0.00]	[0.4534]
LY	4.0217	0.4330	------	- 0.721	4.3542
	[0.0449]**	[0.5105]		[0.54]	[0.1134]

Note 1: INQ, FIS, and Y represent income inequality, fiscal policy and GDP per capita respectively. Notes 2: *Figures in the squared parentheses "[ ]" represent probabilities values of the Chi-square. Note 3:* *, **, and *** indicate causality at 1%, 5% and 10% level of significance respectively

Table 5 shows the lower income group causality results. As it was in the previous tables for both the short run and joint causality results, there is no causality among these variables in lower income countries in sub-Saharan African countries. This pattern of results could be attributed largely to inherent lack of policy coordination in SSA countries causing policy disconnect among fiscal policy, economic growth and income inequality.

Table 5: Panel Multivariate VECM Causality (Low Income countries)

Dependent		**Short run**	**Long run**		**Joint**
Variables	**∆ INQ**	**∆ FIS**	**∆ LY**	**ECM**	**Causality**
INQ	--------	1.0093	1.8504	-0765	2.5555
		[0.3151]	[0.1737]	[0.040]	[0.2787]
FIS	0.1359	-------	0.1218	0685	0.2401
	[0.7124]		[0.7271]	[0.0987]	[0.8869]
LY	0.1636	0.1061	------	- 0.578	0.2862
	[0.6859]	[0.7446]		[0.657]	[0.8667]

Note 1: INQ, FIS, and Y represent income inequality, fiscal policy and GDP per capita respectively. Notes 2: *Figures in the squared parentheses "[ ]" represent probabilities values of the Chi-square. Note 3:* *, **, and *** indicate causality at 1%, 5% and 10% level of significance respectively

Table 6 presents the causality results of countries in SSA that are grouped as lower middle income countries. Based on the results, there is no unidirectional and bidirectional causality among all the variables, including their joint causality estimates.

Table 6: Panel Multivariate VECM Causality (Lower Middle Income countries)

Dependent Variables	Short run		Long run		Joint
	Δ INQ	**Δ FIS**	**Δ LY**	**ECM**	**Causality**
INQ	--------	0.0602	0.0008	-0.876	0.0602
		[0.8062]	[0.977]	[0.057] [	0.9704]
FIS	0.3994	-------	0.5411	-0.546	1.0432
	[0.5274]		[0.4620]	[0.01]	[0.5936]
LY	0.0741	0.9682	------	-0.75	1.0270
	[0.7854]	[0.3251]		[0.56]	[0.5984]

Note 1: INQ, FIS, and Y represent income inequality, fiscal policy and GDP per capita respectively. Notes 2: *Figures in the squared parentheses "[ ]" represent probabilities values of the Chi-square. Note 3:* *, **, and *** indicate causality at 1%, 5% and 10% level of significance respectively

The absence of causality among economic growth, income inequality and fiscal policy in different income group categories suggests that there is an apparent disconnect between the government fiscal policy and the perceived policy outcomes of higher economic growth and income inequality reduction among low middle income SSA countries. The disconnect could possibly arise from unresolved implementation gaps that characterise the lags between policy formulation and policy execution. In SSA, most countries have implemented various forms of fiscal policy adjustments in a bid to address economic growth and income inequality but with no appreciable results. In line with Victor Lledo and Marcos Poplawski-Ribeiro (2013), the absence of causality among fiscal policy, economic growth and income inequality could be largely due to implementation gaps. In order to resolve the gaps in implementing fiscal policies, it has been suggested that fiscal policy should be formulated as realistically as possible and thus gradual fiscal adjustments are desirable ((Baum, Weber, & Poplawski-Ribeiro, 2012; IMF, 2012).

5. Conclusion

The paper examines the causality among fiscal policy, economic growth and income inequality in sub-Saharan African countries. We approach the analysis by decomposing SSA countries into three based on World atlas method. We found that there is no evidence of causality among the variables in low income countries and lower middle income countries. The only evidence of causality is in upper middle income countries where causality runs from economic growth to income inequality. This implies that economic growth could predict the current level of income inequality in upper middle income SSA countries..

The absence of causality in most of the variables in the four income groups points to the lack of effective policy coordination in most SSA countries. This lack of policy coordination could be attributable to the fact that most of the public institutions in SSA are not strong to sincerely implement government policies. It is therefore suggested that efforts should be made to build strong and independent economic and political institutions devoid of unproductive partisan politics. These institutions should monitor the coordination of fiscal policies, growth policies and

income policies. The institutions should also thoroughly monitor the coordination of private and public partnership fiscal initiatives aimed at enhancing economic growth and which ultimately could reduce income inequality.

It is also recommended that inter- regional fiscal initiatives among SSA countries aimed at regional economic growth and reduction of income inequality should be encouraged. This also boils down to building of credible inter-regional institutions that could monitor the coordination of necessary economic initiatives.

In addition, for concrete economic outcomes like equitable distribution of income to be achieved, fiscal policy must be well regulated to ensure that funds are appropriately channelled towards achieving the desired outcomes. Based on the findings, it appears there are some structural problems hindering the effective channelisation of funds that should generate the desired outcomes of higher economic growth and reduction of income inequality. A common problem inherent in the economies of SSA countries is corruption. There is the need to build appropriate institutions that could adequately tackle this menace in SSA countries..

REFERENCES

Abubakar, A. B. (2016). Dynamic Effects of Fiscal Policy on Output and Unemployment in Nigeria: An Econometric Investigation. *CBN Journal of Applied Statistics,* 7(2),101-121.

Adams, S. & Klobodu, E. K. M. (2017). Capital flows and the distribution of income in sub Saharan Africa. *Economic Analysis and Policy*, 55, 169-178.

African Development Bank(AfDB,2012). Income Inequality In Africa: Briefing Notes for AfDB's Long-Term Strategy, March 2012

African Development Bank (AfDB, 2013). African Economic Outlook : Structural Transformation and Natural Ressources. http://dx.doi.org/10.1787/aeo-2013-en

Ahmed, A., Uddin, G. S. & Sohag, K. (2016). Biomass energy, technological progress and the environmental Kuznets curve: Evidence from selected European countries. *Biomass and Bio-energy*, 90, 202-208

Akanbi, O. A. (2016): The growth, poverty and inequality nexus in South Africa: Cointegration and causality analysis. *Development Southern Africa*, 1-20.

Akobeng, E. (2015). Out of inequality and poverty: Evidence for the effectiveness of remittances in Sub-Saharan Africa. *Quarterly Review of Economics and Finance*, 60, 207-223.

Alberto, A & Roberto Perotti(1994). The political economic of growth: A critical survey of the recent literature. *The World Bank Economic Review*, Vol.8, No.3, 351-371

Alcantar-Toledo, J. & Venieris, Y. P. (2014). Fiscal policy, growth, income distribution and socio-political instability. *European Journal of Political Economy*, 34, 315-337.

Ali Zafar(2010): Learning from the Chinese Miracle: The Development Lessons for Sub Saharan Africa. Policy Research Working Paper 5216

Almanzar, M., & Torero, M.; (2017): "Distributional Effects of Growth and Public Expenditures in Africa: Estimates for Tanzania and Rwanda", *World Development,* 95, 177-195

Alex, E. O. & Ebieri, J. (2014). Empirical analysis of the impact of fiscal policy on economic growth of Nigeria. *International Journal of Economics and Finance*, 6(6), 148-161.

Anderson, E., d'Orey, M. A. J., Duvendack, M. & Esposito, L. (2018). Does GovernmentSpending Affect Income Poverty? A Meta-Regression Analysis. *World Development,* 103, 60–71.

Atems, B. (2017). Regional heterogeneity in the relationship between inequality and growth: Evidence from Panel Vector Autoregressions. *The Journal of Economic Asymmetries,* 1–7

Atems, B. & Jones, J. (2015). Income inequality and economic growth: a panel VAR Approach. *Empir Econ*, 48(4), 1541-1561.

Babalola, S. J. & Aminu, U. (2012). Fiscal Policy and Economic Growth Relationship in Nigeria. *International Journal of Business and Social Science*, 2 (17): 244 – 249

Babu, M. S., Bhaskaran, V. & Venakatesh, M. (2016). Does inequality hamper long run growth? Evidence from Emerging Economies. *Economic Analysis and Policy,* 52, 99 113

Bahmani-Oskooee, M., Hegerty, S. W., &Wilmeth, H. (2015). Short-run and long-run determinants of income inequality: evidence from 16 countries. *Journal of Post Keynesian Economics,* 30(3):463-484.

Baiardi, D. & Morana, C. (2018). Financial development and income distribution inequality in the Euro area. *Economic Modelling,* 70, 40–55.

Bansod, D., Mohapatra, G. & Giri, A. K. (2017). Fiscal Policy, Economic Growth and Income Inequality: A Case of Indian Economy. *The Romanian Economic Journal*, 63,72-88.

Barro, R. (1990). Government spending in a simple model of endogenous growth. *Journal of Political Economy,* 98: 103 – 125

Barro, R. J. & Sala-i-Martin, X. (1992). Convergence. *Journal of Political Economy*, 100 (2): 223 – 251

Benos, N. & Karagiannis, S. (2016). Inequality and Growth: Why Physical and Human Capital Interactions Matter. *Journal of Development Economics,* 13 (3), 367–382.

Binatli, A. O. (2012). Growth and income inequality: a comparative analysis. *Economics Research International*, 1-7.

Breitung, L. (1999). The local power of some unit root tests for panel data, discussion paper. Humboldt University, Berlin.

Cabrera, M., Lustig, N. & Moran, H. E. (2015). Fiscal Policy, Inequality, and the Ethnic Divide in Guatemala. *World Development,* 76, 263–279.

Cevik, S. & Correa-Caro, C. (2015). Growing (Un)equal: Fiscal Policy and Income Inequality in China and BRIC. IMF Working Paper 18, 1-26.

Chibi, A., Benbouziane, M. & Chekouri, S. M. (2014). The Impact of Fiscal Policy on Economic Activity over the Business Cycle: An Empirical Investigation in the case of Algeria. *Economic Research Forum, Working Paper* 845, 1-36.

Christian, K. (2014). Africa's Rising Middle Class amid Plenty and Extreme Poverty, *European Centre for Development Policy Management, No.167, 2014.*

Cingano, F.(2014). Trends in income inequality and its impact on economic growth. OECD. Social Employment and Migration Working Papers No163.

Collier, P. & Dollar, D. (2002). Aid Allocation and Poverty Reduction. *European Economic Review, 46, 1475–1500.*

Cooray, A. (2009). Government expenditure, governance and economic growth. *Comparative Economic Studies*, 51, 401-418.

Davtyan, K. (2014). Interrelation among Economic Growth, Income Inequality, and Fiscal Performance: Evidence from Anglo-Saxon Countries. *Research Institute of Applied Economics Working Paper* No. 2014/05, 1-42.

De-Haan, J. & Sturm, J-E. (2017). Finance and income inequality: A review and new evidence. *European Journal of Political Economy*, 50, 171-195.

Demetriades, P. & Law, S. H. (2006). Finance, Institutions and Economic Growth. *International Journal of Finance and Economics,* 11(3), 245 – 260

Dong, X-Y. & Hao, Y. (2018). Would income inequality affect electricity consumption? Evidence from China. *Energy*, 142, 215-227.

Dustin C.(2007): Trading places: Does past growth impact inequality? *Journal of Development Economics* 82(2007) 257-266

Easterly, W. & Rebelo, S. (1993). Fiscal Policy and Economic Growth: An empirical Investigation. *Journal of Monetary Economics,* 32 (1993): 417 – 458

Engle, R. F. & Granger, C. W. (1987). Co-integration and Error Correction: Representation, estimation and Testing. *Econometrica,* 55: 251 – 276

Fashola, M. A. (2001). Macroeconomics Theory; Highlights and Policy Extensions for Less-Developed Economies, 3rd Edition: Concept Publication.

Fawaz, F. & Frey, E. (2018). The impact of abundancy of resources and regime type on income inequality: The case of less-developed countries. *Kasetsart Journal of Social Sciences,* 1-7.

Fawaz, F., Rahnama, M., &Valcarcel, V.J. (2014). A refinement of the relationship between economic growth and income inequality. Applied Economics, 46(27).

Forbes, K.J(2000). A Reassessment of the relationship between inequality and growth. *American Economic Review,* Vol.90, No.4(200):869-887.DOI10.1257/aer.90.4.869

Fosu, A. K. (2017). Growth, inequality, and poverty reduction in developing countries: Recent global evidence. *Research in Economics,*71, 306–336.

Gründler, K & Scheuermeyer, P. (2018). Growth effects of inequality and redistribution: What are the transmission channels? *Journal of Macroeconomics,* 55, 293–313.

Hadri, K. (2000). Testing for stationarity in heterogeneous panel data. *Econometrics Journal* ; 3(2):148–61.

Halter, D., Oechslin, M., & Zweimu Lier, J. (2014). Inequality and growth: The neglected time dimension. Journal of Economic Behaviour and Organisation, 145,275-293.

Halvarsson, D., Martin Korpi, M. & Wennberg, K. (2018). Entrepreneurship and income inequality. *Journal of Economic Behavior & Organization,*145, 275– 293.

Herzer, D. & Vollmer, S. (2012). Inequality and growth: evidence from panel cointegration. *Journal of Economic Inequality,* 10, 489-503.

Hlouskova, J. & Wagner, M. (2006). The performance of panel unit root and stationarity tests: results from a large scale simulation study. *Econometric Reviews*; 25(1):85–116.

Holmes, J. M. &Hutton, P. A. (1990). On the causal relationship between government expenditures and national income. *The Review of Economics and Statistics*, 72(1): 87-95.

Hossain, M. S. (2011). Panel estimation for CO_2 emissions, energy consumption, economic growth, trade openness and Urbanization of newly industrialized countries. *Energy Policy*; 39:6991–9.

Huang, C-J. (2013). Corruption and Income Inequality in Asian Countries: Bootstrap Panel Granger Causality Test. *Romanian Journal of Economic Forecasting*, 16(4), 161- 170.

Huang, H-C., Fang, W. S., Miller, S. M. &Yeh, C-C. (2015). The effect of growth volatility on income inequality. *Economic Modelling*, 45, 212–222.

Hussain, A., Muzafar, S. H., & Ahmad, Z. B. (2012). The effect of fiscal variables on economic growth in Asian economies: A dynamic panel data analysis. *International Journal of Business and Management,* 4(1), 48-61.

Im, K. S., Pesaran, M. H. & Shin, Y. (2003). Testing for unit roots in heterogeneous Income Inequality and Economic Growth. *Economic Modelling*, 30, 814–824.

Iosifidi, M. &Mylonidis, N. (2017). Relative effective taxation and income inequality: Evidence from OECD countries. *Journal of European Social Policy*, 27(1) 57–76

International Monetary Fund (IMF)

Jaejoon,W.(2011). Growth, income distribution, and fiscal policy volatility. *Journal of Development Economics* 96(2011), 289-313

Jakob, de H.,Jan-Egbert, S.(2017). Finance and income inequality: A review and new evidence. *European Journal of Political Economy*, http://dx.doi.org/10.1016/j.ejpoleco.2017.04.007

Jha, S., Mallick, S. K., Park, D. &Quising, P. F. (2014). Effectiveness of countercyclical fiscal policy: Evidence from developing Asia. *Journal of Macroeconomics*, 40, 82- 98.

Kasman, A. &Duman, Y. S. (2015). CO2 emissions, economic growth, energy consumption, trade and urbanization in new EU member and candidate countries: a panel data analysis. *Economic Modelling*, 44:97–103.

Kennedy, T., Smyth, R., Abbas Valadkhani, A. & Chen, G. (2017). Does income inequality hinder economic growth? New evidence using Australian taxation statistics. *Economic Modelling*, 65, 119-128.

Keynes, J. M. (1936). The General Theory of Employment, Interest and Money, London: Macmillan.

Keynes, J. M. (1936). The General Theory of Employment, Interest, and Money. New York: Harcourt Inc.

Khattak, D., Muhammad, A. & Iqbal, K. (2014). Determining the Relationship between Income Inequality, Economic Growth & Inflation. *Journal of Social Economics*, 1(3),104-114

Kuznets, S. 1955. Economic Growth and Income Inequality. *The American Economic Review*, 45, 1, 1-28.

Larch M., Paul van den Noord,Lars J(2010). The stability and growth pact: Lessons from the Great Recession, Economic Papers 429, December 2010

Lee, D. J. & Son, J. C. (2016). Economic growth and income inequality: evidence from dynamic panel investigation. *Glob Econ Rev*; 45(4):331-358.

Li, T., Lai, J. T., Wang, Y. & Zhao, D.(2016).Long-run relationship between inequality and growth in post-reform China: New evidence from dynamic panel model. *International Review of Economics and Finance*, 41, 238–252.

Li, H., &Zou, H. (1998). Income inequality is not harmful for growth: theory and evidence. Review of Development Economics, 2(3), 318-334

Lim, C. Y. & Sek, S. K. (2014). Exploring the Two-Way Relationship between Income Inequality and Growth. *Journal of Advanced Management Science,* 2(1), 33-37.

Liu, Y. & Martinez-Vazquez, J. (2015). Growth–Inequality Trade-off in the Design of Tax Structure: Evidence from a Large Panel of Countries. *Pacific Economic Review*, 20(2), 323-345.

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics,* 22 (1): 3-42.

M'Amanja, D. & Morrissey, O. (2005). Fiscal Policy and Economic Growth in Kenya, CREDIT Research Paper, *Journal of Administrative Science*, 12(2)

Madsen, J. B., Islam, M. R. &Doucouliagos, H. (2018). Inequality, Financial Development and Economic Growth in the OECD,1870-2011. *European Economic Review,*101, 605-624.

Mahmah, A. E. &Kandil, M. E. (2018). The balance between fiscal consolidation and non-oil growth: The case of the UAE. *Borsa Istanbul Review*, 1-17.

Mankiw, N. G., Romer, D. & Weil, D. N. (1992). A Contribution to the Empirics of Economic Growth. *Quarterly Journal of Economics*, 107 (2): 407 – 437

Martineau, N., & Smith, G. W. (2015). Identifying fiscal policy (in) effectiveness from the differential counter-cyclicality of government spending in the interwar period. *Canadian Journal of Economics*, 48(4), 1291-1320.

Martinez-Vazquez, J., Vulovic, V. & Moreno-Dodson, B. (2012). The impact of tax and expenditure policies on income distribution: Evidence from large panel of countries. *International Center for Public Policy Working Paper* 12-25

Masca, S. G., Cuceu, I. C. &Vaidean, V. L. (2015). The Fiscal Policy as Growth Engine in EU countries. *Procedia Economics and Finance*, 32, 1628 – 1637.

Masih, A. M. M. &Masih, R. (1996). Energy Consumption, Real Income and Temporal Causality, Results from a Multi-Country Study Based on Co-integration and Error Correction Modeling Techniques. *Energy Economics, 18(1), 165-183.*

Mehic, A. (2018). Industrial employment and income inequality: Evidence from panel data. *Structural Change and Economic Dynamics,* 45, 84-93

Méndez-Errico, L., Lanzilotta, B. &Brida, J. G. (2016). Dynamic relationship between income inequality and economic growth in Uruguay. A Cointegration approach. *Instituto de Economia*, 48-67

Mikek, P. &Carter, A. (2017). Income Inequality in Latin America and Eastern EU through the Great Recession: An Ordered Probit Analysis. *Advances in Economics and Business,* 5(10), 539-549.

Mikucka, M., Sarracino, F. &Dubrow, J. K. (2017). When Does Economic Growth Improve Life Satisfaction? Multilevel Analysis of the Roles of Social Trust and Income Inequality in 46 Countries, 1981–2012. *World Development*, 93, 447–459.

Milanovic B.(1999). Explaining the increase in inequality during transition. *Economics of Transition,*Vol.7(2) 1999, 299-341

Morakinyo, F. O., David, J. O. &Alao, J. A. (2018). Impact of Fiscal Policy Instrument on Economic Growth in Nigeria. *International Journal of Economics and Financial Management,* 3(1), 14-29.

Muinelo-Gallo, L., Roca-Sagalés, O. (2011), "Economic Growth and Inequality: The Role of Fiscal Policies.*Australian Economic Papers* 50(2-3), 74-97.

Muinelo-Gallo, L. & Roca-Sagalés, O. (2013). Joint Determinants of Fiscal Policy, Income Inequality and Economic Growth.*Economic Modelling*, 30, 814–824.

Musgrave, B. (1988). Public Finance in Theory and Practice, New York: McGraw- Hill Book Company. Narayan, P. K. & Narayan, S. (2010). Carbon dioxide emissions and economic growth: panel data evidence from developing countries. *Energy Policy*, 38(1):661–6.

Nathan, P.A. (2012). The impact of fiscal policy on the Nigerian economy. *International Review of Social Sciences and Humanities*, 4(1): 142-150.

Ndubuisi, P. (2017). Dynamic Relationship Between Fiscal Policy and Economic Growth in Nigeria (Long and Short Run Analysis). *Journal of Business and Economic Development,* 2(4), 215-226

Nissim, B.D.(2007). Economic growth and its effect on income distribution. *Journal of Economic Studies*, 34(1), 42-58.

Obadić, A., Šimurina, N. & Sonora, R. (2014). The effects of tax policy and labour market institutions on income inequality. *Zb. rad. Ekon. fak. Rij*,32(1), 121-140.

Obradović, S., Lojanica, N. &Janković, O. (2016). The influence of economic growth on regional disparities: Empirical evidence from OECD countries. *Zb. rad. Ekon. fak. Rij,* 34(1), 161-186

Ogundajo, G. & Onakoya, A. B. O. (2017). Taxation revenue and economic growth in Africa. *Journal of Accounting and Taxation*, 9, 11-22.

Osinowo, O.H. (2015). Effect of fiscal policy on sectoral output growth in Nigeria. *Advances in Economics and Business*, 13(6), 324-335.

Ostry, M. J. D., Berg, M. A., Tsangarides, M. C. G. (2014). Redistribution, inequality, and growth. International Monetary Fund (2014).

Park, D. & Shin, K. (2015). Economic Growth, Financial Development, and Income Inequality. ADB Economics Working Paper Series 441, 1-31.

Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels with multiple regressors. *Oxford Bulletin of Economic Statistics*. 61, 653–670.

Pedroni, P. (2001). Purchasing power parity tests in co-integrated panels. *Review of Economics and Statistics* 83, 727-731.

Pedroni, P. (2004). Panel cointegration: asymptotic and finite samples properties of pooled time series tests with an application to the PPP hypothesis. *Econometric Theory* 20, 597–625.

Perera, L. D. H. & Lee, G. H. Y. (2013). Have economic growth and institutional quality contributed to poverty and inequality reduction in Asia? *Journal of Asian Economics*, 27, 71–86.

Pesaran, H. & Smith, R. (1995). Estimating Long-Run Relationships from Dynamic Heterogeneous Panels. *Journal of Econometrics*, 68 (1): 79 – 113

Pesaran, M. H., Shin, Y. & Smith, R. P. (1999). Pooled Mean Group Estimation of Dynamic Heterogeneous Panels. *Journal of the American Statistical Association*, 94 (446): 621 – 634

Policardo, l., Punzo, L., Sánchez-Carrera, E. (2015). Brazil and China: Two Routes of Economic Development. Universita di Siena, Quaderni del Dipartimento di Economia Politica e Estatistica No. 709.

Ramos, X. & Roca-Sagalés, O. (2008). Long-term effects of fiscal policy on the size and distribution of the pie in the UK. *Fiscal Studies*, 29 (3), 387–411.

Risso, W. and Sánchez Carrera, E. (2012). Inequality economic and growth in China. *Journal of Chinese Economic and Foreign Trade Studies*, 5(2): 80-90.

Risso, W., Punzo, L., Sánchez-Carrera, E. (2013). Economic growth and income distribution in Mexico: A cointegration exercise. *Economic Modelling*, 35: 708-714.

Rubin, A. & Segal, D. (2015). The effects of economic growth on income inequality in the US. *Journal of Macroeconomics*, 45, 258-273

Samargandi, N., Fidrmuc, J. & Ghosh, S. (2015). Is the Relationship between Financial Development and Economic Growth Monotonic? Evidence from a Sample of Middle Income Countries. *World Development*, 68: 66 – 81

Shahbaz, M., Rehman, I. U. &Mahdzan, N. S. A. (2013). Linkages between Income Inequality, International Remittances and Economic Growth in Pakistan. MPRA Paper No. 45577, 1-50.

Simoes, M., Andrade, J. & Duarte, A. (2013), `A regional perspective on inequality and growth in Portugal using panel cointegration analysis. *International Economics and Economic Policy,* 10(3), 427-451.

Solow, R. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*, 70: 65 –94

Tabassum, A. &Majeed, M. T. (2008). Economic growth and income inequality relationship: Role of credit market imperfection. *The Pakistan Development Review,* 47, 727-743.

Tridico, P. (2010). Growth, Inequality and Poverty in Emerging and Transition Economies. *Transition Studies Review,* 16(4), 979-1001.

United Nations Development Program (UNDP 2016). Human Development Report 2016: Human Development for everyone

Victor, L. and Marcos,P.,2013: Fiscal policy implementation in Sub-Saharan Africa, *World Development* Vol.46, 79-91

Wahiba, N. F. & El-Weriemmi, M. (2014). The relationship between economic growth and income inequality. *International Journal of Economics and Financial Issues*, 4(1):135-143.

Yang, Y. &Greaney, T. M. (2017). Economic Growth and Income Inequality in the Asia Pacific Region: A Comparative Study of China, Japan, South Korea, and the United States. *Journal of Asian Economics,* 48, 6-22

Yu, N., Yu, B., de-Jong, M. &Storm, S. (2015). Does inequality in educational attainmentmatter for China's economic growth? *International Journal of Educational Development,* 41, 164–173

Zouheir, A. &Imen, M. S. (2012). Economic Growth and Income Inequality: Empirical Evidence from North African Countries. *Asian Economic and Financial Review,* 2(1), 142- 154.