Government Expenditure, Efficiency and Economic Growth: A Panel Analysis of Sub Saharan African Low Income Countries

Edmund Lawrence Kimaro[5], Choong Chee Keong[6] and Lau Lin Sea[7]

Abstract

This paper analyzes the impact of government expenditure and efficiency on economic growth of Sub Saharan African low income countries. The paper uses a panel data of 25 Sub-Saharan African low income countries spanning from 2002 – 2015 which are obtained from World Development Indicators (WDI) database. The paper executes panel unit root tests by using Im-Pesaran-Shin and Fisher ADF tests. The paper also uses Pedroni test to accomplish panel cointegration tests. Finally Generalized Methods of Moments (GMM) is applied to answer the two research questions. The results demonstrate that increasing government expenditure accelerates economic growth of low income countries in Sub Saharan Africa. However, when government expenditure is interacted with government efficiency we find no evidence for government efficiency to boost the impacts of government expenditure on economic growth. Fiscal policy makers in Sub Saharan African low income region should consider the rationale for using their spending to accelerate economic growth.

Key words: Government expenditure, efficiency, economic growth, Sub Saharan Africa

---

[5] Corresponding Author, Department of Economics, Faculty of Business and Finance, UTAR, Malaysia. Email: kimseddy@yahoo.com

[6] Professor of Economics, Department of Economics, Faculty of Business and Finance, UTAR, Malaysia. Email: choongck@utar.edu.my

[7] Assistant Professor of Economics, Department of Economics, Faculty of Business and Finance, UTAR, Malaysia. Email: lauls@utar.edu.my

1. Introduction

Does government involvement in economic management generate spill over benefits or costs? The debate concerning government involvement in economic system and its outcome has long history since the Keynesian and Neo Classical eras (Prasetyo & Zuhdi 2013) and this involvement is justified by the nature of market economy. There is a contention that market is not perfect, thus government intervention is required to minimize the distortions which results from market failure. The aim of superseding the economic system is to achieve efficiency, and thus economic growth (Parker & Kirkpatrick 2012; Prasetyo & Zuhdi 2013). However, while correcting the market imperfections government is required not to surrogate the workings of the market system rather to reimburse for its shortcomings (Prasetyo & Zuhdi 2013).

While government intends to achieve better efficiency through superseding the workings system of the economy, there is further contention that government intervention may result into inefficiency rather than efficiency in resources allocation. This is because government tends to displace private sector performance through the effects of crowding-out (Prasetyo & Zuhdi 2013). In most cases, increasing government expenditure in developing countries causes crowding out of private investment. Consequently the whole process reduces economic growth (Chang et al. 2011).

Despite all these debates, the argument whether government expenditure contributes positively to economic growth has become an accepted premise in most economies world over (Prasetyo & Zuhdi 2013). Along this hypothesis, for government expenditure to have significant contribution to the country's economic growth maximum efficiency in resources allocation is essential. The relationships between government expenditure and economic growth tend to vary and these variations are influenced by the level of efficiency (Rahmayanti & Horn 2010). The performance of government towards economic growth is more significant when government advances its accountability (Hauner & Kyobe 2010). Government expenditure is an input which requires maximum efficiency in allocation so as to accelerate economic growth (Therkildsen 2010). Therefore growth maximization requires the attention of simultaneous magnitude of government expenditure and the level of government efficiency in resource allocation.

Sub Saharan African region has 48 countries (see the appendix). Among these, 27 countries experience income per capita less than USD 1025, thus World Bank Classification 2016 classifies them as low income countries (Ogundipe et al. 2014). For more than half a century since the attainment of their political independence the process of public resources allocation has failed to bring better economic growth and perk up the living standards of its people. To date, the problem of abject poverty affects more than 50 per cents of the citizens in Sub Saharan African low income countries (Asiedu 2004). Economic performance in the region is unsatisfactory (Asiedu 2002).

This paper analyses the impacts of government expenditure on economic growth of Sub Saharan African low income countries. The paper also analyses whether government efficiency is a catalyst for boosting the impact of government expenditure on economic growth. Thus, this paper answers the following two research questions;

(i)   What are the impacts of government expenditure on economic growth of Sub Saharan African low income countries?

(ii)   Does government efficiency accelerate the impacts of government expenditure on economic growth of Sub Saharan African low income countries?

The paper utilises advanced econometric measures such as panel unit root tests, panel cointegration and panel GMM to answer the two research questions and accomplish its objectives. The empirical findings from this analysis have dual obligations to fiscal policy makers especially on government expenditure allocation as follows; first, they offer the rationale for government involvement in the economic management and its impact on economic growth by using up to date economic information. Second, empirical findings bring an attention with regard to the government efficiency and its significance towards accelerating the impacts of government expenditure on economic growth.

The rest of this paper is organised as follows; section 2 discusses literature review focusing on government expenditure, efficiency and economic growth relationships. Data and methodology which are used by this paper to answer the two stated research questions and fulfil the intended objectives are presented in section 3. While section 4 presents, discusses and interprets the empirical results, section 5 offers conclusion and policy implications.

2. Literature Review
2.1 An overview of government expenditure, efficiency and economic growth
So far, numerous studies which relate government expenditure and economic growth have produced different results. Some studies see for instance Beraldo, Montolio and Turati (2009); Bojanic (2013); Kapunda and Topera (2013); Taiwo and Abayomi (2011) and Wang (2011) conclude that increasing government expenditure fosters economic growth. Other studies like Carter, Craigwell, and Lowe (2013); Chang et al., (2011); Ghura and Hadjimichael (1995); Kweka and Morrissey (1996); Ndambiri et al., (2012) and Nurudeen and Usman (2010) demonstrate that increasing government expenditure reduces economic growth while some studies like Kollias, Manolas, and Paleologou (2004) and Sinha (1998) reveal a non significant relationship between government expenditure and economic growth. Premised on these different findings it is plausible to conclude that the relationship between government expenditure and economic growth is inconclusive.

There is also a contention that in order to achieve robust results while analyzing the impacts of government expenditure on economic growth government efficiency should be considered (Rahmayanti & Horn 2010; Avkiran 2006; Angelopoulos et al. 2008; Mandl et al. 2008). Economic growth depends not only on government expenditure but also the ability of the government to allocate its public resources and therefore efficiency. Growth maximization requires a simultaneous awareness of government expenditure and efficiency (Angelopoulos et al. 2008). Based on this contention it is logical to conclude that government expenditure and government efficiency are complementary if countries aspire to achieve better economic growth by using government expenditure.

2.2 Theoretical literature
2.2.1 Theoretical linkage between government expenditure and economic growth
Does the increase in government expenditure always accelerate economic growth? Whether the increase in government expenditure fosters economic growth is influenced by various factors such as source of finance and efficiency to facilitate that spending (Riedl 2008; Cakerri et al. 2014), share of total imports to country's government expenditure (Wenyi Shen et al. 2015) and the nature of the country's taxation systems (Gui-Diby 2014).

With regard to the sources of finance and its allocative efficiency; borrowing funds from the domestic private investors implies that the private sector is left with insufficient financial resources to finance their investment projects necessary for economic growth. These modest financial resources which are remained with domestic private investors finally do not logically contribute to economic growth. For each 1 USD which is offered to the government by private investors as a loan to be allocated by politicians imply 1 USD less which would be allocated efficiently by private sector through the mechanisms of market forces (Cakerri et al. 2014; Riedl 2008).

Moreover, Cakerri et al., (2014) and Riedl (2008) emphasize more that the process of increasing government expenditure which is associated with borrowing financial resources from the private investors does not induce new spending power in the economy which is necessary for economic growth. Government borrowing from the private investors ends-up at redistributing the existing income instead of generating new productive projects which foster economic growth. Economic growth is not boosted by redistributing wealth among individuals in the country; rather it is boosted by inducing new spending power. Increasing government expenditure which invites competition between public and private sectors on the available credits increases pressure in the credit market; the outcome is increasing interest rates. This hypothesis is supported by Gisore, Kiprop, Kalio, Ochieng and Kibet (2014) who put forward that the increased interest rates displace private sectors and reduces economic growth. Additionally, the national income multiplier of a country is more superior when it is financed by external financial resources compared to internal financial resources. Financing public projects by using external financial resources bring on new economic resources and trim down crowding-out effects resulted from increasing government expenditure (Wenyi Shen et al. 2015).

Therefore government expenditure is more effective towards promoting economic growth when financial resources are secured from external sources and thus avoiding to jeopardize the growth of private sector. Based on this argument, governments of the developing countries should take into consideration the rationale for securing external financial resources and minimize domestic borrowing when they expand their public sectors.

Another reason as to why government expenditure tends to diminish economic growth is caused by the share of imports to total spending by the government. In developing economies a good number of public projects rely on importation of technology and other compulsory resources. This causes a diminishing degree of home bias in public investment spending which demonstrates that larger percentage of government demand is financed by imports. Increasing

government expenditure of an economy with a diminishing degree of home bias in public investment retards economic growth (Wenyi Shen et al. 2015).

The principal message with regard to the share of imports to total government expenditure is that fiscal policy makers should further be aware that the increase in imports is detrimental to real exchange rates and country's reserves especially when imports are financed by domestic financial resources (Wenyi Shen et al. 2015); therefore countries should consider the significance of instituting their own capacity to meet the government demand instead of relying much on importations for fast economic growth.

The last but not least, Gui-Diby (2014) postulates further that the reason as to why the increasing government expenditure diminishes economic growth is attributed by whether taxation system is distortionary or non distortionary. Afonso, Ebert, Schuknecht and Thone (2005) elaborate about the taxation system and assert that if country's government expenditure is greater than government revenue (a situation which is prevalent in developing countries like Sub Saharan Africa low income region) then the government ends up at debt accumulation. The increasing public debt induces unsustainable macroeconomic imbalances. Concurrently, private sectors may reduce their investment projects because they foresee future increase in tax due to unsustainable fiscal situation i.e., government expenditure to surpass government revenue. The reduction in private investment has a pessimistic multiplier effect; hence may slow down economic growth.

Premised on the nature of the country's taxation hypothesis, governments of the developing countries should consider the efficiency of their taxation systems in order to minimize distortions. Taxation systems should not endanger the private sector sustainability; rather it should be convivial enough to encourage mutual benefits among public and private sectors. Furthermore, governments of the developing countries should consider the importance of overcoming deficits in their budgets in order to avoid debt accumulation. Reducing deficits in the government budget can be achieved through either minimizing government expenditure or increasing government revenues or both.

2.2.2 Theoretical linkage between government efficiency and economic growth
One of the core issues which have become significant when addressing the issues of government expenditure is the question of government efficiency. But what is government efficiency and where does it come from? Before focusing on the government efficiency and economic growth relationships, it is paramount to have a brief meaning of institutions as the universal set from which government efficiency is originated.

Institutions are the humanly formulated constraints which shape human synergies. Relative to physical engineering, institutions are acknowledged as social technologies in the process of productive economic activities which encompass patterned human interactions and determine their inducement (Law & Habibullah 2006). From the institutional outlook, markets are not viewed as the collective physical atmosphere of economic existence, nevertheless social institutions which depend upon the development of comprehensive rules and norms (Hodgson 2006), thus institutions are the rules of game in the economy which govern the interactions between economic agents (Law & Habibullah 2006). Additionally, even in the free market

economy where price mechanisms override the whole process of resource allocation with a minimum government intervention, without the workings of strong institutions and thus government efficiency market itself cannot yield better outcomes (Hodgson 2006).

How do institutions operate and affect the economy? Quality of institutions is important in the economic system because they generate economic synergies. Quality of institutions ensures performance standards among various economic agents. From the knowledge flows viewpoint which exists through the spillovers of technological diffusion, quality of institutions in the perspectives of government regulations quality, trust relationships which are supported by specific socio-cultural economic groups as well as intermediate organizations perform better than markets to fasten technological convergence. For instance in South Korea quality of institutions lead technological convergence among various manufacturing companies like Hyundai, POSCO and Samsung which deal with the supplying of automobiles, steel and electronics respectively (Rasiah 2011).

Moreover, under the existence of information asymmetry which may obstruct perfect interaction between households, firms, government and the rest of the world there are intermediate players like chambers of commerce and training societies which resolve the problem of information asymmetry through research and development; this resolution is promising if the nation possesses better institutions. Therefore institutions are necessary because they accelerate learning and innovation (Rasiah 2011). Quality of institutions dominates international economic integrations in determining cross-country income levels; henceforth institutions are essential for economic performance (Law & Habibullah 2006). Accordingly, there are six dimensions which measure quality of institutions; these are voice and accountability, political stability, government efficiency, regulatory quality, rule of law and control of corruption (Radaelli & Francesco 2010) and they all constitute economic synergies (Rasiah 2011) and determine economic growth (Law & Habibullah 2006).

So far we have discovered that government efficiency is rooted from the quality of institutions (Radaelli & Francesco 2010). Government efficiency, effective government and quality of governance are used synonymously to signify the ability of the government to institute and implement sound policies which have positive impact in the economy. Afonso, Schuknecht and Tanzi (2008) describe the meaning of government efficiency as the capability of the government to invest its public resources in order to produce public goods and services which benefit majority in the economy and promote economic growth. Better quality of institutions ensures more effective government which allocates public resources more efficiently and spur economic growth (Law & Habibullah 2006).

Nevertheless, although institutions are noteworthy in determining economic growth, see for instance (Silve & Plekhanov 2015; Bassanini & Scarpetta 2001; Glaeser et al. 2004; Gazdar & Cherif 2015; Hisamoglu 2014; Law et al. 2013; Butkiewicz & Yanikkaya 2011) some components which measure institutions are not given much consideration in the growth literature (Law & Habibullah 2006; Silve & Plekhanov 2015). Some analysts estimate economic growth model and ignore institutions which empower economic agents and determine their inducement

(Hodgson 2009). Estimating economic growth model which ignore the role of institutions and therefore government efficiency may end up at distorting the analysis (Tebaldi & Elmslie 2008).

Economic growth depends on both government expenditure and the level of government efficiency (Angelopoulos et al. 2008; Butkiewicz & Yanikkaya 2011; Rahmayanti & Horn 2010; Avkiran 2006; Hauner & Kyobe 2010). However, whether government efficiency accelerates or retards the impacts of government expenditure on economic growth is influenced by the objectives of pursuing public expenditure policy (Barrios & Schaechter 2008; Macek & Janků 2015) and the capability of planners to minimize errors when initiating public projects (Wenyi Shen et al. 2015).

Barrios and Schaechter (2008) put forward that the contribution of efficiency towards economic growth through government expenditure is associated with the objectives of implementing that particular public expenditure policy. If the objective of implementing public expenditure policy is to boost economic growth then efficiency will accelerate the impacts of government expenditure on economic growth. On the other hand, if the objective of implementing public expenditure policy does not focus on promoting economic growth then efficiency ends-up at reducing the impact of government expenditure on economic growth. This hypothesis is supported by Macek and Janků (2015) who postulate that government efficiency increases economic growth if fiscal policy is pro-growth. Thus, governments of the developing countries should spotlight on the core objectives when they aspire fast economic growth through public sector expansion.

Likewise, Wenyi Shen et al., (2015) elaborate further that quality of government planners is essential for maximization of government efficiency thereby economic growth. Government planners should be able to foresee future economic conditions prior to the implementation of any public expenditure policy and injection of public funds. Planners must be capable for minimizing errors when they select public projects which will be financed during a particular fiscal year. Good governance and the degree of regulation are the core issues to be in place so as to ensure maximum efficiency which boosts the impact of government expenditure on economic growth.

2.3 Empirical literature
2.3.1 Empirical linkages between government expenditure and economic growth
The following discussions present some past studies which examine the relationships between government expenditure and economic growth. However, these studies overlooked the connotation of modeling expenditure-efficiency while analyzing expenditure-growth relationships, thus attracting non robust results.

In OECD countries, Bleaney, Gemmell and Kneller (2001) use Ordinary Least Squares (OLS) and employ a panel data of 22 OECD countries to measure the relationship between productivity government expenditure and economic growth. Empirical findings demonstrate that productivity government expenditure fosters economic growth of the sample countries. Consistent results which support the positive impact of government expenditure on economic growth are reported by Beraldo et al., (2009) and Wang (2011) also for OECD countries.

Likewise, Taiwo and Abayomi (2011a) employ Ordinary Least Squares (OLS) method and focus on the relationship between government expenditure in category wise and economic growth of Nigeria. Apart from applying OLS method the study uses time series data. The results show that increasing government expenditure promotes economic growth of Nigeria. Similarly, Nurudeen and Usman (2010) also in Nigeria use time series data, cointegration and error correction model. The empirical findings report mixed results as follows; firstly increasing government expenditure on transport and health sectors accelerates economic growth of Nigeria. Second, increasing government expenditure on recurrent and development categories retards economic growth.

More mixed results are also reported by Kweka and Morrissey (1996) who uses time series of Tanzania's economy covering the period from 1965 to 1996 and apply Ram (1986) model. The empirical findings report that; firstly increasing government consumption expenditure fosters economic growth of Tanzania. Secondly, increasing public investment impedes economic growth of Tanzania. This implies that financing of pubic investments should be sidetracked to growth enhancing sectors as economy grows.

In addition to Kweka and Morrissey (1996), Kapunda and Topera (2013) use time series data of Tanzania's economy spanning from 1965 to 2010 and Ordinary Least Squares (OLS) method to analyze the impacts of government expenditure composition on economic growth of Tanzania. Empirical results are inconclusive as for the case of Kweka and Morrissey (1996) and Nurudeen and Usman (2010) as follows; firstly increasing capital government expenditure fosters economic growth of Tanzania. Secondly, increasing recurrent government expenditure reduces economic growth of Tanzania as for the case of Nigeria which is reported by Nurudeen and Usman (2010). Thirdly, there are no evidence to prove the relationships between economic growth and expenditure on health, agriculture, military, general public services and infrastructure.

Furthermore, Loizides and Vamvoukas (2005) use a panel data of three developed economies namely; Greece, Ireland and UK. The study applies cointegration and error correction model. Empirical findings reveal that government expenditure accelerates economic growth of Greece, Ireland and UK. Consistent results are reported by Facchini and Melki (2013) who employ data spanning from 1896 to 2008 and apply cointegration techniques. The findings show that government size and GDP of France exhibit a long run relationship.

Besides, Bojanic (2013a) in Bolivia applies Generalized Method of Moments (GMM) and ensure the ability of not only to produce consistent and efficient estimates (Drukker 2010; Han & Phillips 2010), but also to surmount the problem of endogeneity (Chen et al. 2014; Gopalan & Rajan 2016). Empirical findings demonstrate that increasing government expenditure on military sector accelerates economic growth in Bolivia.

Similar to Bojanic (2013a), Chen, Lee and Chiu (2014) use dynamic panel to examine defense expenditure and economic growth nexus. The study covers 137 countries and apply Two-step GMM thus increases the ability of producing efficient estimators (Siddiqui & Ahmed 2013). Further, Chen et al., (2014) avoid to combine different countries which are not comparable and study them as a single entity, thus classifies them into sub-panels based on the status of their

incomes and obtain four sub-panels which are lower-income group, middle-lower-income group, middle-higher-income group and higher-income group. Mixed results are reported according to the status of incomes.

2.3.2 Empirical linkages between government efficiency and economic growth

With regard to the significance of government efficiency in boosting the impacts of government expenditure on economic growth Rahmayanti and Horn (2010) employ endogenous growth model and incorporate government efficiency to examine the relationships between government expenditure, efficiency and economic growth. The study uses panel data of 63 developing economies. Empirical results show that government efficiency matters up to a certain level of spending for government expenditure to boost economic growth. Beyond that level expenditure reduces economic growth. This contention is also supported by Facchini and Melki (2013) who assert that the effect of efficiency on economic growth in France is positive until when government expenditure reaches 30 per cents of GDP. Facchini and Melki (2013) conclude further that government size varies accordingly with respect to the nature of economies.

Consistent results which support the significance of efficiency to accelerate the effects of government expenditure on economic growth are reported by Hauner and Kyobe (2010) who apply GMM and panel data of 114 countries. Results show that efficiency increases the effects of government expenditure, also higher income countries perform better in terms of public sector thus concluding that efficiency and the status of income are correlated. Additionally, Butkiewicz and Yanikkaya (2011) reveal that if government is less efficient government expenditure tends to reduces economic growth.

More results which support the importance of government efficiency are reported by Angelopoulos et al., (2008) who demonstrate that what matters to growth is not the magnitude of government expenditure parse but the expenditure-efficiency mix. Angelopoulos et al., (2008) put forward that obtaining a robust impact of the overall government expenditure on economic growth without expenditure-efficiency is tedious. This argument is consistent with the hypothesis of Avkiran (2006); Rahmayanti and Horn (2010) who also advocate expenditure-efficiency while assessing the relationship between government expenditure and economic growth. Therefore, efficiency is imperative when examining government expenditure and its impact on economic growth.

2.4 Observations from the literature

This paper notices that quite a few studies apply time series data and thus invite more unobserved heterogeneity (Hsiao 2003; Baltagi 2005). Others use OLS which relies on restraining assumptions (Gujarati & Porter 2005; Chen et al. 2014) and increase inability to overcome the problem of endogeneity resulting from interrelationships between government expenditure and economic growth (Hsiao 2003; Baltagi 2005). Moreover, the use of Ram (1986) model is reported to cause interpretational difficulties because the model was established for the purposes of studying the relationship between exports and economic growth (Dunne et al. 2001; Dunne et al. 2004).

Furthermore, quite a few studies ignore the significance of modeling government efficiency while analyzing the relationships between government expenditure and economic growth thus obtain not only non-robust results (Angelopoulos et al. 2008) but also end up at misrepresenting the analysis (Tebaldi & Elmslie 2008). Additionally, few studies however apply panel data which increase the ability to overcome the problem of endogeneity and hence guarantee consistent results (Hsiao 2003; Baltagi 2005). Others also use GMM and ensure the ability of not only to produce consistent and efficient estimates (Drukker 2010; Han & Phillips 2010), but also to surmount the problem of endogeneity which results from simultaneity relationships between government expenditure and economic growth (Chen et al. 2014; Gopalan & Rajan 2016; Hsiao 2003; Baltagi 2005).

3. Data and Methodology
This section of the paper discusses data and the methodology which is applied by this paper to analyze the effects of government expenditure and efficiency on economic growth of Sub Saharan Africa low income countries.

3.1 Data and variable description
This paper employs panel data of Sub Saharan African low income economies covering the period from 2002 to 2015. However Somalia and South Sudan are not incorporated in this analysis because they are deficient in data for some important variables which are included in the model. Therefore this analysis covers 25 low income countries in Sub Saharan African region. (See the appendix).

The paper uses panel data because they are able to surmount the problem of endogeneity which is the outcome of unobserved information (Baltagi 2005; Hsiao 2003). This advantage ensures unbiased results. Data are obtained from World Development Indicators (WDI) database. The period from 2002 to 2015 is preferred by this paper because data for government effectiveness which presents government efficiency are obtained sequentially from 2002.

According to the World Bank the quality of institutions has six indicators, namely voice and accountability, political stability, government efficiency, regulatory quality, rule of law and control of corruption (Radaelli & Francesco 2010) and they all affect economic growth (Law & Habibullah 2006). Analysts constructed three suggestions with regard to the uses of these six indicators in a growth model; first suggestion is to apply the six indicators independently in a single growth model. However, these six indicators are highly interrelated, thus applying them independently may yield biased results (Buchanan et al. 2012; Globerman & Shapiro 2002). Second suggestion is to extract the six indicators to obtain a combined indicator by using Principle Component Analysis (PCA) and then apply the combined indicator in the growth model (Globerman & Shapiro 2002; Buchanan et al. 2012). Nevertheless, the application of combined indicator limits the ability of assessing how each dimension among the six accelerates economic growth. Third suggestion is to select one indicator among the six to signify institutional quality (Radaelli & Francesco 2010).

Taking into consideration all these suggestions this paper relies on the third suggestion and select government efficiency to represent institutional quality for better results. The significant for

selecting government efficiency is that government efficiency measures the capability of the government to formulate and implement appropriate policies (Avkiran 2006; Afonso et al. 2008). Government is required to formulate appropriate policies on how to allocate government expenditure which fosters economic growth. Thus government efficiency is a suitable indicator to represent institutions while analyzing the relationship between government expenditure and economic growth.

Accordingly, variables which are included in this analysis are GDP per capita (y_{it}) to represent economic growth and it is used as a dependent variable. Control variables are as follows; gross capital formation measured as a percentage of GDP to represent stock of physical capital stock (k_{it}), growth rate of population to represent growth of labor force (l_{it}), inflation (cpi_{it}) in order to capture the effectiveness of monetary policy, trade openness $(trade_{it})$ which is the summation of imports and exports measured as a ratio of GDP to capture the degrees of interaction among the countries, government final consumption expenditure (g_{it}) is measured as a percentage of GDP and government effectiveness (eff_{it}) which is used as a proxy for government efficiency and it is applied as an interaction term with government expenditure.

3.2 Empirical model specification
To the best of our knowledge there are few papers in Sub Saharan African low income region which incorporate efficiency while analyzing the impacts of government expenditure on economic growth. Thus, this paper applies two different models in order to examine the effects of government expenditure and efficiency on economic growth of Sub Saharan African low income countries. Model one examines the effects of government expenditure and other control variables without the inclusion of government efficiency. Model two examines the effects of government expenditure and other control variables including government efficiency. Therefore model two aims at examining the ability of the government to institute suitable policies aiming at proper allocation of public resources and its impact on economic growth. The two models are presented as follows;

3.2.1 Model one

$$y_{it} = \beta_0 + \sum_{i=1}^{5} \beta_i X_{it} + \varepsilon \qquad (3.1)$$

Whereas y_{it} represents economic growth. X stands for control variables are as discussed in section 4.1 above which are the stock of physical capital (k_{it}), growth of labor force (l_{it}), inflation rate (cpi_{it}), trade openness $(trade_{it})$ and government final consumption expenditure (g_{it}).

Assuming that the relationship between economic growth and its explanatory variables is linear, the paper applies natural logs and establish the growth model from equation (3.1) as follows.

$$\ln y_{it} = \beta_0 + \beta_1 \ln k_{it} + \beta_2 \ln l_{it} + \beta_3 \ln cpi_{it} + \beta_4 \ln trade_{it} + \beta_5 \ln g_{it} + \varepsilon_{it} \qquad (3.2)$$

From equation (3.2) government expenditure affects economic growth of Sub Saharan African low income countries as follows;

$$d \ln y_{it} = \beta_5 d \ln g_{it} \tag{3.3}$$

$$d \ln y_{it} \Big/ d \ln g_{it} = \beta_5 \tag{3.4}$$

This equation (3.4) measures the impact of government expenditure on economic growth of Sub Saharan African low income countries. This estimation answers the research question one which is stated in section 1.

3.2.2 Model two

In order to examine the role of government efficiency in allocating public resources this paper includes government efficiency in the general growth model as an interactive term. The objective is to examine the significance of government efficiency in boosting the effects of government expenditure on economic growth of Sub Saharan African low income countries. Thus, government efficiency is interacted with government expenditure. Therefore after interacting government expenditure with government efficiency the paper derives model two as follows;

$$y_{it} = \alpha_0 + \sum_{i=1}^{5} \alpha_i X_{it} + \alpha_6 g_{it} * eff_{it} + \xi \tag{3.5}$$

Assuming that the relationship between economic growth and its explanatory variables is linear, the paper applies natural logs and establish the growth model from equation (3.5) as follows.

$$\ln y_{it} = \alpha_0 + \alpha_1 \ln k_{it} + \alpha_2 \ln l_{it} + \alpha_3 \ln cpi_{it} + \alpha_4 \ln trade_{it} + \alpha_5 \ln g_{it} + \alpha_6 \ln g_{it} * eff_{it} + \xi \tag{3.6}$$

Then from equation (3.6) the significance of government efficiency in stimulating the effects of government expenditure towards economic growth is estimated as follows;

$$d \ln y_{it} = (\alpha_5 + \alpha_6 eff_{it}) d \ln g_{it} \tag{3.7}$$

$$d \ln y_{it} \Big/ d \ln g_{it} = \alpha_5 + \alpha_5 eff_{it} \tag{3.8}$$

Equation (3.8) demonstrates the significance of government efficiency towards boosting the effectiveness of government expenditure for better economic growth. Thus it answers the research question two which is stated in section 1.

4. Empirical Findings and Discussions

This section of the paper focuses on presentation, discussions and interpretations of the results of panel unit root tests, panel cointegration tests and panel GMM. The section also answers the two research questions.

4.1 Panel unit root tests

This paper conducts panel unit root tests by using Im-Pesaran-Shin (IPS) and Fisher ADF tests based on Schwarz Info Criterion (SIC). The reason IPS and Fisher ADF tests is that they rely on heterogeneity assumption among the observations (Maddala 1999; Baltagi & Kao 2000; Chang et al. 2011; Nell & Zimmermann 2011). This assumption is imperative in this analysis because Sub Saharan African low income countries are by nature heterogeneous, therefore the application

of IPS and Fisher ADF tests guarantee reliable results. The results are presented in Table 1 below.

Table 1: Results for Panel Unit Root Tests

Variable	Im-Pesaran-Shin			Fisher ADF		
	Level	First difference	Integration order	Level	First difference	Integration order
$\ln y_{it}$	-0.7423 (0.2289)	-21.4663*** (0.0000)	(1)	47.7770 (0.5630)	351.847*** (0.0000)	(1)
$\ln k_{it}$	0.05945 (0.5237)	-10.6142*** (0.0000)	(1)	59.0507 (0.1784)	193.150*** (0.0000)	(1)
$\ln l_{it}$	-0.5749 (0.2827)	-5.9336*** (0.0000)	(1)	62.0721 (0.1176)	128.659*** (0.0000)	(1)
$\ln cpi_{it}$	-0.3772 (0.3530)	-16.9646*** (0.0000)	(1)	45.6263 (0.6494)	297.919*** (0.0000)	(1)
$\ln trade_{it}$	-0.7506 (.02264)	-13.6218*** (0.0000)	(1)	57.4186 (0.2195)	215.731*** (0.0000)	(1)
$\ln g_{it}$	-0.1530 (0.4392)	-12.8403*** (0.0000)	(1)	54.8839 (0.2948)	227.274*** (0.0000)	(1)
$\ln g_{it} * eff_{it}$	0.4461 (0.6722)	-12.5563*** (0.0000)	(1)	50.4008 (0.4575)	225.434*** (0.0000)	(1)

Null hypothesis: Presence of unit root. The asterisk *** indicates significant at 1 per cent level of significance. Figures in the brackets are the probability values and figures without brackets represent test statistic values.

The results for panel unit root tests demonstrate that variables contain unit root at their levels. However after conducting first difference findings reveal that variables contain no unit root. Based on these findings, it is logical to conclude that economic shocks in Sub Saharan African low income region are temporary.

4.2 Panel cointegration tests
This paper uses Pedroni test in order to perform panel cointegration test. The aim is to examine if there exists a long run association between economic growth and its explanatory variables. Panel cointegration test is significant for policy purposes. It provides an opportunity to predict future economic performance. Results are presented in Table 2 below.

Table 2: Results for Panel Cointegration Tests

	With intercept and trend		With no intercept or trend	
	Test statistic	P-value	Test statistic	P-value
Panel v-statistic	-6.9092	(1.0000)	-4.3583	(1.0000)
Panel rho-statistic	4.5960	(1.0000)	2.7054	(0.9966)
Panel PP-statistic	-67.911***	(0.0000)	-25.2411***	(0.0000)
Panel ADF-statistic	-8.1940***	(0.0000)	-10.1935***	(0.0000)
Group rho-statistic	8.1880	(1.0000)	5.9506	(1.0000)
Group PP-statistic	-33.293***	(0.0000)	-22.4544***	(0.0000)
Group ADF-statistic	-10.9599***	(0.0000)	-9.0255***	(0.0000)

Null hypothesis: No cointegration. Asterisk *** indicates significant at 1per cent level of significance.

The results for panel cointegration test demonstrate that among the seven dimensions, four reject the null hypothesis of no cointegration and accept the alternative hypothesis that there is

cointegration. Therefore in Sub Saharan African low income region there is a long run association between economic growth and its explanatory variables.

5.3 Panel GMM: Results and interpretations
5.3.1 An overview
Fixed and random effect models could satisfy the analysis of government expenditure, efficiency and economic growth. However, the two models exhibit methodological weaknesses as follows; fixed effects model which relies on the assumption of different intercepts for different individuals (Gujarati & Porter 2005; Gopalan & Rajan 2016) employs Ordinary Least Squares (OLS) in its estimations. The applications of OLS may result into spurious estimates because it is unable to surmount the possible simultaneity relationship (Himmelberg et al. 1999; Gopalan & Rajan 2016) which exists between government expenditure and economic growth. If the simultaneity relationship between government expenditure and economic growth remains unsolved the results will be in a risk of endogeneity problem (Baltagi 2005; Hsiao 2003).

Similarly random effects model which relies on individuals' intercept and error term assumption employs Generalized Least Squares (GLS) method in its estimations. GLS is also proved to experience inability to overcome the problem of endogeneity (Gujarati & Porter 2005). Therefore, premised on these methodological shortcomings, fixed and random effect models are unable to solve the problem of endogeneity. The most excellent solution to overcome the problem of endogeneity which guarantee consistent and efficient estimates is to employ Generalized Methods of Moments (GMM) (Clark & Linzer 2012; Liu & Hsu 2006).

5.3.2 Presentation of panel GMM results
From equations (3.2) and (3.6) which are discussed in section 3.2 the paper estimates model one and model two as follows; model one analyzes the impacts of government expenditure on economic growth without taking into consideration the significance of government efficiency as presented by equation (3.2). Model two analyzes the impacts of government expenditure on economic growth by incorporating government efficiency in the growth model as presented by equation (3.6). The following Table 3 demonstrates the findings of the two models.

Table 3: Results for Panel GMM

Variables	Model One (without government efficiency)		Model Two (with government efficiency)	
	Coefficient	Test Statistics	Coefficient	Test Statistics
$\ln y_{it-1}$	-0.0634***	-3.6264 (0.0003)	-0.0549***	-4.1601 (0.0000)
$\ln k_{it}$	-0.0278***	-3.2705 (0.0012)	0.0288**	2.0607 (0.0402)
$\ln l_{it}$	0.1760***	4.3350 (0.0000)	0.1646***	6.1663 (0.0000)
$\ln cpi_{it}$	0.0290***	4.2792 (0.0000)	0.0153***	2.8918 (0.0041)
$\ln trade_{it}$	0.1221***	4.4900 (0.0000)	0.0830***	2.8937 (0.0041)
$\ln g_{it}$	0.3394***	11.2481 (0.0000)	0.3095***	11.4076 (0.0000)
$\ln g_{it}*eff_{it}$			0.0048	0.2309 (0.8176)
S.E. of Regression	0.3341		0.3358	
Prob (J-statistic)	0.2801		0.2718	

Note that Asterisk *** and ** indicate significant at 1 per cent and 5 per cent levels of significance respectively. Figures in the brackets represent P-values while figures without brackets are the Test statistics values.

Results in Table 3 above demonstrate the following. In model one when government efficiency is not incorporated in the growth model, all variables are statistically significant at 1 per cent significant level. In model two however when government efficiency is incorporated in the growth model as an interactive term the results reveal that the interactive term is non significant at all levels of significance. The remaining variables are statistically significant at 1 per cent significant level except capital which is statistically significant at 5 per cents levels of significance. These are justified by their test statistics and p-values which are demonstrated in the table. The coefficient of lagged dependent variable is also statistically significant at 1 per cent level of significance with a negative sign both in model one and model two.

5.3.3 The impacts of government expenditure on economic growth

The impact of government expenditure on economic growth when government efficiency is paid no attention is demonstrated in model one. The coefficient of government expenditure has a positive sign as expected by this paper. The results show that 1 per cent increase in government expenditure to Sub Saharan African low income countries accelerates economic growth by 0.34 per cents.

The findings of positive relationships between government expenditure and economic growth are consistent with Beraldo et al., (2009) and Wang (2011) who conclude that increasing government expenditure fosters economic growth of OECD countries; Taiwo and Abayomi (2011a) who find that increasing government expenditure promotes economic growth of Nigeria; Loizides and Vamvoukas (2005) who reveal that government expenditure accelerates economic

growth of Greece, Ireland and UK and Bojanic (2013a) who demonstrates that the increase in government expenditure on military sector accelerates economic growth in Bolivia.

5.3.4 The effects of government efficiency on economic growth
The significance of government efficiency is demonstrated by the coefficient of interactive term i.e., when government expenditure is interacted with government efficiency. The coefficient of interactive term has a positive sign as expected by this paper although it is statistically non-significant. This positive coefficient implies that government expenditure and government efficiency are complements meaning they execute concurrently to accelerate economic growth of Sub Saharan African low income countries.

The results show that 1 per cent increase in government expenditure which is associated with government efficiency accelerates economic growth of Sub Saharan African low income countries by 0.005 per cents. Based on these findings, governments of the low income countries in Sub Saharan African region have failed to be effective towards the allocation of government expenditure for fast economic growth.

5.3.5 The effects of other control variables on economic growth
The rest of the variables relate to economic growth of Sub Saharan African low income countries as follows; the coefficient of stock of physical capital has a negative sign when government efficiency is not included in the growth model. The results reveal that 1 per cent increase in stock of physical capital reduces economic growth of Sub Saharan African low income countries by 0.03 per cents. However, when government efficiency is included in the growth the coefficient of capital turns to be positive. The results show that 1 per cent increase in stock of physical capital accelerates economic growth of Sub Saharan African low income countries by 0.03 per cents when government efficiency is included in the growth model.

The coefficient of labour has contradicted with the growth theory. In both model one and model two the results show that the coefficient of labour has a positive sign. When government efficiency is not included in the growth model the findings show that 1 per cent increase in labour fosters economic growth of Sub Saharan African low income countries by 0.18 per cents. When government efficiency is included in the growth model the findings show that 1 per cent increase in labour fosters economic growth of Sub Saharan African low income countries by 0.16 per cents. These findings contradict with Barro and Sala-i-Martin (2004) theory that the increase in population is detrimental to income per capita of developing countries.

In all models the coefficients of inflation have a positive sign contrary to the expectations by this paper. The results show that 1 per cent increase in inflation promotes economic growth by 0.03 per cents when government efficiency is not included in the growth model and 0.02 per cents when government efficiency is included in the growth model. The coefficients of trade openness have a positive sign in all models. The results show that 1 per cent increase in trade openness fosters economic growth of Sub Saharan African low income countries by 0.12 per cents when government efficiency is not included in the growth and 0.08 per cents when government efficiency is included in the growth model.

5. Conclusion and Policy Implication

Government involvement in economic management of Sub Saharan African low income countries generates spillover benefits. According to the empirical findings of this paper, government expenditure accelerates economic growth of low income countries in Sub Saharan Africa. On the other hand, government efficiency does not demonstrate any evidence to speed up the impacts of government expenditure on economic growth in the region. Government efficiency in Sub Saharan African low income countries is not effective towards the allocation of public expenditure to enhance economic growth. Thus, governments of Sub Saharan African low income countries have shown weaknesses in terms of formulating and implementing suitable policies towards the allocation of government expenditure for fast economic growth.

Premised on these findings the paper recommends that governments of Sub Saharan African low income countries should expand their public sectors in order to boost economic growth. Expanding public sectors entails among other things to increase government expenditure. While increasing government expenditure, policy makers should deem on the following factors which are essential to maintain positive relationships between government expenditure and economic growth in the region.

First the significance of injecting new spending power in the economy by securing external finances and keep away from domestic borrowing to avoid crowding-out of private sector. Second, avoid any possible distortions when taxation is used to mobilize government revenues in order to safeguard the sustainability of private sector. Third, put many efforts on increasing degree of home bias in public investment spending by reducing their importations when they finance public projects.

Besides, we expected that government efficiency would be a catalyst towards economic growth through government expenditure; however empirical findings by this paper have failed to prove this hypothesis. Although the relationship between government efficiency and economic growth is positive, its impact on growth is non-significant. Thus, governments of Sub Saharan African low income countries should reform their institutions aiming at improving their abilities in terms of formulating and implementing appropriate policies which have direct and significant impacts on economic growth. In order to achieve this, policy makers should consider the rationale for sharpening the capabilities of government planners by inducing them knowledge of minimizing errors when they inject public finds. After achieving these institutional reforms, governments of Sub Saharan African low income countries should ensure that the increase in government expenditure aims at accelerating economic growth in order to enjoy more benefits in the region.

References

Afonso, A. et al., 2005. *Quality of Public Finance*, WP No. 438, European Central Bank, Frankfurt.

Afonso, A., Schuknecht, L. & Tanzi, V., 2008. *Income Distribution Determinants and Public Spending Efficiency*, WP No. 861, European Central Bank, Frankfurt.

Angelopoulos, K., Philippopoulos, A. & Tsionas, E., 2008. Does Public Sector Efficiency Matter? Revisiting the Relation Between Fiscal Size and Economic Growth in a World

Sample. , 137, pp.245–278.

Asiedu, E., 2002. On the Determinants of Foreign Direct Investment to Developing Countries : Is Africa Different? *World Development*, 30(1), pp.107–119.

Asiedu, E., 2004. Policy Reform and Foreign Direct Investment in Africa : Absolute Progress but Relative Decline. *Development Policy Review*, 22, pp.41–48.

Avkiran, N., 2006. *Productivity Analysis in the Service Sector with Data Envelopment Analysis* Third Edit., QLD 4072, Australia: UQ Business School, The University of Queensland.

Baltagi, B.H., 2005. *Econometric Analysis of Panel Data* Third Edit., West Sussex, England: John Wiley & Sons Ltd, England.

Baltagi, B.H. & Kao, C., 2000. *Nonstationary Panels , Cointegration in Panels and Dynamic Panels : A Survey*, New York, USA.

Barrios, S. & Schaechter, A., 2008. *The quality of public finance and economic growth*, Economic Papers 337, European Commission, Brussels.

Barro, R.J. & Sala-i-Martin, X., 2004. *Economic Growth* Second Edi., London, England: The MIT Press, London (UK).

Bassanini, A. & Scarpetta, S., 2001. The Driving Forces of Economic Growth: Panel Data Evidence for the OECD Counttries. *OECD EconomicStudies*, II(33).

Beraldo, S., Montolio, D. & Turati, G., 2009. Healthy , educated and wealthy : A primer on the impact of public and private welfare expenditures on economic growth. *The Journal of Socio-Economics*, 38, pp.946–956.

Bleaney, M., Gemmell, N. & Kneller, R., 2001. Testing the endogenous growth model: public expenditure, taxation, and growth over the long run. *Canadian Journal of Economics/Revue canadienne d'économique*, 34(1), pp.36–57.

Bojanic, A.N., 2013. The Composition of Government Expenditures and Economic Growth in Bolivia. *Latin American Journal of Economics*, 50(1), pp.83–105.

Buchanan, B.G., Le, Q. V & Rishi, M., 2012. International Review of Financial Analysis Foreign direct investment and institutional quality : Some empirical evidence. *International Review of Financial Analysis*, 21(24), pp.81–89.

Butkiewicz, J.L. & Yanikkaya, H., 2011. Institutions and the impact of government spending on growth. *Journal of Applied Economics*, 14(2), pp.319–341.

Cakerri, L., Petanaj, M. & Muharemi, O., 2014. The Effect of Government Expenditures on Economic Growth: The case of Albania. *European Journal of Social Sciences*, 2(1), pp.242–253.

Carter, J., Craigwell, R. & Lowe, S., 2013. Government Expenditure and Economic Growth in a Small Open Economy : A Disaggregated Approach. , pp.1–28.

Chang, H., Huang, B. & Wei, C., 2011. Military expenditure and economic growth across different groups : A dynamic panel Granger-causality approach. *Economic Modelling*, 28, pp.2416–2423.

Chen, P.F., Lee, C.C. & Chiu, Y. Bin, 2014. The nexus between defense expenditure and economic growth: New global evidence. *Economic Modelling*, 36, pp.474–483.

Clark, T.S. & Linzer, D.A., 2012. Should I Use Fixed or Random Effects ? , pp.1–34.

Drukker, D.M., 2010. Generalized method of moments (GMM) estimation in Stata 11.

Dunne, P., Smith, R. & Willenbockel, D., 2004. Models of Military Expenditure and Growth : A Critical Review. In *American Economic Association/ASSA Annual Meetings*. Atlanta, pp. 1–19.

Dunne, P., Smith, R. & Willenbockel, D., 2001. Theoretical and Econometric Issues in Analysing the Military Expenditure-Growth Nexus. In *Sixth Annual Conference on Econometric Modelling for Africa*. Pretoria, pp. 1–20.

Facchini, F. & Melki, M., 2013. Efficient government size: France in the 20th century. *European Journal of Political Economy*, 31, pp.1–14.

Gazdar, K. & Cherif, M., 2015. Institutions and the finance-growth nexus: Empirical evidence from MENA countries. *Borsa Istanbul Review*, 15(3), pp.137–160. Available at: http://dx.doi.org/10.1016/j.bir.2015.06.001.

Ghura, D. & Hadjimichael, M., 1995. *Growth in Sub-Saharan Africa*, WP/95/136, International Monetary Fund.

Gisore, N. et al., 2014. Growth in East Africa : A Disaggregated Model. *European Journal ofBusiness and Social Sciences*, 3(8), pp.289–304.

Glaeser, E.L. et al., 2004. Do Institutions Cause Growth? *Journal of Economic Growth*, 9(3), pp.271–303.

Globerman, S. & Shapiro, D., 2002. Global Foreign Direct Investment Flows : The Role of Governance Infrastructure. *World Development*, Vol. 30(11), pp.1899–1919.

Gopalan, S. & Rajan, R.S., 2016. Has Foreign Aid Been Effective in the Water Supply and Sanitation Sector ? Evidence from Panel Data. *World Development*, 85, pp.84–104.

Gui-Diby, S.L., 2014. Impact of foreign direct investments on economic growth in Africa: Evidence from three decades of panel data analyses. *Research in Economics*, 68(3), pp.248–256.

Gujarati, D.N. & Porter, D.C., 2005. *Basic Econometrics* Fifth Edit., New York, USA: McGraw-Hill/Irwin New York, USA.

Han, C. & Phillips, P.C.B., 2010. GMM Estimation for Dynamic Panels with Fixed Effects and Strong Instruments at Unity. *Econometric Theory*, pp.119–151.

Hauner, D. & Kyobe, A., 2010. Determinants of government efficiency. *World Development*, 38, pp.1527–1542.

Himmelberg, C.P., Hubbard, R.G. & Palia, D.N., 1999. Understanding the Determinants of Managerial Ownership and the link between ownership and performance. *Journal of Financial Economics*, 53, pp.1–46.

Hisamoglu, E., 2014. EU membership, institutions and growth: The case of Turkey. *Economic Modelling*, 38(August 1999), pp.211–219.

Hodgson, G.M., 2009. Institutional Economics into the Twenty-First Century*. *Studi e Note de Economia*, XIV(1), pp.3–26.

Hodgson, G.M., 2006. Institutions, Recessions and Recovery in the Transitional Economies. *Journal of Economic Issues*, XL(4), pp.875–894.

Hsiao, C., 2003. *Analysis of Panel Data* Second Edi., Cambridge University Press New York, USA.

Kapunda, S.M. & Topera, J.S., 2013. Public Expenditure Composistion and Economic Growth in Tanzania : Socio-economic Policy Implications. *Asian-African Journal of Economics and Econometrics*, Vol. 13(1), pp.61–70.

Kollias, C., Manolas, G. & Paleologou, S.-M., 2004. Defence expenditure and economic growth in the European Union. *Journal of Policy Modeling*, 26, pp.553–569.

Kweka, J.P. & Morrissey, O., 1996. Government Spending and Economic Growth in Tanzania , 1965-1996. , (Credit Research Paper no. 00/6).

Law, S.H., Azman-Saini, W.N.W. & Ibrahim, M.H., 2013. Institutional quality thresholds and the finance - Growth nexus. *Journal of Banking and Finance*, 37(12), pp.5373–5381. Available at: http://dx.doi.org/10.1016/j.jbankfin.2013.03.011.

Law, S.H. & Habibullah, M.S., 2006. Financial Development, Institutional Quality and Economic Performance in East Asian Economies. *Review of Applied Economics*, 2(2), pp.201–216.

Liu, W. & Hsu, C., 2006. The role of financial development in economic growth: The experiences of Taiwan, Korea, and Japan. *Journal of Asian Economics*, 17, pp.667–690.

Loizides, J. & Vamvoukas, G., 2005. Government Expenditure and Economic Growth: Evidence from Trivariate Causality Testing. *Applied Journal of Economics*, VIII(1), pp.125–152.

Macek, R. & Janků, J., 2015. *The Impact of Fiscal Policy on Economic Growth Depending on Institutional Conditions*, VSB-Technical University, Ostrava.

Maddala, G.. S., 1999. On the Use of Panel Data Methods with Cross-Country Data. *Annales D'economie et de Statistidue*.

Mandl, U., Dierx, A. & Ilzkovitz, F., 2008. *The effectiveness and efficiency of public spending*, Wconomic Papers 301, European Commission, Brussels.

Ndambiri, H.K. et al., 2012. Determinants of Economic Growth in Sub-Saharan Africa: A Panel Approach. *International Journal of Economics and Management Sciences*, 2(2), pp.18–24.

Nell, C. & Zimmermann, S., 2011. Summary Based on Chapter 12 of Baltagi : Panel Unit Root Tests. , pp.1–10.

Nurudeen, A. & Usman, A., 2010. Government Expenditure And Economic Growth In Nigeria , 1970-2008 : A Disaggregated Analysis. *Business and Economics Journal*, 2010, pp.1–11.

Ogundipe, A., Ojeaga, P. & Ogundipe, O., 2014. Is Aid Really Dead? Evidence from Sub-Saharan Africa. *International Journal of Humanities and Social Science*, Vol 4 No 1.

Parker, D. & Kirkpatrick, C., 2012. *Measuring Regulatory Performance; The Economic Impact of Regulatory Policy: A Literature Review of Quantitative Evidence*, Expert Paper No 3, OECD.

Prasetyo, A.D. & Zuhdi, U., 2013. The Government Expenditure Efficiency towards the Human Development. *Procedia Economics and Finance*, 5, pp.615–622.

Radaelli, C. & Francesco, F., 2010. *Better Regulation for Growth*, The World Bank Group, Washington D.C.

Rahmayanti, Y. & Horn, T., 2010. *Expenditure Efficiency and the Optimal Size of Government in Developing Countries*, Discussio Paper 10-20, Osaka.

Rasiah, R., 2011. The Role of Institutions and Linkages in Learning and Innovation. *International Journal of Institutions and Economies*, 3(2), pp.165–172.

Riedl, B.M., 2008. Why Government Spending Does Not Stimulate Economic Growth. *The Heritage Foundation*, 4999(2208).

Siddiqui, D.A. & Ahmed, Q.M., 2013. The effect of institutions on economic growth: A global analysis based on GMM dynamic panel estimation. *Structural Change and Economic Dynamics*, 24, pp.18–33.

Silve, F. & Plekhanov, A., 2015. *Institutions, innovation and growth: Cross-country evidence*, W/P. no. 177, European Bank, London.

Sinha, D., 1998. Government Expenditure and Economic Growth in Malaysia. *Journal of Economic Development*, 23, pp.71–80.

Taiwo, M. & Abayomi, T., 2011. Government Expenditure and Economic Development : Empirical Evidence from Nigeria. *European Journal of Business and Management*, 3, pp.18–29.

Tebaldi, E. & Elmslie, B., 2008. Institutions, Innovation and Economic Growth. *Journal of Economic Development*, 33(2), pp.27–53.

Therkildsen, O., 2010. *Working in Neopatrimonial Settings : Perceptions of Public Sector Staff in Tanzania and Uganda*, WP. No. 117, Johannes, Gutenberg.

Wang, K., 2011. Health care expenditure and economic growth : Quantile panel-type analysis. *Economic Modelling*, 28(4), pp.1536–1549.

Wenyi Shen, Yang, S.-C.S. & Zanna, L.-F., 2015. *Government Spending Effects in Low-income Countries*, WP/15/286, International Monetary Fund.

Appendix: Low Income Sub-Saharan Africa Countries (27 Countries)

S/No.	Country	S/No.	Country	S/No.	Country
1.	Benin	10.	Gambia	19.	Rwanda
2.	Burkina Faso	11.	Guinea	20.	Senegal
3.	Burundi	12.	Guinea-Bissau	21.	Sierra Leone
4.	Central African Republic	13.	Liberia	22.	Somalia***
5.	Chad	14.	Madagascar	23.	South Sudan***
6.	Comoros	15.	Malawi	24.	Tanzania
7.	Congo, Democratic Republic	16.	Mali	25.	Togo
8.	Eritrea	17.	Mozambique	26.	Uganda
9.	Ethiopia	18.	Niger	27.	Zimbabwe

Source: The World Bank Classification 2016.

Note: Asterisks *** denotes countries which are not included in this analysis.