

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Public debt in sub-Saharan African countries has long been an issue of global concern. The burden of public debt and widespread indebtedness of these economies according to Jose, Alexandra and Tiago (2014) have been the subject of spirited debate amongst economists, academics, policy makers and the general public. Generally, the disappointing growth in these economies over the years reflect the difficulties posed by institutional economic factors, including the question of mentality and cultural disposition, the low level of human capital, legal and institutional framework, the stance of fiscal and monetary policies that have often been discretionary.

Governments borrow in principle to finance public goods that increase welfare and promote growth. According to Rais and Anwar (2012), when a government decides to borrow instead of introducing additional tax measures to finance the budget deficit and restore the economy, it creates a liability on itself known as public debt. A similar opinion is shared by Ogunmuyiwa (2010), who stated that when tax revenue is limited and government does not want to compromise macroeconomic stability by printing more money, then borrowing becomes an inevitable avenue that government can explore to finance infrastructure projects. The public debt can be external and domestic debts.

Sub-Saharan African countries are, however, unable to mobilize sufficient domestic revenue to meet their expenditures and therefore resort to borrowing to finance annual budget deficits. Ezeabasili (2006) is of the opinion that borrowing by countries occur as a result of their inability to generate enough domestic savings to carry out productive activities. Such external borrowings by countries are meant to supplement the domestic savings and allow such countries to carry out productive activities.

According to Babu, Kiprop, Kailo and Gisore (2014), external public debt is debt owed to external creditors. Among them are multilateral creditors such as International Development Association (IDA), Africa Development Bank (ADB), World Bank (WB), International Monetary Fund (IMF) and other International Financial Institutions. Other bilateral creditors which are essentially other countries; for example, Japan, Italy, Germany, as well as commercial creditors, who are private institutions, such as Standard Bank, United Kingdom, NEXIM Bank of China (NEXIM Bank of China is of great importance as an international creditor for economies, Nigeria etc.).

A government can borrow domestically for the purpose of financing fiscal deficit. One way is to borrow directly from the Central Bank which is equivalent to the Central Banks issuing Bonds and other long term instruments. Other alternatives are; borrowing from domestic commercial banks, borrowing from non-bank sector, borrowing from external sources, and printing of money which can arise only on extreme situation. Each method has its own implication for various aspects of the economy. Government usually adopts a mix strategy and utilizes a number of options at the same time that have more benefit for the present situation of the country (Rais & Anwar, 2010).

Lee and Ng (2015) state that the dramatic increase of public debt in developing countries has raised concerns as to whether the borrowings could help to improve economic growth or whether it could become a burden of responsibility that future generation will have to pay. Reinhart and Rogoff (2010) agree that the existence of high debt can have negative impact on economic development.

Soludo (2003) is of the view that countries borrow for two broad categories: macroeconomic reasons [higher investment, higher consumption (education and health)] or to finance transitory balance of payments deficits (to lower nominal interest rates abroad, lack of domestic long-term credit, or to circumvent hard budget constraints). He

is also of the opinion that once an initial stock of debt grows to a certain threshold, servicing them becomes a burden, and countries find themselves on the wrong side of the debt Laffer curve, with debt crowding out investment and growth. According to Obademi (2012), at a point in year 2003, it was estimated that Nigeria needed approximately US\$3 billion yearly to fully service her external debt apart from domestic debt and this is considered unthinkable to do as it will result in the economy getting almost grounded.

According to Makau (2015), debt crisis is a critical factor in retarding the achievement of sustainable development in the Sub-Saharan African (SSA) countries. It has been and continues to be one of the biggest barriers to development in the SSA countries. In the majority of countries, public debt is accumulating and is still considered as a calamity for macroeconomic stability. In many countries, especially the ones that have experienced debt crisis, it causes fear of great disturbances and the breakdown of the state (Svaljek, 1997).

However, due to a number of advantages over taxes, countries unwillingly renounce debt as a source of financing, especially in periods of extremely high, although short-term demand for public expenditures (wars, natural disasters, economic crises, terrorism). The attraction of debt on the one hand and the danger lurking as a consequence of excessively enjoying in the benefits of debt on the other hand require constant caution and attention when using this fiscal instrument.

The interaction between public debt and economic growth is rather complex because, public debt influences the economic growth dynamics and the economic growth rate impact on the size of public debt. Higher rates of economic growth facilitate carrying public debt burden (Casni, Badurina & Sertic, 2014; Cantor & Packer, 1996). Public debt burden should not be encouraged especially in developing economy at no time.

According to Cecchetti, Mohanty and Zampoli, (2011), the sustainability of public debt depends on its ability to raise revenue which decreases when economy experiences a downturn. Private sector default will have adverse effect on the economic activity, thereby increases public debt when private borrowing is backed by discretionary fiscal policy.

Public debt can both stimulate the economy and hinder the economic growth. The size and structure of public debt really matter as well as the allocation of borrowed funds (Casni, et al, 2014). According to the golden rule of public finance over the economic cycle, the government should borrow only to invest and not to fund current spending. This rule protects the investment spending while targeting over the cycle, allows automatic stabilizers to work without jeopardizing long-term fiscal sustainability (Keiko, 2007). In other words, debt should be used only to finance productive government expenditures that increase public capital formation and promote strong and sustainable economic growth (Casni et al, 2014).

Economic theory suggests that reasonable levels of borrowing for developing countries are likely to enhance economic growth as it accelerates the pace of development infrastructure (Lee & Ng, 2015). However, events in the past years (early 1990s) have led to increasing concerns about the possibly adverse consequences of the Sub-Saharan African countries. The view persists, however that the build-up in debt, particularly in the developing economies, could imperil the stability of financial system, according to some analysts. They argue that the heavy debt burdens have reduced the ability of financial institutions, borrowers and the economy at large to withstand recessions and other types of adversity (Ezeabasili, Isu & Mojekwu, 2011; Lopes da Veiga, Ferreira-Lopes & Sequeira, 2014; Iyoha, 1999; Fosu, 1996; Pianizza, 2008; Christensen, 2005).

Pattillo, Poirson and Ricci (2002) posit that countries at early stages of development have small stocks of capital and are likely to have investment opportunities with rates of return higher than those in advanced economies. As long as they use the borrowed funds for productive investment and do not suffer from macroeconomic instability, policies that distort economic incentives, or sizable adverse shocks, growth should increase and allow for timely debt repayments. They further argued that these predictions hold up even in theories based on the more realistic assumption that countries may not be able to borrow freely because of the risk of debt repudiation.

Obademi (2012) posits that, debt structure of a country affects individual citizens, institutions of government, privately owned corporate organizations like banks and consequently the economy at large. More so, the debt structure in this context is the magnitude of the domestic debts as well as the magnitude of the external debts. As at the month of July 2005, Nigeria external debt was US\$34 billion of which \$28 billion or 85% was owed to the Paris Club of fifteen Creditor nations. According to Debt Management Office (DMO, 2015), Nigeria external debts stood at \$9.464 billion or N1.864 trillion in 2015 as against the \$9.711 billion as at December 2014. Apart from external debts, Nigeria's domestic debt stood at \$58.02 billion as at 31st December 2015.

According to Aligidede, Baah-Boateng and Nketiah-Amponsah (2013), the growth of public debt of Ghana in the 1990s which reached an unsustainable level of 186% of GDP, made up of 157% from external sources and 29% owed domestically, landed the country in the midst of Heavily Indebted Poor Countries (HIPC) in 2001. Public debt in sub-Saharan African countries continues to rise significantly, which according to Fosu (1999) work supports debt overhang.

According to Putunoi and Mutuku (2012), in almost all Sub-Saharan Africa, there is a high degree of indebtedness, high unemployment, absolute poverty and poor economic performance despite a previous culture of massive foreign aid. This therefore made public debt one of the major economic policy issue confronting governments of poor countries. However, recently, economists do not consider public debt a major problem per se; rather the problem is mismanagement and unsustainability of the public debt.

Over the decades, the analysis of public debt in developing countries has traditionally focused on external debt. Past research has focused on external debt for two reasons: First, while external borrowing can increase a country's access to resources, domestic borrowing only transfers resources within the country. Hence, only external debt generates a "transfer" problem (Keynes, 1929). Second, since central banks in developing countries cannot print the hard currency necessary to repay external debt, external borrowing is usually associated with vulnerabilities that may lead to debt crisis (Panizza, 2009).

However, several developing countries have adopted aggressive policies aimed at retiring external debt and substituting it with domestically issued debt. According to Putunoi and Mutuku (2013), this has created a high and growing domestic debt. According to the IMF (2007), domestic debt accounted for 23 percent of total debts in Sub-Saharan Africa between 1995 and 2000 up from an average of 20 percent between 1990 and 1994. Furthermore, the domestic debt to GDP ratio for these countries increased considerably from 12 percent to 16 percent in the period.

Growth is robust across most of sub-Saharan Africa countries, with only the bloc of upper-middle income countries grappling with the problem of sluggish economic activity. External current account deficits are large for many low-income countries, as a result

emerging economies have to tackle many challenges and use various ways to reduce and sustain their current account deficit, like to cut on public expenditures, increase revenues and expand the opportunities for new investments. Debt burden can be domestic, external or both. This is the amount of debt that a particular country has and it is considered as a burden on its economy and people and a hindrance to their progress. There are both positive and negative possible effects of public debt on the economy. The positive effects of public debt relate to the fact that in resource-starved economies debt financing if done properly leads to higher growth and adds to their capacity to service and repay external and internal debt. The negative effects work through two main channels--i.e., “Debt Overhang” and “Crowding Out” effects (International Monetary Fund, Regional Economic Outlook report, 2013)

The African continent is divided into two broad geographical areas, basically due to the specific characteristics of each one. The continent is divided by the Sahara Desert into North Africa and Sub-Saharan Africa. North Africa includes the countries that fundamentally base their growth strategies on the production and export of oil, gas, and tourism, and some of them have reached levels of development amongst the highest on the continent.

Sub-Saharan Africa (SSA) region is made up of forty-eight (48) countries whose geographical locations are situated in the southern part of the Sahara. The region covers the total land area of 23,638,000 square kilometres and has an estimated total population of 962.4 million people with annual average population growth of 2.7 percent for the period 1990-2013 with the region’s annual GDP growth averaged 2.8 percent (WDI, 2015). World Bank categorizes countries as well as SSA countries into groups based on their levels of per capita income.

1.2. Statement of the Research Problem

Although public debt contributes to sustaining economic and financial liquidity in an economy, and makes public funds available to facilitate international and domestic trade, it sometimes poses some challenges thereby making it difficult to ascertain its full contribution to economic growth. Significant proportion of Sub-Saharan Africa's public debt is related to financing budget deficit and or infrastructural projects aimed at promoting growth and development. However, countries in the region continually face debt service problems partly due to the failure to achieve growth and development targets. According to Dauda (2007), growth targets were not realized because the development loans increasingly absorbed the limited foreign exchange resources in the settlement of debt service obligations.

The mounting debt level of most sub-Saharan Africa is nevertheless serious. Ezeabasili, et al, (2011) argued, that most countries in sub-Saharan Africa (SSA) have been trapped by hasty and distress borrowing which they are often unable to service. Worse still, they need to borrow more, and the inability to service existing obligation has often been caused by deteriorating world prices of their primary exports. The high levels of debt stock in the region have discouraged the inflow of foreign direct investment for fear of high tax imposition and macroeconomic distortions in the debtor economy as means of defraying debt owed (Valpy & Cobham, 2000). Massive capital flight has occurred in Sub-Saharan Africa as a result of high debt stocks. Collier, Hoeffler, and Pattillo (2004) posit that a dollar increase in the stock of debt leads to 3.2 cents of capital flight in SSA region.

Although a plethora of cross-country empirical studies on external debt and economic growth exist in the literature, the focus has been predominantly on the developed countries (see Geiger 1990, Schclarek, 2004; and Reinhart and Rogoff, 2010). Although,

some studies have also been done on developing economies, most attention was centered on Latin America, and few selected groups of countries in Africa (see Warner, 1992; Cohen, 1993; Afxentiou & Serletis, 1996; Desphane, 1997; and Butts, 2009). Sub-Saharan Africa has not received fair attention relative to its counterparts from other parts of the world especially the industrialized economies. Empirical literature has shown very little studies on sub-Saharan Africa and these studies were one-sided, centred more on external debt (for instance Gerald, 1994; Fosu, 1996) with the most recent studies done by Fosu (1999) and Iyoha (1999).

Moreover, research studies on the public debt-economic growth nexus differ in their methodologies, time period coverage and geographical location as well as their findings and conclusions. These dissimilarities suggest an ensuing controversy in the literature about the relationship between public debt and economic growth. Therefore, there is a need for further empirical investigation into the subject matter. Although, these empirical studies have provided some explanations on the public debt-economic growth nexus in SSA, to the best of our knowledge no empirical study has, for instance, examined the effect of public (external and domestic) debt on economic growth in the SSA region based on their country specific variables. This study intends to bridge this gap in the literature by applying the panel regression to more recent data (1986-2015) to investigate the effect of public debt on economic growth in sub-Saharan Africa.

1.3. Objectives of the Study

The broad objective of the study is to examine effect of public debt on economic growth of selected Sub-Saharan African countries (Angola, Kenya, Nigeria and South Africa) between 1986 and 2015. The specific objectives set below are to:

1. Examine the extent to which aggregate domestic debt stock affect economic growth of the selected Sub-Saharan African countries.

2. Ascertain the degree to which aggregate domestic debt service affect economic growth of the selected Sub-Saharan African countries.
3. Determine the extent aggregate external debt stock contribute to economic growth of the selected Sub-Saharan African countries.
4. To evaluate the degree to which aggregate external debt service affect economic growth of the selected Sub-Saharan African countries.

1.4. Research Questions

To achieve the objectives of this study, the work is tailored in such a way as to provide answers to the following questions;

- i. To what extent does aggregate domestic debt stock impact on economic growth of selected Sub-Saharan African countries?
- ii. To what degree has aggregate domestic debt service influenced economic growth of selected Sub-Saharan African countries?
- iii. To what extent has aggregate external debt stock affected economic growth of selected Sub-Saharan African countries?
- iv. To what magnitude has aggregate external debt service impacted on economic growth of selected Sub-Saharan African countries?

1.5. Research Hypotheses

In a bid to achieve the above objectives of the study and proffer answers to the research questions, the following hypotheses stated in the null have been formulated to guide the study;

- a. There is no significant effect of aggregate domestic debt stock on economic growth of the selected Sub-Saharan African countries.
- b. Aggregate domestic debt service does not have significant effect on economic growth in the selected Sub-Saharan African countries.

- c. Aggregate external debt stock does not have significant effect on economic growth in the selected Sub-Saharan African countries.
- d. There is no significant effect of aggregate external debt service on economic growth of the selected Sub-Saharan African countries.

1.6. Significance of the Study

It is a desire of every nation to achieve economic growth and have sustainable levels of debt. On this notion, the relationship between economic growth and public debt especially as it affects sub Saharan Africa, must be well known and clearly understood. These countries suffer from debt burden problem and continue to receive increasing attention. The root causes of these problem range from oil price shocks, unprecedented increase in international lending to developing countries since the 1970s among others. The failure of many SSA countries to adapt to the changed external environment — especially their domestic policies tended to impact on their economic prospect. To that extent, the end result of the study will prove to be beneficial and lend more support to the improvement of the economies of the region. Specifically, the study is expected to be significant to the following groups in the following ways;

a. International Organizations

While the International Monetary Fund (IMF) is responsible for anti-inflationary macroeconomic programmes, and the World Bank, for market-liberalizing structural adjustment programmes (SAPs) for developing countries, together, their policies generally are seen as spearheading the global trend towards greater economic liberation. However, the result of the study, will guide these regions on the best policies to make, as well as channel responsibility where necessary that will grow their economies to pave the way to attract fund.

b. Investors:

Both the foreign and the local investors are concerned. The outcome of the findings especially on will also be of immense benefit to investors in the economy, and guide them in taking proactive decisions concerning the possible effects of the recommended financial and trade related reforms on trade and investments in the economy.

c. Policy Makers and Regulators

The relevance of public debt to economic growth has become crucial, particularly to those policy-makers who nowadays have to face increasing fiscal imbalances. However, in appraising the effectiveness or otherwise of public debt policies on economic growth in the countries, the study will be useful in policy decisions of the constituted authorities – legislators, Debt Management Office (DMO), Central Banks and others. The study also would help government and policy makers to know what levels of public debt that will deter economic growth and thus adopt policies that will keep the country's debt level in a sustainable level. Thus, the result of the study therefore, will be highly relevant in the formulation and implementation of effective and consistent economic policies that can promote economic balance and impact on the citizens.

d. Researchers

The study will also serve as a reference point for scholars in the future, for further research in this area, as it will provoke yet another source of knowledge to complement the existing ones on the effect of public debt on economic growth of sub Saharan Africa. Hence, the study will significantly benefit the general public, who are always interested in knowing the state of the economy, the private sector as well as inter-country performance. A country knowing about another country's performance will help to fast tract their economic recovery.

1.7. Scope of the Study

To study the effect of public debt on economic growth of sub-Saharan Africa, the study uses panel data on 4 (four) countries from the four regions of SSA countries for a time period of 30 years (1986-2015). The period of study is chosen due to the availability of data for each of the variables considered in this study. In line with previous studies along this area, the study holistically x-rays selected growth variables to include; gross domestic product (GDP) growth rate, aggregate domestic debt value, aggregate external debt value, real interest rate, inflation, exchange rate. One country each selected from among the four regions (West Africa, East Africa, Central African Region and Southern Africa) in the sub-Saharan Africa will be studied to make an in-depth study as well as a comparative analysis of the region.

1.8. Limitations of the Study

There are some limitations that this study encountered. The limitations of the study are as follows:

- **Measurement Problems for Diverse Economies:** Measurement of the various test for these economies do pose some problems. These countries are diverse with challenges in macroeconomic variables and heterogeneous applicability. Applying panel data regression for the diverse economies showed that some years, some data are either not available to statistical bureau or that the countries are not willing to release such data for public consumption. This could affect the stationarity of the data, cause spuriousness of data, or even affect the significance of the result.
- **Appropriateness of Values Employed:** Accuracy of the various data employed are subjective. Data for a variable from different sources produce different figures. Most times, while World Bank's world development indicator gives figures for a particular variable, the country's data on such variable will be

conflicting. The question is, ‘whose data should be relied upon?’ Even the domestic data that should be relied upon are at variance from reports of different bodies.

- **Lack of Homogeneity for the Different Countries:** The study could not cover all the 48 SSA countries due to unavailability of consistent data for others. The fact that these countries in question have different peculiarities in terms of culture, economic system, system of government, currencies, languages, demographic factor, etc. Collating data on them is always a herculean task. Notwithstanding these limitations, the study is comprehensive and successful.

1.9. Definition of Terms

- **Gross Domestic Debt (GDP):** GDP is a measure of economic growth. However, different measures of GDP growth have been used in literature e.g. Per capita GDP, GDP growth rate, Real GDP, etc. In the present study, we have used GDP growth rate because it captures the level of growth. Annual percentage growth rate of GDP at market prices based on constant local currency.
- **Public External Debt:** According to World Bank, total outstanding external debt is defined as the sum of three components: (1) Long-term debt, (2) Short-term debt, and (3) Use of IMF credit. However, only the first component is included in the definition of public external debt, since data on short-term debt do not allow for the breakdown between public and private debt. In the present study, we have used external debt stocks as a percentage of gross national income (% of GNI). Total external debt is debt owed to non-residents repayable in currency, goods, or services. This decomposition is instead available for long-term debt, which is divided into: total Public and Publicly Guaranteed (PPG) and total Private Non-Guaranteed (PNG) long-term debt. The former is the object of the International Monetary Fund and World Bank (IMF-WB) debt sustainability analysis.

Therefore, we will take that aggregate as the definition of total external public debt.

- **Public Domestic Debt:** Domestic public debt is defined as the Central Government securitized debt, represented mainly by Treasury Bills, Bonds, notes and government stocks. Total domestic debt used in the is total domestic debt as a percentage of GDP (% of GDP). Total domestic debt is debt owed to residents repayable in currency, goods, or services. Although in some countries, there are other special securities and consolidated debt. For reasons of comparability across countries, the definition of domestic debt excludes loans, advances, local government debt and contingent liabilities - which are relevant in a number of countries - so that, in some cases, we are probably underestimating the real burden of domestic debt.
- **Debt Service:** According to Investopedia, the free encyclopedia, debt service is the cash that is required for a particular time period to cover the repayment of interest and principal on a debt. In the present study, it is used as total domestic debt service as percentage of gross national income and total external debt as a percentage of GNI (% of GNI). If debt-servicing capacity does not keep pace with economic growth could lead to debt problems. According to Babu et al (2015), debt service crowds out funding for social and capital expenditures in sub Saharan African countries.
- **Debt Overhang Hypothesis:** Debt overhang hypothesis relate to huge debt service. According Krugman (1988) debt overhang hypothesis is a situation where a country's debt service become so heavy that a large portion of output accrues to foreign lenders and consequently creates disincentives to invest; a situation in which the stock of debt becomes large enough to threaten the country's ability to repay its borrowings. Debt overhang is believed to create a disincentive effect

which inversely affects growth. The major argument of debt overhang theory is that indebted nations have limited investment in their productive capacity.

- **Debt Burden Hypothesis:** Debt burden relates to the total outstanding debt stock of a nation that have accumulated over the years and threatened the future and stability of the nation. In sub-Saharan Africa, debt burden is being shifted to future generation since the region cannot generate enough domestic savings to sustain itself and the continual resorting to borrowing externally.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1. Conceptual Review

According to Mankiw, (2013), every country's economy requires an amount of capital to generate production and to sustain economic development. In a situation when government spending exceeds its tax collection, it has a budget deficit, which it finances by borrowing from the private sector or from foreign governments. Governments can get revenue by increasing taxes, printing money, domestic or external borrowing and using previous budget surplus. When a government decides to borrow instead of introducing additional tax measures to finance the budget deficit, it creates a liability on itself known as 'public debt' or 'national debt' or 'government debt'.

Public debt can be classified as sum of external debt and domestic debt. As far as the relationship between external debt and economic growth is concerned, a reasonable level of borrowing is likely to enhance economic growth, through capital accumulation and productivity growth (Chowdhury, 2001). As the government draws its income from much of the population, government debt is seen as an indirect debt of the taxpayers.

A government has various alternatives to borrow for the purpose of financing fiscal deficit. One way is to borrow directly from the country's central bank which is equivalent to printing of money. The other alternatives are; borrowing from domestic commercial banks, borrowing from domestic non-bank sector and borrowing from external sources. Each method has its own implications for various aspects of the economy. Government usually adopts a mix strategy and utilizes a number of options at the same time that have more benefit for the present situation of the country.

2.1.1 Concept of Domestic Debt

According to Oshadami (2007), domestic government debt is debt instrument issued by the Federal Government and denominated in local currency. More so, Babu, Kiprop, Kalio and Gisore (2015) hold that, domestic debt is mainly debt owed to holders of Government securities such as Treasury Bills and Treasury Bonds. Domestic debt has always been fundamental part of a government's borrowing strategy.

Government borrowing through domestic sources is vital in stimulating investment and private savings, as well as strengthening domestic financial markets, since it provides depth and liquidity to the markets. Odozi (1996) posits that domestic debt is the gross liability of Government, and should include Federal, State and Local governments transfer obligations to the citizens and corporate firms within the economy. On the downside, though a broad expansion in domestic debt poses significant negative connotations for private investment, fiscal sustainability and ultimately economic growth and poverty reduction in case of thin financial markets and poor debt management capacity. However, not when the debt is properly utilized and invested. Domestic debt must not be seen for consumption only, but when long term debt instruments are created, the funds created therefrom can be invested.

In developing countries, policy makers and international institutions have given far less attention to domestic than external debt. Even though the strong concern on external imbalances is justified by a number of reasons, including the huge stocks of debt accumulated over the last decades, nonetheless a fully-fledged macroeconomic analysis has to include domestic debt dynamics. Actually, domestic financing is becoming more and more important in many countries and there are reasons to believe that this trend will not revert, especially if donors' willingness to lend continues to decline over time.

2.1.2. Domestic Debt Management

The rationale behind the creation of a domestic market for government securities especially in poor countries is that it could stimulate the development of deep and liquid internal financial markets and protect countries from adverse external shocks. However, the achievement of a certain degree of macroeconomic stability, in terms of credible fiscal and monetary policies and financial markets liberalization, is required to reap the benefits of the development of an internal bonds market (Arnone-Ugolini, 2005; Del Valle-Ugolini, 2003). If this is not the case, the advantages are likely to be offset by adverse effects in terms of higher interest rates, and crowding out of private investments. Domestic public debt is represented mainly by treasury bills, bonds, notes and government stocks. Although in some countries, there are other special securities and consolidated debt. For reasons of comparability across countries, the definition of domestic debt excludes loans, advances, local government debt and contingent liabilities - which are relevant in a number of countries - so that, in some cases, we are probably underestimating the real burden of domestic debt.

Domestic debt management play two major important roles in developing countries: fiscal deficit financing and domestic financing. According to Fischer and Easterly (1990), four different means of fiscal deficit financing abound with its attendant risk of building macroeconomic imbalances: (1) printing money might fuel inflation, (2) running down foreign exchange reserves might trigger an exchange crisis, (3) borrowing abroad might end up in an external debt crisis, and (4) borrowing domestically might increase interest rates and lead also to a debt crisis.

In theory, the seignorage revenue the government can expect to obtain from printing money is non-linear in the inflation rate. The link between money creation and inflation is well-known. In practice, however, seignorage is often a small source of resources both

for developing and developed countries. Empirical evidence shows that in normal times, the maximum amount of seignorage revenue collected over an extended period of time is less than 5percent of GDP (Easterly & Schmidt-Hebbel, 1991). During fiscal crisis episodes, the seignorage can become an important (albeit temporary) means of deficit financing (Reinhart & Rogoff, 2009).

By running down international reserves, instead of printing money, the government can hope to put off the inflationary effects of a fiscal deficit. This policy is also temporary because it can last just until reserves are depleted, or probably collapse even earlier as pointed out by the theoretical and empirical literature on currency crisis. Foreign borrowing allows financing of the fiscal deficit without creating money supply-driven inflationary pressures or crowding out domestic lending to the private sector. However, external credit flows tend to be volatile, procyclical, and subject to sudden stops (Calvo, 2005). By providing not only financing but also foreign exchange, foreign borrowing may induce a real exchange rate appreciation, thus hampering competitiveness and possibly lowering investment and economic growth.

Bua, Pradelli, and Presbitero (2014) argued that domestic borrowing, as typically denominated in local currency, does not bring about some complications associated with external credit flows. The most prominent concern, instead, is the crowding out effect: issuing domestic debt, governments taps private savings that would otherwise be available to finance private investment. If market-determined interest rates increase, this may reduce investment demand. And if interest rates are controlled or lenders are reluctant to raise them to avoid adverse selection and moral hazard problems, the domestic government borrowing can lead to credit rationing and a reduced supply of funds for private investment.

2.1.3. The Role of Domestic Debt in Poor Countries

Domestic public debt started increasing in Low Income Countries from the mid-1990s, in coincidence with an upsurge in financial liberalization (Presbitero, 2012b). Since the mid-Nineties there has been increasing interest by the World Bank and the International Monetary Fund on the development of domestic markets for government securities in developing countries. Their policy recommendations and programs in Middle and Low-Income countries are generally oriented to promote the development of domestic market for government bonds. The rationale of this policy lies in the advantages that internal credit markets could provide for the government and its economy.

As an alternative source of financing with respect to external borrowing and banking credit, it is likely to reduce the vulnerability of a country to reversal in capital flows and external shocks: domestic securities can be a substitute for external financing, avoiding the buildup of foreign- currency denominated debt (with all the risks related to exchange rate devaluations) and the monetary financing of government deficits (with its inflationary effects). To the extent that internal financing is denominated in local currency, domestic debt reduces the exposure of the public debt portfolio to unanticipated movements in the exchange rate (Hausmann, Panizza, & Rigobon, 2006; Bacchiocchi & Missale, 2012) and ensures a higher degree of freedom to use the exchange rate as a stabilization mechanism against external shocks, i.e. lower fiscal dominance on the exchange rate policy (IMF & World Bank, 2001; Kumhof & Tanner, 2005). Also, to the extent that domestic debt is owed to resident creditors, it reduces exposure to capital flow reversals.

Domestic debt, when well-managed, can also reduce the government's exposure to interest rates and currency risks. Furthermore, a market for government securities is likely to support the implementation and the transmission of monetary policy, and a

liquid and depth market with long term instrument could also help reducing the cost of government financing (Del Valle - Ugolini, 2003). Eventually, the development of a domestic bond market is essential for strengthening the process of sustained economic growth, since it helps mobilizing domestic savings and, if the market is properly organized, can lead to an efficient and market-based allocation of capital.

Beaugrand, Loko & Mlachila (2002) stressed the advantages of internal over external borrowing in terms of financial costs and fewer risks, even considering the possibility of currency devaluation. Thus, a limited recourse to domestic market is still recommended because it could help mobilize domestic savings and develop financial markets.

Christensen (2004) on the other hand, underlines that:

1. Notwithstanding its relative small dimension, domestic debt is a severe burden to the government budget because of high interest payments when compared with external debt;
2. The stock of domestic debt is increasing over time;
3. Domestic debt could squeeze private investment because of credit constraints;
4. The short maturity structure poses high rollover risks and increases macroeconomic instability.

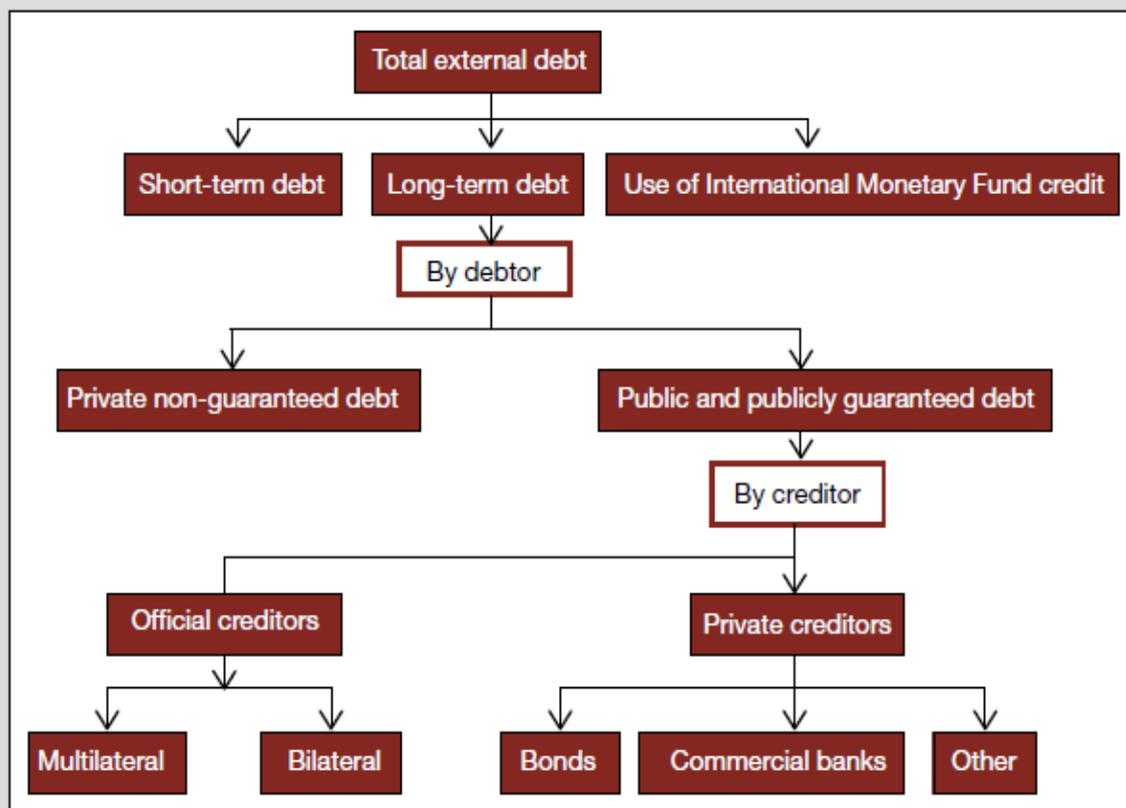
Abbas (2005) challenges the common assumption about the higher cost of domestic borrowing. He argued that the lack of default on domestic debt may be an insight that - domestic debt servicing might be "easier" in certain contexts than external debt. Then, looking at Tanzania's experience, Abbas states that, once considered, the inflation and the real depreciation rate, the cost of domestic financing could be smaller than the concessional terms granted by donors, and that the government could obtain funds at a lower rate than the private sector.

However, in policy-oriented discussions on government borrowing and public debt management in poor countries, a common presumption is that domestic financing is more expensive and riskier than external financing, thus making foreign debt preferable to domestic debt. Supporting this view, Christensen (2005) analyses the structure of public debt in 27 Sub-Saharan African countries and finds that domestic debt represents a significant burden to the budget in terms of interest payments, notwithstanding having a relatively small size. In addition, the author shows that the short-term maturity of domestic government debt is a source of rollover risk and macroeconomic instability, and documents the existence of crowding out effects on private-sector borrowing.

2.1.4. Concept of External Debt

Total external debt, as defined by the International Monetary Fund (IMF) and World Bank, is debt owed to non-residents (figure 1).

Figure 1. External debt and its components



Source: World Bank, 2015a.

Total external debt is the sum of public, publicly guaranteed and private non-guaranteed long-term debt, short-term debt and the use of IMF credit. Short-term debt includes all debt with an original maturity of one year or less and interest in arrears on long-term debt (World Bank, 2015a).

Public and publicly guaranteed debt, in contrast to private nonguaranteed debt, comprises the long-term external obligations of public debtors, including national Governments, political subdivisions (or an agency of either) and autonomous public bodies, as well as the external obligations of private debtors that are guaranteed for repayment by a public entity (World Bank, 2015a). Public domestic debt, in contrast, refers to obligations of the same public entities but to lenders within a country. While recognizing that private debt may create public debt issues when private debt holders become unable to service their debt, this report primarily considers public (domestic and external) debt and public and publicly guaranteed debt, and does not focus on (non-guaranteed) corporate external debt.

Arnone, *et al* (2005) defines external debt as that portion of a country's debt that is acquired from foreign sources such as foreign corporations, government or financial institutions. External debt is thus defined as debt owed to non-residents or based on the place of issuance and the legislation that regulates the debt contract whenever it is issued in foreign countries and under the jurisdiction of a foreign court.

According to Ogbeifin, (2007), external debt arises as a result of the gap between domestic savings and investment, which can increase over time. As the gap widens, debt accumulates and this makes the country to continually borrow increasing amounts in order to stay afloat. A country's external debt is the debt owed by the public and private sectors of that country's economy to non-residents and citizens that is payable in foreign currency, goods and services (*ibid*).

Aluko and Arowolo (2010), further argue that developing countries, facing scarcity of capital, will acquire external debt to supplement domestic saving. Besides, external borrowing is preferable to domestic debt because the interest rates charged by

international financial institutions like International Monetary Funds (IMF) is about half to that charged in the domestic market (Pascal, 2010).

Arnone and Presbitero (2005) and Christensen (2004) highlight that even if the ratio of domestic debt to GDP in African countries is generally small with respect to foreign indebtedness; domestic debt seems to have significant adverse effect on the budget because of interest payment. However, whether or not external debt would be beneficial to the borrowing nation depends on whether the borrowed money is used in the productive segments of the economy or for consumption. Adepoju, Salau and Obayelu (2007) stated that debt financed investment need to be productive and well managed enough to earn a rate of return higher than the cost of debt servicing.

Notwithstanding, government borrowing from the domestic capital market have lesser potential of creating debt crisis, creates positive externality in the domestic capital market and prevents capital outflow (Nyawata, 2012), most developing countries prefer external borrowing to the domestic one. In developing countries therefore, external debt constitutes the greater part of the public debt structure (Atique & Malik, 2012) and the choice of external debt over domestic debt could be rationalized based on the following reasons:

- The over-reliance on domestic borrowing can lead to financial instability and crowd out the private sector (Panizza et al, 2010).
- Accumulation of external debt exposes countries to high debt burden (in terms of domestic currency) resulting from fluctuations in the exchange rate whilst huge domestic debt poses default risk especially in times of financial crisis. Hence, countries that substitute external debt for domestic ones only switch currency mismatch vulnerability for that of maturity mismatch.

- Huge domestic debt may put pressure on the financial institutions jeopardizing the financial stability of the domestic economy.
- Managers of an economy can easily use debt relief initiatives to address external debt burden which is non-existent with domestic debt.

Ajayi (1991) classified the causes of the growth of external debt into external and internal factors. External factors include the cumulative effect of world price shocks which creates fiscal imbalance requiring huge borrowing to fill the fiscal gap, worsening terms of trade and liberal lending policy of international banks. Internal factors are attributed to excessive monetary expansion which causes inflation, over-reliance on external borrowing, over-valued exchange rate and poor management of public projects. Other factors which contribute to swift increases in the external debt stock include, increase in interest rate payable on loan, debt accumulation, volatility in exchange rates, absence of institutional checks on government borrowing and spending, and corrupt leadership (*ibid*).

2.1.4.1. Debt Relief

Since the beginning of debt crisis in the 1980s, sub-Saharan Africa countries have been enjoying assistance from the international financial community so as to improve their debt situation. Among the measures used by the community to assist countries include Paris Club Rescheduling, stock of debt reduction under the Brady Plan, Economic Recovery Programme (ERP) and Structural Adjustment Programme (SAP), Highly Indebted Poor Country (HIPC) and Enhanced Highly Indebted Poor Country (EHIPC) initiatives.

These measures were to some extent effective in helping the beneficiary countries in reducing their debt stocks which enabled a lot of them re-enter the foreign financial

market to mobilize funds (Suma, 2007). However, most countries in SSA that have undergone the HIPC program continue to face debt service problem. External shocks such as worsening terms of trade, civil strife, absence of sustained adjustment and implementation of structural reforms, lack of proper debt management policies in debtor countries, improper management of currency composition of external debt, and ill lending policies of many creditors, for instance, provision of loans on commercial terms with short repayment periods are major contributors to the problem (Boote & Thugge, 1997) as cited in Suma (2007). According to IMF (2014), total cost of debt relief to creditors under the HIPC initiative is estimated to be US\$75 billion whilst the cost to the four multilateral creditors providing relief under the Multilateral Debt Relief Initiative (MDRI) is estimated to be US\$41.1 billion as at the end of 2013 and 2014 in present value terms.

External debt is considered as an international financial obligation that is payable within a specified period of time. Failure of a country to honour its debt service obligation is considered as a mark of financial mismanagement and lack of budgetary control in central government (Suma, 2007). This approach is not aimed at only placing blame on the debtor country for accumulating high levels of debt but also aims at putting firm responsibility on governments for resolving the debt problem (*ibid*).

Abbott (1993) listed some characteristics that prevailed at early stages of debt reliefs; debt relief is mostly ad hoc in nature and is seen as last resort; it is given on exceptional cases limited to the amount necessary to restore the debtors' credit rating that enables it to resume debt service payment promptly. Moreover, the debt relieve process ensures that losses to the creditor is kept at minimum level to protect its investment and additional commercial interest charges is levied as the cost of rescheduling amortization and interest

payment. The process is also expected to create a minimal amount of disruption borne by international monetary and financial institutions.

Debt relief is adopted in special and critical situations, for instance, when there is a threat of default on existing claims. It is intended to help debtor countries not to fall into similar situations and also for the creditor countries to recoup their international investments. Each case is treated exclusively based on issues pertaining to that particular debt without recourse to any other debt case. The conventional approaches to resolving debt problems are mostly characterized by economic and institutional reforms in order to place such economies on sound economic paths.

2.1.4.2. Methods of Debt Relief

Generally, debt consolidation is done through the following methods and strategies; debt rescheduling, debt refinancing, debt moratorium, and debt cancellation. These methods are not mutually exclusive. They are sometimes combined to consolidate a country's debt profile.

- **Debt rescheduling**

This method of debt relief involves adjustment of repayment schedule of existing debt, complete replacement of existing debt payment schedule with a new one that extends the period of payment and reduction of interest and/or granting of grace period for debt payment. This method aims at maintaining a manageable debt profile but does not directly contribute to reduction in external debt stock of a country. Debt rescheduling rather contributes to growth of a country's debt stock since rescheduled interests are capitalized after rescheduling.

Debt refinancing and rescheduling in the form of Paris Club rescheduling was found initially as the solution to debt service problem. In the period 1982-1987, 23 SSA

countries renegotiated their official bilateral debt using the Paris Club debt reschedule mechanism and as at mid-1980s, 30 SSA countries were classified officially as debt-distressed (Klein, 1987). Countries in the region also restructured \$13.2 billion owed to Paris Club creditors in 2010 of which \$9 billion was forgiven (World Bank, 2010).

- **Debt refinancing**

Debt refinancing makes use of new loans in payment of existing debts. It also involves entering into new loan contractual agreements so as to resume honouring debt service obligation that has been suspended. Alternatively, debtor country may use its foreign exchange reserves and short term bank loans for debt service and later receive refund from creditor country. Debt refinancing is considered appropriate for resolving long term structural debts on the assumption that those new loans would be delivered on lenient conditions. However, if new funds are sourced on commercial terms, refinancing can be expensive with its heavy budgetary implications (Abbott, 1993).

- **Debt moratorium**

In times of debt crisis, debt moratorium becomes more useful. It gives debtor country opportunity to suspend all or part of its debt service responsibilities temporarily or into the long term period. The process provides chance for both debtor and creditor country to evaluate external debt position of debtor country. Debt moratorium is applied when it becomes obvious that debt rescheduling and refinancing cannot solve the debt problem.

- **Debt cancellation**

Debt cancellation refers to a process whereby a creditor decides to cancel either part or the entire bilateral debts owed to it by the debtor country. The process requires principal creditors acting multilaterally in agreement to ensure that losses are equally shared, and to prevent the practice whereby relief given by one creditor is used for another debt repayment. Debts are cancelled based on mutual agreement between creditor and debtor countries but there are instances whereby debtor countries repudiate their debt

unilaterally without the consent of creditor countries. Extreme economic difficulties and change of governments are some of the conditions that can cause unilateral debt cancellation. For instance, overthrow of Ghana's president Dr. Kwame Nkrumah in February 1966 led to the country's debt repudiation by his successor.

Debt cancellation method is the last resort to debt consolidation process when the debtor country's economy is on the brink of collapse and there is no probability of recovering the investment of the creditor country. Debt cancellation is the most complete and effective debt relief strategy since accumulation of debt through debt rescheduling and its resulting capitalization of interest is eradicated, financial and administrative burdens are also prevented (Ogbe, 1992).

In July 2005, G8 countries promised cancellation of total debt owed by group of Highly Indebted Poor Countries in the Sub-Saharan Africa who have reached HIPC completion points. These countries include Benin, Burkina Faso, Ethiopia, Ghana, Madagascar, Mali, Mauritania, Mozambique, Niger, Rwanda, Senegal, Tanzania, Uganda, and Zambia. They were expected to start benefitting from the total debt cancellation from 2006.

Some successes were chalked in view of reducing countries' external debt stocks after pursuing HIPC. Debt cancellations have amounted to just over US \$120billion and have reduced the public external debt of these countries by 90 percent, from US \$140billion to US \$15billion (AFD, 2013). Total external debt to exports ratio for Sub-Saharan Africa reduced by 12 percentage points while the ratio of debt to GNI decreased by 1.6 percentage points from 2009 to 2010. This feat was attributed to large debt forgiveness under the HIPC and MDRI programs where 26 countries out of 33 eligible Sub-Saharan African countries now carry the lowest external debt burden in thirty years (World Bank, 2010). This is a big change from the mid-1990s, when some countries' debt overhangs

rose to unsustainable levels, compromising growth and their ability to combat poverty (Jacquelin, 2013).

2.1.4.3. Debt Management Strategy

Governments aim at borrowing at low cost to finance developmental projects but the structure and composition of debts portfolio is of utmost concern since it determines the impact of relevant shocks on government budget and its long term expenditure plan (Gill & Pinto, 2005). Public debt managers are obliged to select appropriate debt instruments to raise the needed fund for the government.

Public debt management strategy is the formal document that guides managers in their decisions and operations. The document basically takes the form of guidelines or qualitative benchmarks for determining optimal government debt portfolio. Guidelines entails description of preferred risk; thus the desired structure of the debt portfolio whilst quantitative benchmarks however outline explicit numerical targets which are desired risk characteristics of the debt portfolio in view of existing constraints. Debt management strategy should be made explicit and public to inform the market, and to ensure sufficient transparency and accountability of debt manager's operations (Wheeler, 2004).

2.1.5. Concept of Debt Service

According to World Bank, total debt service is the sum of principal repayments and interest actually paid in foreign currency, goods, or services (World Bank, 2015). The currency of the lender's country serves as the standard currency for debt payment irrespective of the exchange rate between the currencies concerned. However, in a situation where countries involved use same currency, the borrower invariably repays the debt in his own currency. Investopedia, the free encyclopedia, supports that debt service is the cash that is required for a particular time period to cover the repayment of interest

and principal on a debt. Prudent utilization of public debt leads to higher economic growth and adds to capacity to service and repay external and domestic debt. It also helps the government to accomplish its social and developmental goals.

Debt problems arise if debt-servicing capacity does not keep pace with growth of debt. This may also be expressed as debt exceeding sustainable level. According to Babu, et al (2015), debt service crowds out funding for social and capital expenditures in sub Saharan African countries. After debt servicing and salaries, there is little left for core functions of the government, that is, education, health, basic infrastructure, and other essential services to create an enabling environment for the private sector. However, not all countries that are determined to bring up their economy afloat, perhaps for security purpose.

For example, in 1989, Kenya's debt service was more than a third of its export earnings. On the other hand, Tanzania's debt payment was 86 percent of export earnings in 1987 (Kiringai, 2002). Ikeji (2012) proved that Nigerian's budget for domestic debt service in 2012 was N559.6 billion (more than the budget allocation to Works, Power, Agriculture and Water resources) leaving less fund for infrastructure and other needs.

Increase in the outstanding stock of total debt have implications for the economy as it forced the government to adjust its expenditure and direct additional resources towards the repayment of debt and associated interest payments. Total public debt servicing below 30 percent of government revenue are generally believed to be within the bounds of sustainability. The government is required to make concentrated efforts to increase the revenues and rationalize current expenditure to reduce the debt burden and improve the debt carrying capacity of the country to finance the growth and development needs.

2.1.6. Debt Overhang Hypothesis

Many studies in the literature have blamed the slow growth in developing economies on the debt overhang effect. Debt overhang is believed to create a disincentive effect which inversely affects growth. The major argument of debt overhang theory is that indebted nations have limited investment in their productive capacity. This is seen to serve as disincentives to investment (especially private) as a result of expectation about the consequential economic policies (like increased taxation) required to service debts.

Studies like those of Morisset (1991) argue that if a private sector is credit rationed then higher external debt stocks will have adverse effects on productive investment through a disincentive effect. The disincentive effect is such that where government in debtor countries are unable or unwilling to make debt repayments then private sector investors anticipate higher taxation on both financial and real assets. This seems to tie in nicely with some versions of the Ricardian equivalence which states that an increase in government debt constitutes deferred taxation. This may be seen as a first debt overhang effect. A second debt overhang effect is the creation of macroeconomic instability including anticipated inflation, increased fiscal deficit, exchange rate depreciation etc. Therefore, debt overhang effect also takes its toll on the private sector by providing disincentives to private investments in productive activities.

Were (2001) examined the structure of Kenya's external debt and resultant implications on economic growth. Using time series data from 1970 to 1995, the study finds external debt accumulation to contribute negatively to economic growth and private investment, hence, confirming existence of debt overhang problems in Kenya. Further findings of the investigation indicated that debt servicing does not have a negative impact on growth but had some crowding out effects on private investment.

IMF (1989) claimed that debt overhang problem existed in mainly developing debtor countries in 1980's. The study finds two evidences supporting the debt overhang proposition. Firstly, savings ratio decreased when external finance also decreased. Secondly, the study compares a group of countries with debt problems against another group of heavily indebted countries without debt servicing problems and found a significant drop in savings ratio of the former. By implication, it is deducible that where foreign finance begins to dry up, savings and investment ratio follow suit since savings is utilized to service debt (directly or indirectly through taxation), hence, potential investment from savings is also limited.

Literature also has it that debt overhang may be exaggerated and hence, may not be the true cause of economic slowdown as observed by some researchers. Hofman and Reisen (1991) rejected findings of IMF (1989) based on two pieces of evidence relating to debtor countries. Firstly, they noted that investment in debtor countries were financed by foreign savings in 1978-1981 hence, the period of study was highly exceptional. Secondly, they believed that the IMF paper considered only a group of middle income debtor countries which were arbitrarily selected, wrongly classified as 'indebted' countries and also having never faced a "serious debt servicing problem". The paper claimed that there was no debt overhang in debtor countries. However, their findings suggest that transfer of financial resources from debtor countries to other countries would more convincingly pass as a better explanation for reduction in investment than levels of outstanding debt.

As a backup for Hofman et al (1991), Chowdhury (1994) findings do not support the debt overhang argument. On the debt overhang issue, the paper concludes that external debt of developing countries is not a primary cause of slowing economic growth. Another study which asserts to this finding was carried out by Bulow Rogoff (1990) whose findings suggest that there was no need for establishing institutions for organizing debt relief since

debt overhang found in many studies was an exaggeration. This finding has not been taken seriously as it seemed more widely acceptable that the massive debt stock of developing nations was impeding their growth and hence, in 1996 the Highly Indebted Poor Countries (HIPC) Initiative was established by the World Bank and other donors to provide debt relief to debt ridden poor countries.

2.1.7. Debt Sustainability

Debt sustainability is defined as the condition when a country is able to finance or meet its current and future debt service obligations without resort to exceptional financing such as arrears accumulation, debt restructuring etc. and without compromising growth. Several factors are considered when measuring the capability of a country to honour its debt obligations in accordance with terms and conditions specified in the original contract. Ajayi and Khan (2000) outlined some criteria used in measuring external debt sustainability, namely, debt to export ratio, debt to GNI ratio, debt service to export ratio, debt service to GDP/GNP ratio, reserves to debt ratio, and reserves to imports ratio. Aside from indicating an explosive growth of external debt, hikes in these ratios do not necessarily measure a nation's capability to service its debt as required.

Debt to GDP ratio measures the amount of current domestic production that have to be sacrificed in paying interest on external loan previously contracted. Higher debt to GDP ratio indicates higher debt service burden. Moreover, debt to export ratio also measures the current export proceeds that has to be used up in servicing foreign debt obtained previously. It measures liquidity constraint that confronts a nation and can be worsened by balance of payments problems since it has adverse effect on debt service obligation.

A country with very low debt to GDP ratio may still have difficulty in servicing its external debt. This situation may arise when the structure of domestic production yields

insufficient export commodities necessary for generating foreign exchange returns for servicing the foreign debt. Moreover, depreciation of borrowing country's currency increases debt to GDP ratio even though debt and GDP in foreign currency remains unchanged. This means that the ratio of debt and GDP alone does not provide a vivid picture of debt sustainability.

Another measurement of debt sustainability is reserves to debt stock ratio. This criterion is rarely used but it is a measure of the extent to which a country's reserve can be used to defray its debt. Thus extent to which a country can rely on its reserves for paying its debt depends on the size of the reserves. Higher level of international reserves indicates greater ability of a country to service its debt thus making the debt constraint less binding (Fosu, 2009). Reserves to import ratio similarly measures how far a country can depend on its reserves for purchases of foreign goods in case of any unexpected occurrences.

Moreover, Net Present Value (NPV) of the debt service is also used as an index for measuring external debt sustainability. By discounting all future interest payments on external debt into the present using a specified discount rate can also serve as a measure of a country's ability to service its debt in the future. Higher NPV of external debt service means lower sustainability of debt. This method is however criticized on the grounds that sustainability is measured on current ability to repay without recourse to growth potentials of the economy in the future.

Better still, the use of these ratios as measurement of debt sustainability, generally do not capture the effect of terms and conditionality attached to foreign debt on the ability pay in the future time period. Concessions attached to foreign loans in form of low interest rate, long maturity and moratorium period minimizes the burden of external debt in the future time while non-concessionary external loan increases the burden of debt obligation.

Ratios stated above as a measure of debt sustainability could only serve as a proxy rather than true reflection of debt situation in a particular country.

The choice of the ratio that a country uses depends on resource constraint that country faces. The use of GDP represents general resource constraint, the use of exports indicates foreign exchange constraint, and the use of revenue signifies government inability to raise enough tax revenue to service external debt. IMF (2000) states that in monitoring external debt sustainability it is prudent to consider GDP and export whiles government fiscal revenue and GDP should be considered in terms of total public debt burden.

Under the HIPC initiative, some debt sustainability ratios were defined. The original HIPC initiative requires that NPV of Debt to export ratio ranges between 200-250 percent and debt service to export ratio required at 20 to 25 percent. Countries with large export base were given additional indicators. For instance, revenue to GDP ratio above 20 percent, export to GDP ratio above 40 percent and NPV of debt to Revenue ratio of 280 percent were required (World Bank, 2001a). These indices were later reviewed downward under the EHIPC initiative to free up resources for poverty reduction. The sustainability thresholds under the EHIPC framework are; NPV of debt to export ratio of 150 percent, debt service to export ratio of 15 to 20 percent, NPV of debt to revenue of 250 percent, with the qualifying criteria reduced to 15 percent of Revenue to GDP ratio and 30 percent of export to GDP ratio (World Bank, 2001a).

2.1.8. Concept of Economic Growth

Hardwick, Khan and Langmead (1994) defined economic growth as an increase in a country's productive capacity, identifiable by a sustained rise in real national income. This implies that the increase in the country's productive capacity has to be sustained over a period of time, say five to ten years. Winee and Tobira (2012), also lend credence

to economic growth as an expansion of a country's potential output of goods and services. Further, according to Wikipedia (March 10, 2015), a country's general economic health can be measured by looking at that country's economic growth and development.

At this point, it is important to distinguish between economic growth and economic development. According to Rais and Anwar (2010), economic growth is an increase in average income of an economy, unlike economic development which is an increase in welfare of people of that economy. A fundamental question is asked about economic growth: "Is Economic Growth desirable?" According to Perkins, Fedderke and Luiz (2006), the desirability of economic growth is not supported by all. While some condemn the spread of materialism that leads to increase in income (economic growth), destruction of traditional societies, environmental degradation associated with high income countries, which, following their path of progress can be misleading.

2.1.9. Measurement of Economic Growth

Economic growth is measured by gross domestic product (GDP). A nation's GDP can be calculated by adding up its output inside the borders of that country. This is done by adding up the consumers spending, investment spending and the value of exports and subtracts the value of the imports. This can be represented with the following symbols:

$$GDP = C + I + G + (X - M).$$

Where GDP = Gross Domestic Product

C = Total Consumption

I = Total Investment

G = Total Government expenditures

X = Export

N = Imports

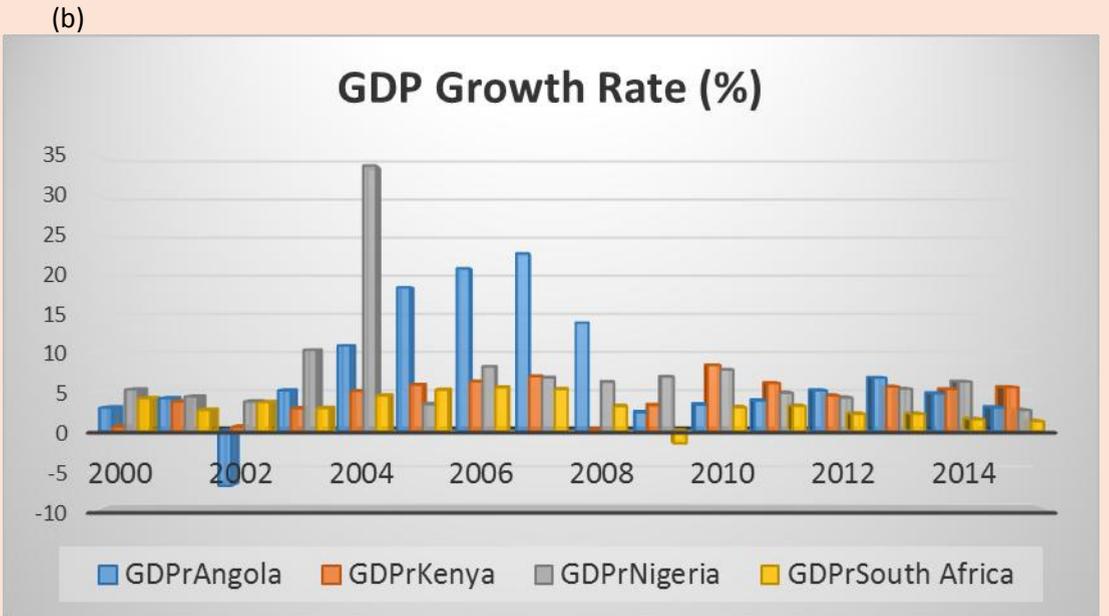
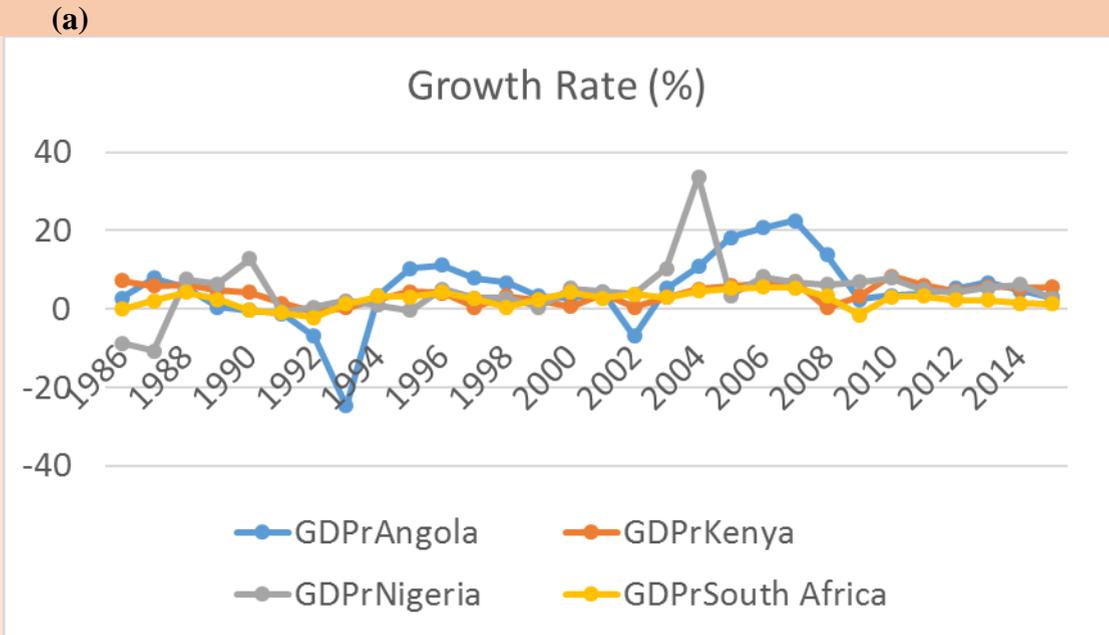
The gross domestic product (GDP) is used as a measure of the health of an economy. A country with a high value of GDP can be described as progressive economy. GDP can be calculated in the Nominal, which refers to the actual amount of money spent on GDP without making allowance for inflation (price changes), and in Real, which on the other hand, tries to correct the figures for nominal GDP, by making allowance for inflation

2.1.10. Comparative Analysis of the Selected Sub-Saharan African Countries' Variables in the Study

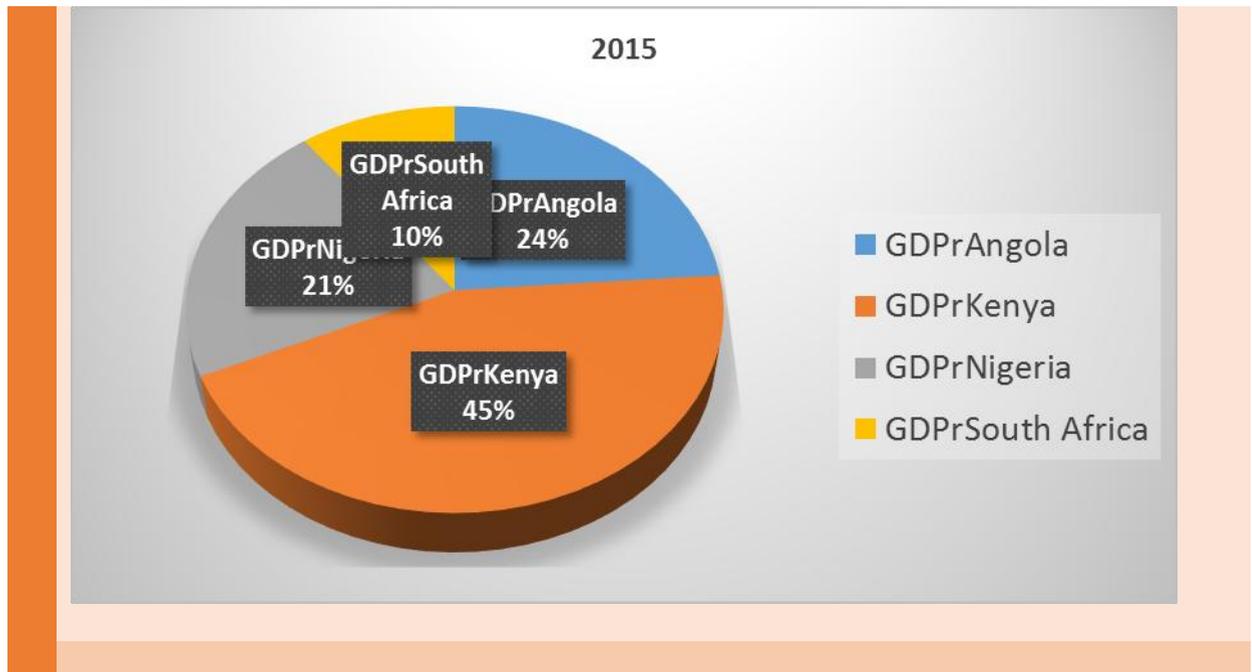
The main variables of the study include the GDP growth rate, domestic debt stock, domestic debt service, external debt stock and external debt service. A comparative analysis using graphical representation and histogram to show countries performance.

Before 1986, growth of many Sub-Saharan African economies equaled that in many other areas of the world with annual GDP growth of 4.8 percent. However, given the contraction in commodity prices, coupled with subdued global demand, growth rates in the region may be difficult to maintain (World Bank and IMF, 2015).

Figure 2: Trend of GDP Growth Rate of the Selected Sub-Saharan African Countries (Angola, Kenya, Nigeria and South Africa)



(c)



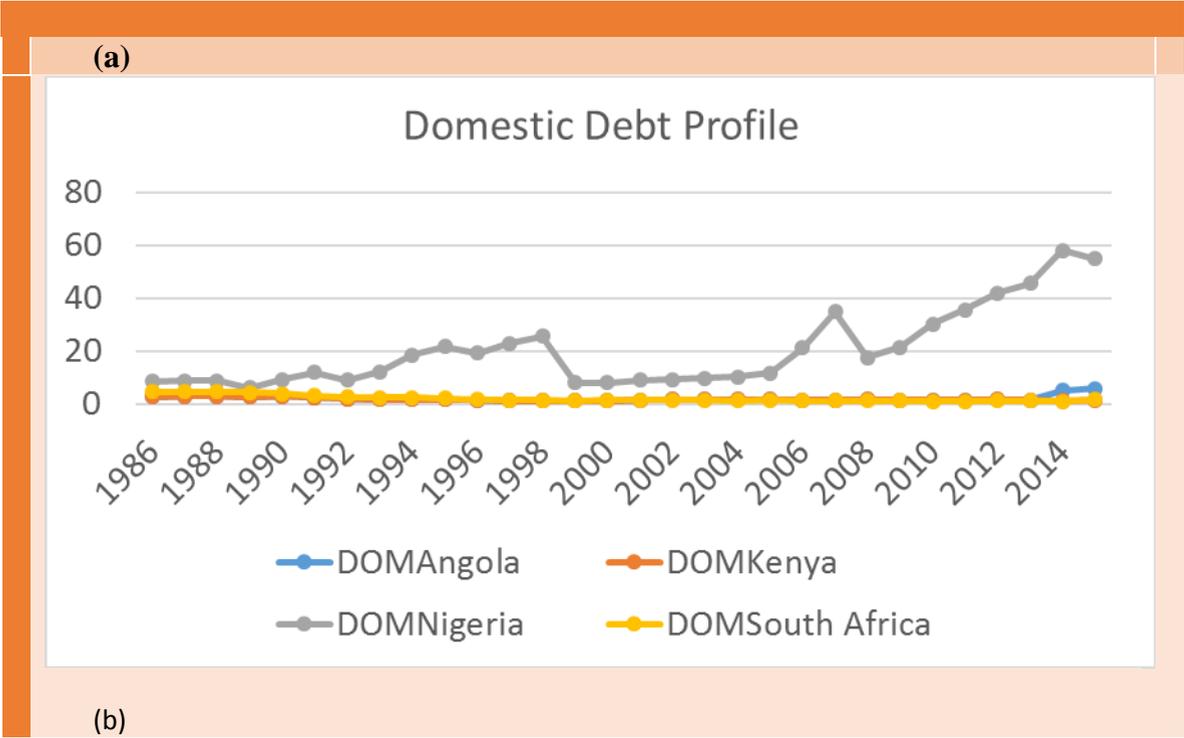
Source: World Bank’s WDI 2016, and Author’s computations for selected countries only

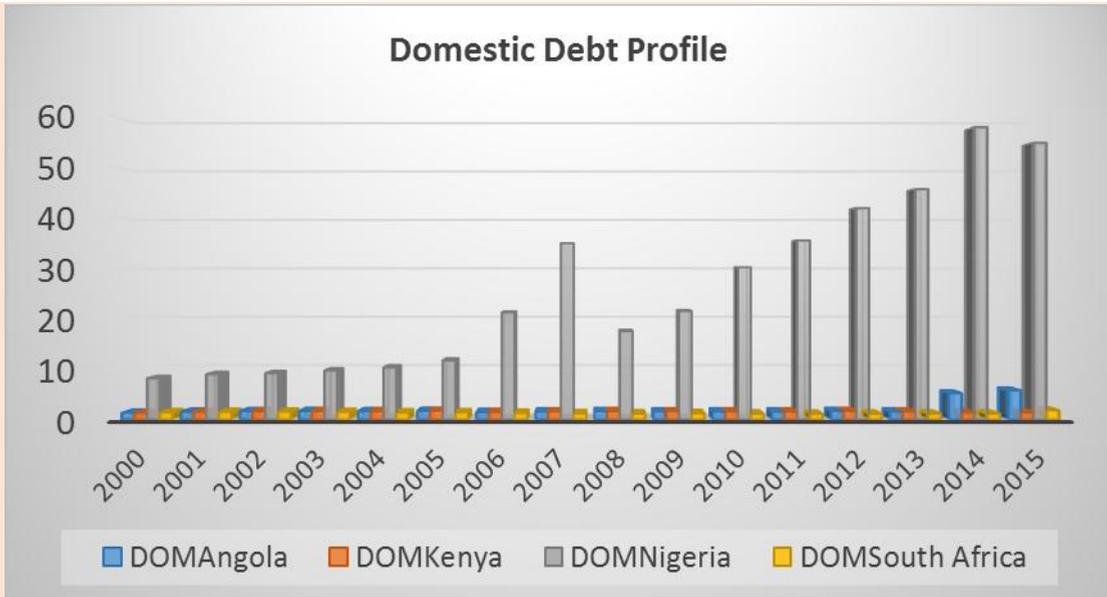
Angola’s economic growth rate fell sharply during the period 1992-1993 (Fig 2a) to a negative growth rate averaging 16%. The period saw the country return to full blown civil war that adversely affected the economy. However, the period 2003-2010 saw the economic growth rise progressively, later begin to slide from 2011. Nigeria experienced a negative economic growth within the period 1986-1987. During the period, structural adjustment programme (SAP) was introduced by IMF to the country to bring succour to the economy. However, in 2004, Nigeria has the highest growth rate at 35% (Fig 2b). The year witnessed a windfall of high oil prices, total revenue rose to an estimated 40.6% of GDP up from 36.5% in 2003, enabled increase in gross international reserves to \$13.27 billion from \$7.46 billion at end of 2003, the naira appreciated in all segments of the market, among other factors (AFDB/OECD, 2015).

Kenya and South Africa economic growth has been progressively slow. However, in 2015, Kenya, among the selected countries have the highest GDP growth rate of 45%

(Fig 2c). According to World Bank (2016), the key drivers for this growth include: a vibrant services sector, enhanced construction, currency stability, low inflation, low fuel prices, a growing middle-class and rising incomes, a surge in remittances, and increased public investment in energy and transportation. South Africa has the lowest growth rate of 10%.

Figure 3: Domestic Debt in Selected SSA Countries (Billions of Dollars)

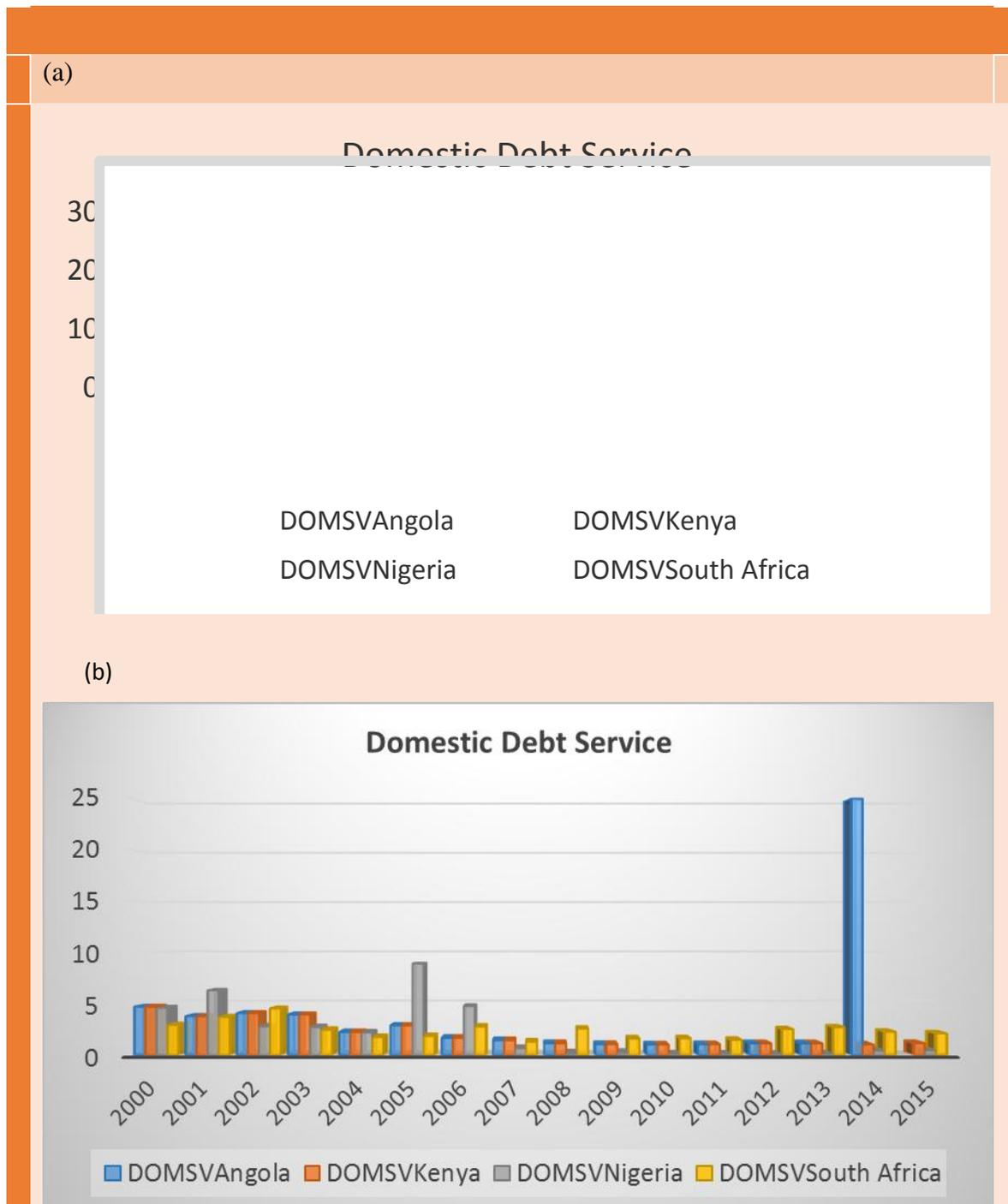




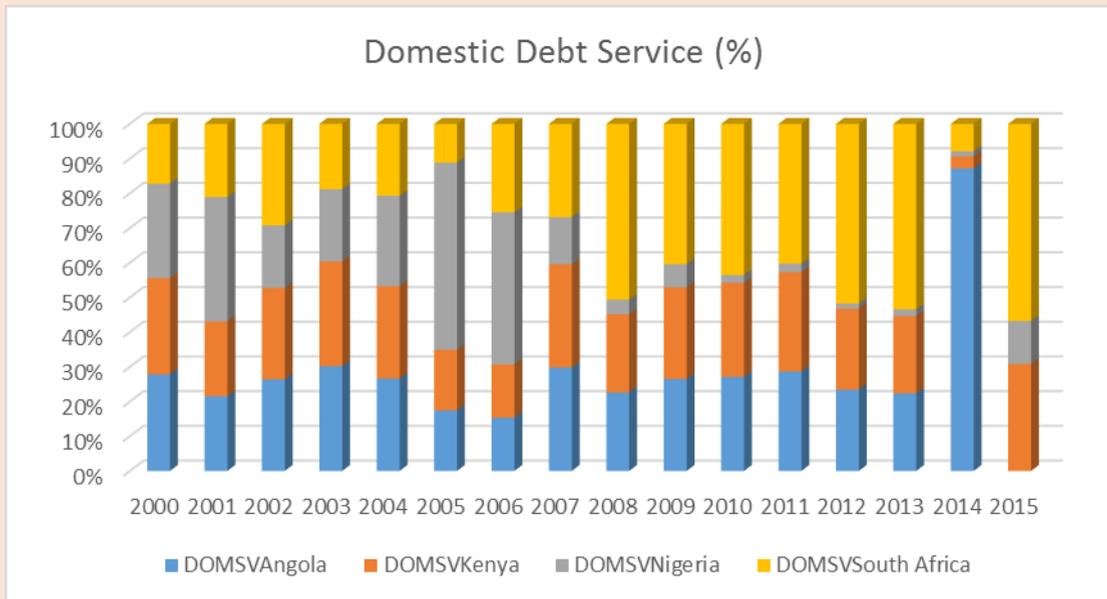
Source: World Bank’s WDI 2016, and Author’s computations for selected countries only

The ratio of domestic debt to GDP in Nigeria has been rising since 1986 to date, driven by the need to finance large fiscal deficits (Fig. 3a and b). This shows that in the face of decreasing foreign aid, including loans and grants, the Government has largely relied on the domestic market to fund its borrowing requirements for development finance. Growth in the budget deficit was recently triggered by a decline in the price of oil, a major source of revenue for Nigeria. Domestic debt in Angola, Kenya and South Africa have been very low within the period, except in 2014-2015, Angola increased her domestic borrowing. The governments of these countries might be better-off borrowing externally.

Figure 4: Trend in Domestic Debt Service of SSA Countries (Angola, Kenya, Nigeria and South Africa (1986-2015)



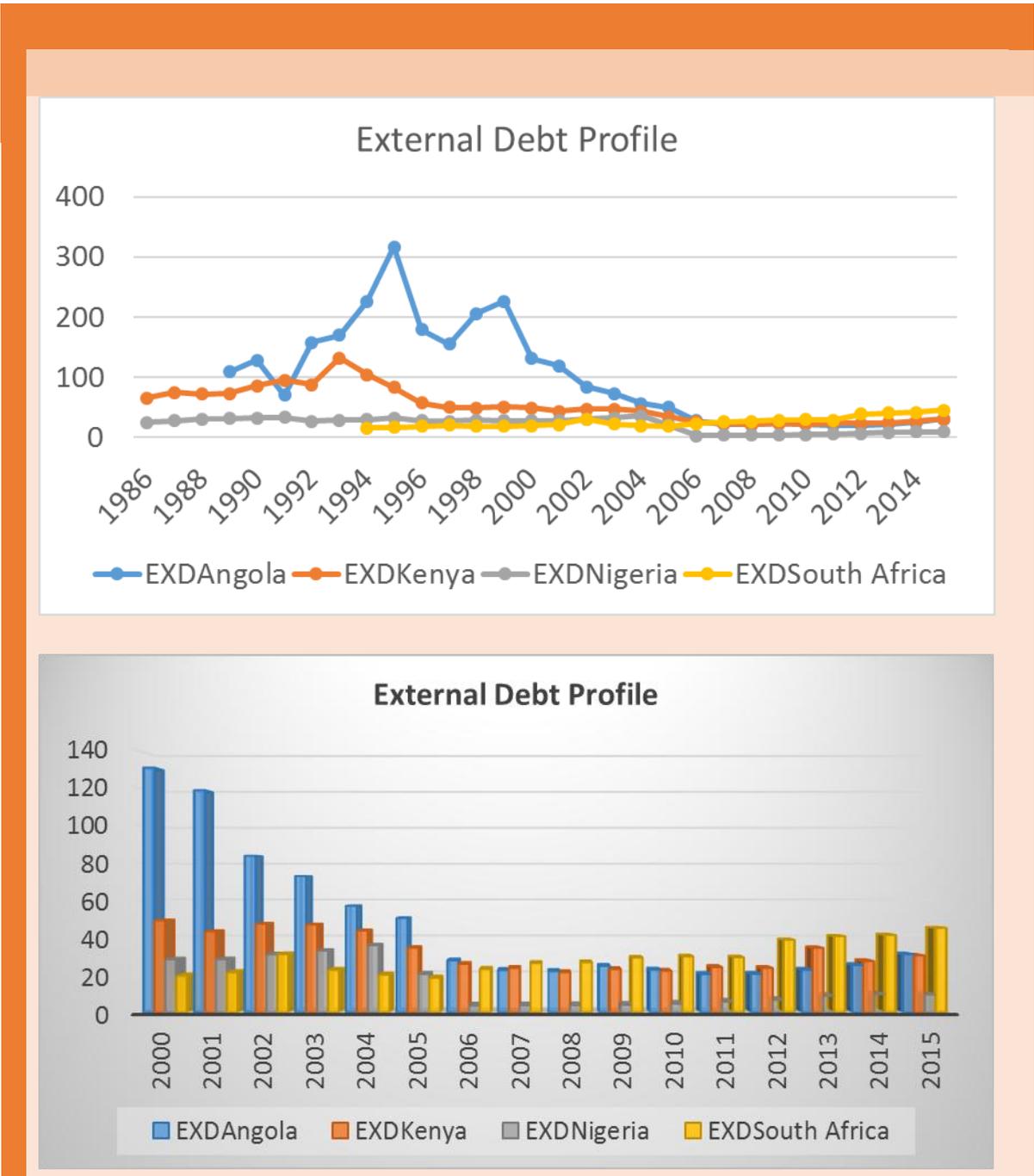
(c)



Source: World Bank's WDI 2016, and Author's computations for selected countries only

Domestic debt service has been progressively rising downwards from 1986-2015 (Fig 4). Nigeria's cost of servicing her domestic debt rose in 2005 to \$9.2 billion while for Angola, the cost rose to an all-time high of \$25 billion. It appears the governments of the countries selected for the study does not allocate enough funds for servicing of their domestic debt.

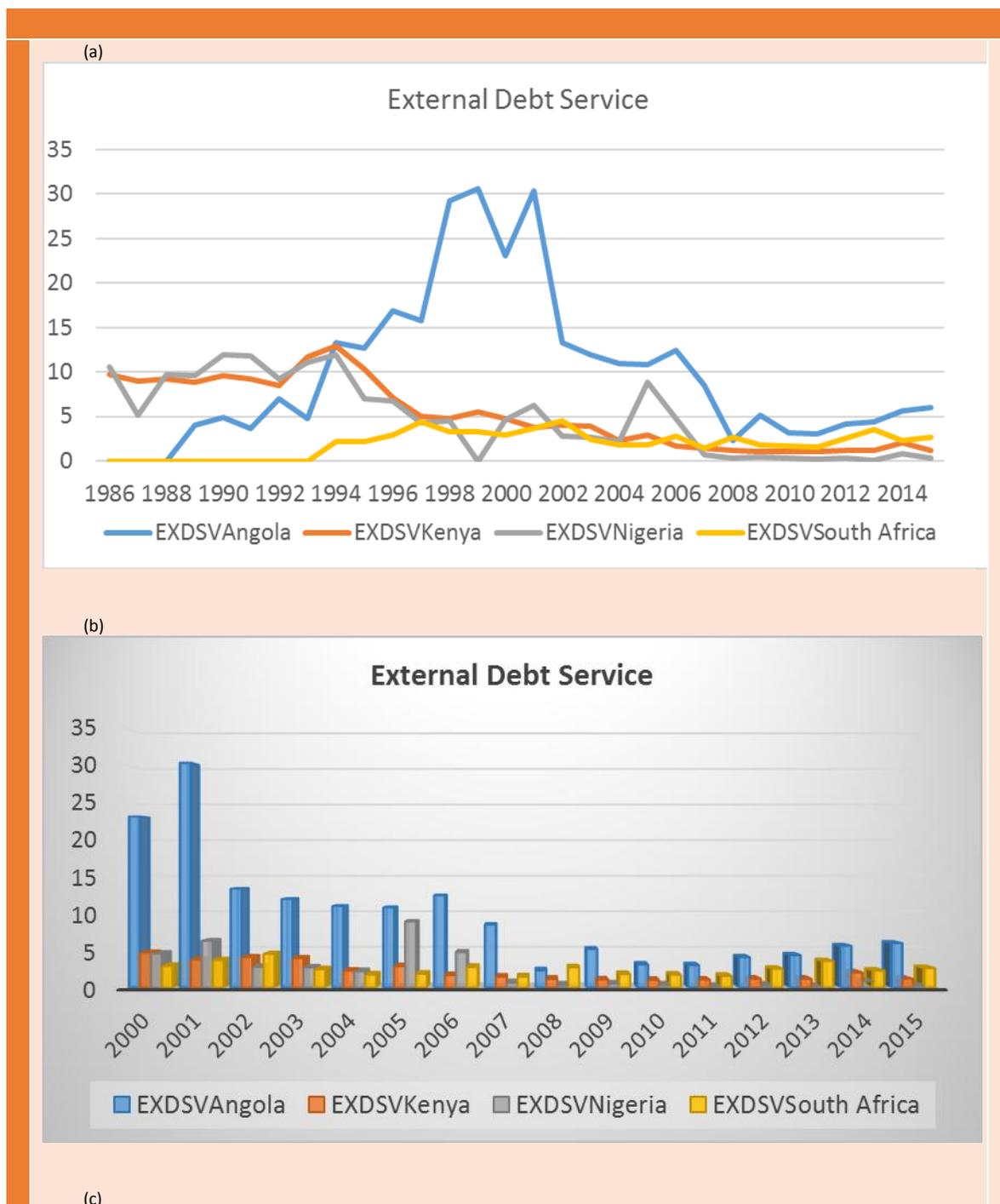
Figure 5: Trend in External Debt of SSA Countries (Angola, Kenya, Nigeria and South Africa (1986-2015)

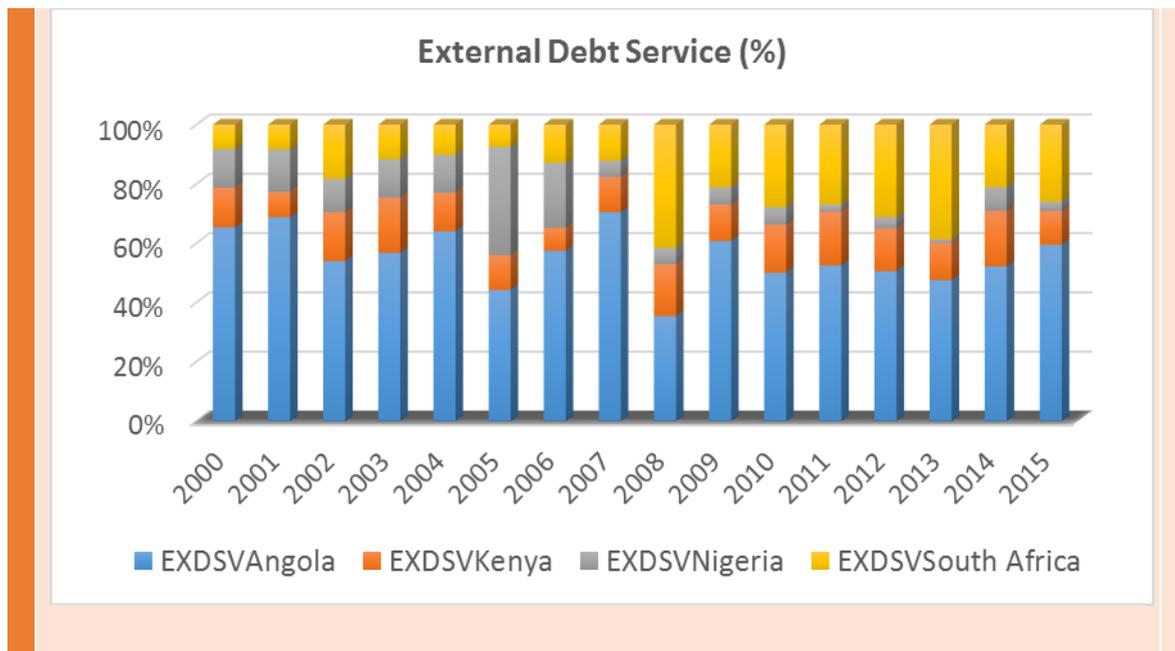


Source: World Bank’s WDI 2016, and Author’s computations for selected countries only

The countries in sub-Saharan Africa are the most indebted, relative to the size of their economies, of all developing countries. Yet the economic situation of sub-Saharan African countries is not monolithic. All selected countries for the study had their external debt rising since early 1980s up till 2006. Since Angola joined the IMF and World Bank in 1989, her debt profile has risen, and got to its peak in 1995, amounting to \$316.5 billion (71.4% of GDP). The reason was principally to finance large oil sector investments and to finance its civil war against the rebels. The contracting of external debt continues to decline after the country's war ended in 2002. Kenya's external debt has been rising since period 1986-1993 (Fig 5), with 1993 as the peak after which it continues to slide downtrend. Between 1986-2004, Nigeria external debt has been rising. After Nigeria debt was rescheduled by the foreign creditors in 2004/2005, external debt continues to slide downward but gradually picking up from 2012. South Africa external debt since 1994-2015 has been rising. In 1994, South Africa transitioned from apartheid to majority rule, joined the IMF and World Bank and has been borrowing externally. However, it is observed that Angola borrow externally more than the four countries.

Figure 6: Trend in External Debt Service of SSA Countries (Angola, Kenya, Nigeria and South Africa (1986-2015))





Source: World Bank’s WDI 2016, and Author’s computations for selected countries only

External debt services in sub-Saharan Africa has been rising. From the graph, debt services in Angola rose from an average of 15.11 percent in 1989-2001 but declined to an average of 7.27 percent in 2002-2015. In contrast, Angola debt service increase more in value than the rest of the selected sub-Saharan African countries (Fig 6a). Debt service that is excessive relative to available resources creates adverse incentives to production, thus inhibiting economic growth. Overall, averagely, South Africa debt service decrease more than the other selected countries.

2.1.11. Review of Selected Sub-Saharan African Economy

According to World Bank (2015), low-income economies are defined as those with a GNI per capita, calculated using the World Bank Atlas method, of \$1,045 or less in 2014; middle-income economies are those with a GNI per capita of more than \$1,045 but less than \$12,736; high-income economies are those with a GNI per capita of \$12,736 or more. Lower-middle income and upper-middle-income economies are separated at a GNI

per capita of \$4,125, for the current 2016 fiscal year. The SSA region consists of twenty-six (26) low income economies, fourteen (14) lower-middle-income economies and six (6) upper-middle income economies while two (2) countries, namely, Equatorial Guinea and Seychelles are high income economies.

A. Nigerian Economy

According to Wikipedia (2015), Nigeria is a middle income, mixed economy and emerging market, with expanding financial, service, communications, technology and entertainment sectors. It is ranked as the 21st largest economy in the world in terms of nominal GDP (Nominal: 2015, 30th in 2013 before rebasing the national accounts, 40th in 2005, 22nd in 2000), the 20th largest in terms of Purchasing Power Parity and the largest economy in Africa. It is the largest economy; its re-emergent, though currently underperforming, manufacturing sector is the third-largest on the continent, and produces a large proportion of goods and services for the West African sub-region. Nigeria recently changed its economic analysis to account for rapidly growing contributors to its GDP, such as telecommunications, banking, and its film industry. (<http://www.economist.com/news/leaders/21600685-nigerias-suddenly-supersized-economy-indeed-wonder-so-are-its-still-huge?frsc=dg%7Ca>).

Previously hindered by years of mismanagement, economic reforms of the past decade have put Nigeria back on track towards achieving its full economic potential. Nigerian GDP at purchasing power parity (PPP) has almost tripled from \$170 billion in 2000 to \$451 billion in 2012, although estimates of the size of the informal sector (which is not included in official figures) put the actual numbers closer to \$630 billion. Correspondingly, the GDP per capita doubled from \$1400 per person in 2000 to an estimated \$2,800 per person in 2012 (again, with the inclusion of the informal sector, it is estimated that GDP per capita hovers around \$3,900 per person). (Population increased from 120 million in 2000 to 160 million in 2010). These figures are to be revised

upwards by as much as 80% when metrics are recalculated subsequent to the rebasing of its economy in April 2014

https://www.google.com/search?tbm=nws&q=nigeria+rebasng+gdp&gws_rd=ssl).

Although much has been made of its status as a major exporter of oil, Nigeria produces only about 2.7% of the world's supply (Saudi Arabia: 12.9%, Russia: 12.7%, USA: 8.6%)

https://en.wikipedia.org/wiki/Economy_of_Nigeria#cite_note-19).

To put oil revenues in perspective: at an estimated export rate of 1.9 Mbbbl/d (300,000 m³/d), with a projected sales price of \$65 per barrel in 2011, Nigeria's anticipated revenue from petroleum is about \$52.2 billion (2012 GDP: \$451 billion). This accounts about 11% of official GDP figures (and drops to 8% when the informal economy is included in these calculations). Therefore, though the petroleum sector is important, it remains in fact a small part of the country's overall vibrant and diversified economy.

The largely subsistence agricultural sector has not kept up with rapid population growth, and Nigeria, once a large net exporter of food, now imports a large quantity of its food products, though there is a resurgence in manufacturing and exporting of food products.

In 2006, Nigeria successfully convinced the Paris Club to let it buy back the bulk of its debts owed to the Paris Club for a cash payment of roughly \$12 billion (USD) (<http://www.cgdev.org/content/publications/detail/3223/>) According to a Citigroup report published in February 2011, Nigeria will get the highest average GDP growth in the world between 2010 and 2050. Nigeria is one of two countries from Africa among 11 Global Growth Generators countries (<http://www.businessinsider.com/willem-buiter-3g-countries-2011-2?slop=1>).

Nigeria's economy is struggling to leverage the country's vast wealth in fossil fuels in order to displace the poverty that affects about 33% of its population. Economists refer to the coexistence of vast wealth in natural resources and extreme personal poverty in developing countries like Nigeria as the "resource curse". Although "resource curse" is more widely understood to mean an abundance of natural resources that fuels official corruption resulting in a violent competition for the resource by the citizens of the nation.

In 2005, Nigeria achieved a milestone agreement with the Paris Club of lending nations to eliminate all of its bilateral external debt. Under the agreement, the lenders will forgive most of the debt, and Nigeria will pay off the remainder with a portion of its energy revenues. Outside of the energy sector, Nigeria's economy is highly inefficient. Moreover, human capital is underdeveloped—Nigeria ranked 151 out of countries in the United Nations Development Index in 2004—and non-energy-related infrastructure is inadequate.

From 2003 to 2007, Nigeria attempted to implement an economic reform program called the National Economic Empowerment Development Strategy (NEEDS). The purpose of the NEEDS was to raise the country's standard of living through a variety of reforms, including macroeconomic stability, deregulation, liberalization, privatization, transparency, and accountability.

The NEEDS addressed basic deficiencies, such as the lack of freshwater for household use and irrigation, unreliable power supplies, decaying infrastructure, impediments to private enterprise, and corruption. The government hoped that the NEEDS would create 7 million new jobs, diversify the economy, boost non-energy exports, increase industrial capacity utilization, and improve agricultural productivity. A related initiative on the state level is the State Economic Empowerment Development Strategy (SEEDS).

A longer-term economic development program is the United Nations (UN)-sponsored National Millennium Goals for Nigeria. Under the program, which covers the years from 2000 to 2015, Nigeria is committed to achieving a wide range of ambitious objectives involving poverty reduction, education, gender equality, health, the environment, and international development cooperation. In an update released in 2004, the UN found that Nigeria was making progress toward achieving several goals but was falling short on others.

A prerequisite for achieving many of these worthwhile objectives is curtailing endemic corruption, which stymies development and taints Nigeria's business environment. President Olusegun Obasanjo's campaign against corruption, which includes the arrest of officials accused of misdeeds and recovering stolen funds, has won praise from the World Bank. In September 2005, Nigeria, with the assistance of the World Bank, began to recover US\$458 million of illicit funds that had been deposited in Swiss banks by the late military dictator Sani Abacha, who ruled Nigeria from 1993 to 1998.

However, while broad-based progress has been slow, these efforts have begun to become evident in international surveys of corruption. In fact, Nigeria's ranking has consistently improved since 2001 ranking 147 out of 180 countries in Transparency International's 2007 Corruption Perceptions Index.

Table 2.1: Trend of Gross Domestic Product of Nigeria at Market Prices Estimated

Year	Gross Domestic Product, (PPP, in Billions)	US Dollar Exchange	Inflation Index (2000=100)	Per Capita Income (as % of USA)
1980	*58	1 Naira	1.30	7%
1985	*82	3 Naira	3.20	5%
1990	*118	9 Naira	8.10	2.5%
1995	*155	50 Naira	56	3%
2000	170	100 Naira	100	3.5%

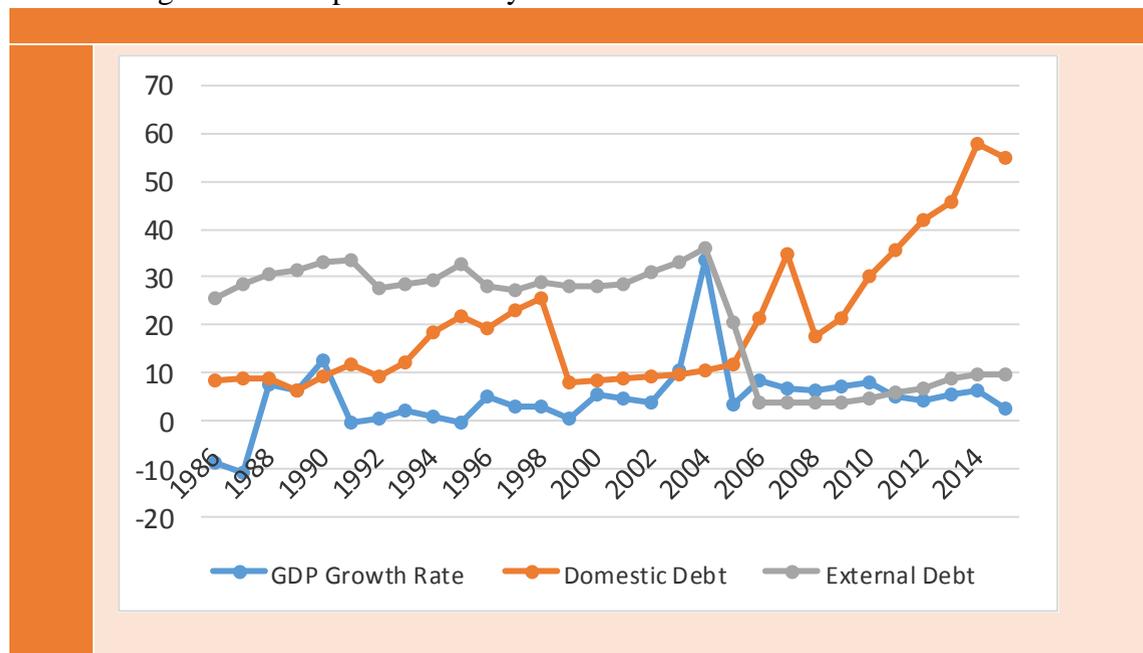
2005	291	130 Naira	207	4%
2010	392	150 Naira	108	5%
2012	451	158 Naira	121	7%
2014	972	180 Naira	(no data)	11%

Source: IMF (2014)

<http://www.imf.org/external/pubs/ft/weo/2006/01/data/dbcselem.cfm?G=2001>

Figures before 2000 are backwards projections from the 2000 - 2012 numbers, based on historical growth rates, and should be replaced when data becomes available. The figure for 2014 is derived from a rebasing of economic activities earlier in 2014.

Figure 7: Graphical Representation of GDP Growth Rate, Domestic Debt and External Debt in Nigeria: A Comparative Analysis



Source: World Bank's WDI 2016, Central Bank of Nigeria Statistical Bulletin and Debt Management Office Nigeria (DMO) with Author's computations for selected countries only

When looking at figure 7, the nation's economic growth rate vis-a-vis the rate at which domestic and external debt is growing, it clearly shows that the rate of economic growth

has adopted a downtrend while on the other hand both external and domestic debt rate is moving upwards. This shows a persistent economic decline since 2005. External debt declined in 2005 while domestic debt has been rising. This might have been the result of obtaining debt relief. Failure to understand the effects that may be brought about by the increasing amount of external debt and domestic debt on the nation's economy might result in a state whereby the country's debt will be unsustainable, i.e the nation failing to meet its debt obligations. As a result, the question we should be asking is what would be the long run effect of this debt growth on the economy of the nation?

Table 2.2 Trend of the Global Ranking of the Nigerian Economy, in Comparison with other Countries of The World, Derived from The Historical List of Countries by GDP (PPP)

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Ranking	52	47	38	37	34	31	31	30	23	20

Source: IMF (2016)

Current GDP per capita of Nigeria expanded 132% in the Sixties reaching a peak growth of 283% in the Seventies. But this proved unsustainable and it consequently shrank by 66% in the Eighties. In the Nineties, diversification initiatives finally took effect and decadal growth was restored to 10%. Due to inflation, per capita GDP today remains lower than in 1960 when Nigeria declared independence. About 45% of the population lives on less than US\$2 per day.

B. The Kenyan Economy

Kenya's economy is market-based with a few state-owned infrastructure enterprises and maintains a liberalized external trade system. The country is generally perceived as Eastern and Central Africa's hub for Financial, Communication and Transportation services. Major industries include: agriculture, forestry and fishing, mining and minerals,

industrial manufacturing, energy, tourism and financial services. Kenya is the 72nd largest economy in the world with per capita GDP estimated at \$1,587.

The government of Kenya is generally investment friendly and has enacted several regulatory reforms to simplify both foreign and local investment, including the creation of an export processing zone. The export processing zone is expected to grow rapidly through input of foreign direct investment. An increasingly significant portion of Kenya's foreign inflows are remittances by non-resident Kenyans who work in the US, Middle East, Europe and Asia (https://en.wikipedia.org/wiki/Economy_of_Kenya#cite_note-7). Compared to its neighbours, Kenya has well-developed social and physical infrastructure.

As of March 2014, economic prospects were positive with above 5% GDP growth expected (https://en.wikipedia.org/wiki/Economy_of_Kenya#cite_note-8). Largely because of expansions in telecommunications, transport, construction and a recovery in agriculture. These improvements are supported by a large pool of English-speaking professional workers. There is a high level of computer literacy, especially among the youth. The economy's heavy dependence on rain-fed agriculture and the tourism sector leaves it vulnerable to cycles of boom and bust. The agricultural sector employs nearly 75 percent of the country's 38 million people. Half of the sector's output remains subsistence production https://en.wikipedia.org/wiki/Economy_of_Kenya#cite_note-cp-14.

Kenya's economic performance has been hampered by numerous interacting factors: heavy dependence on a few agricultural exports that are vulnerable to world price fluctuations, population growth that has outstripped economic growth, prolonged drought that has necessitated power rationing, deteriorating infrastructure, and extreme disparities of wealth that have limited the opportunities of most to develop their skills and knowledge.

Poor governance and corruption also have had a negative impact on growth, making it expensive to do business in Kenya. According to Transparency International, Kenya ranks among the world's half-dozen most corrupt countries. Bribery and fraud cost Kenya as much as US\$1 billion a year. 23 percent of Kenyans live on less than US\$1 per day, pay some 16 bribes a month—two in every three encounters with public officials. Another large drag on Kenya's economy is the burden of human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS). Prospects significantly improved under the Kibaki government, whose policy aims include budgetary reforms and debt restraint.

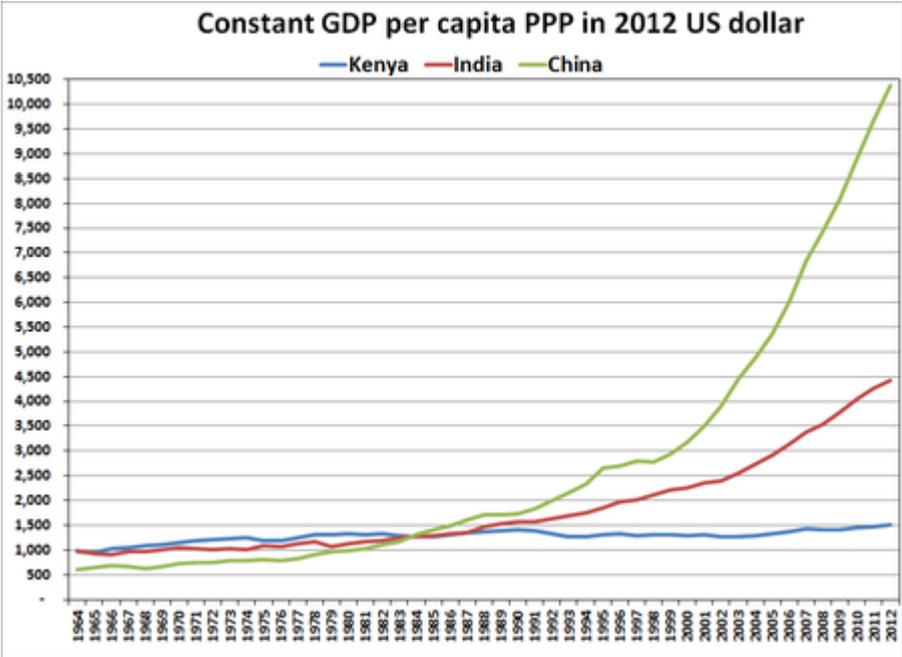
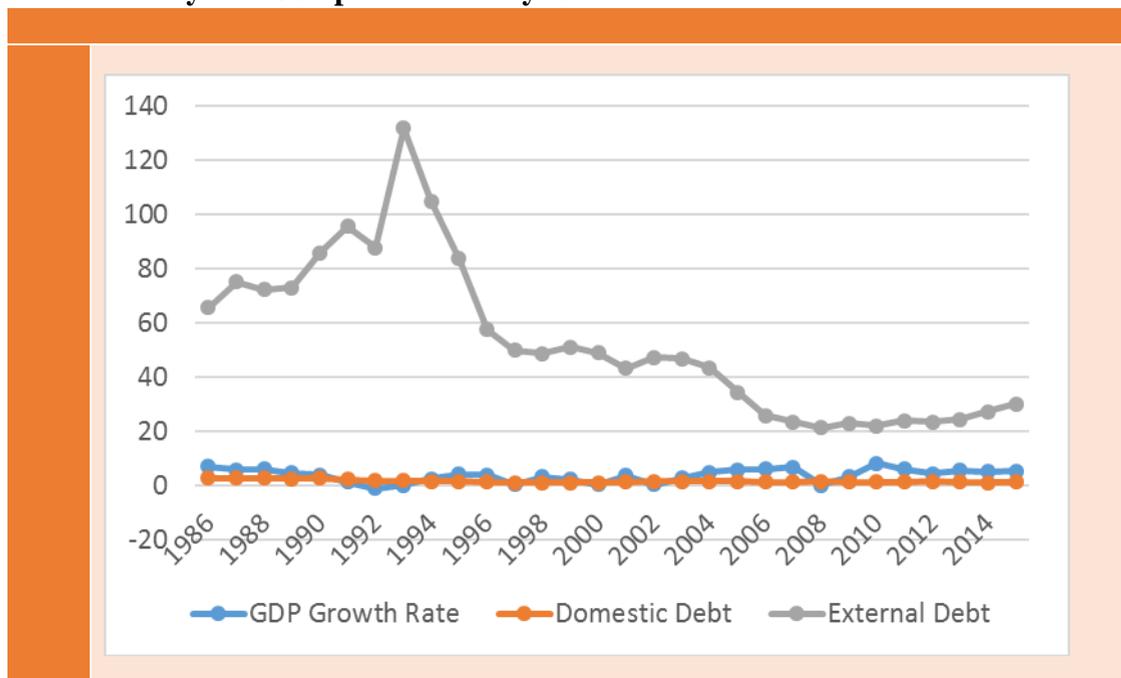


Figure 4.1: Kenya's economic performance since independence.

Source: https://en.wikipedia.org/wiki/Economy_of_Kenya#cite_note-cp-14

In 2006 Kenya's gross domestic product (GDP) was about US\$17.39 billion. Per capita GDP averages were somewhat more than US\$450 annually. Adjusted in purchasing power parity (PPP) terms, per capita GDP in 2006 was about US\$1,200. The country's real GDP growth picked up to 2.3 percent in early 2004 and to nearly 6 percent in 2005 and 2006, compared with a sluggish 1.4 percent in 2003 and throughout President Daniel Arap Moi's last term (1997–2002). Real GDP is expected to continue to improve, largely because of expansions in tourism, telecommunications, transport, and construction and a recovery in agriculture. The Kenya Central Bank forecast for 2007 is between 5 and 6 percent GDP growth. GDP composition by sector, according to 2004 estimates, was as follows: agriculture, 25.7 percent; manufacturing, 14.0 percent; trade, restaurants, and hotels, 13.8 percent; transport and communications, 6.9 percent; government services, 15.6 percent; and other, 24.0 percent.

Figure 8: Graphical Presentation of GDP Growth Rate, Domestic Debt and External Debt in Kenya: A Comparative Analysis



Source: World Bank's WDI 2016, with Author's computations for selected countries only

The rate of economic growth is inversely related with external debt. While external debt is rising, economic growth is declining. However, from 1993, external debt persistently has been declining but domestic debt has been very low. This shows that the government was not so much interested in borrowing domestically.

Challenges of Kenya's Economy

Despite early disillusionment of western donors with the government, the economy has seen a broad-based expansion, led by strong performance in tourism and telecommunications, and acceptable post-drought results in agriculture, especially the vital tea sector. Kenya's economy grew by more than 7% in 2007 and its foreign debt was greatly reduced which underscore that situation in Kenya will be stable over foreseeable future.

The growing flow of foreign investment, prospective promotion of Kenyan goods on global markets and increment in demand for agricultural products, especially, for tea and cut flowers, projected a stable economic growth, in 2014 and expected to reach 4% and more in 2015. Western donors are now adopting a less paternalistic attitude towards their relations with African nations. However, there is still significant improvement to be done. 2007–2008 post-election violence also impacted a lot in Kenyan's economy, these prove for the down swing of Kenya business cycle within the period (<http://enria.org/economic-analysis/kenya-s-economic-growth-in-2014-and-2015>)

C. South Africa Economy

According to Wikipedia, the free encyclopedia, the economy of South Africa is the second largest in Africa, after Nigeria and accounts for 24 percent of Africa's gross domestic product in terms of purchasing power parity (PPP). Ranked by the World Bank as an “upper middle-income country”, in 2014 its GDP stood at \$350.1-billion (R5.416-

trillion), its population at 54 million and per capita GDP at \$6 483, (<https://data.worldbank.org/country/South-africa>).

While much of the world staggered in the wake of the global financial meltdown towards the end of the first decade of the new millennium, South Africa managed to stay on its feet – largely as a result of its prudent fiscal and monetary policies. The country is politically stable and has a well-capitalized banking system, abundant natural resources, well developed regulatory systems as well as research and development capabilities, and an established manufacturing base. It was admitted to the BRIC group of countries of Brazil, Russia, India and China (now known as BRICS) in 2011. Since 1996, at the end of over twelve years of international sanctions, South Africa's Gross Domestic Product has almost tripled to \$400 billion, and foreign exchange reserves have increased from \$3 billion to nearly \$50 billion; creating a diversified economy with a growing and sizable middle class, within two decades of establishing democracy and ending apartheid. (CNN, 2013), (<http://www.cnn.com/2013/11/business/southafrica-sinceapartheid/>)

South Africa has a comparative advantage in the production of agriculture, mining and manufacturing products relating to these sectors. South Africa has shifted from a primary and secondary economy in the mid-twentieth century to an economy driven primarily by the tertiary sector in the present day which accounts for an estimated 65% of GDP or \$230 billion in nominal GDP terms.

The country's economy is reasonably diversified with key economic sectors including mining, agriculture and fisheries, vehicle manufacturing and assembly, food processing, clothing and textiles, telecommunication, energy, financial and business services, real estate, tourism, transportation, and wholesale and retail trade. High levels of unemployment, income inequality, growing public debt, political mismanagement, low

levels of education, reliable access to electricity, and crime are all serious problems that have negatively impacted the South African economy. In 2016 the top 5 challenges to doing business in the country were inefficient government bureaucracy, restrictive labour regulations, a shortage of educated workers, policy instability, corruption whilst the country's strong banking sector was rated as a strongly positive feature of the economy.

South Africa, unlike other emerging markets, has struggled through the late 2000s recession, and the recovery has been largely led by private and public consumption growth, while export volumes and private investment have yet to fully recover. The long-term potential growth rate of South Africa under the current policy environment has been estimated at 3.5%. Per capita GDP growth has proved mediocre, though improving, growing by 1.6% a year from 1994 to 2009, and by 2.2% over the 2000–09 decade, compared to world growth of 3.1% over the same period.

Table 2.3: Trend of South Africa's Gross Domestic Product at Market Prices

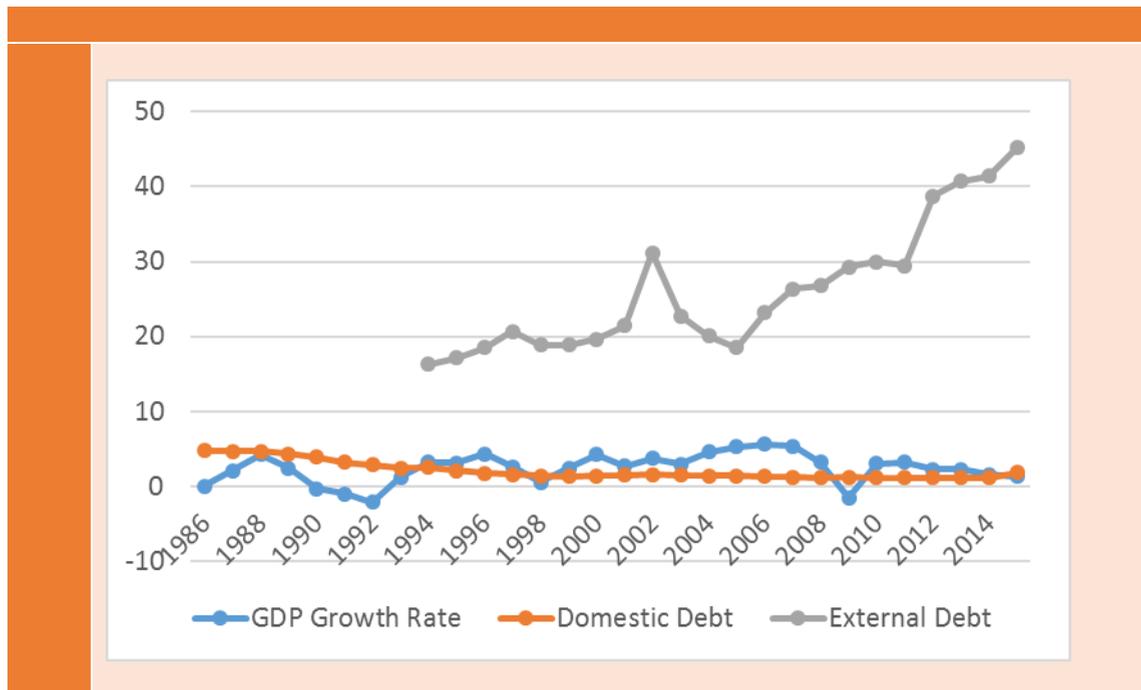
Year	GDP, US\$ bln	US dollar exchange in early January	Unemployment rate	Per capita income, in US\$
1980	80.547	0.8267 Rand	9.2	2764
1985	57.273	2.0052 Rand	15.5	1736
1990	111.998	2.5419 Rand	16.0	3039
1995	151.117	3.5486 Rand	16.7	3684
2000	132.964	6.1188 Rand	25.6	2986
2005	246.956	5.6497 Rand	26.7	5267
2010	363.655	7.462 Rand	24.9	7274

Source: IMF: World Economic Outlook Database (2015)

South Africa has a diverse economy, with key sectors roughly contributing to GDP as follows:

- Agriculture: 2.2%
- Mining: 10%
- Manufacturing: 13.3%
- Electricity and water: 2.6%
- Construction: 3.9%
- Wholesale, retail and motor trade, catering and accommodation: 14.6%
- Transport, storage and communication: 9%
- Finance, real estate and business services: 20.7%
- Government services: 17.6%
- Personal services: 5.9%

Figure 9: Graphical Presentation of GDP Growth Rate, Domestic Debt and External Debt in South Africa: A Comparative Analysis



Source: World Bank’s WDI 2016, with Author’s computations for selected countries only

When looking at Figure 9, the economy has been growing at a downtrend fluctuating rate with domestic debt while external debt has been rising since 1994 persistently. This shows that after the end of apartheid regime, there was need for the country to be developed as the need to contract external loan was necessary.

Challenges Facing the South African Economy

South Africa's economy grew by a marginal 0.7% in the third quarter of 2015, according to preliminary estimates of real gross domestic product (GDP) released by Statistics SA in November of the year, following a 1,3% contraction in the second quarter.

Three of the 10 main industry groups shrunk in size: agriculture, mining, and electricity, gas and water supply. Manufacturing has posted an uptick in growth. Agriculture, mining and manufacturing, traditionally labour intensive sectors that employ unskilled workers now account for 19% of total employment, down from about 30% in 2000; the services sector now accounts for 72% of total employment.

As the National Treasury is at pains to point out, development is not just the pursuit of growth – it is also about creating a more equitable future. The South African government is determined to address its key challenges through the economic integration of its previously disadvantaged majority.

The high levels of unemployment, at over 25%, and inequality are considered by the government and most South Africans to be the most salient economic problems facing the country. These issues, and others linked to them such as crime, have in turn hurt investment and growth, consequently having a negative feedback effect on employment. Crime is considered a major or very severe constraint on investment by 30% of enterprises in South Africa, putting crime among the four most frequently mentioned constraints.

The New Growth Path, launched in November 2010, builds on plans to restructure the economy to ensure more inclusive and sustainable growth – and sets a target of creating five million new jobs by 2020. The road map to do this is provided by the Industrial Policy Action Plan, which proposes multi-sectoral interventions across agriculture, mining, manufacturing, tourism and other high-level services to create substantial employment.

D. Angola Economy

According to Wikipedia, the free encyclopedia (2015), the economy of Angola is one of the fastest-growing in the world, with reported annual average GDP growth of 11.1 percent from 2001 to 2010.

https://en.wikipedia.org/wiki/Economy_of_Angola#cite_note-fastest-5

It is still recovering from the Angolan Civil War that plagued the country from its independence in 1975 until 2002. Despite extensive oil and gas resources, diamonds, hydroelectric potential, and rich agricultural land, Angola remains poor, and a third of the population relies on subsistence agriculture. Since 2002, when the 27-year civil war ended, the nation has worked to repair and improve ravaged infrastructure and weakened political and social institutions.

Despite its abundant natural resources, output per capita is among the world's lowest. Subsistence agriculture provides the main livelihood for 85% of the population. Oil production and the supporting activities are vital to the economy, contributing about 45% to GDP, 90% of exports and over 80 percent of government revenue. Growth is almost entirely driven by rising oil production which surpassed 1.4 million barrels per day (220×10³ m³/d) in late 2005 and which is expected to grow to 2 million barrels per day (320×10³ m³/d) by 2007. Control of the oil industry is consolidated in Sonangol Group,

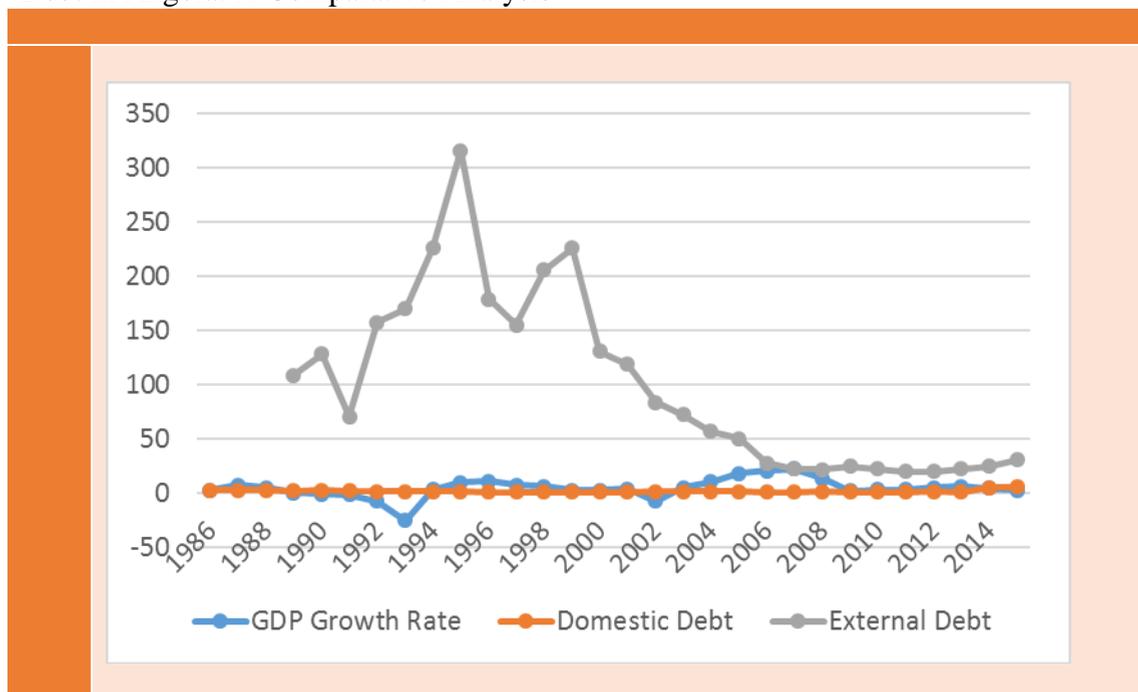
a conglomerate owned by the Angolan government. With revenues booming from oil exports, the government has started to implement ambitious development programs to build roads and other basic infrastructure for the nation.

In the last decade of the colonial period, Angola was a major African food exporter but now imports almost all its food. Severe wartime conditions, including extensive planting of landmines throughout the countryside, have brought agricultural activities to a near-standstill. Some efforts to recover have gone forward, however, notably in fisheries. Coffee production, though a fraction of its pre-1975 level, is sufficient for domestic needs and some exports.

Expanding oil production is now almost half of GDP and 90% of exports, at 800 thousand barrels per day (130×10^3 m³/d). Diamonds provided much of the revenue for Jonas Savimbi's UNITA rebellion through illicit trade. Other rich resources await development: gold, forest products, fisheries, iron ore, coffee, and fruits (<https://en.wikipedia.org/wiki/Wikipedia>).

Angola produces and exports more petroleum than any other nation in sub-Saharan Africa, surpassing Nigeria in the 2000s. In January 2007 Angola became a member of OPEC. By 2010 production is expected to double the 2006 output level with development of deep-water offshore oil fields. Oil sales generated USD 1.71 billion in tax revenue in 2004 and now makes up 80% of the government's budget, a 5% increase from 2003, and 45% of GDP (https://en.wikipedia.org/wiki/Economy_of_Angola#cite_note-budgincrease-24).

Figure 10: Graphical Presentation of GDP Growth Rate, Domestic Debt and External Debt in Angola: A Comparative Analysis



Source: World Bank's WDI 2016, with Author's computation

When looking at figure 10, it is observed that over the years, economic growth of Angola has been very low and it is not reflective of the borrowings, especially external borrowing. External debt has been rising, got to its peak in 1995 after which it continues to slide downward. This is not far-fetched from corruption, which causes funds to be diverted by leaders from the original purpose to either personal use or non-productive developmental projects which does not generate income to grow the economy. Moreso, from the graphical representation, Angola is seen to borrow excessively externally more than borrowing domestically.

Development Challenges

Angola has made substantial progress in economic and political terms since the end of the war in 2002. However, the country continues to face massive developmental challenges

which include reducing the dependency on oil and diversifying the economy, rebuilding its infrastructure, improving institutional capacity, governance, public financial management systems, human development indicators and the living conditions of the population. Large pockets of the population still remain in poverty and without adequate access to basic services and could benefit from more inclusive development policies.

2.2. THEORETICAL FRAMEWORK

The study is anchored on two fundamental theories - Keynesian school of thought and the Neoclassical school. However, the study x-rayed arguments that emanated between the Keynesian school of thought, the Neoclassicals and Ricardo equivalence hypothesis (REH). For clarity of purpose, we divided our theories into two phases, the first phase captures the various theories of public debt and its properties while the second phase contain the theories of economic growth thus.

2.2.1. Theories of Public Debt

2.2.1.1. Traditional Keynes' Theory

The Keynesian economists proposed a positive relationship between public debt and economic growth. In the Keynesian model, it was argued that an increase in government spending stimulates the domestic economic activity, increases aggregate demand, increases savings and private investment at any given level of interest rate and hence encourages private investment. At this point, persistence increase in employment is presumed in the economy and that the sensitivity of interest rate to investment is minute. Sequel to this, expansionary fiscal policy will bring about little or no change in the rate of interest, stimulate level of output, employment opportunities and income.

The Keynesians provide a counter argument to the crowd-out effect by making reference to the expansionary fiscal policy. They argue that usually public debt results in an

increase in domestic production, which makes private investors more optimistic about the future course of the economy resulting in them investing more. This is known as the “crowding-in” effect. The theory suggested that active government policy could be effective in managing the economy.

The Keynesian approach to the relationship between public debt and economic growth considers that the impact of government deficits on growth is considered positive. However, the Keynesian approach to debt cannot be valid in the medium and long term. Indeed, this approach characterized by the assumption of sticky prices and wages as well as the temporary myopia of economic agents can only work within a short period of reasoning. They argued that long term effects of a budget deficit threatening the sustainability of public finances are undeniably negative.

Rather than seeing unbalanced government budgets as wrong, Keynes advocated what has been called countercyclical fiscal policies, that is, policies which acted against the tide of the business cycle. Public debt is appropriate when a nation's economy suffers from recession or when recovery is long-delayed and unemployment is persistently high - and the suppression of inflation in boom times by either increasing taxes or cutting back on government outlays. He argued that governments should solve problems in the short run rather than waiting for market forces to do it in the long run, because "in the long run, we are all dead”.

2.2.1.2. The Neoclassical School

The neoclassical school proposes an adverse relationship between public debt and macroeconomic variables. They argue that public debt lead to higher interest rates, discourages the issue of private bonds, private investments and private spending, increases inflation level, and cause a similar increase in the current account deficits and finally slows the growth rate of the economy through resources crowding out.

The Neoclassical school considers individuals planning their consumption over their entire cycle. By shifting taxes to future generations, public debt increases current consumption. By assuming full employment of resources, the neoclassical school argues that increased consumption implies a decrease in savings. Interest rate must rise to bring equilibrium in the capital markets. Higher interest rates, in turn results in a decline in private investment, domestic production and an increase in the aggregate price level.

Furthermore, Yellen (1989) argues that in standard neoclassical macroeconomic models, if resources are fully employed, so that output is fixed, higher current consumption implies an equal and offsetting reduction in other forms of spending. Thus, investment and/or net exports must be “fully crowding out”. It is worth noting, the importance to distinguish between “financial” crowding out and “resource” crowding out which occurs when the government competes with the private sector in purchasing certain resources (skilled labour, raw materials and so on).

When the government sector expands, the private sector will contract because of the increase in prices on these resources due to an excess demand by the government, hence this leads to a fall in investment and consumption by the private sector. Thus the government sector’s expansion crowds out the private sector. It is worth noting here as well that resource crowding out is an important issue to take into account especially in developing countries where resources are scarce even sometimes to the private sector, so any excess demand for these resources by the government will severely impinge on private sector productivity.

2.2.1.3. The Ricardian School

Finally, there is another contrary approach advanced by Barro (1989) known as the Ricardian Equivalence Hypothesis theory (REH). Ricardian equivalence or the Barro-Ricardo equivalence proposition is an economic theory which suggests that government debt do not affect the total level of demand in an economy. In simple terms, the theory

can be described as follows: Governments may either finance their spending by taxing current taxpayers, or they may borrow money. However, they must eventually repay this borrowing by raising taxes above what they would otherwise have been in future. The choice is therefore between "tax now" and "tax later". Suppose that the government finances some extra spending through debt - i.e. tax later, Ricardo argued that although taxpayers would have more money now, they would realize that they would have to pay higher tax in future and therefore save the extra money in order to pay the future tax. The extra saving by consumers would exactly offset the extra spending by government, so overall demand would remain unchanged.

He argues that an increase in public debt due to an increase in government spending, must be paid for either now or later, with total present value of receipts fixed by the total present value of spending. Thus, a cut in today's taxes must be matched by an increase in future taxes, leaving real interest rates, and thus private investment, and the current account balance, exchange rate and domestic production unchanged. Therefore, debt does not crowd-in nor crowd out macroeconomic variables. This in his view, no positive or negative relationship exists.

In all, there exists a consensus in the literature that an adequate and effective macroeconomic policy is critical to any successful development process aimed at achieving high employment, sustainable economic growth, price stability, long - viability of the balance of payments and external equilibrium. Because of the fact that the development of world economy particularly in the developing part, is an on-going process, majority of governments world over often engage in massive investment activities (public debt) which they believe will not only enhance the development of the domestic economy but also situate the economy on the path of sustainable growth and sub-Saharan Africa is not an exception. This is because, increase in public expenditure if

efficiently utilized could translate into improved infrastructural developments and consequently enhance general welfare and also put the economy on the path of growth.

The bone of contention, however, on the use of this type of fiscal policy (i.e. expansionary fiscal policy) is how the proposed increase in public expenditure over its revenue should be financed. The two contending options have been money printing and borrowing. Money printing is an exclusive right of relevant monetary authority (usually the Central Bank) which involves raising money supply to match demand in the economy. However, where the rate of increase in money supply (usually called Seignorage rate) rises above the rate of growth of economic activity, and given a stable demand function for base money, inflation will result (Ndung'u, 1995). Furthermore, Easterly and Fischer (1990) argue that where governments print money to cover budget deficits, it is unlikely that rapid money supply growth takes place without fiscal imbalances.

The second contending option of deficit financing is borrowing. The use of borrowing (from both domestic economy and foreign countries) particularly since the World War II has been an inevitable and veritable source of macroeconomic financing most especially in such situations where domestic resources are inadequate to put the economy on the path of sustainable economic growth and development. However, borrowing which may result in debt crisis may lead to high real interest rates in the domestic economy and crowd out private sector investments (Easterly & Schmidt, 1990, 1993; Ndung'u, 1995).

2.2.2. Theories of Economic Growth

There have been divergent views expressed on the sources of economic growth over time. As a result, several theories have been postulated to explain the concept of economic growth. Studies draw several theoretical frameworks and examine factors that are taken from several sources. This section discusses some of the theories including the classical growth theory, Keynesian growth theory and neoclassical growth theory.

2.2.2.1 Keynesian Theory

Keynesianism economic theories were developed primarily in the 1930s by Keynes, during the Great Depression. Keynesianism overturned the older ideas of neoclassical economics and were widely adopted by leading Western economies after the Second World War. His theory propose that governments are obligated to use monetary policy, (meaning money supply) and fiscal policy, (meaning government spending) to alter the economy from how it would otherwise behave. He strongly supported government borrowing as a way to solve unemployment and provided the theoretical basis under which sovereign debt has grown to its current levels.

Keynes contended that a general glut would occur when aggregate demand for goods was insufficient, leading to an economic downturn with unnecessarily high unemployment and losses of potential output. In such a situation, government policies could be used to increase aggregate demand, thus increasing economic activity and reducing unemployment and deflation. Keynes argued that the solution to the economic recession was to stimulate the economy ("inducement to invest") through some combination of two approaches: A reduction in interest rates and increased government investment in infrastructure. Furthermore, Blinder (2002) claimed that investment by government to inject money, which results in more spending in the general economy, which in turn stimulates more production and investment, will still involve more income and spending and so forth. The initial stimulation starts a cascade of events, whose total increase in economic activity is a multiple of the original investment.

The Keynesian school advocates that the free market is volatile and does not produce the greatest 'general good' possible. Governments ought to and are able to manipulate economic factors to provide a less volatile economy and make everyone better off than they would have been without the intervention. There is an underlying assumption here

that an objective state of highest “general good” exists as a singular truth and that individuals in government are able to consistently identify that state and alter conditions to move towards this Truth. While Keynesianism often gets the lion’s share of the blame for the recent global financial meltdown, governments world-wide have relied heavily on it to justify their responses to the crisis.

Keynesianism recommends counter-cyclical policies to smooth out fluctuations in the business cycle. An example of a counter - cyclical policy is raising taxes to cool the economy and to prevent inflation when there is abundant demand-side growth, and engaging in borrowing on labour-intensive infrastructure projects to stimulate employment and stabilize wages during economic downturns. On the other hand, they argued that one should cut taxes when there are budget surpluses, and cut spending - or, less likely, increase taxes - during economic downturns.

Keynesian economists believe that adding to profits and incomes during boom cycles through tax cuts, and removing income and profits from the economy through cuts in spending and/or increased taxes during downturns, tends to exacerbate the negative effects of the business cycle. This effect is especially pronounced when the government controls a large fraction of the economy, and is therefore one reason fiscal conservatives advocate a much smaller government.

2.2.2.2. Neoclassical Growth Theory

The Neo-Classical theory of growth is a build-up of the classical growth theory used before Keynes and his followers. The basic neoclassical growth model was developed by Solow-Swan (1956). The model suggested that the key variable in growth is labor productivity: output per worker, i.e how much an average worker in the economy is able to produce. This model assumes that output (Y) is produced using technology (A),

physical capital (K), and labor (L). This relationship can be written as follows: $Y = f(A, K, L)$. According to this model, the role of technological change became crucial, even more important than the accumulation of capital.

From the equation, Y is aggregate output, A is a number based on the current state of technology, K is a quantitative measure of the size of the stock of manufactured capital, and L the quantity of labor used during that period of time. K, A and L are the only factors of production explicitly included in the model. An increase in growth output results from increases in production factors (physical capital and labor) and productivity, which rises as a result of technological change, including changes in organization and practices.

According to Ntshakala (2015), the model has three important predictions: First, increasing capital relative to labour creates economic growth, since people can be more productive given more capital. Second, poor countries with less capital per person will grow faster because each investment in capital will produce a higher return than rich countries with ample capital. Third, because of diminishing returns to capital, economies will eventually reach a point at which any increase in capital will no longer create economic growth. This point is called “steady state”. An increase in government expenditure means that there has been an increase in government acquisition of goods and services for current or future use.

However, the increase is justified if it emanated from an improvement in health services and education, as they are believed to be the most important investments in human capital. This study will tend to adopt this theory. Considering the fact that if public debt is borrowed for financing education, health and development investments, it is considered to be productive and expected to positively contribute to economic growth through

improved capital, labour and technology. This will result to an increase in government spending.

2.2.2.3. Rostow's Five Stages of Growth Theory

Rostow (1960) in his work "The Stages of Economic Growth" postulates that for any country to move from being a less developed to a developed economy it needs to pass through a sequence of events, or stages. These stages are: the traditional society stage, transitional Stage (The preconditions for take-off), the take-off stage, the drive to maturity and the high mass consumption stage. There exists a proportionate association between such investment and economic growth and development. Rostow deduced that the necessary condition for takeoff is that investment increases from 5% to 10% of profits which means that if a developing country does not have enough domestic resources for investment it must fill the gap with public debt.

2.2.2.4. Balanced Growth Theory

The theory propounded by Ragnar Nurkse (1907-1959), states that there should be a simultaneous and harmonious development of different sectors of the economy so that all sectors grow together. However, for this to be achieved, a balance is required between the demand and supply sides. The supply side has to do with the simultaneous development of all inter-related sectors which help in increasing the supply of goods which comprises of issues such as investment in power, agriculture, irrigation, transport while the demand side concerns the provision of employment opportunities and increasing incomes so that the demand for goods and services may rise on the part of the consumers. The balanced growth theory has a similar focus with the Solow's model of long run growth but it is instructive to say that they cannot be simply substituted for one another (Obademi, 2012). The interest in the Solow's theory of long run growth is the savings component

2.2.2.5. The Harrod-Domar Growth Model

The Harrod-Domar Growth Model also known as Dual Gap model, advocates that more investment leads to more growth. According to Harrod (1939, 1948) and Domar (1946), the capitalist system is inherently unstable by using the production function. However, they explained how the aggregate supply expanded, which means the investment has two effects, one on the aggregate demand side such as business expands more, and the other on the aggregate supply side whereby more investment increases capital stock and produces more business. Most fundamental strategy of economic growth is simply to increase the proportion of national income saved, which will raise savings and then increase at the rate of GDP (Masoud, 2014).

Harrod-Domar growth model has been used by development economists to estimate the financing gap of a developing economy. They claimed that, with abundant supply of labour, scarcity of capital becomes the only constraint to production (Effendi, 2001).

2.2.3. Public Debt and Economic Growth

Most theoretical literature that analyzes the relationship between public debt and economic growth, tends to defend that, in the short run, and particularly at moderate levels of government debt, there are Keynesian effects, meaning that public expenditure clearly contributes to economic growth (supported, among others, by Elmendorf & Mankiw, 1999). According to the theory of debt, public debt kept within reasonable limits can help countries to consolidate their growth. Indeed, when these countries use the borrowed funds to finance productive investment, growth is expected to accelerate and allow them to repay the debts at maturity. However, in the long run and in the presence of high levels of government debt, non-Keynesian effects will take place. There are fears that the payment of these high debts will imply future increases in taxes, contributing to a reduction in private consumption and investment expenses and consequently slowing

down economic growth, as supported by the neoclassical view (e.g. Modigliani, 1961; Diamond, 1965; Saint-Paul, 1992; Aizenman, et al., 2007).

There is also another theoretical explanation, known as the Ricardian equivalence, which, in contrast with the two previous views, defends that public indebtedness does not affect economic growth. According to the Ricardian equivalence proposition (see, among others, Barro, 1989; Galí, et al, 2007), an increase in public expenses may accelerate economic growth in one period. However, afterwards, economic agents will react and in the presence of tax rises and other austerity measures, they will decrease their consumption and investment expenses, slowing down economic growth and compensating for the effect of the public expenses increase on economic growth (Ferreira, 2014).

Public debt can be classified as the sum of external debt and domestic debt. As far as the relationship between public debt and economic growth is concerned, a reasonable level of borrowing is likely to enhance economic growth, through capital accumulation and productivity growth (Chowdhury, 2001). This is so because at early stages of development, countries have small stocks of capital and they have limited investment opportunities. External borrowing for productive investment creates macroeconomic stability (Burnside, 2000).

However, high level of accumulated debt has an adverse effect on rate of investment and economic growth. Most broad rationalization of the adverse effect of debt is “debt overhang” effect. If there is some likelihood that in future, debt will be larger than the country’s repayment ability, then anticipated debt-service costs will depress further domestic and foreign investment (Krugman, 1988; Sachs, 1990; Karagol, 2002). The other channel through which debt obligations affect economic growth is known as

“crowding out” effect. If a greater portion of foreign capital is used to service a country’s debt, very little will be available for investment and growth. Debt-servicing cost of public debt can crowd out public investment expenditure, by reducing total investment directly and complementary private expenditures indirectly (Karagol, 2002).

However, various authors (Pattillo, 2002, 2004) are unable to find evidence of a significant crowding out effect, while others (i.e. Chowdhury, 2004, Clements, 2003, Elbadawi, 1997) finds that both debt burden and debt service obligations have reduced the investment and economic performance.

A recent World Bank study by Gill and Pinto (2005), identified three reasons why public debt might be better than taxation, which were categorized into three: (i) tilting; (ii) smoothing; and (iii) stability. Under the first, it would be more equitable if a country can finance projects of long gestation nature through debt, as such projects benefit future (richer) generations than through taxing the current (poorer) generation. The second reason is raising and lowering taxes frequently might entail efficiency losses and generate economic uncertainty and hence, debt allows a more efficient manner for conducting counter-cyclical policies and for meeting emergency spending needs.

The third reason is debt ensures stability, since it avoids reliance on printing money. The latter involves high and volatile inflation, obscuring information content of relative prices and thereby hurting investment. However, as Gill and Pinto (2005) remind us, debt is nothing but postponed taxation, since it has to be re-paid; and returns from every infrastructure project funded by debt, regardless whether it is physical or social infrastructure, have to include not only the user fees but also higher future taxes.

2.2.4. Domestic Debt and Economic Growth

The traditional view considers that in the long run, domestic debt has a negative impact on economic growth while the Ricardian equivalence hypothesis implies the neutrality of domestic debt to growth. Generally domestic debt has been incurred mainly on the consideration that it shall be used for investment purposes. The issue is empirically examined using the Co-integration test and the Granger causality test for India over the period 1959-95. Co-integration and the Granger causality tests support the Ricardian equivalence hypothesis between domestic debt and growth (Singh, 1999).

Abbas and Christensen (2007) explored the role of domestic debt markets in economic growth. Their study covered 93 countries over the 1975 to 2004 period and revealed that domestic debt markets play an increasingly important role in supporting economic development in developing countries. The most prominent concern about domestic debt is the crowding out effect on private investment. When governments borrow domestically, they use up domestic private savings that would otherwise have been available for private sector lending. In turn, the smaller residual pool of loanable funds in the market raises the cost of capital for private borrowers, reducing private investment demand, and hence capital accumulation, growth and welfare (Diamond, 1965).

According to Akram (2013), domestic debt has received far less attention as compared to external debt than in developing countries. Yet, in many countries, domestic financing is becoming increasingly vital because foreign donor's willingness to lend has reduced over time. In developing countries, justification behind the creation of domestic debt is that it defends such nation from adverse external shocks and foreign exchange risks and kindles the development of internal financial markets.

Government securities in developing countries have been argued as an attempt by banks to guard against high private sector credit risk. Furthermore, banks holding high-yielding government domestic debt makes them self-satisfied about costs, decrease their efforts to mobilize deposits and fund private sector projects (Barajas & Salazar, 1999; Barajas, Steiner & Salazar, 2000; Kumhof & Tanner, 2005; Hauner, 2006; Aizenmann et al, 2004).

Bildiric and Ersin (2007) in their study on relationship between inflation rate, interest rate and domestic debt for developing nations concluded that an increase in domestic debt drives both inflation and interest rates upwards. The World Bank (2001) concluded that extensive domestic borrowing by most African countries led to massive crowding-out effect, where most investors opted to invest in government securities as a result of their lucrative rates as opposed to other forms of investment. Internal financing, nevertheless, entails problems of its own. For instance, financing that is done through the central bank by printing more money is inflationary in nature, however, would likely promote financial repression. Using the commercial banks to finance the domestic deficit tends to create other distortions in economy.

However, according to Beugrand, Loko and Mlachila (2002), domestic debt is more expensive in comparison with external debt. Moreover, due to high yields on public domestic debt, banks become self-satisfied about costs and consequently, decrease efforts to mobilize deposits and finance private sector projects.

2.2.4.1. Domestic Debt Service and Economic Growth

Domestic debt servicing (the payment of interest and repayment of principal) absorbs a major part of government revenues which would have been used in developmental projects to boost economic growth, thereby showing that government has fewer resources

to spend on development projects. In this way, internal debt servicing is more harmful for the economic growth than the stock of internal debt because of the shrinking resources to finance development projects (Abbas & Christensen, 2007). Moreover, in shallow financial markets, as the domestic debt increases, the interest cost also rises due to holding a large amount of debt in short term instruments.

Unlike external debt servicing, the terms are often more favorable than for domestic borrowing, as domestic debt instruments carry much higher interest rates and have shorter maturities. Extensive use of domestic borrowing can have severe repercussions on the economy. However, domestic debt service can consume a significant part of government revenues, especially given that domestic interest rates are higher than foreign ones.

2.2.5. External Debt and Economic Growth

The external debt was always considered as a natural consequence of economic activities. It comes from the fact that some countries or institutions have financial surpluses and others have financing needs. The use of external debt allows a country to invest excess capital of its own financial resources by borrowing capital surpluses (Klein, 1994). Theoretically, debt created is supposed to generate growth and promote economic development. However, the debt crisis of the 1980's has challenged the assumption that the use of international borrowing allows to increase investment and promote development.

For developed countries, the current recession prevailing in these countries since the outbreak of the European debt crisis, led to believe that there is a negative relationship between the size of debt and economic growth. This correlation has been confirmed by several studies which were adequately described by Reinhart and Rogoff (2010). These

authors have addressed this issue over long period data concerning growth, inflation and debt of 20 industrialized countries and 24 developing countries. Both for developed countries and for emerging economies, they have shown that with a debt ratio above 90% of GDP, the relationship between public debt and economic growth is weak, but beyond this limits the growth is largely weakened. For developing countries, their study showed a fall of two points of the rate economic growth when the ratio of public debt exceeds 60% of GDP. However, economic growth becomes negative when this ratio exceeds 90% of GDP.

In this context, several theoretical arguments (Krugman, 1988; Sachs, 1989; Pattillo, *et al.*, 2002, Clements, *et al.*, 2003) showed that an increase in the ratio of public debt could lead to a reduction in growth due to crowding-out effect on private investment and the relative inefficiency of the state in the use of economic resources. Other arguments are often raised and especially fixed on the problem of fiscal sustainability caused by external debt which could lead the government to put in default or require a costly "inflation tax" leading to a slowdown in economic growth.

Past researches mainly focus on external debt for two basic reasons. First, external borrowings increase a country's access to resources while domestic borrowing only transfers resources within the country. In other words, domestic borrowing only changes hands of money holders while money remains same. So, only external debt generates a "transfer" problem (Keynes, 1929). Second, since central banks in developing countries cannot print the hard currency necessary to repay external debt, external borrowing is usually associated with vulnerabilities that may lead to debt crises. External debt plays both a positive and negative role in shaping economic growth, particularly of the developing countries. External debt has positive effect when it is utilized by the Government for investment oriented projects like power generation and supply,

infrastructure, education, health, production and agriculture sectors. On the other hand, it would affect negatively when it is used for private and public consumption purposes, which do not bring any return. Additionally, a low level of external debt affects economic growth positively, but this relationship becomes negative at a higher level.

Further, when distinguishing between public external debt and private external debt, results support a negative relationship between public external debt and growth, but no significant relationship when only considering private external debt. So the negative relationship between total external debt and economic growth is driven by the incidence of public external debt levels, and not by private external debt levels. For industrialized countries, results did not support any significant relationship between gross public debt and economic growth (Schclarek, 2004).

Islam (1992) examines the relationship between foreign aid and economic growth for the case of Bangladesh using time series data covering the period 1972–1988. His findings suggest a weak positive link of debt on growth, while in general the domestic resources appear to exert stronger impact than the foreign resources. In a similar context, Mbaku (1993) tries to investigate the relationship between foreign debt and growth in Cameroon and the results obtained agree with the Islam (1992) findings.

2.2.5.1. External Debt Service and Economic Growth

Theory holds that both stock of external debt and its service (the payment of interest and repayment of principal) affect growth by discouraging private investment or altering the composition of public spending (Babu, *et al*, 2014). Higher external interest payments can increase a country's budget, thereby reducing public savings if private savings do not increase to offset the difference. This may either drive up interest rates or crowd out the credit available for private investment, depressing economic growth. Debt service may

discourage growth by squeezing the public resources available for investment in infrastructure and human capital (Clements, *et al*, 2005).

Increase in the outstanding stock of total public debt have implications for the economy as it forced the government to adjust its expenditure and direct additional resources towards the repayment of debt and associated interest payments. Total public debt servicing below 30 percent of government revenue are generally believed to be within the bounds of sustainability. The government is required to make concentrated efforts to increase the revenues and rationalize current expenditure to reduce the debt burden and improve the debt carrying capacity of the country to finance the growth and development needs.

According to the “debt overhang” hypothesis, there is some likelihood that in the future debt will be larger than the country’s repayment ability; expected debt service cost will discourage further domestic and foreign investment. Potential investors will fear that the more there is production, the more they will be “taxed” by creditors to service the external debt, and thus they will be less willing to incur investment costs today for the sake of increased output in the future (Krugman, 1988; Corden, 1988; Sachs, 1989; and Pattillo, *et al*, 2002).

Thus, the high burden of servicing debt increases future taxes provided on the private sector, which consequently reduces private investment. Resources which are channeled for investment will be offset by the burden of debt service. Moreover, changing the quality of the investment, the debt can damage the economic performance and the uncertainty of repayment of debt service is a challenge to pursue economic reform (Clements, *et al*, 2003). According to Eaton (1993), the critical factors affecting debt service capacity are returns on investment, the cost of borrowing, and the rate of savings.

The benefits of external borrowing have been emphasized in the literature to the neglect of the costs.

For instance, if the acquisition of additional foreign debt increases the debt servicing burden more than it increases the country's capacity to bear the burden, such an acquisition becomes undesirable and the situation must be reversed through export expansion. If export is not expanded, more borrowing will be necessitated for servicing debt and external debt will pile up above the country's capacity to bear (Egbetunde, 2012). According to Cohen (1999), the slowdown in investment is explained by the debt service rather than by loans.

2.3. EMPIRICAL LITERATURE

2.3.1. Public Debt and Economic Growth

Public debt and economic growth study is a world issue. This is so because, as no nation is self-sufficient or an island of its own, hence the need to make up for their shortfall. A lot of empirical studies have been carried out on the relationship between public debt and economic growth both in the developed countries and developing countries, with conflicting results. While most of the studies show negative impact of debt on economic growth, some reveal positive impact of debt on economic growth (Kumar & Jaejoon, 2012; Afonso & Jalles, 2013; Baum et al, 2011; Reinhart & Rogoff, 2010a, 2010b; Panizza & Presbitero, 2013; Checherita & Rother, 2010; Obademi, 2012; Lee & Ng, 2015; Pattillo et al, 2004; Schclarek, 2004; Abbas & Christensen, 2007).

2.3.2. Public Debt and Economic Growth in Developed Countries

A large number of empirical papers have been written on developed countries than anywhere else, and most results reveals that the relationship between debt and growth is non-linear and characterized by the presence of a threshold above which debt starts

having a negative effect on economic growth. While non-linearities and threshold effects could arise from the presence of debt overhang (Krugman,1988; Sachs,1989), it is not clear whether a debt overhang argument could be easily applied to advanced economies in which the majority of debt-holders are resident (and therefore there is not an external transfer problem), Panizza and Presbitero (2013).

Reinhart and Rogoff (2010) empirically examine a threshold effect by collecting annual data on debt and output growth for 20 advanced economies over 1946-2009 and splitting their sample into four groups: (i) country-years for which public debt is below 30 percent of GDP (443 observations); (ii) country-years for which public debt is between 30 and 60 percent of GDP (442 observations); (iii) country-years for which public debt is between 60 and 90 percent of GDP (199 observations); and (iv) country-years for which public debt is above 90 percent of GDP (96 observations). Furthermore, they compute median and average GDP growth for each group and show that there are no large differences among the first three groups, but that average and median GDP growth are substantially lower in the fourth group. Overall, their study finds that high levels of debt are negatively correlated with economic growth, but that there is no link between debt and growth when public debt is below 90 percent of GDP.

It is also possible that high levels of debt pose constraints on a country's ability to conduct countercyclical policies, and thus increase output volatility and reduce economic growth. However, the relationship between debt and the ability of conduct countercyclical policies is more likely to depend on the composition of public debt than on the level of public debt (Hausmann & Panizza, 2011; De Grauwe, 2011). This suggests that countries with different debt structures and monetary arrangements are likely to start facing problems at very different levels of debt

Egert (2012) estimates a sample of 20 advanced economies over the period 1946-2009 with a simplified version of an equation, allowing for two (with a threshold at 90 percent), three (with thresholds at 30 and 90 percent), and four (with thresholds at 30, 60, and 90 percent) regimes, finds a negative and statistically significant correlation between debt and growth, but do not find any significant threshold effect. In fact, the results suggest that the negative correlation between debt and growth decreases (in absolute value) when the debt-to-GDP ratio increases.

Checherita and Rother (2010), empirically investigated the impact of high and growing government debt on economic growth for 12 Euro area countries between 1970 and 2011, using panel fixed effect corrected for heteroscedasticity and autocorrelation. The study finds evidence of a non-linear impact on growth with the debt turning point at about 90-100% of GDP beyond which the government debt-to-GDP ratio has a deleterious impact on long term growth. At the same time, there is evidence that annual change of the public debt ratio and the budget deficit-to-GDP ratio are negatively and linearly associated with per-capita GDP growth. However, it was also discovered that the channels through which public debt may have an impact on economic growth are: private savings, public investment, total factor productivity, and sovereign long term nominal and real interest rates. From a policy perspective, the results provide additional arguments for debt reduction to support longer-term economic growth prospects.

Koutellos, Stengos and Tan (2012) examine the effect of public debt on growth in multiple regimes of 82 countries over three non-overlapping 10-year growth episodes. They use the structural threshold regression model to estimate an augmented Solow growth model, to investigate the heterogeneity causalities of public debt on economic growth. In their analysis, they tried investigate other threshold variables besides the debt-to GDP ratio. They correctly point out that the effect of public debt on

economic growth could be influenced by variables such as trade openness or institutional quality and not accounting parameters, otherwise, it will lead to spurious results. However, therefore, their result suggests that there is no statistically significant relationship between debt and growth in advanced countries.

Baum et al (2013) whilst investigating the causality between public debt and economic growth, for twelve Euro area countries between 1990 and 2010, conclude that there is a threshold at the 67% public debt ratio (above 95% there is a negative impact on economic growth) and that interest rates are pressured upwards when debt ratio is greater than 70% of GDP.

Checherita-Westphal and Rother (2012) study twelve Euro area countries from 1970 until 2010, and conclude that the negative effect of government debt on growth starts between 70% and 80%, and private saving, public investment and TFP are the channels where public debt is found to have a non-linear impact on growth. Introducing some political variables, Elgin and Uras (2012) relate the higher informal sector size with a higher probability of sovereign default risk and a country's public indebtedness for 155 countries, using data from 1960 until 2008.

Heylen, et al (2013), when analyzing 132 fiscal episodes for 21 OECD countries over a twenty-eight-year period, reach the conclusion that: consolidation programmes of public debt reduction are more successful when they are followed by product-market deregulation and when they are adopted by left-wing governments. Labour market deregulation could have an effect to the contrary on debt reduction, as well as causing wage bill cuts (this last point is only effective when government efficiency is low).

Mencinger, Aristovnik and Verbic (2014) attempts to empirically explore the transmission mechanism regarding the short-term impact of public debt and growth. The study examines and evaluates the direct effect of higher indebtedness on economic growth. They employ panel estimation on a generalized economic growth model augmented with a debt variable for a panel dataset of 25 sovereign member states of the EU countries which are in the epicentre of the current sovereign debt crisis. They divided the sample of EU countries into subgroups, distinguishing between so-called 'old' member states, covering the period 1980–2010, and 'new' member states, covering the period 1995–2010. The results across all models indicate a statistically significant non-linear impact of public debt ratios on annual GDP per capita growth rates. Further, the calculated debt-to-GDP turning point, where the positive effect of accumulated public debt inverts into a negative effect, is roughly between 80% and 94% for the 'old' member states, and 53% and 54% for the 'new' member states. The study therefore concludes that the threshold value for the 'new' member states is lower than for the 'old' member states.

Panizza and Presbitero (2013) survey public debt and economic growth in 16 OECD countries. From their study, they conclude that the case for a causal effect running from high debt to low growth still needs to be made. Apart from causality issues, the study also shows that the evidence of a common debt threshold above which growth collapses is far from being robust. The researchers were able to employ these variables to achieve the result: debt/GDP ratio, initial GDP PC, national gross savings, population growth, schooling, trade openness, inflation rate, dependency ratio, banking crisis, liquid liabilities/GDP.

Kumar and Woo (2010) investigates the impact of high public debt on long-run economic growth in a group of 38 advanced and emerging market economies over the period 1970-2007. They experiment with different estimations techniques such as pooled OLS, robust

regression, between estimators (BE), fixed effects (FE) panel regression, and system GMM (SGMM) dynamic panel regression and argue that the system GMM estimation allows them to address endogeneity. Their results are consistent with those of Cecchetti, Mohanty & Zampoli (2012). The empirical results suggest an inverse relationship between initial debt and subsequent growth, controlling for other determinants of growth: on average, a 10 percentage point increase in the initial debt-to-GDP ratio is associated with a slowdown in annual real per capita GDP growth of around 0.2 percentage points per year, with the impact being somewhat smaller in advanced economies than in emerging market economies. The result also shows some evidence of nonlinearity with higher levels of initial debt having a proportionately larger negative effect on subsequent growth.

Schlarek (2004) applies the system generalized method of moments (GMM) dynamic panel econometric technique to a data set consisting of a panel of 59 developing countries and 24 industrialized countries with data averaged over each of the seven five-year periods between 1970 and 2002. For developing countries, the author finds that lower total external debt levels are associated with higher growth rates and that this negative relationship is driven by the incidence of public external debt, but not by private external debt. Moreover, the author does not find any support for an inverted U-shaped relationship between external debt and growth. Further, particularly for industrialized countries, he finds no robust linear or nonlinear relationship between gross government debt and economic growth, suggesting that higher public debt levels are not necessarily associated with lower GDP growth rates in developed countries.

Afonso and Jalles (2013) analyze the linkages between growth, public debt and productivity on 155 countries between 1970 and 2008. The authors conclude that there is a negative effect of debt ratio and financial crisis on economic growth. Furthermore,

those higher debt ratios could benefit Total Factor Productivity (TFP) growth. Furthermore, Afonso and Alves (2014) study the effect of public debt on economic growth for annual and 5-year average growth rates, as well as the existence of non-linearity effects of debt on growth of 14 European countries from 1970 until 2012. They use panel data techniques with variables grouped into four areas: 1) monetary variables, namely interest rates; 2) public finance variables; 3) institutional variables; and 4) macroeconomic variables. The main results show that debt has a detrimental effect on growth, although the debt service represents a larger damaging consequence for growth. In addition, the result finds evidence of debt thresholds around 75% and 74% for annual and 5-year average growth rates, respectively.

Gnegne and Jawadi (2013) investigate public debt and its dynamics for the UK and the USA, which proved to be asymmetric and nonlinear, concluding that public debt seems to be based on several threshold effects, which helps to understand its dynamics with more accuracy. Certain, macroeconomic events such as economic slowdowns, debt and financial crisis, as well as oil shocks, have proved to be important factors linked with structural breaks in public debt dynamics.

Though, while there is evidence that public debt is negatively correlated with economic growth, the presence of such a correlation does not necessarily imply that debt reduces growth. The link between public debt and economic growth could be driven by the fact that it is low economic growth that leads to high levels of debt (Reinhart & Rogoff, 2012). Alternatively, the observed correlation between debt and growth could be due to a third factor that has a joint effect on these two variables.

2.3.3. Public Debt and Economic Growth in Asia and Developing Countries

Lee and Ng (2015) examine whether public debt contributes to economic growth in Malaysia over the period 1991 to 2013 using regression and correlation analysis. It also examines whether other indicators of debt burden, such as budget deficit, budget expenditure, and external debt service and government consumption, have an impact on economic growth. The results of these study are consistent with the existing literature that found a negative association between debt and growth. The results indicate that public debt over time has a negative impact on GDP. In addition, it is found that the budget deficit, government consumption and external debt service are a decreasing function of GDP.

Akram (2013) examine the effect of public debt on economic growth and investment for the four countries in South Asia, namely Bangladesh, India, Pakistan and Sri Lanka, for the period 1975-2011. The study used standard panel data estimation techniques with development of a hybrid model that explicitly incorporates the role of public debt in growth equations. The results show that both public external debt and debt servicing negatively affect economic growth and investment, which points to the existence of the “debt overhang effect” and the “crowding out effect”. Similarly, domestic debt also exhibits a negative and significant relationship with economic growth and investment. The results suggest that reliance on debt for development purposes is not a safe option and countries need to extend the efforts to increase the revenue to finance the development expenditure.

Atique and Malik (2012) examine the determinants of economic growth for Pakistan, the impact of domestic debt and external debt on the economic growth of Pakistan separately over period of 1980 -2010. The findings suggested an inverse relationship between domestic debt and economic growth and also the relationship between external debt and

economic growth was found negative. The results also concluded that external debt slows down economic growth more as compared to domestic debt. In other words, the negative effect of external debt is stronger on the economic growth in comparison to domestic debt.

Rais and Anwar (2010) investigate the effect of public debt on economic growth in Pakistan within the period of 1972-2010 using OLS technique. Pakistan relies heavily on both external and domestic capital flows to bridge the financing gap of government. The study finds that Pakistan outstanding public debt exceeded its GDP and per capita income is lower than per citizens' indebtedness. It is also discovered that external financing of domestic budget deficit is cheaper than the domestic financing. Rahman, Bashir and Dey (2012) in their study, found positive significant correlation between Gross Domestic Product (GDP) and external debt. Their study also found a bi-directional causality that runs through GDP to ED and ED to GDP.

Sheikh, Faridi and Tariq (2010) employ empirical models to explain the impact of domestic debt on one hand and domestic debt service on economic growth on the other hand. The study suggest that the resources generated through domestic borrowing have been used partially to finance those expenditures of government which impacts on economic growth, as well as show an inverse relationship between domestic debt servicing and economic growth.

Alshyab (2016) investigate the growth implications of public debt in Jordan, separating the effects of external and domestic components for period 1980-2013. The empirical analysis is based on a neoclassical growth model, relying on a Cobb Douglas function with capital, labor, and public debt as independent factors of production. The model was tested with three different specifications of the variable public debt, namely, total,

domestic, and external debt. The study provides evidence for a negative effect of public debt on economic growth.

2.3.4. Domestic Debt and Economic Growth in Sub Saharan Africa

Abbas and Christensen (2007) use a specific public domestic debt database, covering 93 low- income countries and emerging markets over 1975–2004, and apply Granger causality regressions and panel data methods to test the relationship between debt and economic growth. They conclude that there is bidirectional and statistically significant causality; public domestic debt has a strong positive impact on per capita income and although not as statistically strong, economic growth also has a clear positive impact on public domestic debt.

Onyeiwu (2012) investigates the relationship between domestic debt and economic growth in Nigeria using Least Square Method (OLS), Error Correction and Parsimonious models to analyze quarterly data between 1994 and 2008. The result reveals that domestic debt holding of government is far above a healthy threshold of 35 percent of bank deposit as the average over the period of study is 114.98 percent of bank deposit presenting evidence of crowding out of private investments. The study also affirms that the level of debt has negative effect on economic growth.

Maana, Owino and Mutai (2008) examine the impact of domestic debt in the Kenyan economy using Barro growth regression model. For the period of study, the result indicates that although, the composition of Kenya's public debt has shifted in favour of domestic debt, domestic debt expansion had a positive but not significant effect on economic growth. More so, it is found that the Barro model needs a more sophisticated data set that may not be available in developing country, like Kenya.

Adofu and Abula (2010) examine the empirical relationship between domestic debt and economic growth in Nigeria using OLS regression techniques and the time series data from 1986-2005. The result indicate that domestic debt affected growth of the economy negatively. Singh (1999) evaluated the relationship between domestic debt and economic growth in India applying Co-integration technique and Granger causality test for the period 1959-1995. The result shows that the domestic and economic growth are not co-integrated. However, the study supports the Ricardian equivalence hypothesis between domestic debt and economic growth.

Putunoi and Mutuku (2013) investigates the effects of domestic debt on economic growth in Kenya, using advance econometric technique and quarterly times series data spanning 2000-2010. The long run relationship between the variables was investigated using the Engel-Granger residual based and Johannes VAR based co-integration test. The test found evidence of co-integration, hence, error correction model was used to capture the short-run dynamics. The study shows that domestic debt expansion in Kenyan for the period of study has a positive and significant effect on economic growth.

2.3.5. External Debt and Economic Growth in Sub Saharan Africa

The impact of external debt on economic growth as well as the relationship between debt and growth and what causes what has been the subject of several econometric researches and most of the results broadly confirm the theory of indebtedness, showing a negative impact of external debt on growth (Oks & VanWijnbergen, 1995; Agenor & Montiel, 1999; Hansen, 2001; Dijkstra & Hermes, 2001; Clements et al., 2003; Idlemouden & Raffinot, 2005; Zouhaier & Fatma, 2014; Azam, et al, 2013).

Most of these studies were motivated by the “debt overhang” hypothesis—a situation where a country’s debt service burden is so heavy that a large portion of output accrues to

foreign lenders and consequently creates disincentives to invest (Krugman, 1988; Sachs, 1989). From this point of view, it is necessary to reduce the external debt of developing countries (Deshpande, 1997); Patillo et al, 2002; Clements et al., 2003; Cordella, et al, 2005; Sen, et al, 2007). The effectiveness of the reduction was often reversed empirically, especially when it was measured by its direct effects on growth and the low-income countries (Arslanalp & Henry, 2004, 2005, and 2006; Depetris & Kraay, 2005; Presbitero; 2008; Johansson, 2010).

Imbs and Ranciere (2009) and Pattillo, Poirson and Ricci (2002, 2004) find a nonlinear effect of external debt on growth: that is, a negative and significant impact on growth at high debt levels (typically, over 60 percent of GDP), but an insignificant impact at low debt levels. In contrast, Cordella, Ricci and Arranz (2005) find evidence of debt overhang for intermediate debt levels, but an insignificant debt-growth relationship at very low and very high levels of debt.

Lopes da Veiga, Ferreira-Lopes and Sequeira (2014) analyse the implications of public debt on economic growth and inflation in a group of 52 African economies between 1950 and 2012. The results indicate that the limits of public debt affect economic growth and exhibit negatively, from a given level of debt, an inverted U behaviour regarding the relationship between economic growth and public debt. The highest average rates of real and per capita growth are achieved when public debt reaches 60% of the real GDP and an average inflation rate of 8.2%.

Clements et al. (2003) find support for a non-linear relationship between external debt and economic growth using a panel dataset of 55 low-income countries over the time period 1970–1999. The authors estimated that the critical threshold turning point in the net present value of external debt is in the range of 20%–30% of GDP (considering the

nominal value of external debt, the critical value is higher at around 50%). The conclusion is associated with the debt-overhang hypothesis defined by Krugman (1988), where after exceeding a certain level of a threshold value, debt has adverse effects on growth due to growing uncertainty to meet a country's debt servicing obligations. Altogether, this consequently has deleterious effects on investment incentives which, together with lowering the solvency of a country's repayment ability, reduces potential growth (Imbs & Ranciere, 2004).

Similarly, Pattillo, Poirson and Ricci (2002) confirmed a non-linear, Laffer-type relationship between the level of external debt and economic growth using a large panel dataset of 93 developing countries over the period 1969–1998. The findings suggest that the key channel through which excessive external indebtedness depresses growth is via the reduced effectiveness of investments rather than the level of investment. This is consistent with other empirical studies showing that total factor productivity explains most variations in output (Checherita & Rother, 2010; Clements et al. 2003). In addition, Pattillo, Poirson and Ricci (2004) estimated that the critical value when external debt has a deleterious effect on growth is between 35–40% of GDP for the considered panel of developing countries.

Ogunmuyiwa (2011) examines how the external public debt leverages the growth in developing countries, particularly in Nigeria, using a time series from 1970 to 2007 and various econometric methods, namely the Augmented Dickey Fuller test (ADF), the Granger Causality Test, and Johansen Co-integration, among others. The results show that the causality between external debt and economic growth in Nigeria is imperceptible. However, Sulaiman and Azeez, (2012) findings from the error correction model shows that external debt has contributed positively to the Nigerian economy during 1970-2010.

Ezike and Mojekwu (2011) found that debt reduction would enhance macro-economic performance in the Nigerian economy. Sichula (2012) found significant relationship does exist between external debt and GDP during 1970-2011 by using Granger causality test. As external debt stock decreases it shows an increase in GDP growth in the HIPCs of the Southern African Development Community.

Amoateng and Amoako (1996) investigated the relationship between external debt and growth for 35 African countries using Granger causality test. The results show that there is a unidirectional and positive causal relationship between debt service and economic growth. Chowdhury (1994) tried to resolve the Bullock and Rogoff's (1990) proposition by finding the cause and effect relationship between external debt and economic slowdown in 7 Asian countries for the period 1970-1988. The results of the Granger causality tests show that the Bullock and Rogoff (1990) propositions, that external debt of developing countries are a symptom rather than a cause of economic slowdown was rejected. The results confirm a feedback or bi-directional relationship between debt and growth for Malaysia and Philippines.

Cordella, et al (2005) investigated the relationship between debt and economic growth using ordinary least squares (OLS) method in a panel of 79 developing countries and a time series of 1970-2002. The study concludes that there is a marginal negative relationship between debt and growth at intermediate levels of debt, which does not happen at the lower levels. It also shows that countries with good governance and strong institutions face debt-overhang when debt rises above 15-30 percent of the GDP, but the marginal effect of debt on growth becomes irrelevant above 70-80 percent. In countries with inadequate policies and poor institutions, debt-overhang and the limits of irrelevance seem to be lower.

Ayadi and Ayadi (2008), made a comparative study of the impact of external debt on economic growth of Nigerian and South African economies. The Neoclassical growth model which incorporates external debt, debt indicators and some macroeconomic variables was employed and analysed using both Ordinary Least Square (OLS) and Generalized Least Square (GLS) techniques of estimation. Their findings revealed that debt and its servicing requirement has a negative impact on the economic growth of Nigeria and South Africa.

Umaru, Hamidu and Musa (2013) investigates impact of external debt, and domestic debt on economic growth in Nigeria between 1970-2010 through the application of Ordinary least square method to establish a simple relationship between the variables under study, Augmented Dickey-Fuller technique in testing the unit root property of the series and Granger causality test of causation between GDP, external debt and domestic debt. The results of unit root suggest that all the variables in the model are stationary and the results of Causality suggest that there is a bi-directional causation between external debt and GDP while no causation existed between domestic debt and GDP as well no causation existed between external debt and domestic debt. The result show that external debt brought a negative effect while domestic debt impacted positively on economic growth of Nigeria (Obademi, 2012).

Kasidi and Said (2013) showed that there is no long run relationship between the external debt and economic growth of Tanzania for the period of 1990-2010 by utilizing co-integration analysis. The study suggested there is a need for further research to identify the impact of external debt on foreign direct investment and on domestic revenues.

2.3.6. Debt Service and Economic Growth in Sub Saharan Africa

Chowdhury (2004), Clements, et al. (2003) and Elbadawi, et al (1997) have found that both debt service obligations and debt burden have negative implications on economic growth and investment and according to Cohen (1993) and Hansen (2002), investment and growth are negatively affected by only debt servicing.

Karagol (2002) investigated both the short-run and long-run relationship between economic growth and external debt service for Turkey during 1956-1996. The study employed a standard production function model analyzed using multivariate co-integration techniques. The Vector Auto regression estimates showed that there exists one co-integration equation. It also reveals that debt service is negatively related to economic growth in the long-run. The causality test showed unidirectional causality between debt service and economic growth.

Makau (2015), empirically examines the relationship between Kenya's external indebtedness, debt service and economic growth between 1970 and 2003. The study employed the OLS estimation method, co-integration and error correction model (ECM) applying the following variables; GDP growth rate, savings, external debts, total debt service, interest rate, growth in labour force. The study found that there is a negative relationship between the GDP growth rate and external debt servicing; Savings to GDP ratio had a positive effect on GDP growth rate and there was a negative effect of external debt on the GDP growth rate.

2.3.7 Summary of Literature

Table 2.4: Webometric Analysis of Empirical Studies on Public Debt and Economic Growth

S/N	Author(s)/ Year of Study	Topic/Objective	Scope	Variables used	Method	Findings
Public Debt and Economic Growth in Developed/Advanced Economies						
1	Checheritta, C. & Rother, P. (2010).	The Impact of High and Growing Government Debt on Economic Growth: An Empirical Investigation for Euro Area	12 Euro Area countries, period of 1970-2011	Private savings, public investment, total factor productivity, sovereign long term nominal and real interest rates	Panel fixed effect corrected for heteroscedasticity and autocorrelation	Evidence of a non-linear impact on growth with the debt turning point at about 90-100% of GDP beyond which the government debt-to-GDP ratio has a deleterious impact on long term growth.
2.	Panizza, U. & Presbitero, A.F. (2013).	Public Debt and Economic Growth in Advanced Economies: A Survey	16 OECD countries; 1982-2008	Debt/GDP ratio, initial GDP, national gross savings, population growth, schooling, trade openness, inflation rate, dependency ratio, banking crisis, liquid liabilities/GDP.	System GMM estimator and standard OLS regression	Theoretical models yield ambiguous results. Presence of thresholds and, more in general, of a non-monotone relationship between debt and growth is not robust to small changes in data coverage.
3.	Afonso, A. & Alves, J. (2014).	The Role of Government Debt in Economic Growth	14 European Countries; 1970-2012	Real GDP per capita and Real GDP growth rate, Urbanization rate, Credit, Inflation, Trade Openness, Debt, Short term interest, Cyclical adjusted primary balance, total government expenditure, total budget balance, total debt service, gap	Panel Data techniques	Results show a negative impact of -0.01% for each 1% increment of public debt; Debt service has a 10 times worse effect on growth.

				btw actual and potential GDP at mkt prices, etc.		
4.	Kumar, M.S. & Woo, J. (2010).	Impact of High public debt on long-run economic growth	A Panel of 38 Advanced and Emerging economies; 1970-2007	GDP per capita, human capital, trade openness, financial market debt, inflation, terms of trade, banking crisis, budget deficit.	Cross-country OLS regression	Inverse relationship between initial debt and subsequent growth; controlling for other determinants of growth: on average, a 10 percentage point increase in the initial debt-to-GDP ratio is associated with a slowdown in annual real per capita GDP growth of around 0.2 percentage points per year, with the impact being somewhat smaller in advanced economies
5.	Mencinger, J., Aristovnik, A. & Verbic, M. (2014).	Impact of growing public debt on economic growth in the European Union	25 Sovereign member states of EU; Period of 1980-2010 for Old members and 1995-2010 for Old members	GDP, Central government debt, openness, government structural balance, real exchange rate, inflation, population growth, government total expenditures	A panel estimation on a generalized economic growth model augmented with a debt variable	The results across all models indicate a statistically significant non-linear impact of public debt ratios on annual GDP per capita growth rates. The threshold value for the 'new' member states is lower than for the 'old' member states
6.	Heylen, F., Horbeeck, A. & Buyse, T. (2013).	Government Efficiency, Institutions, and the Effects of Fiscal Consolidation on Public Debt	21 OECD Countries, Period of 1981-2008	Government debt, public investment, government wage bill, fiscal balances	A Panel regression	Consolidation programs imply a stronger reduction of the public debt ratio when they rely mainly on spending cuts, except public investment; consolidation program will be more effective in bringing down debt when it is adopted by a more efficient government apparatus.
7.	Cecchetti, S.G., Mohanty, M.S. & Zampoli, F. (2012).	The Real Effects of Debt	18 OECD Countries, Period of 1980-2010	Gross saving, population growth, human capital, dependency ratio, openness to trade, CPI inflation, financial	The neoclassical growth model of Solow and Panel data regressions with country-specific fixed effects	Results support the view that, beyond a certain level, debt is a drag on growth. The longer-term lesson is that, to build the fiscal buffer required to address extraordinary events, governments should keep debt well below the

				development, banking crises.		estimated thresholds
8.	Elgin, C. & Uras, B.R. (2012).	Public Debt, Sovereign Default Risk and Shadow Economy	152 Countries across all continents; between 1999-2007	Public debt, interest rate, GDP per capita, trade openness, informal sector size, current account deficit, inflation, growth.	Cross-country Panel regressions.	Result show that after controlling for previously highlighted variables in the literature that could explain the variation in financial instability, sovereign default risk and public indebtedness, the size of informality remains as a significant determinant of these variables.
9.	Baum, A., Checherita-Westphal, C. & Rother, P. (2013).	Debt and Growth: New Evidence For The Euro Area	12 Euro Area Countries for the period 1990-2010	Real GDP growth rate, gross fixed capital formation, trade openness, GDP per capita, population growth, secondary education, budget balance, interest rates	A Dynamic Threshold Panel Methodology	Short-run impact of debt on GDP growth is positive and highly statistically significant, but decreases to around zero and loses significance beyond public debt-to-GDP ratios of around 67%.
10	Kourtellos, A., Stengos, T. & Tan, C.M. (2012).	The Effect of Public Debt on Growth in Multiple Regimes	Panel dataset covering 82 countries across the globe between 1980-2009	Public debt, three other policy variables, two measures of institutions, two geographic variables, two demographic variables	Structural threshold regression methodology	Strong evidence for threshold effects based on democracy, which implies that higher public debt results in lower growth for countries in the Low-Democracy regime.
11	Egert, B. (2012).	Public debt, economic growth and nonlinear effects: Myth or reality?	Group of advanced and emerging market economies between 1790-2009	Reinhart and Rogoff (2010) variables	Pooled panel regression with country fixed effects	Findings show that when non-linearity is detected, the negative nonlinear effect kicks in at much lower levels of public debt (between 20% and 60% of GDP). These results, based on bivariate regressions on secular time series, are largely confirmed on a shorter dataset (1960-2010) when using a multivariate growth framework

						that accounts for traditional drivers of long-term economic growth and model uncertainty
12	Afonso, A. & Jalles, J.T. (2013).	Fiscal Composition and Long-term Growth	A panel of 155 developed and developing countries for the period 1970-2008	GDP per capita, budget balance, central government debt, total government revenue and expenditure, human capital, population, real interest rate, real effective exchange rate, terms of trade	Cross-country panel regression	The results show that revenues have no significant impact on growth whereas expenditures have negative effects
13.	Hausmann, R. & Panizza, U. (2011).	Redemption or Abstinence? Original Sin, Currency Mismatches and Counter Cyclical Policies in the New Millennium.	A sample of 65 countries (developing) trading in the international debt securities market, between 1993-2008	Currencies, bonds.	Cross-country panel regression.	Domestic bond market is still not a venue through which to borrow from foreigners in local currency. If a country faced the need to borrow abroad, it would still need to do so mostly in foreign currency, and hence still suffers from original sin.
14.	Casni, A.C., Badurina, A.A. & Certic, M.B. (2014).	Public debt and growth: evidence from Central, Eastern and Southeastern European countries	14 European countries in the period between 2000 and 2011	GDP growth rate, government gross debt, trade openness, total investment, industry value added.	Pooled mean group estimator (PMG)	Empirical results, in the long-run debt significantly influences the GDP growth having a negative sign as expected and pointing out that government gross debt lowers the GDP growth. In the short run, debt has statistically significant negative influence on the GDP growth as well, controlling for other determinants of growth.
15.	Ferreira, C. (2014).	Debt and economic growth in the European Union: what causes what?	28 European Union countries; 2001-2012	Real GDP growth rate, different categories of debt	Panel Granger causality estimations	Non-statistically significant causality between foreign debt and economic growth and the limited importance of the causality between private debt and real GDP growth.
Public Debt and Economic Growth in Asia and Emerging Economies						
16	Lee, S-P. & Ng, Y-L. (2015).	Public debt and economic growth in Malaysia	Malaysia; 1991-2013.	GDP per capita, public debt, budget deficit, budget	Correlation, regression analysis and descriptive	The result show negative association between debt and growth. It is also discovered that public debt over time

				expenditure, government consumption, external debt service	statistics	has a negative impact on GDP.
17	Rais, S.I. & Anwar, T. (2012).	Public debt and economic growth in Pakistan; A time series analysis	Pakistan; 1972-2010	Domestic debts, external debt, consumption expenditures, investments, imports, taxes, subsidies, national savings, exports.	Simple ordinary least square (OLS) regression	External financing of domestic budget deficits is cheaper than. Both types of debt, have negative role in the per capital income growth rate.
18	Atique, R. & Malik, K (2012)	Impact of Domestic and External Debt on the Economic Growth of Pakistan	Pakistan; 1980-2010	real GDP growth and its causative factors (domestic debt, external debt, labor force, inflation, corruption, investment	Ordinary Least Square (OLS) approach to Cointegration, Unit Root Testing, Serial Correlation Testing, test for checking Heteroscedasticity and CUSUM test of stability	Found inverse relationship between domestic debt/external debt and economic growth but significant. The result also show that external debt amount slows down economic growth more as compared to domestic debt amount
19	Akram, N. (2013)	Empirical Examination of Debt and Growth Nexus in South Asian Countries	Bangladesh, India, Pakistan and Sri Lanka, for the period 1975-2011	Real GDP growth, investment, external debt, domestic debt, debt servicing, openness, labour force, human capital, urbanization, inflation	Standard panel data estimation techniques	Results show that both public external debt and debt servicing negatively affect economic growth and investment, which points to the existence of the “debt overhang effect” and the “crowding out effect”. Similarly, domestic debt also exhibits a negative and significant relationship with economic growth and investment.
20	Rahman, M.M., Bashar, M.A. & Dey, S. (2012)	External Debt and Gross Domestic Product in Bangladesh: A Co-Integration Analysis	Bangladesh; 1972-2010	Gross domestic product, total external balance	Times series econometric techniques: Co-integration analysis	There is a positive significant correlation and a long-run relationship between GDP and ED. Also result shows a bi-directional causality.
21	Sheikh, M.R., Faridi, M.Z. & Tariq, K. (2010).	Domestic Debt and Economic Growth in Pakistan: An	Pakistan; 1972-2009	Workers remittances, total domestic debt, debt	OLS techniques	The negative impact of domestic debt servicing on economic growth is stronger than positive impact of

		Empirical Analysis		servicing, exports, government expenditures, exchange rate, FDI, M2		domestic debt on economic growth.
22	Alshyab, N. (2016).	Domestic versus External Public Debt in Jordan: An Empirical Investigation	Jordan; 1980-2013	Real GDP growth, total public debt, domestic public debt, external public debt	Johansen co-integration approach, Vector Error Correction Model and Granger causality	The study shows evidence for a negative effect of public debt on economic growth.
23	Sen, S., Kasibhatla, K.M. & Stewart, D.B. (2007).	Debt overhang and economic growth: The Asian and the Latin American experiences	6 Asian countries and 5 Latin American countries; 1970-2000	GDP per capita, debt-GDP ratio, debt service-export ratio, capital stock-GDP ratio, total labour force, external debt-export	Dynamic panel data econometric estimations, Dynamic and system GMM estimations.	Findings indicate that debt overhang impeded growth in Latin American economies severely and the impact was moderately negative in the Asian region
24	Azam, M., Emirullah, C., Prabhakar, A.C. and Khan, A.Q. (2013).	The Role of External Debt in Economic Growth of Indonesia- A Blessing or Burden?	Indonesia; 1980-2012.	GDP growth rate, total external debt stock, export, inflation, savings, telephone lines	Ordinary Least Square (OLS) method	The main finding of the study shows external debt has a negative impact on economic growth during the period under the study. Thus, external debt is not a blessing but rather a burden for Indonesia.
Public External Debt and Economic Growth in Developing and Sub-Saharan African Countries						
25	Cordella, T., Ricci, L.A. & Ruiz-Arranz, M. (2005).	Debt Overhang or Debt Irrelevance? Revisiting the Debt-Growth Link	79 Developing countries; 1970-2002.	Per capita GDP growth, population growth, secondary school enrolment, investment, central government balance, terms of trade growth, inflation, net private capital flows, and the openness indicator, nominal debt and NPV of external debt.	Panel data technique	The study concludes that there is a marginal negative relationship between debt and growth at intermediate levels of debt, which does not happen at the lower levels.

26	Hansen, H. (2001).	The Impact of Aid and External Debt on Growth and Investment	50 Developing countries; 1974-1993	Real per capita growth, gross domestic investment, institutional quality, inflation, budget surplus, openness, external debt, debt service, ODA	Cross country panel regression	If debt service payments and ODA are reduced one-for-one there will be no impact on growth, while there may be a drop in investment rates.
27	Ogunmuyiwa, M.S. (2011)	Does External Debt Promote Economic Growth in Nigeria?	Nigeria; 1970-2007	Gross domestic product, external debt	Granger causality test, unit root test, co-integration test, error correction mechanism	Empirically, result shows that causality does not exist between external debt and economic growth as causation between debt and growth was also found to be weak and insignificant in Nigeria.
28	Clements, B., Bhattacharya, & Nguyen, T.Q (2003).	External Debt, Public Investment, and Growth in Low-Income Countries	55- Low income countries include sub-Saharan Africa; 1970-1999	GDP, terms of trade, population growth, secondary school enrolment, gross domestic investment, government fiscal balance, openness indicator, debt service	Panel data regression techniques	Reduction in the stock of external debt projected for highly indebted poor countries (HIPC) would directly increase per capita income growth by about 1 percentage point per annum. Reductions in external debt service could also provide an indirect boost to growth through their effects on public investment.
29	Zouhaier, H.& Fatma, M. (2014).	Debt and Economic Growth	19 Developing countries over the period 1990-2011	Real growth rate of GDP per capita, investment, trade openness, inflation, external debt	Dynamic panel data regression	The ratio of total external debt to GDP and GNI is negative but statistically significant. Also there is a negative interaction between external and investment.
30	Kasidi, F & Said, A.M. (2013).	Impact of External Debt on Economic Growth: A Case Study of Tanzania	Tanzania; 1990-2010	Gross domestic growth (GDP), external debt, debt service	Correlation coefficient, OLS technique and Unit root test.	The study show that there is significant impact of the external debt and debt service on GDP growth.
31	Sichula, M. (2012).	Debt Overhang and Economic Growth in HIPC Countries: The Case of Southern African Development Community (SADC)	Heavily Indebted Poor Countries (HIPC) of the Southern African Development Community	External debt, GDP, debt servicing, private capital, terms of trade, exchange rate	Panel regression analysis, granger causality test	Result show that debt overhang is still a paradox that may exist but debt relief plays a major role in GDP growth for these countries

			(SADC); 1970-2011			
32	Umaru, A., Hamidu, A.A. Musa, S. (2013).	External Debt and Domestic Debt Impact on the Growth of the Nigerian Economy	Nigeria; 1970-2010.	GDP, external debt, domestic debt	Ordinary least square method (OLS), Augmented Dickey-Fuller technique and Granger causality test	The of Causality suggest that there is a bi-directional causation between external debt and GDP while no causation existed between domestic debt and GDP as well no causation existed between external debt and domestic debt. The results also revealed that external debt has a negative impact while domestic debt has impacted positively on economic growth (GDP).
33	Lopes da Veiga, J. Ferreira-Lopes, A. &Tiago Sequeira (2014).	Public Debt, Economic Growth, and Inflation in African Economies	Group of 52 African economies; 1950-2012	Real GDP, GDP per capita, inflation,	Cross-country panel regression	The highest average rates of real and <i>per capita</i> growth are achieved when public debt reaches 60% of the real GDP and an average inflation rate of 8.2%. When this ratio falls between 60-90%, the average rate of economic growth drops by up to 1.32 p.p. and continues dropping by up to 1.64 p.p. when the ratio exceeds 90%.
34	Sulaiman, L.A.&Azeez, B.A. (2012).	Effect of External Debt on Economic Growth of Nigeria	Nigeria; 1970-2010	GDP, external debt, ratio of external debt to export, inflation, exchange rate	Ordinary Least Square (OLS), Augmented Dickey-Fuller (ADF) Unit Root test, Johansen Co-integration test and Error Correction Method (ECM).	The co-integration test shows that long-run equilibrium relationship exists among the variables. The findings from the error correction method show that external debt has contributed positively to the Nigerian economy.
35	Obademi, O.M. (2012).	An Empirical Analysis of the Impact of Public Debt on Economic Growth: Evidence from Nigeria 1975-2005	Nigeria, 1975-2005	GDP, external debt value, domestic debt value, total debt value, budget deficit	Co-integration technique, Phillip Peron Unit root test and Error correction model; external debt service, domestic debt service...	The result concluded that though in the short-run the impact of borrowed fund on the Nigerian economy was positive, the impact of debt in the long-run depressed economic growth as a result of incompetent debt management.
36	Babu, J.O., Kiprop, S., Kalio,	External debt and economic growth in	East Africa Community	Real GDP per capita growth, investment,	Cross country panel regression	The findings suggest that external debt has a negative significant

	A.M. & Gisore, M. (2014).	the East Africa Community	member countries; 1970-2010	government expenditure, terms of trade, openness and external debt	techniques.	effect on per capita GDP growth rate in the EAC.
37	Presbitero, A.F. (2008).	The Debt-Growth Nexus in Poor Countries: A Reassessment	A panel of 114 developing (low & middle income) countries; 1980-2004	GDP growth rate, external debt, investment, population growth rate, primary enrolment, inflation, measure of openness, terms of trade.	System Generalized Moments of Method (GMM)	Result show that Debt-Laffer curve loses statistical significance once institutional quality is controlled for and debt overhang seems to be at work exclusively in countries with sound institutions. On the contrary, external debt proves to be irrelevant for countries with weak institutions.
38	Egbetunde, T. (2012).	External borrowing in and economic growth in Nigeria	Nigeria; 2012.	Real GDP, external debt outstanding, domestic debt and debt service	OLS, unit root test and co-integration technique	The paper argues that the rate at which borrowings contribute to economic growth in Nigeria was low which may be as a result of mismanagement of the resources obtained as loan.
39	Pattillo, C. Poirson, H. & Ricci, L. (2004).	What Are the Channels Through Which External Debt Affects Growth?	A panel dataset of 61 developing countries over the period 1969–98	Terms of trade, fiscal balance to GDP, openness, population growth, secondary education, investment, external debt, debt service	Fixed effects and differenced and system GMM	Results indicate a negative impact of high debt on growth through physical capital accumulation and total factor productivity growth. On average, for high-debt countries, doubling debt will reduce output growth by about 1 percentage point and reduce both per capita physical capital and total factor productivity growth by somewhat less than that.
Public Domestic Debt and Economic Growth in Developing and Sub-Saharan African Countries						
40	Onyeiwu, C. (2012).	Domestic Debt and the Growth of Nigerian Economic	Nigeria; 1994-2008.	GDP, foreign exchange rate, credit to private sector, budget deficit, money supply, domestic debt.	OLS, Error correction model and parsimonious models	The study also shows that the level of debt has negative effect on economic growth, presenting evidence of crowding out of private investments.
41	Putunoi, G.K. and Mutuku, C.M.	Domestic Debt and Economic Growth	Kenya, 2000-2010	Real GDP, domestic debt, private sector	The Jacque Bera (JB) and Augmented	The study shows that domestic debt expansion in Kenyan for the

	(2013).	Nexus in Kenya		credit domestic interest rates	Dickey-Fuller (ADF) tests	period of study has a positive and significant effect on economic growth.
42	Abbas, S.M.A. & Christensen, J.E. (2007).	The Role of Domestic Debt Markets in Economic Growth: An Empirical Investigation for Low-income Countries and Emerging Markets	93 low-income countries and emerging markets; 1975-2004	GDP growth rate, GDP per capita, population growth rate, investment, fiscal balance, terms of trade, openness, domestic debt, all bank deposits, private savings, politico-economic stability	Cross-country panel data regression	The result shows some evidence that, above a ratio of 35% percent of bank deposits, DD begins to undermine growth, lending credence to traditional crowding out and bank efficiency concerns.
43	Adofu, I. & Abula, M. (2010).	Domestic Debt and the Nigerian Economy	Nigeria; 1986-2005	GDP, domestic debt outstanding, domestic credit, interest rate.	Ordinary Least Square (OLS) method	The findings reveal that the increasing domestic debt profile has affected the growth of the economy negatively.
44	Maana,I., Owino, R. & Mutai, N. (2008)	Domestic debt and its impact on the economy: The case of Kenya	Kenya; 1996-2007	Real GDP growth, government expenditure, private sector credit, broad money supply (M3), secondary school enrolment, trade	Barro Growth regression	The study found no evidence that the growth in domestic debt crowds out private sector lending in Kenya. In other words, domestic debt expansion has a positive but not significant effect on economic growth during the period.
Debt Service and Economic Growth in Developing and Sub-Saharan African Countries						
45	Makau, J.K. (2015)	External Public Debt Servicing and Economic Growth in Kenya: 1970 -2003: An Empirical Analysis	Kenya; 1970-2003	Annual growth rate of GDP, savings, external debt, total debt service, interest, growth rate in labour force.	OLS, Error correction method, Co-integration test	The study concluded that removing the external debt constraint would not only be good for growth, but also would make resources available which would foster economic growth.
46	Karagol, E. (2002)	The Causality Analysis of External Debt Service and GNP: The Case of Turkey	Turkey; 1956-1996	GNP, capital stock, labour force, human capital debt service	Extension of Cunningham (1992) model and multivariate Co-integration techniques	The result show that external debt service has a negative short-run impact on economic growth. Also there is a uni-directional causal relationship between debt service and GNP level

2.3.8 Gap in the Empirical Literature

The research gap in the empirical literature will be viewed under the following sub-heading:

1. **Geographical Gap:** Literature on the effect of domestic and external debt on the economy of sub-Saharan Africa is scanty as most studies have largely focused on developed countries. However, the conflicting results could be traced to a varying number of factors including the cross-country nature of most of the previous study. A major criticism on the cross-sectional studies hinges on the fact that countries with varying variables are pooled for a study. Some economists argue that for a cross-sectional analysis to be valid, the countries selected for study should be made as homogenous as possible by grouping the countries by geography, size or economic nature (Mesghena, 2005).
2. **Information/Knowledge Gap:** Most studies used data that are not updated and current, which may not reflect the true and current dispensation of the region. This was what informed our choice of data from 1986. Furthermore, most studies on public debt and economic growth have typically focused on external debt and tend to forget about domestic debt. This study aims at filling this gap by using the most recent data to analyze the effect of public (domestic and external) debt on sub-Saharan African economy through the selected countries to give a comprehensive result. Most Studies have concentrated much on either of them but not all.
3. **Methodological Gap:** Extant studies on the relationship between public debt and economic growth have shown conflicting results. While some studies reveal positive and significant effect, others find negative significant effect or none at all. Furthermore, most studies have failed to incorporate the fact that there are other macroeconomic variables that are brought about by debt increase, which affect economic growth. This study aims at filling this gap by adding exchange rate, and inflation as extra macroeconomic variables to the model. Since each country is unique, it is not enough to apply cross-country results to policy formation for each country. Therefore, the need to also estimate the relationship between public debt and economic growth with a separate analysis for each country, using country-specific data.

CHAPTER THREE

METHODOLOGY

3.1. Research Design

Creswell (2003) defines a research design as the scheme, outline or plan that is used to generate answers to research problems. It is an arrangement of conditions for collection and analysis of data in a manner that is relevant to the purpose of the research. The method of study adopted in this study is the ex-post facto finametric research design. This design was adopted because the study intends to use already established secondary data for the study. According to Salkind (2010), “Ex post facto study or after-the-fact research is a category of research design in which the investigation starts after the fact has occurred without interference from the researcher”. Thus, the data for the study were collected from source that the researcher has no ethical and statutory powers to manipulate. Hence, the data were collected and used in their original state.

3.2. Population of the Study

The study focused on time series data for eight macroeconomic variables for the period of 30 years and 120 observations on selected sub-Saharan Africa. Sub-Saharan Africa is made up of 48 countries, however, due to data unavailability, we were constraint to four countries, one each from the four sub-regions as West Africa, East Africa, Central Africa and the Southern Africa Republic.

3.3. Sample and Sampling Techniques

A purposive sampling technique was adopted to select one (1) country each from the four (4) regions of the SSAs. Thus, samples of four countries are used for the study. Objectively, only selected variables that can address public debt issues such as Gross Domestic Product (GDP) growth as the dependent variable and proxy for economic growth; and the independent variables including domestic debt stock (DDS), Real interest rate (RIR), Domestic debt services (DOMSERV), Total External Debt Stock (TEDS), External Debt Services (EXSERV), Exchange Rate (EXR), Inflation (INF) The study covers a period of 30 years (1986 – 2015). The selected countries are shown on Table 3.1.

Table 3.1: List of Selected SSA Countries for the Study

SN	West Africa	East Africa	Central Africa	South Africa
1	Nigeria	Kenya	Angola	South Africa

3.4. Data Sources and Definition of Variables.

To empirically test the effect of public debt on economic growth, time series data of the selected sub-Saharan African countries for the period of 1986 - 2015 has been used. This study uses secondary data mainly drawn from World Bank (World Development Indicators, International Financial Statistics) and IMF (World Economic Outlook) 2016 online data bases.

Different variables have been used in various studies to analyze the effect of public debt on economic growth. A brief description and some background of the variables used in the study from metadata indicators of the World Development Indicator (WDI) is summarized in Table 3.2.

Table 3.2: Data Source and Definition of Variables

Sr No.	Name of Variable	Data Source	Description
1	GDP Growth Rate (Yit)	WDI	Different measures of GDP growth have been used in literature e.g. Per capita GDP, GDP growth rate, Real GDP, Real GNP etc. In the present study, we have used GDP growth rate because it captures the level of growth. Annual percentage growth rate of GDP at market prices based on constant local currency.
2	Total Domestic Debt Stock (DOM)	WDI	Total domestic debt stock (% of GDP). Total domestic debt is debt owed to residents repayable in currency, goods, or services. Total domestic debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, and short-term debt.
3	Total Domestic Debt Services (DOMSERV)	WDI	It is measured with Total domestic debt service (% of GNI). Total debt service is the sum of principal repayments and interest actually paid in currency, goods, or services on long-term debt, interest paid on short-term debt, and repayments (repurchases and charges) to the IMF.

4	Real Interest Rate (RIR)		WDI	Real interest rate is the lending interest rate adjusted for inflation as measured by the GDP deflator.
5	Total External Debt Stock (EXDS)		WDI	Proxied by external debt stocks (% of GNI), that is, Total external debt stocks to gross national income. Total external debt is debt owed to non-residents repayable in currency, goods, or services. Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt.
6	External Debt Services (EXDSERV)		WDI	Represented with debt service on external debt, total (TDS, current US\$). Total debt service is the sum of principal repayments and interest actually paid in currency, goods, or services on long-term debt, interest paid on short-term debt, and repayments (repurchases and charges) to the IMF. Data are in current U.S. dollars.
7	Inflation (INFL)		WDI	In order to capture the impact of uncertainty created by debt/debt servicing, inflation becomes very crucial as a control variable. There exist different indicators to measure inflation. Consumer price index and GDP deflator are most widely used indicators of inflation. In this study, we have used CPI as an indicator of inflation.
8	Exchange Rate (EXR)		WDI	Measured by Official exchange rate (LCU per US\$, period average). Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar).

Source: World Development Indicator (WDI) and Author's arrangement

3.5. Model Specification

The model is a panel regression (a type of pooled data) which covers four Sub-Saharan African countries for the time periods from 1986 to 2015. Two equations were developed for the study in line with the topic which is split into domestic debt equation and external debt equation and in line with the theories that the work is anchored which presupposes the effect capital has on economic growth. Thus, capital inflows and variables that encourage inflow of capital would

result in positive economic growth while capital outflows and variables that encourages capital outflow would have negative effect on economic growth. Following the above facts, fixed effect panel models were derived from the functional relationship that the independent variables have effect on the dependent variable. The models are explained one after the other.

However, a model based on a panel structure provides the ability to analyse a dataset consisting of both time series (different periods) and cross sections (different entities), each with one dependent and possible multiple independent variables. Broadly speaking, panel estimation can be divided into two approaches: fixed effects model and the random effects model approach. However, the default model is the fixed effect model of which its use depends on the Hausman’s test, which may rather suggest the use of random effect model.

The effect of debt on GDP growth in this study is analysed with an unbalanced panel model. The panel is unbalanced because some observations are adjusted in such a way that some cross-section have missing data for some years. The sample consists of observations for data from the four Sub-Saharan African countries between 1986 and 2015 (30 x 4 = 120) so that the final sample includes 120 observations.

3.5.1 Domestic Debt Equation

This model addresses objectives one and two of the study – the effect of domestic debt and domestic debt services on economic growth of SSA. In order to observe the overall effect of domestic debt on economic growth of sub-Saharan Africa, the equation estimated growth model as suggested by Obademi (2012). In the light of the above, econometrically, the model is specified as follows:

$$\mathbf{GDP = f (DOM, DOMSERVE, INF) \dots\dots\dots (3.1)}$$

Where

GDP = Gross domestic product for country ‘i’ at time ‘t’.

DOM = Aggregate domestic debt stock for country ‘i’ at time ‘t’.

DOMSERV = Total domestic debt service (% of GNI) for country ‘i’ at time ‘t’.

INF = Inflation rate for country ‘i’ at time ‘t’. Inflation is used here as a control variable.

The equation 3.1 above can be stated to form a panel regression model as shown below,

$$Y_{it} = \beta_0 + \beta X_{it} + U_{it} \quad i = 1, \dots, N \quad t = 1, \dots, T \dots\dots\dots 3.2$$

Where,

y_{it} is the gross domestic product, i over a given period t . x_{it} corresponding to variables which can have an effect on GDP: domestic debt stock, interest rate, inflation.

To specify the fixed effects model, equation one is modified by decomposing the disturbance term u_{it} . The disturbance term is divided into an individual specific effect component, u_i , and a remainder disturbance, v_{it} , component that differs over cross section (countries) and time (year).

$$U_{it} = u_i + v_{it} \dots\dots\dots 3.3$$

Equation (3.2) is now rewritten by the substitution for u_{it} from equation (3.3) to form the following equation:

$$Y_{it} = \beta_0 + \beta X_{it} + U_{it} + V_{it} \dots\dots\dots 3.4$$

Equation 3.4 can be fully written in a fixed effect form as;

$$GDP_{it} = \beta_0 + \beta_1 \sum_{i=1}^n DOM_{it} + \beta_2 \sum_{i=1}^n DOMSERV_{it} + \beta_3 \sum_{i=1}^n INF_{it} + u_i + v_{it} \dots\dots\dots 3.5$$

where;

β_0 is the constant term, μ_i is the panel specific error, and v_{it} is the error term, while β_i coefficients which measure the impact of each variable.

Theoretical Expectations

The expected signs for the coefficients are: $\beta_1 < > 0$ while β_2 and $\beta_3 < 0$. The *a priori* expectation presupposes that total domestic debt stock (DOM) can have positive or negative effect on GDP, interest on debt (debt servicing) and inflation will have negative effect on GDP.

3.5.4. External Debt Equation

The model addresses objective three and four - effect of external debt and external debt services on economic growth of SSA is built based on the works of Kasidi & Said (2013); Malik, Hayat & Hayat (2010). Thus, the functional form of the relationship is thus:

$$\mathbf{GDP} = \mathbf{f}(\mathbf{EXDS}, \mathbf{EXDSERV}, \mathbf{EXR}, \mathbf{INF}) \dots\dots\dots (3.6)$$

Where:

EXDS = Total External Debt Stock proxied by external debt stocks (% of GNI).

EXSERV = External Debt Services represented with debt service on external debt, total (TDS, current US\$).

EXR = Exchange rate for country ‘i’ at time ‘t’. Exchange rate is used here as a control variable.

INF = Inflation rate for country ‘i’ at time ‘t’. Inflation is used here as a control variable.

The equation 3.6 above can be stated to form a panel regression model as shown below,

$$\mathbf{Y}_{it} = \delta_0 + \delta \mathbf{X}_{it} + \mathbf{U}_{it} \quad \mathbf{i} = 1, \dots, \mathbf{N} \quad \mathbf{t} = 1, \dots, \mathbf{T} \dots\dots\dots (3.7)$$

Where,

y_{it} is the gross domestic product, i over a given period t . x_{it} corresponding to variables which can have an effect on GDP: total debt stock, etc.

To specify the fixed effects model, equation one is modified by decomposing the disturbance term u_{it} . The disturbance term is divided into an individual specific effect component, u_i , and a remainder disturbance, v_{it} , component that differs over cross section (countries) and time (year).

$$\mathbf{U}_{it} = \mathbf{u}_i + \mathbf{v}_{it} \dots\dots\dots (3.8)$$

Equation (3.7) is now rewritten by the substitution for u_{it} from equation (3.6) to find the following equation:

$$\mathbf{Y}_{it} = \delta_0 + \delta \mathbf{X}_{it} + \mathbf{U}_{it} + \mathbf{V}_{it} \dots\dots\dots (3.9)$$

Relationship can be rewritten in econometric form as follows:

$$\mathbf{GDP}_{it} = \delta_0 + \delta_1 \sum_{i=1}^n \mathbf{EXDS}_{it} + \delta_2 \sum_{i=1}^n \mathbf{EXDSERV}_{it} + \delta_3 \sum_{i=1}^n \mathbf{EXR}_{it} + \delta_4 \sum_{i=1}^n \mathbf{INF}_{it} + \mathbf{u}_i + \mathbf{v}_{it} \dots\dots\dots (3.10)$$

where;

α_0 is the constant term, μ_i is the panel specific error, and v_{it} is the error term, while δ_i coefficients which measure the impact of each variable.

Theoretical Expectations

The expected signs for the coefficients are: $\beta_1 < > 0$ while β_2 and $\beta_3 < 0$. The *a priori* expectation presupposes that total external debt stock (EXDS) can have positive or negative effect on GDP, interest on debt (debt servicing), exchange rate and inflation will have negative effect on GDP.

3.6. Method of Data Analyses

3.6.1. Panel Techniques

The panel estimation involves the identification and stacking of the data, which is followed with the estimation and the verification of the specification bias using panel unit root analyses, and Hausman tests. Also, we should also stress some of the problems related with panel data approaches, such as: (1) the possibility of an impact caused by unobserved heterogeneity (2) the lack of some particular data and (3) biased estimators due to incorrect specification of the model. These will address problems related with endogeneity and cross-section dependence.

3.6.2. Panel Unit Root Tests

One of the econometric problems in empirical analysis is non-stationarity of time series data. Spurious regression and inconsistent results are likely to be obtained if we run a regression in the level form while the variables in the model are non-stationary and therefore inference based on such data are likely to be meaningless. Due to this economic problem, the variables in the models will be tested for panel unit roots using the Levin, Lin, and Chu (LLC) and Im, Pesaran and Shin (IPS) tests.

The Levin, Lin, and Chu (2002), is based on the null hypothesis that each individual time series contains a unit root against the alternative that each time series is stationary. Im, Pesaran and Shin Test (IPS, 2003) is based on the null hypothesis that each series in the panel contains a unit root, i.e., $H_0: \rho_i = 0$ for all i and the alternative hypothesis allows for some (but not all) of the individual series to have unit roots. The study employed the two panel unit root test in order to validate the results of each.

3.6.3. The Hausman's Test

In order to choose the best methodology for estimation of a panel regression, we therefore apply the Hausman (Hausman, 1978) test. Thus, the choice between fixed and random effect models will be done using the Hausman model selection criteria. The Hausman selection test is based on the fact that the individual effects and the regressors are uncorrelated. In such circumstance, the random effects model becomes the focus of interpretation; however, the fixed effects will be showcased for empirical robustness. On the other hand, the fixed effect model will be the focus of analyses of the study.

Decision Rule: Using the Hausman test: The basic idea of this test is to examine whether we can accept the null hypothesis that the random effect model is the best solution. If the hypothesis is rejected, it means that the fixed effects model is preferable, (Green, 2008).

Econometric software

The econometric software used for the analysis in this study is the E-views 9.0

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.1. Statistical Analysis

In this chapter, the data and the estimated results of the models for the study in chapter three were presented and interpreted. Firstly, the summary of statistics of the variables employed; and followed by unit root test for the stationarity of the variables employed in the study. Then, the results of models estimated through the fixed and random-effects techniques of panel data analysis were presented.

4.2. Statistical Properties of the Variables

The results of the summary statistics of the variables were presented in Table 4.1. The statistics is based on four (4) selected Sub-Saharan African countries (Nigeria, Kenya, Angola and South Africa) out of the total of 48 in the region for the time period 1986-2015. When analyzing time series data, the initial step is to investigate whether the variables under study are normal distributed. To test for normality of the variables, descriptive statistics were checked putting keen interest on the Jargue-Bera probability. The concern of the researcher was on the measures of central tendency that comprises of the mean, median, and the mode as well as the measures of variability or dispersion that comprises of standard deviation (or variance), the minimum and maximum variables, kurtosis, skewness and also the Jargue-Bera statistics. When using the Jargue-Bera test, a null hypothesis of normal distribution was tested against the alternative hypothesis of non-normal distribution. For normal distribution the JB statistic is expected to be statistically indifferent from zero thus:

$H_0: JB = 0$ (normally distributed)

$H_1: JB \neq 0$ (not normally distributed). Rejection of the null for any of the variables would imply that the variable is not normally distributed

Table 4.1: Descriptive Statistics of the Variables

	GDP?	DOM?	INT?	DOMSERV?	TEDS?	EXDSERV?	EXR?	INF?
Mean	3.967210	1.462022	5.435828	4.899514	55.64412	1.89E+09	53.38266	135.3521
Median	4.146839	1.468812	5.782726	3.938747	46.97062	7.19E+08	57.11487	10.21300
Maximum	33.73578	3.003363	25.28227	12.98749	228.6423	9.71E+09	157.4994	5399.507
Minimum	-10.75170	0.469695	-43.57266	0.068682	2.062688	2.92E+08	1.754523	-7.419000
Std. Dev.	4.346859	0.632706	11.64158	3.701707	42.64432	2.19E+09	43.22527	608.0093
Skewness	2.586288	0.763282	-1.807777	0.579036	1.425474	1.853644	0.641526	7.041202
Kurtosis	24.21419	3.377681	8.229658	2.036531	5.635561	5.855173	2.537851	57.59258
Jarque-Bera	2046.256	10.61347	173.4758	9.739525	64.69294	93.97033	7.981667	13641.77
Probability	0.000000	0.004958	0.000000	0.007675	0.000000	0.000000	0.018484	0.000000
Sum	408.6226	150.5882	559.8903	504.6499	5731.345	1.95E+11	5498.414	13941.26
Sum Sq. Dev.	1927.309	40.83234	13823.70	1397.669	185490.9	4.87E+20	190579.3	37706881
Observations	103	103	103	103	103	103	103	103
Cross sections	4	4	4	4	4	4	4	4

Source: Authors' Computation based on data from WDI, 2015

Mean is the average value of the series; median is the middle value of the series when the values are ordered from smallest to the largest. Of the two, the median is a robust measure of the centre of the distribution that is less sensitive to outliers. Max and Min represent the maximum and minimum values of the series in the employed sample. Standard deviation measures dispersion in the series.

The variables employed included GDP growth rate (GDP), Total Domestic Debt Stock (DOM), Total Domestic Debt Services (DOMSERV), Interest Rate (INT), Total External Debt Stock (TEDS), External Debt Services (EXSERV), Inflation and Exchange Rate (EXR).

As can be seen in Table 4.1, all the variables in the series are non-normally distributed. The null hypothesis of normal distribution is rejected for all the variables at the 5% level. The Jarque Bera is a test for normality of the distribution where the null hypothesis is that the distribution of the sample is a normal one. If the probability value of the Jarque bera test is significant, then the null hypothesis is rejected and the alternative is accepted which says that the sample is not normally distributed. If each variable is statistically significant (indicated by a zero probability), then the series is not normally distributed. Therefore, the farther the probability statistic of a variable is to zero, the lower the value of its Jarque Bera statistic and the more normally distributed it is (vice

versa). From the results above, the Jarque Bera tests shows that the null hypothesis is strongly rejected for all the distribution.

The mean and median of the variables are positive with INFLATION very high above 100%. This suggests that the INFLATION rate especially at the beginning of each year is significantly positive and perhaps imply that higher average values attract higher relationship with economic growth.

Table 4.2: Pool Unit Root Test

Variables		Im, Pesaran and Shin W-stat	Levin, Lin & Chu t*	Conclusion
GDP	Level	-6.15324*** (0.0000)	-6.87801*** (0.0000)	I(0)
INF	Level	-3.71073*** (0.0001)	-4.45334*** (0.0000)	I(0)
DOM	Level	-0.70362 (0.2408)	-2.37058*** (0.0089)	I(1)
	1 st Difference	-8.26498*** (0.0000)	-8.06224*** (0.0000)	
INT	Level	-6.28817*** (0.0000)	-5.83581*** (0.0000)	
DOMSERV	Level	-0.61115 (0.2706)	-1.02626 (0.1524)	I(1)
	1 st Difference	-11.2982*** (0.0000)	-12.2466*** (0.0000)	
TEDS	Level	1.08232 (0.8604)	-0.24807 (0.4020)	I(1)
	1 st Difference	-10.5158*** (0.0000)	-11.3956*** (0.0000)	
EXSERV	Level	-2.93667*** (0.0017)	-2.58083*** (0.0049)	I(0)
EXR	Level	3.09245 (0.9990)	0.57685 (0.7180)	I(1)
	1 st Difference	-6.68868*** (0.0000)	-7.94020*** (0.0000)	

Source: Authors computation using E-views 9.0

Note: () P.values, *** denotes significant at 1%, ** denotes significant at 5%; * denote significant at 10%.

From the table 4.2, INFLATION, EXSERV, and GDP are fully stationary at levels while EXR, DOM, DOMSERV, and TED were not stationary at level. This necessitated differencing of these variables along with others that were not stationary at levels. The first difference test shows that all the differenced variables were stationary at first difference.

4.3. Model Estimation

4.3.1. Effect of Domestic Debt on Economic Growth of Sub-Saharan Africa

This objective is addressed using Model one developed in chapter three of the study. The Hausman test was conducted to determine whether the panel regression would be performed at fixed or random effect.

Table 4.3: Fixed Effect and Random Effect Regression for Domestic Debt and Economic Growth Dependent Variable: GDP

Dependent Variable: GDP				
Method: Pooled Least Squares				
Sample: 1986 2015				
Included Observations: 30				
Cross-sections included: 4				
Total Pool (balanced) observations: 120				
Variables	Fixed Effect		Random Effect	
	Coefficient	Prob.	Coefficient	Prob.
C	3.385249	0.0005	4.361774	0.0000
DOM	-1.101393	0.0135	-1.634744	0.0001
INF	-0.000147	0.8375	-0.000216	0.7471
INT	0.100892	0.0076	0.085496	0.0155
R-squared	0.103621		0.065833	
Adjusted R-squared	0.054279		0.040811	
S.E. of regression	4.111744		4.140918	
Sum squared resid	1842.802		1920.487	
Log likelihood	-324.9931			
F-statistics	2.100055		2.630982	
Prob(F-statistics)	0.058935		0.053564	
Durbin-Watson stat	1.366348		1.306433	
Hausman Specification Test				
	Chi-Sq. Statistic	4.494984		
	Probability	0.2040		

Source: Authors' Computation based on data from WDI, 2015

The Hausman test tests the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator. If they are (insignificant P-value, Prob>chi2 larger than .05) then it is safe to use random effects. If you get a significant P-value, however, you should use fixed effects. Hausman test for equation 1, P- value = 0.2040. Since the null hypothesis (H_0) is not rejected, then the random effect result is accepted and then interpreted.

From the random effect result, domestic debt has a significant negative effect on economic growth in the sub-Saharan African countries and the coefficient came out with the expected negative sign. By size of the effect this implies that increase in domestic debt in the sub-Saharan African countries leads to decrease in gross domestic product investment. Having found that domestic debt has a significant effect on economic growth of Sub-Sahara Africa, it becomes necessary to use OLS cross-sectional regression to determine the effect of domestic debt on economic growth of the individual countries, for the purposes of economic policies for each country.

**Table 4.4: Pooled OLS Regression – Country Specific for Domestic Debt and Economic Growth
Dependent Variable: GDP**

Dependent Variable: GDP		
Method: Pooled Least Squares		
Sample: 1986 2015		
Included Observations: 30		
Cross-sections included: 4		
Total Pool (balanced) observations: 120		
Variables	Pooled OLS	
	Coefficient	Prob.
DOM – ANG	1.641047	0.0015
DOM – KEN	2.219698	0.0084
DOM – NIG	-4.677452	0.0318
DOM – SA	0.082683	0.9488
INF – ANG	0.000158	0.8104
INF – KEN	-0.023434	0.7878
INF – NIG	0.343306	0.0000
INF – SA	0.080566	0.7988
INT – ANG	0.023927	0.7976
INT – KEN	-0.008314	0.9346
INT – NIG	0.696008	0.0000
INT – SA	0.248502	0.1528
R-squared	0.206745	
Adjusted R-squared	0.122843	
S.E. of regression	3.959892	
Sum squared resid	1630.797	
Log likelihood	-317.9044	
Durbin-Watson stat	1.499705	

Source: Authors' Computation based on data from WDI, 2015

From the result in table 4.4, domestic debt stock (DOM) significantly help explain the amount of gross domestic product (GDP) in Angola, Kenya and Nigeria. The variable is highly significant - as its p-values are less than the 0.05 mark for significance. However, domestic debt has a positive effect in both Angola and Kenya but has a negative effect in Nigeria. Therefore, if the parameter changes, domestic debt stock in Angola will change positively. Also changes in domestic debt stock in Kenya has positive change on gross domestic product. While changes in domestic debt stock in Nigeria affect gross domestic product negatively. Thus, based on the magnitude of the size of the parameters, domestic debt impact on growth more in Nigeria than other sub-Saharan African countries. Despite the fact that domestic debt is significant and positive in Nigeria, the rise in inflation will definitely affect the gains from domestic debt negatively. Domestic debt is highly insignificant for South Africa, and by implication, domestic debt contribution to economic growth in South Africa is very minimal.

At a first glance, the random effects coefficients seem quite diverse in size and sign. Therefore, in the table 4.5, we will test whether there is unobserved heterogeneity.

Table 4.5: Heteroscedasticity Test using the Residual Covariance Matrix

	ANG	KEN	NIG	SA
ANG	5.851799	4.581294	0.658455	1.540090
KEN	4.581294	4.853948	0.159999	1.117615
NIG	0.658455	0.159999	43.06781	3.391526
SA	1.540090	1.117615	3.391526	3.628364

Source: Authors' Computation based on data from WDI, 2015

The variances of the residuals across cross-sectional units range from 0.15999 to 43.067, it seems unlikely that these are all realizations of a single σ (variance). On the contrary, the differences among the variances suggest that there is cross-sectional heteroscedasticity. The findings of tables 4.5 suggest that the specification of Σ with $\text{var}(\varepsilon_{it}) = \sigma^2_i$ and $\text{cov}(\varepsilon_{it}, \varepsilon_{jt}) = \sigma_{ij}$ is most appropriate. This shows that there is a correlation among the variables used in the study.

4.3.2. Effect of Domestic Debt Service on Economic Growth of Sub-Saharan Africa

This objective (two) is also addressed using model one developed in chapter three of the study. The Hausman test was conducted to determine whether the panel regression would be performed at fixed or random effect. Panel regression result of the relationship between domestic Debt servicing and economic growth of Sub-Saharan Africa.

Table 4.6: Fixed Effect and Random Effect Regression for Domestic Debt Service and Economic Growth Dependent Variable: GDP

Dependent Variable: GDP				
Method: Pooled Least Squares				
Sample: 1986 2015				
Included Observations: 30				
Cross-sections included: 4				
Total Pool (unbalanced) observations: 105				
Variables	Fixed Effect		Random Effect	
	Coefficient	Prob.	Coefficient	Prob.
C	4.538840	0.0000	4.497552	0.0000
DOMSERV	-0.220109	0.0350	-1.180787	0.0000
INT	0.098895	0.0099	0.073737	0.0387
INF	1.151077	0.0236	-1.143405	0.9497
R-squared	0.127944		0.071806	
Adjusted R-squared	0.074553		0.044236	
S.E. of regression	4.147125		4.214506	
Sum squared resid	1685.467		1773.968	
Log likelihood	-294.7200			
F-statistics	2.396352		2.604484	
Prob(F-statistics)	0.033357		0.055966	
Durbin-Watson stat	1.425880		1.355549	
Hausman Specification Test				
	Chi-Sq. Statistic	6.308696		
	Probability	0.0975		

Source: Authors' Computation based on data from WDI, 2015

Note: Analysis is done at 5%. significant

The Hausman test tests the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator. If they are insignificant P-value (Prob > chi2 larger than .05) then it is safe to use random effects. If you get a significant P-value, however, you should use fixed effects. Hausman test for equation one, P- value = 0.0975. Since we did not reject the Ho, we go with the random effect result.

From the random effect result, domestic debt servicing has a significant effect on economic growth in the sub-Saharan African countries and the coefficient came out with the expected negative sign. Increased change in domestic debt servicing in sub-Saharan African countries will reduce gross domestic product. Also, interest rate has a significant positive effect on the sub-Saharan African countries economic growth for the period of the study. The variable is significant as its p-value is both 0.0387 and positive. A one-unit increase in interest rate in the sub-Saharan African countries increases gross domestic product investment by 0.074 units. Having found that domestic debt servicing has a significant effect on economic growth of Sub-Saharan Africa, it becomes necessary to use OLS cross-sectional regression to determine the effect of domestic debt on economic growth of the individual countries, for the purposes of economic policies for each country.

Table 4.7: Pooled OLS Regression – Country Specific for Domestic Debt Services and Economic Growth. Dependent Variable: GDP

Dependent Variable: GDP		
Method: Pooled Least Squares		
Sample: 1986 2015		
Included Observations: 30		
Cross-sections included: 4		
Total Pool (unbalanced) observations: 105		
Variables	Pooled OLS	
	Coefficient	Prob.
DOMSERV – ANG	1.178849	0.0000
DOMSERV – KEN	-1.014246	0.0000
DOM SERV– NIG	-1.304383	0.0000
DOM SERV– SA	2.168123	0.0356
INT – ANG	0.155757	0.1159
INT – KEN	0.181809	0.9333
INT – NIG	0.561586	0.0000
INT – SA	-0.031797	0.9278
INF – ANG	0.000256	0.7417
INF – KEN	0.152123	0.1201
INF – NIG	0.270720	0.0000
INF – SA	0.392866	0.3340
R-squared	0.072266	
Adjusted R-squared	-0.037466	
S.E. of regression	4.390947	
Sum squared resid	1793.078	
Log likelihood	-297.9693	
Durbin-Watson stat	1.289738	

Source: Authors' Computation based on data from WDI, 2015

From the result in table 4.7, domestic servicing also has significant impact on the amount of gross domestic product (GDP) in Angola, Kenya, Nigeria and South-Africa. However, domestic debt service is positive in both Angola and South-Africa but has a negative effect on economic growth of Kenya and Nigeria. The variable is highly significant - as its p-values are less than the 0.05 mark for significance. Therefore, if the parameter changes, domestic debt servicing will change positively in Angola and South Africa. Also changes in domestic debt services in Kenya and Nigeria decreases gross domestic product. However, a rise in inflation and interest rate will further increase the cost debt service, thereby crowding out resources meant for investment. Thus, based on the magnitude of the size of the parameters, domestic debt services impact more on growth in South Africa than other sub-Saharan African countries.

At a first glance, the random effects coefficients seem quite diverse in size and sign. Therefore, in the table 4.8, the work tested whether there is unobserved heterogeneity.

Table 4.8: Heteroscedasticity Test using the Residual Covariance Matrix

	ANG	KEN	NIG	SA
ANG	7.450125	6.915252	0.416531	1.076806
KEN	6.915252	7.197403	0.166718	1.158927
NIG	0.416531	0.166718	41.97807	1.878741
SA	1.076806	1.158927	1.878741	2.941770

Source: Authors' Computation based on data from WDI, 2015

The variances of the residuals across cross-sectional units range from 0.0768 to 41.97807, it seems unlikely that these are all realizations of a single σ (variance). On the contrary, the differences among the variances suggest that there is cross-sectional heteroscedasticity. The findings of tables 4.8 suggest that the specification of Σ with $\text{var}(\varepsilon_{it}) = \sigma^2_i$ and $\text{cov}(\varepsilon_{it}, \varepsilon_{jt}) = \sigma_{ij}$ is most appropriate. This explains that the variables are correlated across the countries.

4.3.3. Effect of External Debt on Economic Growth of Sub-Saharan Africa.

This objective is addressed using model two developed in chapter three of the study. The Hausman test was conducted to determine whether the panel regression would be performed at fixed or random effect.

Table 4.9: Fixed Effect and Random Effect Regression for External Debt Stock and Economic Growth. Dependent Variable: GDP

Dependent Variable: GDP				
Method: Pooled Least Squares				
Sample: 1986 2015				
Included Observations: 30				
Cross-sections included: 4				
Total Pool (unbalanced) observations: 105				
Variables	Fixed Effect		Random Effect	
	Coefficient	Prob.	Coefficient	Prob.
C	4.038160	0.0416	3.181362	0.0022
EXDS	-2.021309	0.0449	-1.013261	0.0005
EXR	0.020803	0.2810	0.028812	0.0056
INF	-1.023005	0.0034	-0.000243	0.7198
R-squared	0.140489		0.131764	
Adjusted R-squared	0.087865		0.105975	
S.E. of regression	4.113350		4.072313	
Sum squared resid	1658.126		1674.957	
Log likelihood	-293.8614			
F-statistics	2.669710		5.109263	
Prob(F-statistics)	0.019245		0.002477	
Durbin-Watson stat	1.620729		1.601617	
Hausman Specification Test				
	Chi-Sq. Statistic	0.994781		
	Probability	0.8025		

Source: Authors' Computation based on data from WDI, 2015

Note: Analysis is done at 5%. significant

The Hausman test has the assumption that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator. If they are (insignificant P-value, Prob>chi2 larger than .05) then it is safe to use random effects. If you get a significant P-value, however, you should use fixed effects. Hausman test for equation 1, P- value = 0.8025. Since the null hypothesis (Ho) is not rejected then the random effect result is accepted and then interpreted.

From the random effect result, total external debt stock has a significant effect on economic growth in the sub-Saharan African countries and the coefficient came out with the expected negative sign. A one-unit increase in external debt in Sub-Saharan Africa decreases gross domestic product by 1 unit. Moreover, exchange rate has a significant positive effect on the sub-Saharan African countries economic growth for the period of the study which is contrary to theoretical expectation. The variable is highly significant - as its p-values is both 0.0056 and positive. A one-unit change in exchange rate in the sub-Saharan African countries will increase external debt payment and affect gross domestic product negatively. Since external debt has a significant effect on economic growth of Sub-Sahara Africa, it becomes necessary to use OLS cross-sectional regression to determine the effect of domestic debt on economic growth of the individual countries, for the purposes of economic policies for each country.

Table 4.10: Pooled OLS Regression – Country Specific for External Debt stock and Economic Growth. Dependent Variable: GDP

Dependent Variable: GDP		
Method: Pooled Least Squares		
Sample: 1986 2015		
Included Observations: 30		
Cross-sections included: 4		
Total Pool (unbalanced) observations: 105		
Variables	Pooled OLS	
	Coefficient	Prob.
EXDS – ANG	0.119196	0.0000
EXDS – KEN	0.117398	0.0000
EXDS – NIG	0.118531	0.0000
EXDS – SA	-1.115953	0.0006
EXR – ANG	0.042772	0.0149
EXR – KEN	0.046015	0.0139
EXR – NIG	0.063376	0.0000
EXR – SA	0.146056	0.8528
INF – ANG	-0.000252	0.7401
INF – KEN	-0.014348	0.8867
INF – NIG	-0.052344	0.0596
INF – SA	0.315397	0.3728
R-squared	0.150237	
Adjusted R-squared	0.049728	
S.E. of regression	4.198462	
Sum squared resid	1639.319	
Log likelihood	-293.2625	
Durbin-Watson stat	1.579890	

Source: Authors' Computation based on data from WDI, 2015

From the result in table 4.10, total external debt stock (EXDS) is significant on the amount of gross domestic product (GDP) in the four countries used in this study. However, external debt has a positive effect on economic growth in Angola and Kenya while negative a negative on economic growth in Nigeria and South Africa. A unit change in external debt increases economic growth in Angola and Kenya by 0.12 units, and a unit change in external debt decreases GDP in Nigeria and South Africa. However, exchange rate shows significant and positive effect on economic growth in Angola, Kenya and Nigeria but inconsistent with theory. By implication, increase in exchange rate in the economies of sub-Saharan Africa will increase their external debt payment which will invariably affect growth negatively.

At a first glance, the random effects coefficients seem quite diverse in size and sign. Therefore, in the table 4.5, we will test whether there is unobserved heterogeneity.

Table 4.11: Heteroscedasticity Test using the Residual Covariance Matrix

	ANG	KEN	NIG	SA
ANG	7.187422	7.148577	0.526048	1.194352
KEN	7.148577	7.262556	0.467676	1.165970
NIG	0.526048	0.467676	43.01752	2.331021
SA	1.194352	1.165970	2.331021	2.939829

Source: Authors' Computation based on data from WDI, 2015

The variances of the residuals across cross-sectional units range from 0.467676 to 43.01752, it seems unlikely that these are all realizations of a single σ . On the contrary, the differences among the variances suggest that there is cross-sectional heteroscedasticity. The findings of tables 4.11 suggest that the specification of Σ with $\text{var}(\epsilon_{it}) = \sigma^2_i$ and $\text{cov}(\epsilon_{it}, \epsilon_{jt}) = \sigma_{ij}$ is most appropriate. This shows that there is correlation among the variables

4.3.4. Effect of External Debt Service on Economic Growth of Sub-Saharan Africa.

Objective four is addressed using model two developed in chapter three of the study. The Hausman test was conducted to determine whether the panel regression would be performed at fixed or random effect.

Table 4.12: Fixed Effect and Random Effect Regression for External Debt Service and Economic Growth. Dependent Variable: GDP

Dependent Variable: GDP				
Method: Pooled Least Squares				
Sample: 1986 2015				
Included Observations: 30				
Cross-sections included: 4				
Total Pool (unbalanced) observations: 105				
Variables	Fixed Effect		Random Effect	
	Coefficient	Prob.	Coefficient	Prob.
C	1.703471	0.0912	1.602598	0.0811
EXDSERV	8.41E-11	0.7988	1.911451	0.0000
EXR	0.039231	0.0010	0.037195	0.0005
INF	-0.000275	0.7038	-0.000277	0.6870
R-squared	0.121913		0.119599	
Adjusted R-squared	0.067599		0.093187	
S.E. of regression	4.190016		4.132122	
Sum squared resid	1702.955		1707.444	
Log likelihood	-292.9475			
F-statistics	2.244576		4.528190	
Prob(F-statistics)	0.045207		0.005089	
Durbin-Watson stat	1.598859		1.618718	
Hausman Specification Test				
	Chi-Sq. Statistic	0.255688		
	Probability	0.9681		

Source: Authors' Computation based on data from WDI, 2015

The Hausmann tests the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator. If they are (insignificant P-value, Prob>chi2 larger than .05) then it is safe to use random effects. If you get a significant P-value, however, you should use fixed effects. Hausman test for equation 1, P- value = 0.9681. Since the null hypothesis (Ho) is not rejected then the random effect result is accepted and then interpreted.

From the random effect result, external debt service has significant effect on economic growth in the sub-Saharan African countries but the coefficient did not come out with the expected negative sign. However, exchange rate has a significant positive effect on the sub-Saharan African countries economic growth for the period which is contrary to theoretical expectation. The variable is highly significant - as its p-values is both 0.0005 and positive.

Having found that external debt servicing has no significant effect on economic growth of Sub-Saharan Africa, it becomes necessary to use OLS cross-sectional regression to determine the effect of external debt servicing on economic growth of the individual countries, for the purposes of economic policies for each country.

Table 4.13: Pooled OLS Regression – Country Specific for External Debt Service and Economic Growth. Dependent Variable: GDP

Dependent Variable: GDP		
Method: Pooled Least Squares		
Sample: 1986 2015		
Included Observations: 30		
Cross-sections included: 4		
Total Pool (unbalanced) observations: 105		
Variables	Pooled OLS	
	Coefficient	Prob.
EXDSERV – ANG	-1.041409	0.0015
EXDSERV – KEN	-1.433009	0.0006
EXDSERV – NIG	-1.045110	0.0231
EXDSERV – SA	1.116510	0.0000
EXR – ANG	-0.024187	0.3152
EXR – KEN	-0.027082	0.2565
EXR – NIG	0.056512	0.0000
EXR – SA	-0.035532	0.9511
INF – ANG	-0.000500	0.5220
INF – KEN	-0.051312	0.6058
INF – NIG	-0.032831	0.1693
INF – SA	0.316394	0.3728
R-squared	0.156827	
Adjusted R-squared	0.056013	
S.E. of regression	4.215968	
Sum squared resid	1635.243	
Log likelihood	-290.8377	
Durbin-Watson stat	1.692284	

Source: Authors' Computation based on data from WDI, 2015

From the result in table 4.13, external debt service significantly helps explain the amount of gross domestic product (GDP) in Angola, Kenya, Nigeria and South-Africa. The variable is highly significant - as its p-values are less than the 0.05 mark for significance. However, external debt service has negative effect in Angola, Kenya and Nigeria, which is consistent with theoretical expectation but has a positive effect in South Africa. A one-unit increase in external debt service in Angola decreases gross domestic product by 1 unit. Also a one-unit increase in

external debt service in Kenya decreases gross domestic product by 1 unit. Again, a one-unit increase in external debt service in Nigeria decreases gross domestic product by 1 unit. Therefore, external debt service affects economic growth of sub-Saharan Africa negatively. However, external debt service in South Africa is not consistent with theory.

The table 4.14 test whether there is unobserved heterogeneity in the result.

Table 4.14: Heteroscedasticity Test using the Residual Covariance Matrix

	ANG	KEN	NIG	SA
ANG	6.381654	6.351509	0.441790	1.209807
KEN	6.351509	6.473484	0.476008	1.217170
NIG	0.441790	0.476008	43.49966	1.677502
SA	1.209807	1.217170	1.677502	2.865455

Source: Authors' Computation based on data from WDI, 2015

The variances of the residuals across cross-sectional units range from 0.441790 to 43.49966, it seems unlikely that these are all realizations of a single σ . On the contrary, the differences among the variances suggest that there is cross-sectional heteroscedasticity. The findings of tables 4.14 suggest that the specification of Σ with $\text{var}(\varepsilon_{it}) = \sigma_i^2$ and $\text{cov}(\varepsilon_{it}, \varepsilon_{jt}) = \sigma_{ij}$ is most appropriate, which shows that the variables are correlated.

4.4. Test of Hypotheses

Having employed series of econometric tools in performing the analysis, we proceed to test our hypotheses to enable us discuss our findings

Hypothesis One: There is no significant relationship between domestic debt and economic growth of Sub-Saharan Africa

The bases for rejecting or accepting the hypothesis is on the 5% significant level, which implies that the probability of hypothesis testing is 0.05. The probability is rejected from the results above when the probability value of the independent variable is less than 5% (0.05). From the output of the panel regression, we found that out of the four countries under investigation, only Nigeria, Kenya and Angola's total domestic debt has significantly contributed to the growth in

their respective countries while total domestic debt of South Africa appear to be insignificant in promoting economic growth. On this premises, we conclude that there is a significant relationship between domestic debt and economic growth in the sub-Saharan African country since three countries out of four passes the test of hypothesis and thus we reject the null hypothesis.

Hypothesis Two: Domestic debt servicing does not have significant effect on economic growth in Sub-Saharan Africa

Following the lead of the regression panel output, findings reveals that domestic debt servicing in most of the African counties have a significant relationship with economic growth hence, we reject the null hypothesis and thus conclude that there is a significant relationship between domestic debt servicing and economic growth in sub-Saharan African countries

Hypothesis Three: External debt does not have significant effect on economic growth in Sub-Saharan Africa.

Following the lead of the panel regression, all the country under investigation passes the test of hypothesis under external debt as the probability value of all the countries under investigation appear to be less than the 0.05% level of significant hence, we reject the null hypothesis and concluded that there is a significant relationship between external debt and sub-Saharan African countries

Hypothesis Four: External debt servicing does not have significant effect on economic growth in Sub-Saharan Africa.

Following the lead of the panel regression, all the country under investigation passes the test of hypothesis that external debt servicing has a significant impact on economic growth. This is because the probability value of all the countries under investigation appear to be less than the 0.05% level of significant hence, we reject the null hypothesis and conclude that there is a significant relationship between external debt servicing and economic growth of sub-Saharan African countries

4.5. Discussion of Findings

4.5.1. Effect of Domestic Debt and Economic Growth in SSA

The results of the random effect show that domestic debt is significant but has a negative effect on economic growth of sub-Saharan Africa, which is in line with the a priori expectation that domestic debt is inversely related to economic growth. On country- specific, domestic debt is significantly positive in Angola and Kenya but negative in Nigeria. This imply that domestic debt is an important determinant of economic growth in Angola and Kenya at 5% significance level ($p\text{-value} = 0.0015$ & $0.0084 < 0.05$). Its positive coefficient means that it has a direct relationship with economic growth. This implies that an increase in change of domestic debt will spur economic growth in both countries.

However, the findings here is contrary to the study of Abbas and Christensen (2007) who used a specific public domestic debt database to study the relationship between debt and economic growth in 93 low- income countries and emerging markets over 1975–2004. They found a strong positive impact of debt on per capita income. The finding here is similar to that of Maana, Owino and Mutai (2008) who examined the impact of domestic debt in the Kenyan economy and found that domestic debt expansion had a positive but not significant effect on economic growth.

Furthermore, the positive relationship between domestic debt and economic growth also tally with the findings of Putunoi and Mutuku (2013) who investigated the effects of domestic debt on economic growth in Kenya, using advance econometric technique and quarterly times series data spanning 2000-2010. The study shows that domestic debt expansion in Kenyan for the period of study has a positive and significant effect on economic growth.

On the contrary, domestic debt reduces economic growth in Nigeria which is in line with a priori expectation. This supports the works of Rais and Anwar (2010) Atique and Malik (2012) examined the determinants of economic growth for Pakistan, the impact of domestic debt and external debt on the economic growth of Pakistan separately over the period of 1980-2010, found an inverse relationship between domestic debt and economic growth for Pakistan.

On the other hand, the study found that domestic debt has no significant effect on the economic growth of South Africa. Although external debt has a positive coefficient, it is not an important determinant of economic growth at 5% significance level ($P\text{-value}=0.9488 > 0.05$). This implies that it has negligible or very small impacts on economic growth. This might be that most external loans had been contracted to build roads and health facilities, which will take some time for the country to realize the benefits while on the other hand these loans are paid over a long period of time which doesn't put much pressure on the economy as some of these loans are still on grace period.

4.5.2 Domestic Debt Service and Economic Growth of Sub-Saharan Africa

The results indicate that domestic debt service has significant positive effect on economic growth only in South Africa and significantly negative in Angola, Kenya and Nigeria. Therefore, we conclude that domestic debt service has significant positive effect on economic growth of sub-Saharan African countries. This result is consistent with the a priori expectation that debt service is negatively related with economic growth. The outcome of the study is consistent with the findings of Sheikh, Faridi and Tariq (2010) which employed empirical models to explain the impact of domestic debt on one hand and domestic debt service on economic growth on the other hand, found out that there is an inverse relationship between domestic debt servicing and economic growth.

On the country-specific finding, domestic debt service increases economic growth in South Africa, which is inconsistent with a priori expectation. However, this implies that South African economy is not affected by the much resources that go into servicing of its domestic debt. This means that the country has other sources of revenue through which they grow the economy. By comparison, domestic debt servicing impacts more on growth in South Africa than other countries of sub-Saharan Africa. Besides, the cost of servicing the debt is transferred within the economy domestically.

4.5.3. External Debt and Economic Growth of Sub-Saharan Africa

The generally from the random effect estimation indicates that external debt stock is significantly negative in sub-Saharan Africa which is in line with theoretical expectation. However, on country-

specific finding, external debt stock is significantly positive in Angola and Kenya but negative in both Nigeria and South Africa.

The study found that total external debt (TEXD) has a significant positive effect on economic growth in the sub-Saharan African countries of Angola and Kenya. This results disagree with the findings of Umaru, Hamidu and Musa (2013) that investigated the impact of external debt, and domestic debt on economic growth in Nigeria between 1970-2010 through the application of Ordinary least square method to establish a simple relationship between the variables under study, Augmented Dickey-Fuller technique in testing the unit root property of the series and Granger causality test of causation between GDP, external debt and domestic debt. They found that external debt brought a negative effect while domestic debt impacted positively on economic growth of Nigeria. The study supports the works of Hassan and Mamman (2013) and Egbetunde, (2012) whose empirical results indicate that external debt has a positive effect on economic growth. Their findings suggest that increase in external debt leads to increase in GDP but our study has found a decrease in GDP.

The study found that total external debt has a significant negative effect on gross domestic product in sub-Saharan African countries (Nigeria and South Africa), which is in tandem with a priori expectation. This outcome is in agreement with the study of Reinhart and Rogoff (2010) Reinhart and Rogoff (2010) who empirically examined a threshold effect by collecting annual data on debt and output growth for 20 advanced economies over 1946-2009. And found that high levels of debt are negatively correlated with economic growth, but that there is no link between debt and growth when public debt is below 90 percent of GDP. It also agrees with the study of Fosu (1996) who estimated the effect of external debt on economic growth in 35 countries of Sub-Saharan Africa during the 1980s when the debt was a heavy burden. And concluded that weight/volume of debt also negatively affects the economic growth in Sub-Saharan Africa, by reducing productivity levels.

Furthermore, the study supports the findings of Onyeiwu (2012) and Ayadi and Ayadi (2008), whose work made a comparative study of the impact of external debt on economic growth of Nigerian and South African economies. They revealed that debt and its servicing requirement has

a negative impact on the economic growth of Nigeria and South Africa. The study of Onyeiwu (2012) also affirms that the level of debt has negative effect on economic growth in Nigeria.

4.5.4. External Debt Servicing and Economic Growth of SSA

The results of the study indicate that external debt service has significant effect on economic growth of Angola, Kenya and Nigeria but significant positive effect on economic growth of South Africa. Therefore, the study concludes that external debt service has significantly affect economic growth of sub-Saharan Africa countries positively. The study is consistent with a priori expectation that external debt service is inversely related with economic growth.

The study supports the findings of Lee and Ng (2015) and Mohd, Daud, Ahmad and Azman-Saini (2013) who find that external debt s has a negative impact on the Malaysian economy. They also find that Malaysia's growth in the accumulation of external debt is more the country's economic growth. Pattilo et al (2002), states that a high external debt service will discourage domestic and foreign investments. This is because, in order to pay the principal amount and interest payment, future tax revenue needs to rise or the given tax revenue must be diverted from productive uses, which may hurt economic growth (Lin & Sosin, 2001).

Similarly, external debt service payment has significant positive effect on economic growth of South Africa which is contrary to expectation. The results show that external debt services increase economic growth. The results support the findings of Patenio and Tan-Curz (2007) whose empirical findings indicate positive effect of external debt servicing on economic growth in Philippine. Thus debt servicing may not be really a threat to economic growth in Kenya, but we should be carefully about it since the positive relationship is not significant (Muinga, 2014).

Table 4.15: Summary of Model Variables and Their Degree of Influence on Economic Growth in Sub-Saharan African Countries

S/N	Model Variables	Significance and Positive	Significance and Negative	Insignificance and Positive	Insignificance and Negative	Remarks on Performance of variables in SSA
1	Domestic debt and economic growth	DOM (Angola & Kenya); INF (Nigeria); INT (Nigeria)	DOM (Nigeria)	DOM (South Africa); INF (Angola & South Africa); INT (Angola & South Africa)	INF (Kenya); INT (Kenya)	Domestic debt is a good fiscal tool for SSA region
2	Domestic debt service and economic growth	DOMSERV (South Africa); INF (Nigeria); INT (Nigeria)	DOMSERV (Angola, Kenya, Nigeria)	INF (Angola & Kenya)	INF (South Africa); INT (Angola, Kenya & South Africa)	Reduces growth in SSA region
3	External debt and economic growth	EXDS (Angola & Kenya); EXR (Angola, Kenya & Nigeria)	EXDS (Nigeria & South Africa)	EXR (South Africa); INF (South Africa)	INF (Angola, Kenya & Nigeria)	External debt is a good determinant of growth
4	External debt service and economic growth	EXDSERV (South Africa); EXR (Nigeria)	EXDSERV (Angola, Kenya & Nigeria)	INF (South Africa)	EXR (Angola Kenya & South Africa); INF (Angola, Kenya & Nigeria)	External debt services reduce growth in SSA region

Source: Authors Compilation

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.1. SUMMARY OF FINDINGS

By means of Panel data analysis, the study investigated the unit roots of the variables in the study, random effect pooled data regression was used to analysis the objectives of the study after the Hausman test approved the use of the method, conducted panel regression and heteroscedasticity on the variables used in the study. Based on the hypotheses of the study, the following findings are summarized and presented;

A. Domestic Debt and Economic Growth Model

1. In Angola, it was found out that domestic debt has a significant positive effect on economic growth while inflation and interest rate show insignificant positive effect on economic growth (GDP).
2. For Kenya, it was found out that domestic debt has significant positive effect on economic growth while inflation and interest rate are found to exhibit insignificant negative effect on economic growth.
3. For Nigeria, domestic debt was found to have significant positive effect on economic growth while inflation and interest rate equally have significant positive effect on economic growth in sub-Saharan African countries.
4. Similarly, in South Africa, domestic debt was found to have insignificant and positive effect on economic growth in sub-Saharan African countries. Inflation and interest rate were also found to have insignificant and positive effect on economic growth in the region.

B. Domestic Debt Service and Economic Growth Model

1. In Angola, it was found out that domestic debt service has significant positive effect on economic growth while inflation and interest rate have insignificant positive effect on economic growth.

2. In Kenya, it was found that domestic debt service has significant negative effect on economic growth as postulated while inflation and interest rate both have insignificant and positive effect on economic growth.
3. Domestic debt service was found to have significant negative effect on economic growth in Nigeria, while inflation and interest rate both have significant and positive effect on economic growth.
4. For South Africa, domestic debt service was found to have insignificant and positive effect on economic growth. Inflation was found to have insignificant and negative effect on economic growth whereas interest rate has insignificant but positive effect on economic growth.

C. External Debt and Economic Growth Model

1. Total external debt was found to have significant positive effect on economic growth of Angola. Exchange rate also was found to have significant and positive effect on economic growth whereas inflation has insignificant and negative effect on economic growth of Angola.
2. For Kenya, total external debt was found to have significant and positive effect on economic growth. Exchange rate has significant positive effect on economic growth whereas inflation was found to have insignificant and negative effect on economic growth in Kenya.
3. In the case of Nigeria, total external debt was found to have significant and negative effect on economic growth. Exchange rate has significant positive effect on economic growth whereas inflation was found to have insignificant and negative effect on economic growth in Nigeria.
4. In South Africa, total external debt was found to have significant but negative effect economic growth. Exchange rate and inflation were both found to have insignificant and positive effect on economic growth in South Africa

D. External Debt Service and Economic Growth Model

1. External debt service was found to have significant and negative effect on economic growth in Angola. Exchange rate and inflation both have insignificant and negative effect on economic growth of Angola.
2. In Kenya, external debt service has significant negative effect on economic growth. Both exchange rate and inflation indicated insignificant negative effect on economic growth in Kenya.
3. For Nigeria, external debt service has significant and negative effect on economic growth. Exchange rate has significant positive effect on economic growth whereas inflation has insignificant negative effect on economic growth in Nigeria.
4. In the case of South Africa, external debt service has significant positive effect on economic growth. Exchange rate had insignificant and negative effect on economic growth whereas inflation had insignificant but positive effect on economic growth.

5.2. CONCLUSION

The first objective of the study was to measure the effect of domestic debt on economic growth of sub-Saharan Africa (Angola, Kenya, Nigeria and South Africa). The findings revealed that domestic debt is an important determinant of economic growth such that an increase in change of domestic debt will spur economic growth of the sub-Saharan Africa. Therefore, a one-unit increase in domestic debt will increase economic growth by 1.64 units in Angola and 2.22 units in Kenya. This means that domestic debt has a positive impact on Angola and Kenya's economic growth. Contrarily, increase in domestic debt causes decline in economic growth in Nigeria. Further findings reveal that domestic debt is not significant in South Africa. The impact of domestic debt was indeed very little and as a result was found not to be an important determinant of economic growth in South Africa. This means that domestic debt levels of South Africa are too low for the country to feel their impact on the economy.

The second objective of this study was to ascertain the effect of domestic debt service on economic growth in sub-Saharan Africa. The analysis revealed that domestic debt service is an important determinant of economic growth in sub-Saharan Africa. Domestic debt services

payment impact negatively on economic growth of Kenya and Nigeria. This means that servicing domestic debt crowds-out funding meant for social and capital expenditures in these countries. After debt servicing and salaries, there is little left for core functions of the government, that is, education, health, basic infrastructure, and other essential services to create an enabling environment for the private sector. For Angola and South Africa, domestic debt service impact positively on economic growth. This means that these economies have other revenue generating investment from which these debts are being serviced.

The third objective of the study was to investigate the effect of external debt on economic growth of sub-Saharan Africa. The results showed that external debt is an important determinant of economic growth in sub-Saharan Africa. External debt has negative impact on Nigeria and South Africa's economy. This means that a big portion of the nation's spending is directed to unproductive and growth retarding activities (i.e. recurrent spending). An increase in change of external debt brings about 0.12 and 1.12 percent shrink on economic growth in Nigeria and South Africa. The results further revealed the external contribute positively to economic growth of Angola and Kenya. This means that external debt contracted for these countries are channeled to productive use.

The last objective of the study was to determine the effect of external debt service on economic growth of sub-Saharan Africa. The result indicated that external debt service is an important determinant of economic growth in sub-Saharan Africa. The analysis showed that external debt service has negative impact of economic growth of Angola, Kenya and Nigeria. This means that servicing external debt drains resources that would have been channeled to developmental projects that will generate income that will grow the economy. More so, the adverse effect can be trace to corruption on the part of the leaders of the countries. Furthermore, the study also showed positive impact on South Africa's economic growth. Though, this is contrary to expectation, it goes to show that the country has other revenue generating sources through which they are able to service the debt.

5.3. POLICY RECOMMENDATIONS

Following the conclusions drawn above from the findings of the study which emanated from the random effect estimation and the panel regression test for each hypothesis tested, some divergent results are observed for the sub-Saharan Africa region. Since country-specific data were used, this study therefore makes the following recommendations based on the observed peculiarities in each selected country:

1. Domestic Debt and Economic Growth in Sub-Saharan Africa

Policy makers in sub-Saharan Africa (especially in Nigeria) should adopt policies that will ensure development of the domestic market and financial deepening so as to tap on local resources at reasonable cost. Likewise, government should divest itself of all projects which the private sector can handle including refining crude oil (petroleum product) and transportation but should provide enabling environment for private sector investors such as tax holidays (however, excessive tax holidays should not be encouraged), subsidies, guarantees and most importantly improved infrastructure. The government should ensure that the tax base revenue should be strengthened and all leakages closed.

Government through the management of domestic debt in South Africa, should adopt policies that would benefit the economy by the participation of foreign investors in the domestic debt market. This would promote competition thereby lowering the cost of domestic borrowing, and also increase efficiency in the domestic debt market since foreign participation is expected to introduce financial technology and innovation. The government should also develop a framework for capturing and monitoring non-residents investment in government securities for purposes of improving the monitoring of foreign direct investment in the country.

2. Domestic Debt Service and Economic Growth in Sub-Saharan Africa

The study recommends that government of sub-Saharan African countries should put in place measures to ensure that the domestic economy keep growing by servicing her debt as at when due so every party in the country will be better-off. When debts are serviced as they fall due, there will be no hitches for contacting new ones. In the same vein, governments should institute

and equip a debt management office that will be entrusted with the responsibility of controlling and monitoring earmarked allocation for domestic debt service and ensure penalty for defaulters.

3. External Debt and Economic Growth in Sub-Saharan Africa

The governments of Nigeria and South Africa should ensure that funds that are borrowed from external sources are invested in projects or sectors that would eventually generate enough returns to defray the interest accruing and the principal amount borrowed. These loan can be channeled to the manufacturing sector and adopting advanced technology that will make locally made goods attractive in the international market. In order to achieve this, efforts should be made to ensure that the locally made products are of high standard so as to compete favourably both at internal and external markets as this will enhance exports, discourage imports, and as well, lead to a decline in the country's demand for external debts. Thus, there must be vigorous promotion of the nation's exports through reviving of the agriculture and industrial sector that would absorb the shock in exchange rate and interest rate volatility.

The governments should ensure fiscal prudence, political commitment and macroeconomic stability (such as good fiscal stance, stable exchange rate, lowering interest rate, inflation among others). Borrowed funds from abroad should not be diverted into expenditures on consumables, payment of workers' emoluments, refinancing of previous loans, and unproductive projects. There should be political stability that would spur investor's (both local and foreign) confidence. Likewise, there is the need for government revenue mobilization agencies in these countries to broaden their tax bases devising various strategies to capture untaxed informal sectors into their tax nets and check revenue leakages so as to increase domestic revenue since over-reliance on external financing results in rising debt burden which does not augur well for economic growth

4. External Debt Service and Economic Growth in Sub-Saharan Africa

In view of the negative effect of external debt service on growth of the affected economies, the study recommends that governments should equip their debt management offices to ensure proper arrangement for repayment of the loan(s) within agreeable time. This will curtail the associated leakages from the economy. External loans contracted should be used only for productive investment of highest priorities including basic infrastructural developments that

would help in yielding returns as well mitigate the crowding out effect of debt service on investment that inhibits growth. This would help in deriving enough resources for external debt servicing so that the country's external debt situation does not lead to debt overhang.

5.4. Contribution to Knowledge

Several contributions emerge from this research. First, according to Mesghena (2005), that for analysis to be valid with pooled data, the countries must be grouped by size, geography, or economic structure, otherwise such analysis will produce inconsistent results. This has brought about criticisms against cross-sectional studies on countries. This study further contributed to knowledge by adopting country-specific data approach in its analysis to avoid the occurrence of this type of phenomenon. In view of this, country-specific recommendations were made in this study.

Second, most studies on debt and economic growth have been on a one-sided area of debt, on a particular country and the periods of their study were old. It is either these studies are done mostly on external debt (Ezeabasili et al, 2011; Ogumuyiwa, 2011, etc.) or on domestic debt (Nduka & Achugbu, 2014; Onyeiwu, 2012) which may not reflect the true position of a region's debt profile. To the best of the researcher's knowledge, this is one of the first studies to empirically examine the effect of public debt on economic growth of sub-Saharan Africa through domestic debt and external debt structure, selecting one country from each of the four regions to empirically carry out an in-depth study. The study further contributed to knowledge by extending the period of study to 2015.

Third, on methodology, this empirical study has succeeded in incorporating more sophisticated estimating tools, fixed and random effect model using a pooled data to examine the interplay between public debt and economic growth in the sub-Saharan Africa, while two different models were employed and hence establish the fact that public debt responds to growth of the sub-Saharan African countries in a multidimensional or symbiotic manner.

Fourth, the study modified some models developed in previous studies to reflect the present situation of sub-Saharan Africa. The model developed by Obademi (2012) as $GDP = f(EXD, DDB, TDB, BDF, U)$ has been modified as $GDP = f(DOM, INT, INF)$; (ii) The model developed

by Kasidi & Said (2013) as $GDP = f(ED, DS)$ was modified to incorporate EXR, INF as $GDP = f(EXDS, EXR, INF)$ and $GDP = f(EXSERV, EXR, INF)$, thus reflecting each specific variable for the study differently.

5.4. Suggested Area for Future Research

Future research should address the limitation of this study. Several extensions to this study are possible. First, we focused only on eight countries as sample size (that is two each from the four regions) as representing sub-Saharan Africa to empirically examine the effect of public debt in the regions. Notwithstanding how robust the results from these selected countries may be, yet it may not reflect a true and comprehensive stand of the region. Therefore, increasing the number of countries, period of study and adding more variables like tax, subsidies, workers' remittances, school enrolment, population growth, and inflation could be considered.

Second, future research can be carried out to study an in-depth analysis on a comparative basis: inter-regional basis (comparative analyses between countries of the same region) or intra-region basis (between one region and another).

Third, research in the future could look at what causes what between public debt and economic growth in sub-Saharan Africa. To find out whether it is public debt that actually causes economic growth in sub-Saharan Africa or economic growth causes public debt so as to know where and how government policy can be directed.

Fourth, a further study can examine the decomposition of the two types of public debt (domestic and external). For external debt, bilateral and multinational debt structure; for domestic debt, Central Banks, Commercial Banks, Merchant Banks, Sinking Fund and Non-Bank Public; to ascertain which component of the debt actually influence growth more than others in sub-Saharan Africa.

Fifth, future research can examine whether there is nonlinear effect on the relationship between public debt and economic growth sub-Saharan Africa. The study can be carried out using the sources of growth based on debt overhang concept.

A much larger data set and the employment of different methodologies, which capture the impact of maturity structure, interest rate and currency composition of debt, could facilitate further research on the subject area.

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APPENDICES

Appendix 1: Variables for ANGOLA

S/N	YEAR	GDP GR	TDDS	DOMSERV	TEXDS	EXDSERV	EXR	INT	INF
1	1986	2.8	23.7864				2.99E-08		-2.723
2	1987	7.9	23				2.99E-08		-7.322
3	1988	5.6	22				2.99E-08		-5.303
4	1989	0.4	19.33333	3.416158	109	3.978	2.99E-08		29.402
5	1990	-0.3	17.33333	3.967918	128.5	4.876	2.99E-08		0.301
6	1991	-1.2	7.125	3.942867	70.8	3.662	5.51E-08		169.906
7	1992	-6.9	7.692308	7.084859	158.1	7.017	2.51E-07		249.087
8	1993	-24.7	17.47212	4.770883	170.4	4.774	2.66E-06		1,273.99
9	1994	3.5	5.707836	13.33458	226.4	13.335	5.95E-05		2,127.61
10	1995	10.4	4.706485	12.58101	316.4	12.68	0.00275023	-84.651616	1,895.32
11	1996	11.2	2.447896	16.90061	179.3	16.937	0.128029167	-94.219936	5,399.51
12	1997	7.9	5.972251	15.81838	155.6	15.818	0.229040083	-29.111618	94.32
13	1998	6.8	2.641992	29.29203	206.2	29.292	0.392823518	7.1559281	35.317
14	1999	3.2	17.33469	30.589	226.3	30.589	2.790706167	-72.555048	556.939
15	2000	3	6.392603	23.1031	131.1	23.103	10.04054417	-60.797519	418.233
16	2001	4.2	4.524354	30.3599	119	30.36	22.05786167	-5.0192936	106.322
17	2002	-6.9	3.510235	13.34937	83.9	13.349	43.53020667	-18.617079	196.577
18	2003	5.2	4.722134	11.94485	73	11.945	74.60630083	6.0731999	84.887
19	2004	10.9	4.162413	10.98699	57	10.987	83.5413625	30.431597	39.793
20	2005	18.3	4.834842	10.78999	50.5	10.802	87.15914167	32.252741	26.816
21	2006	20.7	4.714845	12.50223	27.8	12.436	80.36807206	5.7233504	13.041
22	2007	22.6	3.362232	8.531797	22.6	8.50	76.70614275	4.5129794	12.616
23	2008	13.8	3.758215	2.321875	22	2.32	75.03335417	-5.9724793	19.682
24	2009	2.4	4.386129	5.204528	24.8	5.18	79.32816667	24.952013	-7.419
25	2010	3.4	4.244884	3.124322	22.8	3.11	91.90572034	0.1222772	22.394
26	2011	3.9	3.495619	3.063613	20.4	3.02	93.93475	-4.3569502	24.167
27	2012	5.2	3.593358	4.07874	20.5	4.09	95.46795542	8.9531737	7.07
28	2013	6.8	4.905443	4.338787	22.7	4.37	96.51827948	13.645883	2.505
29	2014	4.8	5.210188	24.97735	25.3	5.62	98.30241686	12.188511	-1.37
30	2015	3	5.654835	23.34553	31.10	6.00	98.76543234	10.864532	10.3

Source: World Development Indicator (World Bank), 2016

Appendix 2: Variables for KENYA

S/N	YEAR	GDP GR	TDDS	DOMSERV	TEXDS	EXDSERV	EXR	INT	INF
1	1986	7.1775554	2.7754	9.676828568	65.769955	9.68	16.22574167	4.864495047	8.712
2	1987	5.9371074	2.98543	8.989552809	75.201364	8.99	16.45449167	8.157389639	5.402
3	1988	6.2031838	3.0033629	9.183943078	72.334199	9.18	17.7471	8.026232316	6.456
4	1989	4.6903488	2.7599101	8.817651346	73.258854	8.82	20.57246667	6.815211935	9.769
5	1990	4.192051	2.8750172	9.636959432	85.974607	9.64	22.91476667	7.332797069	10.637
6	1991	1.4383468	2.3542784	9.248918634	95.828855	9.25	27.50786667	5.745512647	12.532
7	1992	-0.799494	1.9007692	8.532971905	87.823394	8.53	32.21683333	1.825329186	18.897
8	1993	0.3531973	1.8377675	11.7217004	131.89936	11.72	58.00133333	3.413472407	25.698
9	1994	2.6327845	1.6414255	12.98749096	104.98961	12.99	56.050575	16.42810989	17.016
10	1995	4.4062165	1.6481435	10.36455753	83.761776	10.37	51.42983333	15.80164834	11.221
11	1996	4.1468393	1.4179547	7.087267126	57.646186	7.09	57.11486667	-5.77658854	41.989
12	1997	0.4749019	1.3406369	5.07409892	49.949041	5.07	58.73184167	16.87956849	11.435
13	1998	3.2902137	1.2201222	4.745299674	48.868757	4.75	60.3667	21.09632603	6.931
14	1999	2.3053886	1.1780212	5.459095827	51.290027	5.46	70.32621667	17.45404878	4.194
15	2000	0.5996954	1.3032671	4.714503382	49.214644	4.72	76.17554167	15.32743345	6.08
16	2001	3.7799065	1.5044289	3.781436399	43.356213	3.78	78.563195	17.81250097	1.573
17	2002	0.5468595	1.6268533	4.077541525	47.422128	4.08	78.74914167	17.35814064	0.933
18	2003	2.9324755	1.6500969	3.938747351	46.970625	3.94	75.93556944	9.770510928	6.197
19	2004	5.1042998	1.6141828	2.239147584	43.730683	2.25	79.17387606	5.045257596	7.127
20	2005	5.9066661	1.6906885	2.881382357	34.609216	2.89	75.55410945	7.609987548	4.9
21	2006	6.3306328	1.4551774	1.670047028	25.9	1.67	72.10083502	-8.1324325	23.53
22	2007	6.9932852	1.5479125	1.433814717	23.7	1.436	67.31763812	4.958935652	8.129
23	2008	0.2322827	1.6158503	1.14977083	21.4	1.152	69.17531982	-0.98499697	15.151
24	2009	3.3069398	1.561448	1.047690394	23.1	1.051	77.3520123	2.837078161	11.637
25	2010	8.4022771	1.5551379	1.005281696	22.2	1.008	79.2331517	12.025898	2.094
26	2011	6.1116135	1.5414188	1.040251706	24.2	1.043	88.81076997	3.840675702	10.792
27	2012	4.5549124	1.6664746	1.134166445	23.7	1.172	84.52960176	9.453556297	9.383
28	2013	5.6872313	1.5666269	1.128226395	24.5	1.169	86.1228789	11.67670729	5.366
29	2014	5.3280578	1.3440912	1.0125654	27.4	2.02	87.92216381	8.362867165	7.994
30	2015	5.6	1.4236464	1.1423178	30.40	1.157	98.178	6.362	6.6

Source: World Development Indicator (World Bank), 2016

Appendix 3: Variables for NIGERIA

S/N	YEAR	GDP GR	TDDS	DOMSERV	TEXDS	EXDSERV	EXR	INT	INF
1	1986	-8.75417698	8.57465	10.62709744	25.574	10.627	1.754523004	-1.49676131	11.63
2	1987	-10.7517001	8.77686	5.099037325	28.316	5.099	4.016037344	-31.9218172	63.398
3	1988	7.54252203	8.78565	9.711178733	30.693	9.71	4.536966667	-5.12928467	22.922
4	1989	6.46719114	6.15027	9.561868599	31.586	9.562	7.364735	-16.9599606	45.04
5	1990	12.7660092	9.34357	11.96841781	33.099	11.968	8.038285	14.64820819	9.291
6	1991	-0.61785059	11.91232	11.80890929	33.73	11.809	9.909491667	2.072104493	17.605
7	1992	0.43372536	9.05155	9.162958334	27.5648	9.163	17.298425	-25.7670094	68.063
8	1993	2.0903778	12.10011	11.09153314	28.7182	11.092	22.0654	4.374451184	26.132
9	1994	0.90976334	18.6229	11.89633904	29.42886	11.896	21.996	-8.03440845	31.009
10	1995	-0.30746897	21.82819	6.962237404	32.5848	6.962	21.89525833	-43.5726628	113.076
11	1996	4.99370554	19.18915	6.803501856	28.06	6.804	21.884425	-9.71197375	32.727
12	1997	2.80225644	22.92559	4.215709789	27.0878	4.216	21.88605	16.61355048	1.013
13	1998	2.71564018	25.62038	4.565022452	28.77354	4.565	21.886	25.28226568	-5.666
14	1999	0.47423758	8.09375	4.5921368	28.03921		92.3381	2.767926713	17.05
15	2000	5.31809338	8.16223	4.609622109	28.27368	4.61	101.6973333	-10.319763	35.23
16	2001	4.4110652	8.96407	6.304022028	28.347	6.304	111.23125	23.83785487	-0.323
17	2002	3.78464818	9.18834	2.785546489	30.99187	2.786	120.5781583	-10.8121418	39.897
18	2003	10.3541846	9.70569	2.719082264	32.91681	2.719	129.22235	8.613594343	11.141
19	2004	33.735775	10.31483	2.193052582	35.94466	2.193	132.888025	19.36913623	-0.158
20	2005	3.44466681	11.71162	8.906769565	20.47797	8.907	131.2743333	-3.34037277	22.024
21	2006	8.21096486	21.25164	4.766161629	3.54449	4.766	128.6516667	-0.37309511	17.338
22	2007	6.82839835	34.99172	0.653608983	3.65421	0.65	125.8081083	11.6143345	4.771
23	2008	6.2702637	17.50385	0.214026638	3.72036	0.356	118.5460167	4.190483705	10.835
24	2009	6.934416	21.51377	0.263468989	3.9473	0.489	148.9017417	23.70649656	-4.321
25	2010	7.83973948	30.21221	0.083579904	4.57877	0.36	150.298025	-42.3101829	103.823
26	2011	4.88738661	35.52691	0.090331988	5.66656	0.136	153.8616083	5.941525553	9.51
27	2012	4.27927731	41.96916	0.068682119	6.52707	0.31	157.4994258	6.883105755	9.271
28	2013	5.39441631	45.72241	0.097471665	8.8219	0.103	157.311225	10.24734736	5.873
29	2014	6.30971825	58.01483	0.414718777	9.71145	0.86	158.5526417	11.35621215	4.663
30	2015	2.7	54.91142	0.4597852	9.464	0.31	192.441	13.956	9

Source: World Development Indicator (World Bank), 2016

Appendix 4: Variables for SOUTH AFRICA

S/N	YEAR	GDP GR	TDDS	DOMSERV	TEXDS	EXDSERV	EXR	INT	INF
1	1986	0.017786895	4.75643				2.285031666	-2.3307335	17.062
2	1987	2.100777788	4.678534				2.036033333	-1.74458491	14.498
3	1988	4.200042663	4.623759098				2.2734675	0.130334477	15.183
4	1989	2.394859815	4.357884736				2.6226775	2.195600281	17.259
5	1990	-0.317783203	3.896351664				2.587320833	4.742400733	15.522
6	1991	-1.018308015	3.222633762				2.761315	3.962334598	15.727
7	1992	-2.137041716	2.817650495				2.852014167	3.783397094	14.571
8	1993	1.233613398	2.423019788				3.267741583	-0.26886473	16.471
9	1994	3.199999999	2.489104258	2.112771372	16.25046259	2.113	3.550798333	5.49683051	9.561
10	1995	3.100000005	2.117864731	2.22216351	17.10623658	2.222	3.627085	6.970414424	10.213
11	1996	4.299999997	1.75587799	2.931864868	18.525118	2.932	4.299349167	10.76408751	7.906
12	1997	2.600000002	1.582134829	4.379655285	20.65473299	4.38	4.607961667	11.12432938	7.986
13	1998	0.499999997	1.383163366	3.261408832	18.89592312	3.261	5.528284167	12.99255332	7.787
14	1999	2.400000005	1.272053724	3.226435223	18.8780989	3.226	6.109484167	10.2517035	7.028
15	2000	4.199999997	1.387289781	2.927175706	19.61049752	2.927	6.939828333	5.242528076	8.796
16	2001	2.700000003	1.483163339	3.702743066	21.44336038	3.703	8.609180833	5.693978316	7.642
17	2002	3.700374403	1.529310408	4.529549096	31.13383757	4.53	10.54074667	3.159022767	12.205
18	2003	2.949075466	1.468811665	2.459225431	22.69941612	2.459	7.564749167	8.662840201	5.974
19	2004	4.554559908	1.355727761	1.743112206	20.10531404	1.743	6.4596925	4.472619704	6.527
20	2005	5.277051971	1.383769392	1.845905205	18.47774979	1.846	6.359328333	4.908467702	5.449
21	2006	5.585045962	1.290746292	2.777902023	23.2077745	2.778	6.771549167	4.603671469	6.274
22	2007	5.360474053	1.177517826	1.295598911	26.34884884	1.47	7.045365	3.966380361	8.849
23	2008	3.191043888	1.145843272	2.57710645	26.75974626	2.72	8.261223333	5.78272573	8.832
24	2009	-1.538089135	1.214002102	1.601315874	29.28304177	1.81	8.473674158	3.910367979	7.505
25	2010	3.039747085	1.115808113	1.614933946	29.92637097	1.73	7.321221961	3.274351596	6.351
26	2011	3.212451755	1.10278667	1.462680034	29.41764819	1.55	7.261132132	2.201760863	6.532
27	2012	2.219824006	1.129775292	2.511162526	38.79213115	2.52	8.209968627	3.068624022	5.287
28	2013	2.212354431	1.12947141	2.701286949	40.74214497	3.56	9.655056069	2.372363812	6.588
29	2014	1.524842816	1.113878429	2.2675432	41.438	2.28	10.85265557	3.13933574	5.701
30	2015	1.3	1.8121176	2.1047523	45.219	2.62	12.759	5.252	4.6

Source: World Development Indicator (World Bank), 2016

APPENDIX 5: Panel Regression (Random Effect) for Model 1

Dependent Variable: GDP?
 Method: Pooled Least Squares
 Date: 02/03/17 Time: 10:40
 Sample: 1986 2015
 Included observations: 30
 Cross-sections included: 4
 Total pool (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.385249	0.937958	3.609168	0.0005
DOM?	-1.101393	0.487224	-2.260529	0.0135
INF?	-0.000147	0.000713	-0.205592	0.8375
INT?	0.100892	0.037124	2.717696	0.0076
Fixed Effects (Cross)				
_ANG--C	-0.168421			
_KENYA--C	-0.182451			
_NIG--C	1.544469			
_SA--C	-1.193596			

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.103621	Mean dependent var	3.729610
Adjusted R-squared	0.054279	S.D. dependent var	4.228093
S.E. of regression	4.111744	Akaike info criterion	5.724019
Sum squared resid	1842.802	Schwarz criterion	5.890184
Log likelihood	-324.9931	Hannan-Quinn criter.	5.791473
F-statistic	2.100055	Durbin-Watson stat	1.366348
Prob(F-statistic)	0.058935		

Dependent Variable: GDP?
 Method: Pooled EGLS (Cross-section random effects)
 Date: 02/03/17 Time: 10:41
 Sample: 1986 2015
 Included observations: 30
 Cross-sections included: 4
 Total pool (balanced) observations: 120
 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.351774	0.782833	5.559009	0.0000
DOM?	-1.634744	0.405666	-4.029778	0.0001
INF?	-0.000216	0.000669	-0.323225	0.7471
INT?	0.085496	0.034765	2.459246	0.0155
Random Effects (Cross)				
_ANG--C	2.10E-15			
_KENYA--C	-2.09E-15			
_NIG--C	3.50E-14			
_SA--C	-3.50E-14			

Effects Specification		
	S.D.	Rho
Cross-section random	1.44E-07	0.0000
Idiosyncratic random	4.111744	1.0000

Weighted Statistics			
R-squared	0.065833	Mean dependent var	3.729610
Adjusted R-squared	0.040811	S.D. dependent var	4.228093
S.E. of regression	4.140918	Sum squared resid	1920.487
F-statistic	2.630982	Durbin-Watson stat	1.306433
Prob(F-statistic)	0.053564		

Unweighted Statistics			
R-squared	0.065833	Mean dependent var	3.729610
Sum squared resid	1920.487	Durbin-Watson stat	1.306433

Correlated Random Effects - Hausman Test

Pool: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	4.594984	3	0.2040

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
DOM?	-0.101393	-0.634744	0.072822	0.0481
INF?	-0.000147	-0.000216	0.000000	0.7789
INT?	0.100892	0.085496	0.000170	0.2371

Dependent Variable: GDP?

Method: Pooled Least Squares

Date: 02/03/17 Time: 10:39

Sample: 1986 2015

Included observations: 30

Cross-sections included: 4

Total pool (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
_ANG--DOM_ANG	1.641047	0.503616	3.258527	0.0015
_KENYA--DOM_KENYA	2.219698	0.825728	2.688170	0.0084
_NIG--DOM_NIG	-4.677452	2.149164	-2.176405	0.0318
_SA--DOM_SA	0.082683	1.283494	0.064420	0.9488
_ANG--INF_ANG	0.000158	0.000656	0.240545	0.8104

_KENYA--INF_KENYA	-0.023434	0.086848	-0.269829	0.7878
_NIG--INF_NIG	0.343306	0.068730	4.995003	0.0000
_SA--INF_SA	0.080566	0.315301	0.255522	0.7988
_ANG--INT_ANG	0.023927	0.093067	0.257096	0.7976
_KENYA--INT_KENYA	-0.008314	0.101135	-0.082211	0.9346
_NIG--INT_NIG	0.696008	0.118559	5.870568	0.0000
_SA--INT_SA	0.248502	0.172554	1.440137	0.1528
R-squared	0.206745	Mean dependent var		3.729610
Adjusted R-squared	0.122843	S.D. dependent var		4.228093
S.E. of regression	3.959892	Akaike info criterion		5.688008
Sum squared resid	1630.797	Schwarz criterion		5.972862
Log likelihood	-317.9044	Hannan-Quinn criter.		5.803642
Durbin-Watson stat	1.499703			

	_ANG	_KENYA	_NIG	_SA
_ANG	5.851799	4.581294	0.658455	1.540090
_KENYA	4.581294	4.853948	0.159999	1.117615
_NIG	0.658455	0.159999	43.06781	3.391526
_SA	1.540090	1.117615	3.391526	3.628364

APPENDIX 6: Panel Regression (Random Effect) for Model 2

Dependent Variable: GDP?
 Method: Pooled Least Squares
 Date: 02/03/17 Time: 10:52
 Sample: 1986 2015
 Included observations: 30
 Cross-sections included: 4
 Total pool (unbalanced) observations: 105

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.538840	0.694012	6.540000	0.0000
DOMSERV?	-0.220109	0.102952	-2.137967	0.0350
INT?	0.098895	0.037591	2.630854	0.0099
INF?	1.151077	0.510722	2.253823	0.0236
Fixed Effects (Cross)				
_ANG--C	-0.255023			
_KENYA--C	-0.355556			
_NIG--C	1.632786			
_SA--C	-1.418339			

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.127944	Mean dependent var	3.988892
Adjusted R-squared	0.074553	S.D. dependent var	4.310933
S.E. of regression	4.147125	Akaike info criterion	5.747048
Sum squared resid	1685.467	Schwarz criterion	5.923979
Log likelihood	-294.7200	Hannan-Quinn criter.	5.818744
F-statistic	2.396352	Durbin-Watson stat	1.425880
Prob(F-statistic)	0.033357		

Dependent Variable: GDP?
 Method: Pooled EGLS (Cross-section random effects)
 Date: 02/03/17 Time: 10:52
 Sample: 1986 2015
 Included observations: 30
 Cross-sections included: 4
 Total pool (unbalanced) observations: 105
 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.497552	0.668660	6.726215	0.0000
DOMSERV?	-1.180787	0.198929	-5.935721	0.0000
INT?	0.073737	0.035197	2.094980	0.0387
INF?	-1.143405	0.100687	-0.063195	0.9497
Random Effects (Cross)				
_ANG--C	0.000000			
_KENYA--C	0.000000			
_NIG--C	0.000000			
_SA--C	0.000000			

Effects Specification		
	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	4.147125	1.0000

Weighted Statistics			
R-squared	0.071806	Mean dependent var	3.988892
Adjusted R-squared	0.044236	S.D. dependent var	4.310933
S.E. of regression	4.214506	Sum squared resid	1793.968
F-statistic	2.604484	Durbin-Watson stat	1.355549
Prob(F-statistic)	0.055966		

Unweighted Statistics			
R-squared	0.071806	Mean dependent var	3.988892
Sum squared resid	1793.968	Durbin-Watson stat	1.355549

Correlated Random Effects - Hausman Test

Pool: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.308696	3	0.0975

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
DOMSERV?	-0.220109	-0.180787	0.000812	0.1676
INT?	0.098895	0.073737	0.000174	0.0567
INF?	0.000088	-0.000043	0.000000	0.5563

Dependent Variable: GDP?

Method: Pooled Least Squares

Date: 02/03/17 Time: 10:53

Sample: 1986 2015

Included observations: 30

Cross-sections included: 4

Total pool (unbalanced) observations: 105

Variable	Coefficient	Std. Error	t-Statistic	Prob.
_ANG--DOMSERV_ANG	1.178849	0.147294	8.003374	0.0000
_KENYA--DOMSERV_KENYA	-1.014246	0.254857	-3.979667	0.0000
_NIG--DOMSERV_NIG	-1.304383	0.180425	-7.229503	0.0000

_SA--DOMSERV_SA	2.168123	1.040107	2.084519	0.0356
_ANG--INT_ANG	0.155757	0.098148	1.586957	0.1159
_KENYA--INT_KENYA	0.181809	0.107217	1.695716	0.0933
_NIG--INT_NIG	0.561586	0.082779	6.784159	0.0000
_SA--INT_SA	-0.031797	0.349823	-0.090894	0.9278
_ANG--INF_ANG	0.000256	0.000774	0.330616	0.7417
_KENYA--INF_KENYA	0.152123	0.096978	1.568640	0.1201
_NIG--INF_NIG	0.270720	0.047301	5.723283	0.0000
_SA--INF_SA	0.392866	0.404582	0.971041	0.3340
<hr/>				
R-squared	0.072266	Mean dependent var	3.988892	
Adjusted R-squared	-0.037466	S.D. dependent var	4.310933	
S.E. of regression	4.390947	Akaike info criterion	5.904177	
Sum squared resid	1793.078	Schwarz criterion	6.207487	
Log likelihood	-297.9693	Hannan-Quinn criter.	6.027084	
Durbin-Watson stat	1.289738			
<hr/>				

	_ANG	_KENYA	_NIG	_SA
_ANG	7.450125	6.915252	0.416531	1.076806
_KENYA	6.915252	7.197403	0.166718	1.158927
_NIG	0.416531	0.166718	41.97807	1.878741
_SA	1.076806	1.158927	1.878741	2.941770

APPENDIX 7: Panel Regression (Random Effect) for Model 3

Dependent Variable: GDP?
 Method: Pooled Least Squares
 Date: 02/03/17 Time: 10:55
 Sample: 1986 2015
 Included observations: 30
 Cross-sections included: 4
 Total pool (unbalanced) observations: 105

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.038160	1.956032	2.064465	0.0416
TEDS?	-2.021309	1.007946	-2.005374	0.0449
EXR?	0.020803	0.019190	1.084015	0.2810
INF?	-1.023005	0.100718	-10.15712	0.0034
Fixed Effects (Cross)				
_ANG--C	-0.256225			
_KENYA--C	-0.240090			
_NIG--C	0.919533			
_SA--C	-0.521714			

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.140489	Mean dependent var	3.979543
Adjusted R-squared	0.087865	S.D. dependent var	4.306914
S.E. of regression	4.113350	Akaike info criterion	5.730693
Sum squared resid	1658.126	Schwarz criterion	5.907624
Log likelihood	-293.8614	Hannan-Quinn criter.	5.802389
F-statistic	2.669710	Durbin-Watson stat	1.620729
Prob(F-statistic)	0.019245		

Dependent Variable: GDP?
 Method: Pooled EGLS (Cross-section random effects)
 Date: 02/03/17 Time: 10:55
 Sample: 1986 2015
 Included observations: 30
 Cross-sections included: 4
 Total pool (unbalanced) observations: 105
 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.181362	1.013535	3.138879	0.0022
TEDS?	-1.013261	0.210395	-4.815993	0.0005
EXR?	0.028812	0.010167	2.833758	0.0056
INF?	-0.000243	0.000675	-0.359670	0.7198
Random Effects (Cross)				
_ANG--C	-7.58E-16			
_KENYA--C	-8.86E-16			
_NIG--C	1.46E-15			
_SA--C	1.69E-16			

Effects Specification		
	S.D.	Rho
Cross-section random	4.01E-08	0.0000
Idiosyncratic random	4.113350	1.0000

Weighted Statistics			
R-squared	0.131764	Mean dependent var	3.979543
Adjusted R-squared	0.105975	S.D. dependent var	4.306914
S.E. of regression	4.072313	Sum squared resid	1674.957
F-statistic	5.109263	Durbin-Watson stat	1.601617
Prob(F-statistic)	0.002477		

Unweighted Statistics			
R-squared	0.131764	Mean dependent var	3.979543
Sum squared resid	1674.957	Durbin-Watson stat	1.601617

Correlated Random Effects - Hausman Test

Pool: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.994781	3	0.8025

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
TEDS?	-0.021309	-0.013261	0.000214	0.5822
EXR?	0.020803	0.028812	0.000265	0.6227
INF?	-0.000096	-0.000243	0.000000	0.5485

Dependent Variable: GDP?

Method: Pooled Least Squares

Date: 02/03/17 Time: 10:56

Sample: 1986 2015

Included observations: 30

Cross-sections included: 4

Total pool (unbalanced) observations: 105

Variable	Coefficient	Std. Error	t-Statistic	Prob.
_ANG--TEDS_ANG	0.119196	0.019473	6.121091	0.0000
_KENYA--TEDS_KENYA	0.117398	0.022810	5.146777	0.0000
_NIG--TEDS_NIG	0.118531	0.010215	11.60362	0.0000

_SA--TEDS_SA	-1.115953	0.203074	-5.495302	0.0006
_ANG--EXR_ANG	0.042772	0.017246	2.480084	0.0149
_KENYA--EXR_KENYA	0.046015	0.018349	2.507735	0.0139
_NIG--EXR_NIG	0.063376	0.009061	6.994410	0.0000
_SA--EXR_SA	0.146056	0.785118	0.186031	0.8528
_ANG--INF_ANG	-0.000252	0.000756	-0.332676	0.7401
_KENYA--INF_KENYA	-0.014348	0.100456	-0.142829	0.8867
_NIG--INF_NIG	-0.052344	0.027450	-1.906882	0.0596
_SA--INF_SA	0.315397	0.352193	0.895521	0.3728

R-squared	0.150237	Mean dependent var	3.979543
Adjusted R-squared	0.049728	S.D. dependent var	4.306914
S.E. of regression	4.198462	Akaike info criterion	5.814524
Sum squared resid	1639.319	Schwarz criterion	6.117834
Log likelihood	-293.2625	Hannan-Quinn criter.	5.937431
Durbin-Watson stat	1.579890		

	_ANG	_KENYA	_NIG	_SA
_ANG	7.187422	7.148577	0.526048	1.194352
_KENYA	7.148577	7.262556	0.467676	1.165970
_NIG	0.526048	0.467676	43.01752	2.331021
_SA	1.194352	1.165970	2.331021	2.939829

APPENDIX 8: Panel Regression (Random Effect) for Model 4

Dependent Variable: GDP?
 Method: Pooled Least Squares
 Date: 02/03/17 Time: 10:56
 Sample (adjusted): 1986 2015
 Included observations: 30 after adjustments
 Cross-sections included: 4
 Total pool (unbalanced) observations: 105

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.703471	0.998542	1.705959	0.0912
EXDSERV?	8.41E-11	3.29E-10	0.255611	0.7988
EXR?	0.039231	0.011565	3.392343	0.0010
INF?	-0.000275	0.000722	-0.381269	0.7038
Fixed Effects (Cross)				
_ANG--C	-0.127945			
_KENYA--C	-0.250592			
_NIG--C	-0.137034			
_SA--C	0.721800			

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.121913	Mean dependent var	3.933624
Adjusted R-squared	0.067599	S.D. dependent var	4.339246
S.E. of regression	4.190016	Akaike info criterion	5.768222
Sum squared resid	1702.955	Schwarz criterion	5.946209
Log likelihood	-292.9475	Hannan-Quinn criter.	5.840330
F-statistic	2.244576	Durbin-Watson stat	1.598859
Prob(F-statistic)	0.045207		

Dependent Variable: GDP?
 Method: Pooled EGLS (Cross-section random effects)
 Date: 02/03/17 Time: 10:57
 Sample (adjusted): 1986 2014
 Included observations: 29 after adjustments
 Cross-sections included: 4
 Total pool (unbalanced) observations: 104
 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.602598	0.909482	1.762101	0.0811
EXDSERV?	1.911451	0.208110	9.184811	0.0000
EXR?	0.037195	0.010418	3.570357	0.0005
INF?	-0.000277	0.000686	-0.404146	0.6870
Random Effects (Cross)				
_ANG--C	0.000000			
_KENYA--C	0.000000			
_NIG--C	0.000000			
_SA--C	0.000000			

Effects Specification		
	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	4.190016	1.0000

Weighted Statistics			
R-squared	0.119599	Mean dependent var	3.933624
Adjusted R-squared	0.093187	S.D. dependent var	4.339246
S.E. of regression	4.132122	Sum squared resid	1707.444
F-statistic	4.528190	Durbin-Watson stat	1.618718
Prob(F-statistic)	0.005089		

Unweighted Statistics			
R-squared	0.119599	Mean dependent var	3.933624
Sum squared resid	1707.444	Durbin-Watson stat	1.618718

Correlated Random Effects - Hausman Test

Pool: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.255688	3	0.9681

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
EXDSERV?	0.000000	0.000000	0.000000	0.6607
EXR?	0.039231	0.037195	0.000025	0.6851
INF?	-0.000275	-0.000277	0.000000	0.9929

Dependent Variable: GDP?

Method: Pooled Least Squares

Date: 02/03/17 Time: 10:58

Sample (adjusted): 1986 2014

Included observations: 29 after adjustments

Cross-sections included: 4

Total pool (unbalanced) observations: 104

Variable	Coefficient	Std. Error	t-Statistic	Prob.
_ANG--EXDSERV_ANG	-1.041409	0.261009	-3.989935	0.0015
_KENYA--EXDSERV_KENYA	-1.433009	0.292009	-4.907414	0.0006
_NIG--EXDSERV_NIG	-1.045110	0.375510	-2.783175	0.0231
_SA--EXDSERV_SA	1.116510	0.155110	7.198182	0.0000

_ANG--EXR_ANG	-0.024187	0.023953	-1.009786	0.3152
_KENYA--EXR_KENYA	-0.027082	0.023718	-1.141855	0.2565
_NIG--EXR_NIG	0.056512	0.010017	5.641856	0.0000
_SA--EXR_SA	-0.035532	0.577898	-0.061485	0.9511
_ANG--INF_ANG	-0.000500	0.000777	-0.642760	0.5220
_KENYA--INF_KENYA	-0.051312	0.099083	-0.517876	0.6058
_NIG--INF_NIG	-0.032831	0.023699	-1.385322	0.1693
_SA--INF_SA	0.316394	0.352650	0.897189	0.3720
R-squared	0.156827	Mean dependent var	3.933624	
Adjusted R-squared	0.056013	S.D. dependent var	4.339246	
S.E. of regression	4.215968	Akaike info criterion	5.823802	
Sum squared resid	1635.243	Schwarz criterion	6.128924	
Log likelihood	-290.8377	Hannan-Quinn criter.	5.947416	
Durbin-Watson stat	1.692284			

	_ANG	_KENYA	_NIG	_SA
_ANG	6.381654	6.351509	0.441790	1.209807
_KENYA	6.351509	6.473484	0.476008	1.217170
_NIG	0.441790	0.476008	43.49966	1.677502
_SA	1.209807	1.217170	1.677502	2.865455

APPENDIX 9: DESCRIPTIVE STATISTICS

Table 4.1: Descriptive Statistics of the Variables

	GDP?	DOM?	INT?	DOMSERV?	TEDS?	EXDSERV?	EXR?	INF?
Mean	3.967210	1.462022	5.435828	4.899514	55.64412	1.89E+09	53.38266	135.3521
Median	4.146839	1.468812	5.782726	3.938747	46.97062	7.19E+08	57.11487	10.21300
Maximum	33.73578	3.003363	25.28227	12.98749	228.6423	9.71E+09	157.4994	5399.507
Minimum	-10.75170	0.469695	-43.57266	0.068682	2.062688	2.92E+08	1.754523	-7.419000
Std. Dev.	4.346859	0.632706	11.64158	3.701707	42.64432	2.19E+09	43.22527	608.0093
Skewness	2.586288	0.763282	-1.807777	0.579036	1.425474	1.853644	0.641526	7.041202
Kurtosis	24.21419	3.377681	8.229658	2.036531	5.635561	5.855173	2.537851	57.59258
Jarque-Bera	2046.256	10.61347	173.4758	9.739525	64.69294	93.97033	7.981667	13641.77
Probability	0.000000	0.004958	0.000000	0.007675	0.000000	0.000000	0.018484	0.000000
Sum	408.6226	150.5882	559.8903	504.6499	5731.345	1.95E+11	5498.414	13941.26
Sum Sq. Dev.	1927.309	40.83234	13823.70	1397.669	185490.9	4.87E+20	190579.3	37706881
Observations	103	103	103	103	103	103	103	103
Cross sections	4	4	4	4	4	4	4	4

Source: Authors computation