

**THE EFFECT OF EXTERNAL DEBT ON ECONOMIC GROWTH  
IN SUB-SAHARAN AFRICA**

**BY**

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## DECLARATION

I, AGBEMAVOR KORSI FIAGBE, hereby declare that this thesis is an original research undertaken by me under the guidance of my supervisors; and with the exception of references to other people's work which have been dully cited, this thesis has neither in part nor in whole been submitted for another degree elsewhere.

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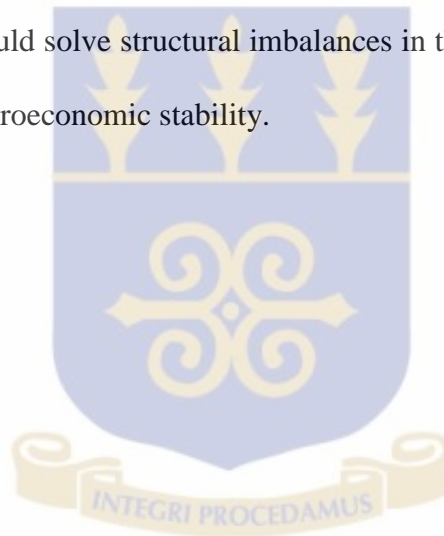
## ABSTRACT

Many economies in Sub-Saharan Africa have been experiencing high external debt stocks over the past three or so decades, thereby deepening the problem of debt burden in the Region. Growth performance, however, remains relatively moderate over the years. The relationship between economic growth and external debt as espoused in theoretical and empirical literature remains unclear. Whilst a school of thought postulate that external debt supplements savings and investment, and hence promotes economic growth, others claim that external debt serves as a substitute to savings and investment and hence impedes economic growth. Moreover, some posit that there is an optimal level of debt that promotes growth and beyond that threshold, debt is deleterious to growth. Earlier studies on debt-growth nexus have suggested controversy in empirical literature. Most studies concluded that debt negatively affects economic growth, some aver that debt positively affects growth whilst others claim that debt has no influence on economic growth but most of these studies focused on the developed economies. Some studies on Sub-Saharan Africa concluded that external debt is deleterious to growth, but these studies are very scanty. This study uses a sample of 39 SSA countries for 24 years (1990-2013) to examine the effect of external debt on economic growth in SSA.

System GMM estimation technique was adopted in the empirical analysis to obtain robust estimates of the effect of external debt on economic growth. The study accounts for unobserved country-specific time invariant effects, time series variations in the data, controls for endogeneity, autocorrelation, heterogeneity and other biases that may characterize panel estimation model. The estimation results reveal that external debt negatively affects economic growth in SSA. Moreover, country classification based on the level of per capita income does not significantly influence the external debt-growth relationship in the region. Furthermore,

the estimation result does not support a non-linear relationship between external debt and economic growth. The study shows that control variables such as labour force, investment, and export growth all have positive and significant effects on economic growth.

The study found that the Direct Effect of Debt Hypothesis (DEDH) holds for SSA. The DEDH postulates that external debt discourages long term investments that is crucial for growth. It is hence recommended that governments of SSA countries should channel borrowed external funds into long-term investment projects to make up for the investment loss, which also would generate sufficient future cash flow for amortization of the debt, negotiate with creditors for more debt relief programmes, and pursue export-led growth strategy and policies that would solve structural imbalances in their economies, improve their tax efforts, and maintain macroeconomic stability.



## DEDICATION

This thesis is dedicated to God Almighty, to my mother, Madam Rejoice Fomekah who has been the anchor behind every stage of my educational achievements, and finally to everyone who has imparted knowledge in me through teaching and research.



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## ACRONYMS

ADI	African Development Indicators
ADF	Augmented Dickey Fuller
AfDB	African Development Bank
AFD	Agence Française De Développement
AR	Autoregressive
BRIC	Brazil Russia India China
DEDH	Direct Effect of Debt Hypothesis
DOH	Debt Overhang Hypothesis
DSAs	Debt Sustainability Assessments
DSF	Debt Sustainability Framework
ERP	Economic Recovery Programme
EHIPC	Enhanced Highly Indebted Poor Country
FDI	Foreign Direct Investment
FE	Fixed Effects
FONDAD	Forum on Debt and Development
GDI	Gross Domestic Income
GDP	Gross Domestic Product
GLS	Generalised Least Squares



GMM	Generalised Method of Moments
GNP	Gross National Product
Govt.	Government
HIPC	Highly Indebted Poor Country
ibid.	Ibidem
IDS	International Debt Statistics
ILO	International Labour Organization
IMF	International Monetary Fund
IV	Instrumental Variable
LDCs	Less Developed Countries
LCH	Liquidity Constraint Hypothesis
MDGs	Millennium Development Goals
MDRI	Multilateral Debt Relief Initiative
NPV	Net Present Value
NGOs	Non-Governmental Organisations
OLS	Ordinary Least Squares
OPEC	Organisation of Oil Exporting Countries
PNG	Private Non Guarantee Debt
PPG	Public Private Guarantee Debt

RE	Random Effects
SADC	Southern African Development Community
SAP	Structural Adjustment Programme
SSA	Sub-Saharan Africa
UNCTAD	United Nations Conference on Trade and Development
UNECA	United Nations Conference on Trade and Development
VECM	Vector Error Correction Model
WDI	World Development Index
WEO	World Economic Outlook

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

Economic growth and development has been the main target for most developing countries hence resources are mobilized from all sources (including taxes, printing of money, and borrowing) for investment into viable projects for growth acceleration. Sustainable economic growth has been a predominant concern for all countries, especially developing economies that frequently face burgeoning fiscal deficits mainly driven by higher levels of debt service, particularly external debt servicing and widening current account deficits (Shabbir, 2009).

Developing countries are, however, unable to mobilize sufficient domestic revenue to meet their expenditures and therefore resort to borrowing to finance annual budget deficits. Ogunmuyiwa (2010) stated that when tax revenue is limited and government does not want to compromise macroeconomic stability by printing more money, then borrowing becomes the only available avenue that government can explore to finance infrastructure projects.

Public borrowing occurs in domestic or foreign markets but over-reliance on the domestic market can lead to financial instability and crowd out the private sector (Panizza et al., 2010), hence most countries depend on foreign borrowing for the provision of public goods. According to World Bank, external debt is the total public and private debt owed to non-residents repayable in foreign currency, goods, or services (World Bank, 2015). Thus, external debt is the total debt owed by nationals and/or government of one country to foreign nationals and/or governments. Total debt service is the sum of principal repayments and interest actually paid in foreign currency, goods, or services (*ibid*). 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.

Public debt is normally used-up on two major categories of expenditures: thus on higher investment or/and higher consumption which domestic resources cannot support. It is therefore expected that these expenditure patterns that borrowing countries, especially developing countries undertake would facilitate economic growth and improve the standard of living in these countries.

Even though government's 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 and 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.

Several factors contribute to the growth of external debt but Ajayi (1991) classified the causes 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*).

External debt may promote economic growth when the borrowed funds are invested in sustainable projects that generate revenue for servicing of the debt. Sulaiman and Azeez (2012) claimed that external debt accumulation does not imply slow economic growth whilst Were (2001) argued that it is the lack of information on the nature, structure, and the magnitude of the debt coupled with inability to meet the debt obligation that impedes growth. These arguments imply that external borrowing is not intrinsically detrimental to economic growth.

Most studies on external debt and economic growth were much focused on identifying mechanisms through which external debt affects economic growth. Anyanwu (1994) for instance, explained that huge debt accumulation discourages private investment for fear of higher taxes to repay the debt in the future. Moreover, other debt-induced macroeconomic turbulences in the domestic economy may also hinder economic growth.

### 1.1.1 External Debt and GDP Growth of Sub-Saharan at a Glance

Despite recent tightening of concessionary terms associated with bilateral and multilateral loans, Sub-Saharan Africa countries still rely heavily on external debt for fiscal sustainability in order to accelerate economic growth through agricultural modernization and expansion in industrial sectors of their economies.

From Table 1, external debt as a percent of GDP owed to official creditors for pre-crisis period (2004-2008) averaged 17.6 percent. It fell to 9.6 percent in 2010 and then to its lowest level of 9.4 percent in 2012. The figure grew marginally by 0.8 percentage points as at the end of 2013 and was projected to reach 10.9 and 11.2 percent for 2014 and 2015, respectively.

Middle-income economies within the region have also experienced an upward trend in the growth of external debt as percent of GDP. Pre-crisis value was at 5.2 percent declined to 4.6 percent in 2010 and rose to 4.9 percent in 2011, later hitting 6.6 percent in 2013. The external debt as a percent of GDP for middle-income countries was expected to be constant at 7.1 percent in 2014 and 2015 (See Table 1).

**Table 1: External Debt to Official Creditors (Percent of GDP)**

Year	2004-08	2009	2010	2011	2012	2013	2014*	2015*
Sub-Saharan Africa	17.6	11.6	9.6	9.5	9.4	10.2	10.9	11.2
<i>of which:</i>								
Middle-income countries	5.2	4.8	4.6	4.9	5.7	6.6	7.1	7.1
Low-income countries <sup>1</sup>	34.3	20.8	23	23.4	21.3	21.9	22.9	23.1
Fragile states	77	57.5	34.1	32	22.2	21.7	20.7	19.7

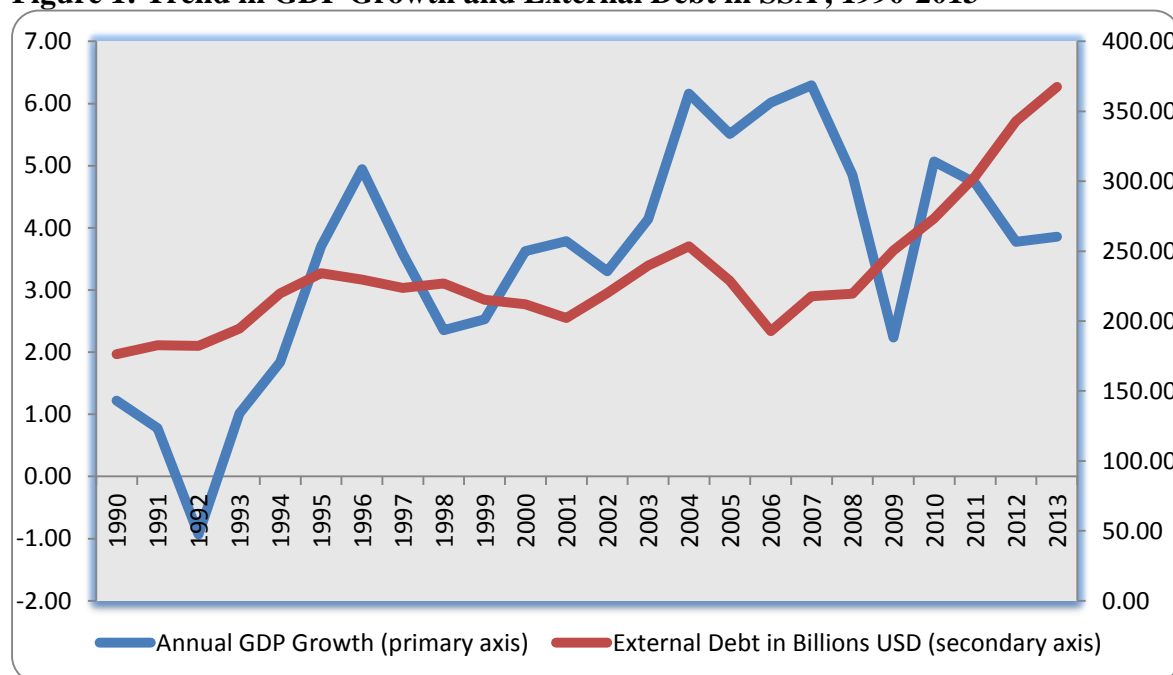
Source: IMF, World Economic Outlook April 2014

\*Projections <sup>1</sup>Excluding fragile states

Table 1 shows that Low-income countries excluding fragile states within the Region have also experienced some fluctuations in debt to GDP ratio over the periods. It stood at 34.3 percent for the pre-crisis period, declining to 23.4 percent and 21.3 percent in 2011 and 2012 respectively, and increasing again to 21.9 in 2013. The external debt as a percent of GDP for Low-income countries is project at 22.9 percent for 2014 and 23.1 percent for 2015.

Fragile states within the region generally recorded the highest value of debt to GDP ratio over the years. The pre-crisis era recorded a value of 77 percent more than twice as that of low-income countries and 14 times larger than that of middle-income countries for the same period. The value however, consistently depicts a downward trend recording 34.1 percent, 32 percent, and 22.2 percent for the years 2010, 2011 and 2012 respectively. Fragile states' official debt as a percent of GDP was larger than that of Middle-income countries and Low-income countries combined for the periods except from 2012 but still remained the highest among the categories of countries in Sub-Saharan Africa. The value was projected to reach 20.7 percent in 2014 and fall to 19.7 percent in 2015 (see Table 1).

**Figure 1: Trend in GDP Growth and External Debt in SSA<sup>1</sup>, 1990-2013**



Source: World Bank's WDI 2014, and Author's computations.

<sup>1</sup>Developing countries only

From Figure 1, GDP growth and external debt generally exhibit upward trends with some level of fluctuations between 1990 and 2013. External debt rose from 176.34billion to 234.17billion from 1990 to 1995 representing about 32.8 percent increase whilst GDP grew from 1.22 percent to 3.7 percent, representing 2.48percentage points for the same period. Most countries in the region adopted Structural Adjustment Programme (SAP) and Economic Recovery Programme (ERP) within this period to ensure that growth targets were realized but not much was achieved. The implementation of the SAP lead to the sacrifice of medium and long term growth objectives in SSA (Iyoha, 1999). The SAP and ERP era was as well characterized by low external resource inflow. Following the implementation of SAP, there was a major decline in net real resource flow from IMF and World Bank to the developing economies in the late 1980s (Iyoha, 1999).

By the late 1990s, most countries in SSA adopted the Highly Indebted Poor Country (HIPC) initiative and were being relieved of their external debts. Between 1996 and 2001, external debt stock for the region remained positive but declined by 13.63 percent whilst GDP growth declined by 1.15 percentage points.

By the end of 2004, external debt jump to 253.52billion representing 25.44 percent increase from 2001, GDP growth also increased by 2.43 percentage points for the same period. GDP growth rose from 5.51 percent to 6.02percent with external debt decreasing from 228.68billion to 192.7billion for the period 2004-2006. The external debt begun to rise consistently thereafter, hitting 367.51billion in 2013 representing an increase of 91.74 percent from 2006 however, GDP growth declined by 2.22 percentage points for the same period.

Generally, Figure 1 depicts upward trend in external debt and GDP growth. This trend denotes some level of positive correlation between external debt growth rates and GDP growth rates over the period (1999-2013). There seems to be some level of match between



the economic growth and external debt stock levels in SSA culminating in the recent debate concerning the importance of foreign loans in the growth and developmental processes of the region. IMF (2013) in analysing debt sustainability of countries that have undergone the HIPC programme from 2006 to 2010 reported that although 15 countries that benefitted from the programme have their debt to GDP ratios below their pre-HIPC levels, there are some notable developments affecting the debt distress of those countries. This situation clearly offers a course for alarm and hence needs empirical enquiry to ascertain if there is any link between external debt and economic growth in Sub-Saharan Africa (SSA).

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. 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.

## 1.2 Statement of Problem

Although external debt contributes to sustaining economic and financial liquidity in an economy, and makes external funds available to facilitate international 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 external debt is related to 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. Within a healthy and expanding world economy, an appreciable growth and development in debtor countries are conditions for curbing debt service problems but none of these conditions were met in the 1980s (Abott, 1993). Growth targets were not realized because the development loans increasingly absorbed the limited foreign exchange resources in the settlement of debt service obligations (Dauda, 2007).

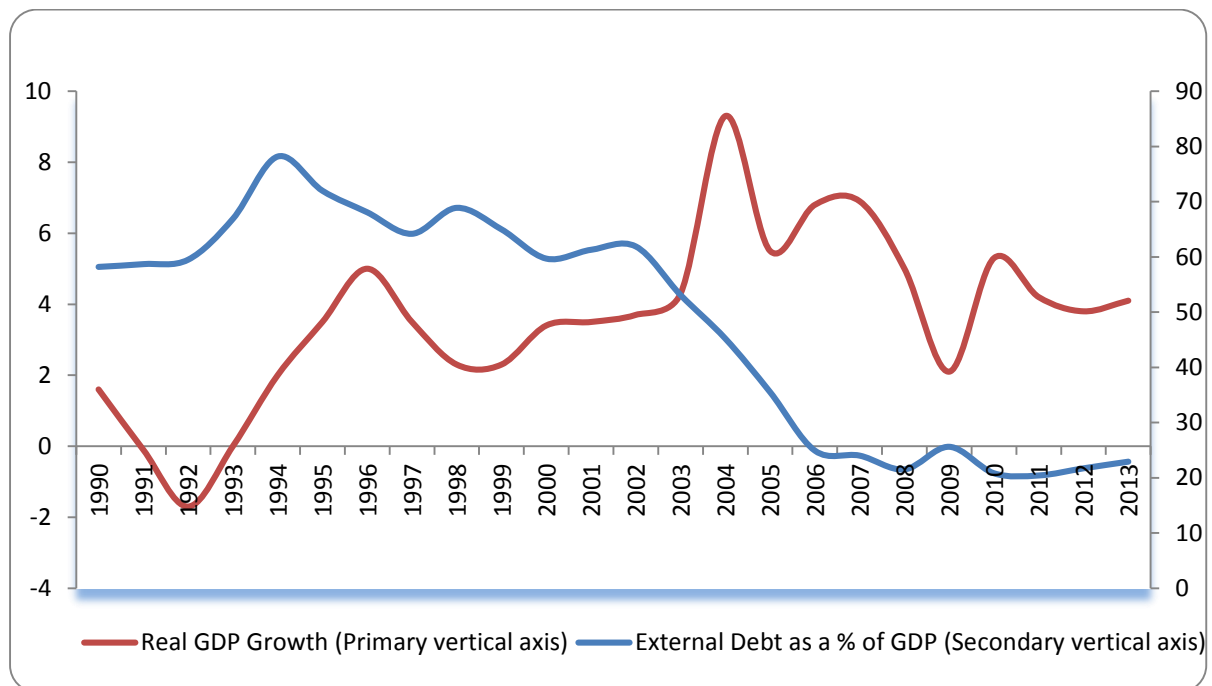
Annual debt service burden remains excessively onerous even though actual payments of principal and interest by low-income SSA countries in 1990 were less than 37 percent of the region's GNP after repeated rescheduling yet at that reduced level, the payments accounted for over 8 percent of the region's GNP and 28 percent of export earnings; indicating that it would have otherwise absorbed 22 percent of GNP and 70 percent of total export earnings in that year were the debts not rescheduled (FONDAD, 1992).

External debts for SSA countries have been increasing recently generating concerns among analysts and policy-makers about a looming debt distress threatening the region. From a level of US\$176.36 billion in 1990, total external debt stocks of SSA rose to US\$235.94 billion in 1995. During the same period, external debt as a percent of GDP rose from 58.21 percent to 71.95 percent respectively. For the years under study (1990-2013), the highest external debt to GDP ratio of 78.23 percent was attained in 1994. With the total external debt stock

standing at US\$213.44 billion in 2000, the value rose by US\$55.63 billion as at the end of 2010 reaching US\$269.08 billion. External debt witnessed a rapid build-up for the 3 year period (2010-2013) increasing by US\$ 98.43 billion (from US\$269.08 billion to US\$367.51 billion) representing about 77 percent larger than the increment realized during last decade (2000-2010).

Over the past decades, SSA has been faced with low economic growth performance coupled with rapid increase in the level of external debt. Using data on GDP growth for SSA, Figure 2 indicates that the region has recorded a moderate growth in the recent past with some years witnessing negative growth. Real GDP growth stood at 1.55 percent in 1990, deteriorating to negatives over the subsequent three years, and later improved to 2.02 percent in 1994. The value rose marginally to 3.73 percent by the end of 2000. From 2000 to 2010, growth rate of real GDP rose by 1.59 percentage points reaching 5.32 percent with the highest growth rate of 9.33 percent recorded in 2004. The real GDP growth fell to 4.22 percent in 2011 and further declined to 4.07 percent by the end of 2013.

**Figure 2: Trend in External Debt (% of GDP) and GDP Growth (Annual) in Sub-Saharan Africa<sup>1</sup>, 1990-2013**



Source: World Development Indicators 2015

<sup>1</sup>Developing countries only

Clearly, the data presented in Figure 2 indicates that SSA has been experiencing moderate GDP growth amidst falling external debt to GDP ratio over the years. This situation indicates that SSA economy is expanding relative to the level of external loan inflow in the region. Although debt to GDP ratio has shown a downward trend, the region's low economic performance in view of the high external debt stock seems to exacerbate its debt burden making it increasingly unsustainable. This study therefore seeks to investigate whether the debt stock levels has anything to do with the growth performance in the region.

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 and Cobham, 2000). Massive capital flight has occurred in Sub-Saharan Africa as a result high debt stocks. Collier, Hoeffler, and Pattillo (2004) reported that with a dollar increase in the stock of debt leads to 3.2 cents of capital

flight in SSA region. Similarly, Ndinkumana and Boyce (2003) found that for every dollar of external borrowing by an SSA country in a given year, on average, roughly 80 cents left the country as capital flight. Thus as a result of economic implications of external debt, domestic resources that could have been otherwise invested into growth-stimulating projects, abscond to the developed economies for investment in order to avoid abnormal domestic risks.

Moreover countries in Sub-Saharan Africa are unable to generate enough revenue to service their external debts due to narrow tax bases and worsening terms of trade. Consequently debt service responsibilities could only be honoured through cutting down government spending on certain crucial sectors such as education, health, social services and debt refinancing. Gonçálves (1995) disclosed that devastating effect of debt on fragile economies in Africa is highlighted for instance in Uganda when its government spends US\$3 per person on health compared to US\$17 per person on debt payment. Zambia also spent 35 times more on debt than it did on primary school education between 1990 and 1993. Debt refinancing compounds future debt service obligation. Since government investment constitutes significant percentage of total domestic investment, a decline in government spending reduces the total investment leading to low medium and long-term economic growth.

Furthermore, increase in world interest rate is found to be a contributory factor to low economic growth in Sub-Saharan Africa. Ghura (1995) finds that a percentage point increase in real international interest rate reduces per capita GDP growth rate by 0.13 percent in Sub-Saharan Africa. A rise in the world interest rate above the interest at which external loan is obtained creates negative impacts on external debt sustainability by raising the external debt stock level acquired on variable interest. Consequently export earnings would have to be used in servicing the foreign debt, thereby limiting the resource available for public investment and growth (Fosu, 1996, 1999; Elbadawi et al., 1997).

Ajayi (1991) posits that debt management systems have direct macroeconomic implications on the borrowing countries. For instance large scale external borrowing causes Dutch Disease when appropriate fiscal policies are not pursued to counter the effect of the foreign resource inflow on the value of home currency. Thus huge funds inflow may cause appreciation of the domestic currency and loss of competitiveness of export sector of debtor economy which can stifle growth. Additionally, external borrowing may contribute to underdevelopment of the financial sector of the economy. The domestic financial intermediaries may be denied of money creation role as government chooses to borrow from external source instead of domestic source thereby transferring associated benefits that could have contributed immensely to the growth of the domestic economy to their foreign counterparts.

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 centred on Latin America, and few selected groups of countries in Africa (see Warner, 1992; Cohen, 1993; Afxentiou and 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. The empirical literature has very little studies on SSA (for instance Gerald, 1994; Fosu, 1996) with the most recent studies done by Fosu (1999) and Iyoha (1999).

Fosu (1999) applied Ordinary Least Square (OLS) estimation technique on augmented production function to analyse the direct effect of external debt on economic growth in SSA using a sample of 35 SSA countries for 1980-1990. Iyoha (1999) used simulation approach with small macro-economic model with data on SSA countries for 1970-1994 and found that large stock of external loan and its servicing obligation is detrimental to investment and economic growth in SSA.

Moreover, research studies on the external debt-economic growth relationship differ in their methodologies, time period covered and geographical location as well as their findings and conclusions. These dissimilarities suggest an ensuing controversy in the literature about the relationship between external debt and economic growth. Therefore, there is a need for further empirical investigation into the subject matter. Furthermore, although these empirical studies have provided some explanation on the relationship between external debt and economic growth in SSA, no empirical study has, for instance, examined the impact of country groupings based on their per capita income on external debt-growth relationship in the region. This study intends to bridge this gap in the literature by applying the System GMM methodology to more recent data (1990-2013) to investigate the effect of external debt on economic growth in SSA.

### **1.3 Research Questions**

It is difficult to state a priori the effect of external debt on economic growth. External debt promotes economic growth if it improves economic wellbeing but can retard growth through debt overhang, and liquidity constraint, crowding out effect, human capital development effect, and through the direct effect of debt on growth. The study would attempt to find answers to some pertinent questions regarding external debt and its impact on growth in Sub-Saharan Africa.

This study will specifically consider questions such as:

- Does rapid rise in external debt affect economic growth in Sub-Saharan Africa?
- Is the relationship between external debt and economic growth in Sub-Saharan Africa nonlinear?

- Is external debt more deleterious in middle-income countries than low-income countries in Sub-Saharan Africa?

#### **1.4 The Objectives of the Study**

This study investigates whether there is any direct relationship between external debt and economic growth in Sub-Saharan Africa. The study further seeks to examine whether some level of external debt promotes economic growth, and whether external debt-growth relationship differs across country groupings in the region. All other factors that have significant causal effects with external debt and growth will also be controlled.

The main objective of this work is to;

1. Investigate the effect of external debt on economic growth
2. Examine whether the relationship between external debt and economic growth is nonlinear for Sub-Saharan Africa.
3. Probe further, whether external debt is more deleterious in middle-income countries than in the low-income countries in Sub-Saharan Africa.

#### **1.5 Hypothesis**

Although there are three main objectives of this study for which hypothesis could be tested for each of them, the second and third objectives as specified above hinges on the principal objective of the study thus to examine the effect of external debt on economic growth in Sub-Saharan Africa. Hence, the hypothesis to be tested under the study focuses on the first objective and it is specified as follows:

$H_0$ : External Debt does not affect Economic Growth in SSA

$H_a$ : External Debt does affect Economic Growth in SSA



## 1.6 Significance of the Study

Developing countries which Sub-Saharan Africa is largely its hub depend heavily on external funding (borrowing or aid) for financing their expenditures. External funding has been crucial in developmental projects, financing capital and budgetary support (Suma, 2007). External debt has the potential to promote growth however lack of prudent debt management framework may render it counterproductive. In view of this, international donors most often demand fiscal prudence, economic and political stability, and sound banking system and low cost of doing business, and conducive environment for investment in order to guarantee further assistance.

In order to enjoy continual access to foreign loan, countries strive to maintain sound macroeconomic environment and fiscal prudence in public expenditure and some successes are being made with respect to some key macroeconomic indicators such as inflation and real output growth in the region but fiscal and external balances continue to worsen. External debt has taken a significant share of public debt in Sub-Saharan Africa augmenting inadequate domestic resources for debt servicing and provision of public goods, but the ensuing debate that it has contributed to macroeconomic instability and hence exacerbate the worsening economic situation in the region calls more investigation into the topic.

Literature although extensive on debt and economic growth relationship, it proffers mixed conclusions. Some studies have discovered negative relationship between external debt and economic growth, others posit positive relationship whilst some unravel no relationship. This study will hence provide more insight into the subject matter by conducting empirical investigation on Sub-Saharan Africa, and probe further, whether external debt-growth relationship is influenced by classification of countries into low-income and middle-income countries in the region.

This work will also help economic managers to better understand the extent to which external debt and economic growth correlate so as to adopt efficient policy instruments towards achieving set targets that are germane to growth and development. It will also be useful to international development partners and donors to better appreciate external debt and growth nexus for control and regulation purposes in order to minimize any adverse effect that may accompany external debt in Sub-Saharan Africa.

### **1.7 Scope and Source of Data for the study**

To study the effect of external debt on economic growth in SSA, the study uses panel data on 39 SSA countries for a time period of 24 years (1999-2013). The study could not cover all the 48 SSA countries due to unavailability of consistent data for 9 countries. Data for the empirical analysis are extracted from IMF's World Economic Outlook (WEO) and the World Bank's World Development Indicators (WDI) databases that are accessible online.

### **1.8 Organization of the Study**

This study is grouped under six chapters. Chapter two which is next presents the overview of the study whilst chapter three highlights the theoretical and empirical literature review on the relationship between external debt and economic growth. Methodology is presented in chapter four. Estimation, analysis, and discussion of results are captured under chapter five. Finally, conclusion and policy recommendations are offered in chapter six.

## **CHAPTER TWO**

### **OVERVIEW OF DEBT AND ECONOMIC PERFORMANCE IN SUB-SAHARAN AFRICA**

#### **2.1 Introduction**

This chapter outlines debt profile and economic outlook of Sub-Saharan Africa using key macroeconomic variables that are vital in the assessment of growth and development of an economy. These macroeconomic variables are not only tied up to GDP growth or GDP per capita growth but also to those that represent long term targets, objectives and aspirations of the region (for instance, The Millennium Development Goals). We also analyse some debt instruments used in the international financial market to ascertain their impact on total external debt of the region.

#### **2.2 Debt Crisis and External Debt in Sub-Saharan Africa**

In spite of several economic reforms pursued over the past decades, most countries in Sub-Saharan Africa have recorded only modest growth with rapid rise in inflation, huge budget deficits, unsustainable balance of payments (BOP) deficits coupled with high levels of debt. The causes of these crises can be attributed to poor domestic policies, deteriorating terms of trade and a high debt burden (Onyekwelu and Ugwuanyi, 2014).

The problem of external debt default in Sub-Saharan Africa would be well understood if seen as an integral part of global external debt crisis which emerged in 1982 due to: excessive borrowing by developing countries coupled with liberal lending by foreign commercial banks in 1970s, the fall in commodity prices especially petroleum products in early 1980s, astronomic increase in international lending rate in 1982.

Prior to the 1982 global debt crisis, most non-oil exporting developing countries resorted to foreign borrowing to make up for their BOP deficits caused by current account deficit due to oil price shocks that occurred from 1973 to 1979. Upsurge in oil prices made huge oil cash available for International Commercial Banks which increased their liquidity out of which funds were liberally lent to countries without any proper scrutiny of their creditworthiness. By early 1982, there was a sudden drop in oil prices with a swift rise in international lending rate causing balance of payments problems in many countries. Shortly Mexico announced its inability to settle debts owed to creditors, followed by other Latin American countries.

The 1982 global financial crisis caused a sudden end to the era of liberal lending. Developing countries could no more roll over their debts and could hardly service their debt from extra borrowing from abroad. Export earnings were also insufficient for debt servicing as a result of unfavourable terms of trade confronting those economies. Debt stocks of countries were escalating at a time when export earnings were on the decline due to rapid fall in prices on the international market. Consequently, imports were being gradually cut down as a way of solving increasing current account deficits. Economic condition further worsened globally and debt default replicated in other economies ravaging through Latin America and this marked the emergence of the debt crisis in heavily indebted developing economies as well as Sub-Saharan Africa.

Aside from the contagious effect of the global debt crisis, significant proportion of external debt growth of Sub-Saharan African countries since 1982 may be attributed to some external factors which are beyond the control of these economies. Continual decline in terms of trade, high interest rate, and exchange rate misalignment, uncontrolled fluctuations in export earnings, and rescheduling and refinancing of debt are some of the dominant factors especially from 1989.

External debt problem in Sub-Saharan African started initially in the form of difficulty in servicing external loans in accordance with terms and conditions specified in the original loan contract. Drouin (1989) claim 27 out 44 Sub Saharan African countries had payments arrears hence debt financing and rescheduling were adopted to resolve the problem. Whilst this strategy seemed to relieve debtor countries of debt service burden in the short run, it led to continual postponement of debt into the future without finding the fundamental structural defect of their economies that causes the problem. This method persisted until 1990s where debt levels of majority of countries in the region were pronounced unsustainable.

International financial community has been providing assistance to debtor countries since the emergence of the debt crisis in attempt to reduce their external indebtedness, reduce poverty, foster growth, and to achieve external viability (IMF, 1999). This assistance takes the form of lending to developing countries with high concessions, and provision of debt reliefs. This assistance has helped to some extent reducing external indebtedness of countries but could not halt the increasing BOP deficits, fiscal imbalances, rate of external borrowing, and poverty in Sub-Saharan African.

Most developing countries including those of Sub-Saharan Africa have undergone some economic reforms based on recommendations from international financial community as an attempt to reduce external debt hikes and its deleterious effect on growth. Among those programs are IMF and World Bank inspired Structural Adjustment Programme (SAP) and Economic Recovery Program (ERP) instituted in the 1980s, and the Highly Indebted Poor Country (HIPC) initiative in 1996.

The SAP and ERP were tailored to alleviate debt burden that bedevilled developing economies through institutional and structural reforms and to restore international creditworthiness. The SAP was envisaged to bring macroeconomic stabilization in the short

run and to usher countries onto medium and long-term path of sustainable growth. Countries were made to abandon their macroeconomic policies and pursue those prescribed by IMF and World Bank. The SAP program was characterized by adoption of austerity measures, cutting down public expenditures level, laying-off of public sector workers, and devaluation of national currencies. These measures created some difficulties and deepened external debt service burden and some political leaders saw the initiative as a threat to their political sovereignty.

For most of Sub-Saharan African Countries, the era of SAP meant decrease in income, high unemployment, increasing poverty, austerity, and declining standard of living (ILO 1996) as cited in Iyoha (1999). Consequently, some resisted the SAP and ERP initiative and undertook partial implementation of the program hence not much was achieved in terms of growth. Following the implementation of SAPs, Sub-Saharan African countries have abandoned medium to long term growth objectives (UNECA, 1989). ILO (1996) reported that Sub-Saharan Africa grew by 3.4 percent from 1974-1980, falling to 1.7 percent for the period 1981-1990 and plummeted to 0.6 percent for the period 1991-1993.

By the end of 1990 countries in the region began to abandon SAP and ERP program due to its failure in meeting outlined growth objectives. External debts of poor countries escalated to unsustainable levels despite the continual rescheduling. The debt of SSA jumped from US\$60.71 billion to US\$176.36 billion representing 190.5 percent increase for the decade of 1980 to 1990 (World Bank, 2015). The situation was compounded by general feeling of development failures among developing countries. IMF and World Bank in their effort to find more comprehensive strategy to deal with the debt problem established a group whose core mandate was to assess the magnitudes of multilateral debts in developing countries and find possible ways of solving it.

The group suggested a Multilateral Fund intended to deal with the debt problem on condition of countries adopting and pursuing stringent reforms and adjustment programs (World Bank, 2003). By 1995 the debt stocks of most Sub-Saharan African countries were so huge with high debt service burden. Rwanda and Malawi spent 79 percent and 76 percent respectively of their export earnings on servicing of external debt (World Bank, 2000). The Multilateral Fund proposal was adopted and later transformed into HIPC in 1996 where some countries were declared as Highly Indebted Poor Countries based on the magnitude of their debt stocks. Out of a total of 44 countries declared as heavily indebted poor countries, 33 were Sub-Saharan Africa countries (World Bank, 1996). The initiative was to relieve poor countries of their indebtedness basically through debt cancellation.

In September 1999, the original HIPC program was revised into Enhanced HIPC initiative following complaints from NGOs, development experts, and HIPC countries that too little reliefs were being granted at slow pace, and the number of beneficiary countries was small. UNCTAD (2004) reported that the primary objective of EHIPC initiative was to strengthen the link between debt relief and policies that were designed to suit country's circumstance so as to reduce poverty through delivery of deeper, faster and broader debt relief.

The severity of Sub-Saharan Africa's debt problem is well appreciated when viewed within the context of debt ratios. Debt to GNP ratio for the region stood at 97.1 percent in 1988; Madagascar recorded 192 percent, Congo Democratic Republic had 205 percent, and that of Mozambique hitting 375 percent (Iyoha, 1996). Over the last decade, debt burden of Sub-Saharan Africa has grown worse than any other region facing debt service problem (Drouin, 1989). In the early 1990s, debt to export ratio for SSA was higher than that of any other region except Latin America and the Caribbean. However in 1995, the region recorded the highest ratio of 269.8 percent ahead of all other regions. Debt to export ratio for Highly

Indebted Poor Countries for which 80 percent are SSA countries stood at an alarming rate of 565.4 percent (Iyoha, 1999).

Economic analysts have cautioned about possible re-occurrence of debt crisis that hit the region in the past and sent most countries into IMF bailout, HIPC. Given the current global and financial crises, the possibilities that SSA countries will again face debt-financing difficulties are indeed real (Fosu, 2009). The current rapid growth of external debt in the region affirms earlier caution by IMF that bringing a single debt measure down to a critical threshold at a single point in time is no guarantee against future debt problems (IMF, 2001) and that debt relief under the HIPC Initiative provides a basis, but not a guarantee for long-term debt sustainability in HIPC countries (IMF, 2002a).

The rising debt stock may be attributed to a situation where significant proportion of borrowed funds are channelled into recurrent expenditures which produces no or little resources towards future servicing of the debt hence governments continually resort to further borrowing for debt service. In other words, external debt is mostly diverted into consumption creating little impact on economic growth. Growth of external debt has for most times been higher than the growth of output within the region.

### **2.3 External Debt Finance**

Until the 1970s, most developing countries contracted external debts from foreign governments, Bretton Woods Institutions and Regional Commercial Banks normally at concessional interest rates. Thus interest rates payable on foreign loans were charged below the market interest rates however, in late 1970s and 1980s foreign commercial banks started to push OPEC money into developing economies initially at low interest rate which later rose significantly thereby increasing the cost of external borrowing. IMF and The World Bank



classified Sub-Saharan African countries into low-income, lower-middle-income, and upper-middle-income countries based on their per capita income levels. The implication of the country categorization on access to international loan is that as a country moves into higher per capita income bracket, it is unable to access grants and concessional loans from the international financial market and would have to borrow at commercial interest rates that may compounds its interest cost.

A rise in foreign interest rates increases the cost of external borrowing as well as the burden of debt service on debtor countries. Interest cost on foreign loan can have dire consequences on growth because those scarce resources would be used for interest payments rather than for investments. Bank of Ghana (2005), for instance, indicated that due to upsurge in Ghana's external debt, government continually resorts to non-concessionary window of the IMF Standby Facility to service its debt. High interest payment means that financial resources are cut from public investment crucial for economic growth.

Interest payable on external debt could be accommodated by governments if the foreign capital inflow are invested in self-sustaining long-term capital projects. These long-term projects would be able to generate sufficient cash flows more than the cost of the loan. However, foreign loans, aid and grants inflows to developing countries as well as Sub-Saharan Africa are most often spent on recurrent expenditures. Table 2 shows external debt financing and its relative drain on domestic production (GDP) in Sub-Saharan Africa.

From Table 2, external debt financing has been rising over the decades. The year 1990 witnessed a total interest payment of \$5.29 billion representing 1.27 percent of GDP, and 3.80 percent of export of goods and services. Interest payment on public and publicly guaranteed loan amounted to \$4.02 billion whilst that of private non-guaranteed was \$0.33 billion.

Interest payment on external debt has been fluctuating between 1993 and 2004 with debt to export ratio hitting as high as 11.84 percent in 1997 with total interest payment of \$4.76 billion. The year 2005 recorded the highest payment of interest on external loan of \$8.58 billion representing 141.46 percent increment from the previous year. The same year saw a tremendous rise in interest payment on public and publicly guaranteed debt amounting to \$7.41 billion indicating 86.26 percent rise whilst private non-guaranteed debt representing 4.09 percent of the total debt financed for the period. Interest payment as a percentage of GDP has been varying over the recent years but remained lower than pre-crisis's (2004-2008) average of 1.07 percent with a tremendous increase in interest payment on private non-guaranteed debt after the crisis period.

**Table 2: Financing of External Debt in Sub-Saharan Africa, 1990-2013**

Year	Interest payment (% of Export revenue)	Interest payment (% of GDP)	Interest payment on public non-guarantee debt	Interest payment on public private guarantee debt	Total interest payment on external debt (US\$ billions)
1990	3.80	1.27	0.33	4.02	5.29
1991	8.18	1.89	0.31	4.10	5.24
1992	18.06	2.68	0.30	3.55	4.58
1993	10.52	2.03	0.27	2.42	3.34
1994	9.03	2.39	0.52	3.43	4.74
1995	5.62	2.08	0.50	3.47	5.34
1996	10.34	2.48	0.49	4.32	5.79
1997	11.84	2.64	0.42	3.22	4.76
1998	11.10	2.35	0.33	3.40	4.92
1999	9.27	2.32	0.30	3.16	4.72
2000	5.83	1.76	0.40	2.92	4.53
2001	6.78	2.04	0.48	2.54	3.71
2002	6.20	1.82	0.52	2.52	3.68
2003	5.04	1.46	0.34	2.65	3.43
2004	4.58	1.35	0.27	2.69	3.56
2005	3.89	1.26	0.35	7.41	8.58
2006	3.61	1.19	0.62	3.47	5.13
2007	2.47	0.84	0.54	3.73	5.61
2008	2.05	0.73	0.86	3.51	5.89
2009	2.01	0.58	0.80	3.05	4.86
2010	1.52	0.46	0.95	3.02	4.93
2011	1.72	0.56	1.18	3.58	5.59
2012	2.01	0.62	1.50	4.85	7.51
2013	2.61	0.77	1.31	5.55	7.99

Source: IMF's World Economic Outlook  
World Bank's IDS 2015

## 2.4 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, ERP and SAP, HIPC and 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 and Thugge, 1997) as cited in Suma (2007).

The HIPC initiative and Multilateral Debt Relief Initiative (MDRI) are nearly complete with 35 out of 39 eligible countries reaching the completion point under the HIPC initiative. Moreover, Eritrea, Somalia, and Sudan are at their pre-decision point stage and are yet to qualify for debt relief under the initiative, Chad remains in the interim phase whilst Zimbabwe is undergoing qualification eligibility assessment (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 MDRI is estimated to be US\$41.1 billion as at the end of 2013 in present value terms.

#### **2.4.1 Conventional Strategies of Debt Relief**

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.

#### **2.4.2 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 repudiated 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).

## **2.5 Debt management strategy**

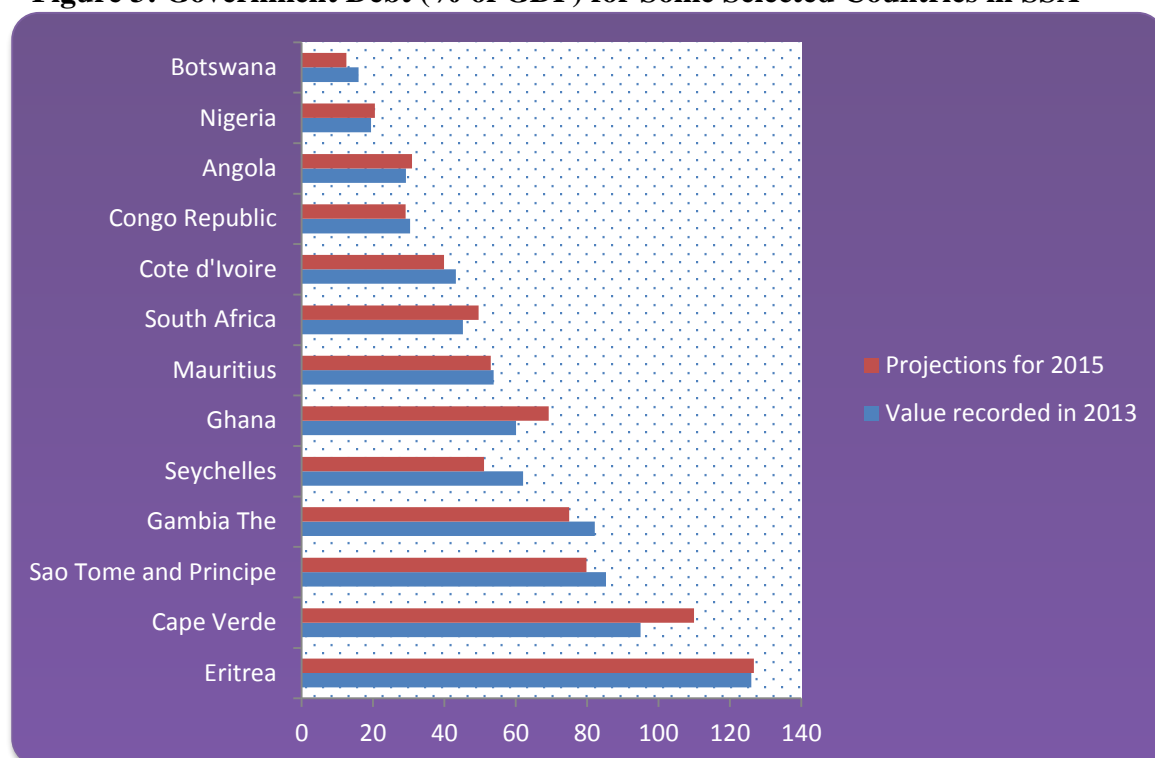
Governments aim at borrowing at low cost to finance developmental projects but the structure and composition of debts portfolio is of utmost concern since it determines the impact of relevant shocks on government budget and its long term expenditure plan (Gill and Pinto, 2005). Public debt managers are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

## **2.6 Public Sector Debt**

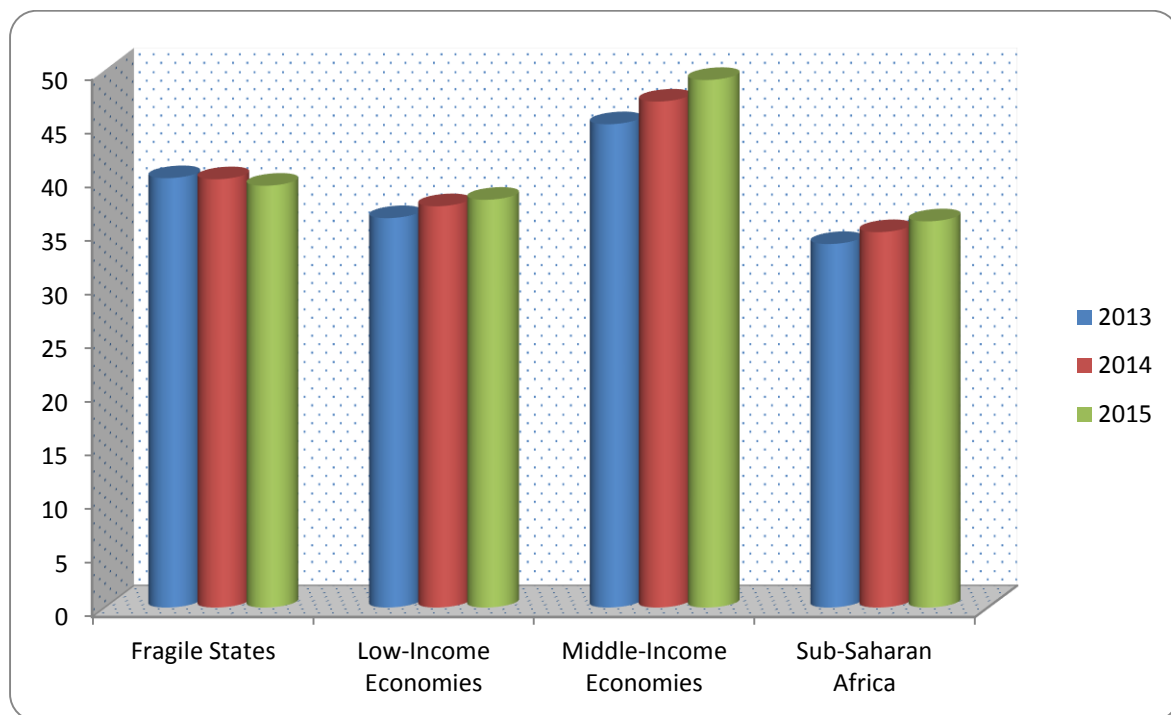
Total government debt as a percentage of GDP for Sub-Saharan Africa for the period 2004-2008 stood at 37.4 percent fell to 31.7 percent by the end of 2010. The years 2011 and 2012 witnessed a constant percentage of 32.8 and subsequently increased by 1.1 percentage points in 2013. Public debt as a percentage of GDP was projected at 35 and 36 percent for 2014 and 2015, respectively (IMF, 2014). Some countries within the region experienced astronomic growth in their public debts and were expected to hit unsustainable levels in the nearest future. For instance, Eritrea recorded a staggering 126 percent and expected to increase to 126.7 percent by the close of 2015. Cape Verde's public debt to GDP ratio stood at 95 percent projected to hit 109.9 percent in 2015 whilst Ghana's reached 60.1 and was expected to hit 69.2 percent for the same period. Gambia The, recorded 82.1 and projected to fall to 75 percent (See Figure 3).

**Figure 3: Government Debt (% of GDP) for Some Selected Countries in SSA**

Source: IMF's Regional Economic Outlook, April 2014

From Figure 4, Government debt as a percentage of GDP for SSA has been rising over the recent years, with little variation existing across country groupings. Overall public sector debt for SSA region stood at 33.9 percent of GDP by the end of 2013, and was estimated to increase to 35 percent and 36 percent for 2014 and 2015 respectively. Middle-income economies within the region recorded the highest government debt to GDP ratio in all the three years. It stood at 45 percent in 2013 was estimated at 47.1 percent in 2014 and 49.1 percent in 2015. Likewise, the value for low-income economies was 36.3 percent in 2013, and was forecasted at 37.4 percent and 38 percent for 2014 and 2015 respectively.

Public debt as a percentage of GDP for fragile states stood at 40 percent in 2013 and was predicted to fall consistently to 39.9 percent and 39.3 percent for the same periods. The fragile-states recorded the second largest public sector debt as a percentage of GDP for all the three year periods followed by the fragile states.

**Figure 4: Government Debt as a Percentage of GDP for SSA, 2013-2015**

Source: IMF's Regional Economic Outlook, April 2014

Public debt comprises foreign-currency debt and local currency debt but foreign-currency debt predominates in African countries. This situation is typically as a result of reliance on concessional multilateral and bilateral funding and the rudimentary of domestic financial market (Blommestein and Horman, 2007). Local-currency debts are most often contracted on short-term basis but few countries manage to issue long-term ones. Local commercial banks tend to be the main creditors of the domestic debts. However some countries have active pension funds and other institutional investors defining the nature of local-currency debt.

Foreign-currency debt is less costly compared to local-currency debt in terms of interest payment even though the former predominates in nominal terms, reflecting high interest charged on local-currency debt and availability of external source of funding on highly concessional terms (*ibid*). Domestic debts although relatively costly, it minimizes exchange rate risk and the potential macroeconomic implications on the domestic economy. Large debt to GDP ratios with unsustainable fiscal deficits coupled with low economic performance may

result in rising risk premium for sovereign debt in the world financial markets as in the cases of Italy, Greece, and Portugal between 2010 and 2011 (Miteza, 2012).

One of the instruments used by countries to access the international financial market to raise funds towards financing developmental projects is sovereign bonds. It is a debt security issued by central government and it is denominated in foreign currency. Sub-Saharan Africa countries hardly use this instrument but for the recent adoption by some few countries within the region. Nevertheless, of late many African countries preferred going to the international bonds markets and China rather than to international financial institutions. For instance, Cote d'Ivoire issued \$ 1 billion Eurobond in February 2014 and Zambia's bond inflows stood at 3.75 percent of GNI in 2012 representing 0.375 percent of GNI between 2000-2012, Ghanaian bond inflows were 3.05 percent of GNI in 2007 representing 0.6 percent of GNI over five years. The magnitude of recent bond flows to SSA is larger than it has ever been, and was equivalent to 20 percent of aid and 12 percent of FDI in 2013 (Elekdag and Muir, 2014).

The use of Eurobond became popular among countries in the region in 2013 to the extent that even large aid recipient countries such as Rwanda issued its maiden one and other countries such as Cote d'Ivoire, Kenya and Zambia planned to follow suit in 2014 (*ibid*).

**Table 3: Bond Issued by Some Countries in Sub-Saharan Africa**

Country	Date	Bond value	Purpose
Gabon	2013	\$1500	\$610 million to replace existing debt for better debt management
Ghana	2013	\$750	For capital expenditure and refinancing public debt to reduce cost of borrowing
Nigeria	2013	\$1000	To finance projects in the electricity sector which is undergoing privatization; to support a shift from domestic borrowing towards cheaper foreign credit
Rwanda	2013	\$400	Construction of a 28-megawatt hydropower plant, construction of a hotel and payment of some state owned RwandAir's debt
South Africa	2013	\$2000	Extend maturity of debt, use low financing cost, finance roads and power
Zambia	2012	\$750	To invest in infrastructure

Source: Hou et al. (2014)

Middle-income countries, for instance, Ghana took advantage of low international interest rate to mobilize external funds and still considering issue of another \$1 billion Eurobond in 2015 whilst low-income countries such as Rwanda would also want to take advantage of falling international interest rates to reduce their dependency on aid to finance investments that donors were unable to fund. Kenya was considering \$1.75 billion and Eurobond which is expected to serve as a benchmark for domestic corporates to access foreign capital market.

Huge public sector expenditure leading to high fiscal deficit is one of the causes of high government debts in the region. Governments increasingly depend on borrowing from the domestic market in order to finance those expenditures. Many countries increasingly depend on issuing short-term treasury bills at high interest rates, and dollar-denominated government

bonds thereby increasing their reliance on non-concessional debts. Rising levels of government debts has sparked some concerns from economic analysts about debt sustainability in the region and the need for fiscal consolidation.

## **2.7 Some Macroeconomic Performances in Sub-Saharan Africa**

### ***2.7.1 Growth performance***

Until the end 1960 sub-Saharan Africa enjoyed a moderate growth of real output while the 1970s witnessed notable increase as this period was characterized by huge inflow of foreign direct investment and rapid boom in commodity prices in the international market. Economic performance however deteriorated in late 1970s and was exacerbated by the global financial and economic crises in the early 1980s whose impacts were much felt especially in 1983 where SSA recorded a negative GDP growth of -1.13 percent (World Bank, 2015).

The impacts of global economic downturn on developing economies in 1980s were so severe such that the decade was referred to as “lost decade” for Africa with regards to its development endeavours (Iyoha, 1999). Although many countries in the developing regions managed to restore growth fortunes after 1980s global economic distress, stagnation persisted in Sub-Saharan Africa until the first half of 1990. The protracted economic problem in the region was as a result of negative impact of external and internal developments, external debt burden, and structural and institutional setbacks and policy slippages (UNCTAD, 1998; 1999).

**Table 4: Real GDP Growth in Sub-Saharan Africa (Percentage Changes), 2004-2015**

	2004-08	2009	2010	2011	2012	2013	2014*	2015*
Sub-Saharan Africa	6.4	2.6	5.6	5.5	4.9	4.9	5.4	5.5
Of which:								
Middle-income countries	5.1	-0.8	4.1	4.9	3.4	2.7	3.0	3.3
Low-income countries <sup>1</sup>	7.3	5.1	7.0	6.5	6.2	6.8	6.9	6.8
Oil exporting countries	8.4	4.8	6.7	6.1	5.2	5.7	6.6	6.5
Fragile states	2.7	3.3	4.8	3.3	7.5	6.0	7.1	7.1
World economic growth	4.6	-0.4	5.2	3.9	3.2	3.0	3.6	3.9

Source: IMF's Regional Economic Outlook, April 2014

<sup>1</sup>Excluding fragile states \* Projections

Prior to the emergence of the global financial crisis, the region's output grew impressively 6.4 percent, which is higher than world economic growth of 4.6 percent for the period between 2004 and 2008. The Crisis negatively affected real output growth in the subsequent year with growth dropping to 2.6 percent in 2009. It however maintained a constant rate of 4.9 percent for 2012 and 2013 and was projected to pick up an upward trend with a rate of 5.4 percent and 5.5 percent for 2014 and 2015 respectively.

Middle-income economies within the region also suffered the impact of the 2007 crisis with output growth declining to 2.7 percent against pre-crisis rate of 5.1 percent whilst low-income economies appeared relatively resilient with a decline of 0.5 percentage points from pre-crisis period to 2013 as compared to middle-income countries of 2.4 percentage points.

According to UNECA (2009), Sub-Saharan Africa has experienced some appreciable level of real GDP per capita growth of 5.7 percent on average within the period of 1998 to 2008 whilst the period 1988 to 1998 recorded an average of 3.7 percent. Following the decline in the global demand and commodity prices as a result of economic downturn in 2008, WEO

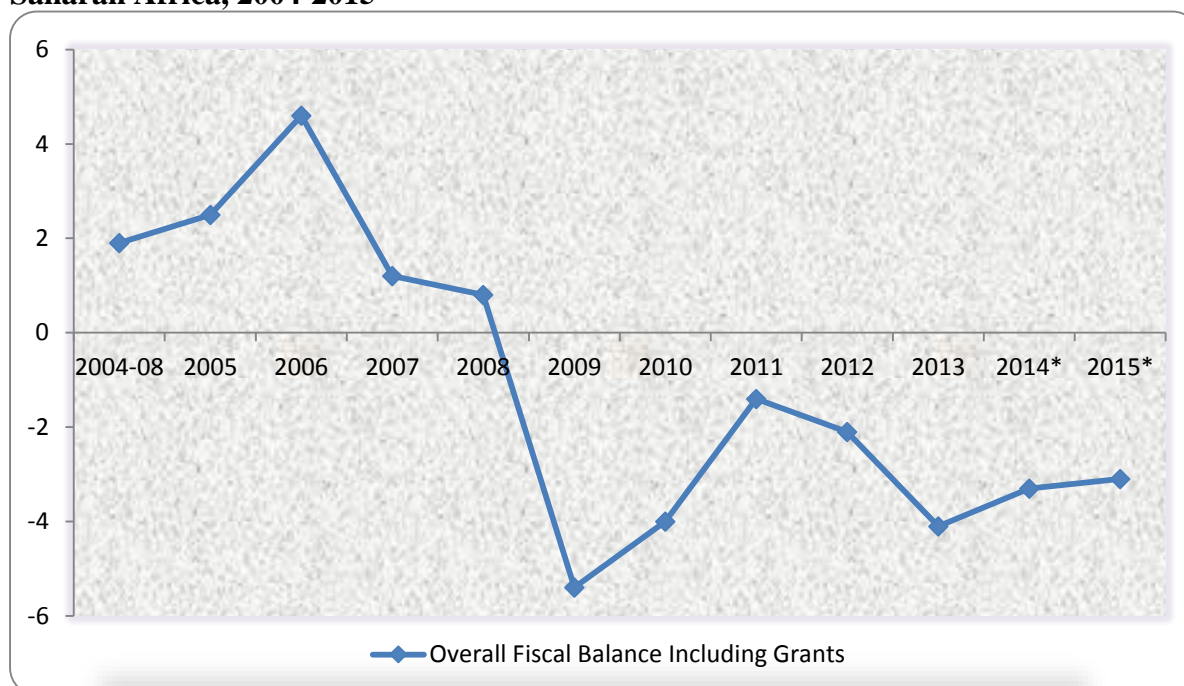
(2009) recorded that Sub-Saharan Africa's real GDP growth declined by almost 1.7 percentage points between 2007 to 2008 thus from 6.21% to 5.17%. However, the evidence has shown that Sub-Saharan Africa's growth performance in the past has been predominated by tremendous growth performance of commodity exporting countries in the region who took advantage of the increasing global demand and prices (Diallo, 2010).

### **2.7.2 Fiscal Balances**

Fiscal deficits widened across the region and remained one of the major sources of vulnerability for many countries (IMF, 2014). Factors such as ambitious public investments, large increase in public sector wages, rising subsidies and transfers, and weak revenue generating systems may be responsible for the rising trend in fiscal deficits in many countries in Sub-Saharan Africa. Zambia for instance, had public sector workers' salary increased by 45 percent in 2013 (*ibid*). Deterioration in fiscal balance has the tendency to produce low fiscal buffers limiting the scope of policy responds in times of external shocks to an economy.



**Figure 5: Trend in Overall Fiscal Balance Including Grants (% of GDP) in Sub-Saharan Africa, 2004-2015**



Source: IMF's Regional Economic Outlook, April 2014 \*Projections

From Figure 5, total fiscal balance including grants stood at 1.9 percent of GDP for 2004-2008, deteriorated to negative 4 percent in 2010 and by the close of 2013 the value rose to negative 4.2 percent of GDP and was expected to worsen by negative 3.3 and negative 3 percent for 2014 and 2015 respectively (IMF, 2014).

### 2.7.3 Inflation

Inflation has generally revealed a downward trend for the period under review. By the end of 1980, consumer price index for the region stood at 13.60 percent and averaged 9.56 percent for the period 1981-1990. Inflation grew marginally at early 1990s hovering around 9 percent but skyrocketed to 28.81 percent in 1994, declined over the subsequent years hitting as low as 4.18 percent in 2004 (World Bank, 2015). It however increased to 10.56 percent in 2008 and the increment may be attributed to some internal and external disturbances that affect the region within those periods. Domestic food prices rose rapidly in Guinea, Sierra-Leone,

Madagascar, and Kenya during these periods as these countries are net staple importers and were not able avoid importing inflation from abroad . Unfavourable weather conditions such as drought in Kenya and flood in Benin lead to poor harvest resulted in high prices in those countries (IMF, 2014).

IMF (2011) reported that other factors such as political crisis and foreign exchange shortages fuelled inflation in Cote d'Ivoire and guinea respectively. Inflation has fallen to 4.37 percent at the close of 2010 while the year 2013 witnessed a rate of 4.93 percent. Renewed bouts of currency depreciation in most middle-income countries in the region may reignite inflation pressures that were generally eased in 2013 (IMF, 2014).

The SSA region has been experiencing high level of consumer price index and Figure 6 shows the trend in end of year consumer prices in SSA for the pre-crisis period to 2015. Consumer Price Index for the region was projected to reach annual rate of 6.2 and 5.8 percent in 2014 and 2015, respectively. Moreover, exchange rate pass-through on domestic prices due to potential domestic currency depreciation in Malawi, delayed effect of recent and planned wage increase in Tanzania, rising private sector credit in Mozambique, and the impact of consolidating public sector finance in Ghana and Zambia, are some of the factors that may put additional pressures on inflation in the region (*ibid*).

#### **2.7.4 Foreign Direct Investment**

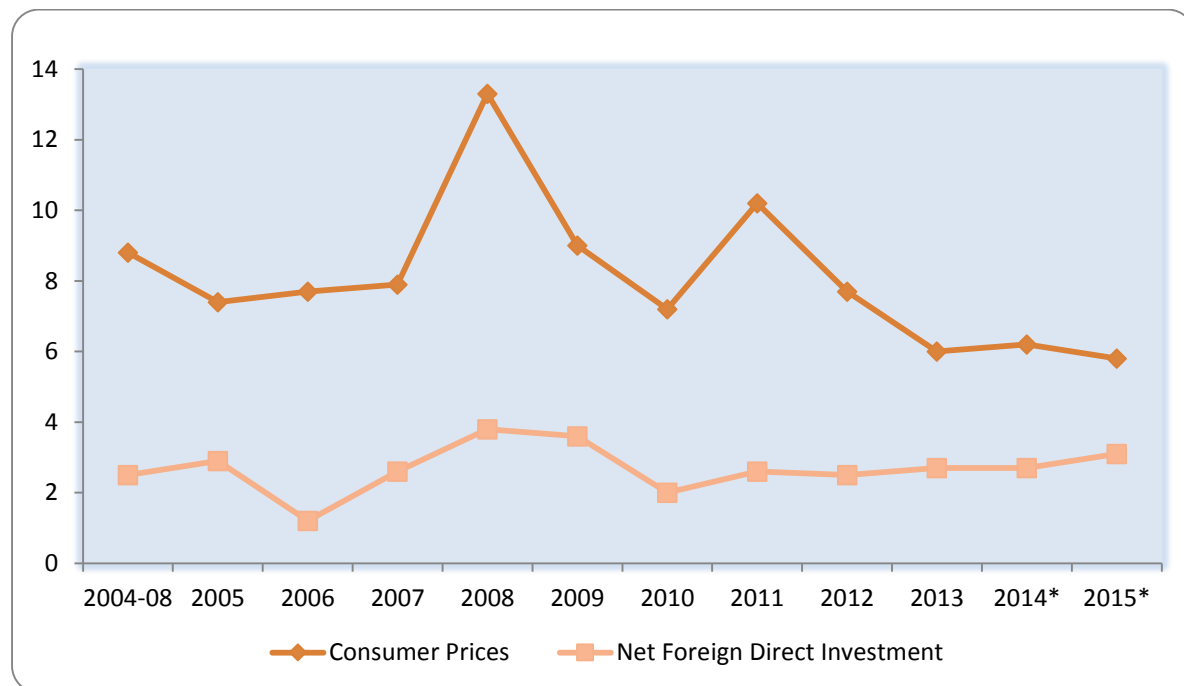
The IMF (1993) defines foreign direct investment within the context of international business as an investment “that reflects the objective of a resident entity in one economy obtaining lasting interest in an enterprise resident in another country”. Foreign direct investment are the net inflows of investment to acquire 10 percent or more of voting stock in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital,

reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments (World Bank, 2015). FDI inflows into Sub-Saharan African economies are partial reflection of foreigners' interest to extract resources from those economies, even though diversification of exports is in progress (IMF, 2011).

FDI inflows into various regional economies including Sub-Saharan Africa have been growing rapidly over the years. Foreign Direct Investment inflow into the region over the past four decades shows an exponential growth trend (Loots and Kabundi, 2012). Despite poor economic conditions in SSA, FDI has risen from US \$5 billion in 1995 to US \$18 billion in 2005 although Africa's share in the world's FDI inflow declined over the long period (UNCTAD, 2006). Bartels et al (2009) stated that the flow of FDI in SSA is highly asymmetric, asset specific and volatile. The most recipient countries are Angola, Chad, Ghana, Nigeria, Sudan, Equatorial Guinea, and Congo Democratic Republic (UNCTAD, 2007).

FDI as a percentage of GDP has been rising over the years with 1980 recording 0.09, 1.05 in 1989, and 2.75 percent by the end of 1999 (WDI, 2015). FDI inflow to GDP ratio for the region peaked in 2001 with the value of 4.54 percent with a marginal fall over the subsequent years. The ratio has risen incrementally by 0.1 percentage points between 2010 and 2013 thus from 2.46 to 2.47 percent. Figure 6 depicts the trend in net foreign direct investment in SSA region for the period 2004-2015.

**Figure 6: Trend in End of Period Consumer Price Index (Percentage Change) and Net Foreign Direct Investment (% of GDP) in Sub-Saharan Africa, 2004-2015**



Source: IMF's Regional Economic Outlook, April 2014

\*Projections

### 2.7.5 External Trade

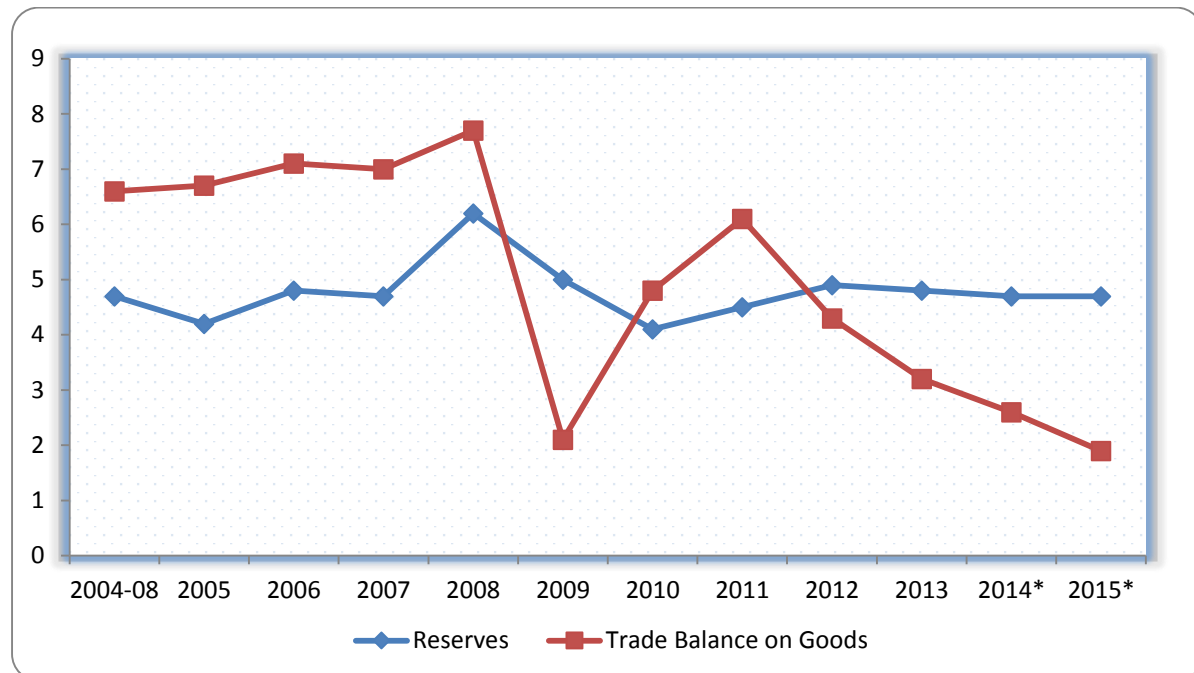
The extent to which an economy is involved in international trade measures its openness. External forces have the capacity of influencing economic environment in countries but the degree of influence depends on the extent to which those economies are opened to international trade. Export promotion policy such as export subsidy may enhance openness and promote economic growth but may at the same time restrict openness since the subsidy may harm other countries through distortion of international prices (Azam, J.P et al, 2002). Despite variations in empirical findings, overall conclusion is that openness promotes economic growth.

From figure 7, trade balance on good as a percentage of GDP for Sub-Saharan Africa for the period 2004-2015 generally shows a downward trend with some variations. Total trade balance on goods for Sub-Saharan Africa for 2004-2008 stood at 6.6 percent of GDP for the pre-crisis period fell to 4.8 percent in 2010, further to 3.2 percent in 2013. Trade balance on goods is expected to decline to 1.9 percent of GDP by the end of 2015. However, the region continues to widen its export destinations which have help boost trade between the region and the rest of the world. One third of non-oil exports of the region now go to the BRICs (Brazil, Russia, India, China) compared with less than 10 percent a decade ago (WEO 2014). Total export of the region for 2004-2008 was 37 percent of GDP, 34.7 percent in 2010, and 35.8 in 2013. It is expected at 33.9 percent by the end of 2015. Imports for the same periods stood at 35 percent, 35.4 percent, 38.4 percent, and projected at 37.3 percent of GDP respectively.

#### **2.7.6 Foreign Reserves**

One of the traditional measures of reserves is the current account based measure thus gross official reserves in months of imports. It represents how swift countries could adjust to shocks. At the end of 2007, reserves covered 5.8 months of imports, up from 3.7 months in 1997 to 2002 (Drummond and Dhasmana, 2008). Some countries within Sub Saharan Africa also have to grapple with potential capital outflow hence capital account based measure of foreign reserves may be relevant. The ratio of reserves to short term debt especially relevant for countries that have short term foreign financing risks was less than 1 percent for only few countries within the region (*ibid*). Figure 7 illustrates the trend in SSA's foreign reserves in months of import of goods and services from 2004-2015. The pre-crisis period recorded 4.7 months of reserves with 6.2 months in 2008. It however increased marginally over the recent years and was estimated at 4.7 months by the end of 2015.

**Figure 7: Trend in Reserves (Months of Imports of Goods and Services) and Trade Balance (% of GDP) in Sub-Saharan Africa, 2004-2015**



Source: IMF's Regional Economic Outlook, April 2014 \*Projections

## 2.8 Concluding Remarks

External debts of countries in Sub-Saharan Africa have been on the rise reflecting policy directions increasingly favouring current expenditure over investments, low tax revenue mobilization, increasing public sector wage and low fiscal consolidation in most countries. Projections have rated Sub-Saharan Africa's growth to remain robust within the top 30 percent in the world in the near-term outlook (IMF, 2014), concerns however remain regarding how this growth can be an inclusive one and be translated into combating widespread poverty and inequality, towards the achievement of Millennium Development Goals by 2015 deadline in many countries.

## **CHAPTER THREE**

### **LITERATURE REVIEW**

#### **3.1 Introduction**

Concerns have been raised by economic analysts over the inability of developing countries and, for that matter, Sub-Saharan African Countries to effectively administer their debt management policies, leading to continuous upsurge in external debt levels and low economic performance. The development of huge external debt accumulation has invited theories and empirical investigations into assessing the impact of debt on economic growth. This chapter will discuss existing theories and empirical studies on external debt and growth in order to better understand the nature, scope, and methodology informing their findings and conclusions.

#### **3.2 Theoretical literature**

##### ***3.2.1 Motivations for External Debt***

There are three major sources available for government to raise financial resources towards funding public expenditures: printing of money, taxation and borrowing. Taxation in most developing countries particularly Sub-Saharan Africa has a limited capacity in raising enough revenue necessary for investment in massive infrastructural projects for economic take-off. Printing of money to finance projects puts inflationary pressures in an economy which may jeopardize macroeconomic stability. According to the monetarist school of thought for instance, inflation is everywhere a monetary phenomenon.

Gill and Pinto (2005) pointed out that the issue of equity, stability and smoothing justifies the choice of public debt over taxation and printing of money. They argue that debt allows more equitable use of investment opportunities with long gestation periods and taxing the current generation to fund projects that will benefit future generations would be inequitable. Over-reliance on printing of money could lead to high inflation. Debt financing also helps in meeting urgent spending needs whilst frequent fluctuations in the tax rate creates economic uncertainty and induce deadweight loss.

Furthermore, debt is preferred to the printing of money and taxation on the grounds of political expediency. Government may borrow in order to postpone undertaking urgent structural changes which may be painful in the short run but beneficial in the long run. The postponement of immediate policy implementation may promote the interest of some well-connected players in the economy. Rodrik (1999) however argue that policy interactions, shocks and conflict management, and institutions play a key role in explaining debt accumulation and macroeconomics performance and the tendency to avoid short-run adjustment costs might have prolonged negative consequences for future growth and equity. Thus when government, for instance, reneges on the needed immediate reforms it exacerbates the negative implications of debt accumulation.

Moreover, the choice of external borrowing can be explained using the dual-gap theory which states that investment is a function of saving, and that the level of domestic saving in developing countries is insufficient for generating the level of investment that is required for growth and development. It is hence prudent to solicit additional funds abroad to complement domestic resources. Todaro and Smith (2006) argue that the phenomenon of external borrowing for developing countries is not uncommon at their early stage of development since domestic capital is inadequate for investment.



Ajayi and Khan (2000) stated that the principle that should guide debt contractual agreements hinges primarily on the cost and benefit evaluation of economic activities. It requires that a country should borrow from external sources if the rates of returns on such funds are greater than the cost of borrowing them. If foreign borrowing increases the debt service capacity of the borrowing economy more than the addition to debt burden, then such borrowing becomes desirable. Strict compliance with this principle will help countries to expand production with the aid of external savings.

### ***3.2.2 Debt Sustainability Index***

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.

A robust economy that can guarantee the future repayment of its foreign loans can be the one whose total output and export volume is considerably large. The level of national output and export suggests the content of foreign capital inflow which contribute to output production and the extent to which future capital outflow may occur in the form of debt settlement.

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 while 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).

In an effort to promote institutional strength for adoption of prudent debt management policies in order to minimize debt default among countries, IMF and the World Bank in 2005 endorsed a joint framework for debt sustainability assessments (DSAs) for low-income countries (IMF, 2014). The debt sustainability framework (DSF) was revised in 2006 alongside with the implications of the multilateral debt relief initiative (MDRI). Table 5, provides the indicative threshold for each debt burden indicator under DSF which classifies countries into three policy performance categories (strong, medium and weak).

**Table 5: Debt Burden Threshold under IMF and World Bank's Debt Sustainability Framework**

	Present Value of Debt in Percent of			Debt Service in Percent of	
	Exports	GDP	Revenue	Exports	Revenue
Weak Policy	100	30	200	15	25
Medium Policy	150	40	250	20	30
Strong Policy	200	50	300	25	35

Source: International Monetary Fund, HIPC Initiative and MDRI Statistical Update, 2014

The primary objective of the DSF is to guide borrowing decisions in low-income countries in a way that matches their need for fund as well as their current and prospective ability to service the loan in the future, and designed to fit their specific circumstances. The framework provides guidance on the lending and grant allocation decisions of creditors and donors to ensure that resource inflow to LDCs are consistent with their long-term sustainability and progress towards achieving the MDGs (*ibid*).

Smyth and Hsing (1995) in their attempt to test the effect of government debt on economic growth and also to ascertain whether optimal debt ratio exists discovered an optimal level of external debt for developing countries as 38.4 percent of their Gross Domestic Products. Clements, Bhattacharya and Nguyen (2003), established external debt threshold at 20 to 25

percent of the present value of the external debt, representing 50 percent of a country's GDP in terms of the nominal value of the debt.

Patillo, Poirson and Ricce (2002) asserted that external debt reaching as high as 160 percent of a country's export may not be detrimental to economic growth however, accumulation of foreign debt beyond such limit will have dire consequences on growth. Maghyereh, Omet and Kalaji (2002) as quoted in Akram (2013) also concluded that optimal level of external debt in Jordan is 53 percent of GDP.

### ***3.2.3 External Debt Burden and Debt Service Capacity***

Loan from abroad could become a burden on the borrowing nation if it fails to raise sufficient resources from current production to fulfil debt service obligations. The difficulty in servicing debt is a reflection of debt burden, and can be measured in terms of current national income that is committed to financing previously contracted loan (Ogunlana, 2005). A situation where the debt service becomes onerous and large amount of national income is devoted in servicing it implies that debt service burden on such country is huge. Conversely, external debt becomes less burdensome when debt service obligations absorb a small proportion of national income.

In analysing the capacity to service external debt, the question is what should be the optimal level of foreign loan which will induce no future debt service burden? Salop and Spittaller (1980) adopted optimization framework to provide theoretical explanation to this question. They argued that optimally, the marginal cost of external borrowing should be equal to its marginal benefit. However, Hjertholm (1999) demur that cost–benefit optimization approach does not provide any formula that is operational in ascertaining the debt service capacity of countries. Hjertholm (1997) proposes that the issue of debt capacity should be considered

from the perspective of expected growth. Hjertholm approached the issue of debt capacity in three ways. First, is output growth sufficient enough to meet debt servicing obligation? This condition has rarely been met in developing countries in recent decades (osei and Quartey, 2001). Secondly, since external debt is financed by foreign exchange, is the rate of growth of export earnings at least equal to interest rate? Thirdly, is the rate of expansion of the tax base equal to the interest rate? Hjertholm (1997) provides evidence that these conditions have not been met in Sub-Saharan Africa.

Non-optimization approach has also been used to find optimal external debt that falls within the capacity of a country to service. This theoretical model incorporates expected growth trajectory of an economy. It emphasizes foreign borrowing essentially for investment purposes as a means of bridging the wedge between domestic borrowing and investment (King, 1968; Solomon, 1977). This model though simple to understand, its assumption could be seen as rigid and hence renders the model unrealistic. Mc Donald (1982) pointed out that focusing on investment as though such investments will readily generate foreign exchange to service the debt in the future is not realistic.

Furthermore, debt dynamic model is also used to ascertain external solvency of an economy. World Bank (1985) and Hernandez (1988) observe that export value provides more accurate measure of income in foreign currency that can be used to service external debt. However, changes in export growth, and interest rate over time makes it difficult to rely on dynamic model in analysing optimal foreign loan. Even though these theoretical explanations do not provide comprehensive insight into external debt sustainability, they give fair idea about external debt service capability.

### ***3.2.4 Effects of External Debt on Growth***

The Harrod-Domar growth model explains the direct relationship between savings and rate of economic growth and the indirect relationship between capital and growth. The model assumes that economic growth is as a result of capital accumulation in form of savings and development economists have used it to explain financing gap of developing countries. The model explains that for a set growth target, the investment to meet this target can be ascertained by multiplying the target by the incremental capital output ratio. Development economists claim that in case of abundant labour supply, the only constraint to production is capital scarcity (Effendi, 2001). The financing gap is the difference between available financing for investment and the required investment and using foreign capital such as foreign debt to fill the gap would help achieve the targeted growth rate. Empirical evidence in support of this theory in developing countries however remains imaginary since the growth of foreign debt has not helped achieve targeted growth in these countries.

Moreover, a school of thought holds the position that external debt has positive effect on domestic savings, investment and hence promotes economic growth. External debt is seen as an inflow of foreign capital which adds up to most often insufficient domestic savings. Thus foreign borrowing fills savings and investment gap and makes funds available in the borrowing economy for investment in productive ventures which require huge capital outlay for economic take-off. This claim is in consonance with the views of Eaton who suggested that international debt (foreign savings) is a complement to domestic savings and investment and hence have positive effect on economic growth (Eaton, 1993).

Moreover, many countries cannot avoid borrowing funds from abroad to finance their development projects since external loans most often comes at lower interest rate compared to domestic ones. Low interest rate makes loans from abroad relatively cheaper to budget

managers. Economic managers are also motivated to secure loan from abroad and limitless international market since risk of crowding out borrowers from its own economy is low. This low interest rate and utter absence of crowding out private borrowers would as well facilitate economic growth.

In contrast to the view that external debt serves as a supplement to domestic savings and investment, another school of thought views external debt as a substitute to savings and investment and hence has adverse implications on growth. Literature has identified five dominant channels through which external debt affect growth negatively. These channels are explained using debt overhang hypothesis, crowding out effect, human capital development effect, import compression hypothesis and the direct effect of debt hypothesis.

Krugman (1988) defined debt overhang as “*a situation in which the expected repayment on foreign debt falls short of the contractual value of the debt*” whiles according to Borensztein (1990), debt overhang refers to “*a situation in which the debtor country benefits very little from the return to any additional investment because of the debt service obligations*”.

Debt overhang hypothesis (DOH) has two versions: the narrow (traditional) and broader version. The narrow perspective posits that debt overhang effect exists when the country's debt discourages investment. Thus when investors expect that government would increase the tax rate on returns to capital to service the debt, they would reduce their investment levels to avoid the higher future taxes (Krugman, 1988; Sachs, 1989; Anyanwu, 1994). Neoclassical models posit that imposition of taxes for interest payment on external debt reduces individual's disposable income and hence curtail savings of the taxpayer. The broader version of debt overhang posits that there will be disincentive to invest when investors expect inflation, devaluation and other economic distortionary measures as means to service the



debt. Debt rescheduling negotiations also discourages investment since it raises uncertainty within the business environment (Claessens et al., 1996).

Agenor and Montiel (1996) pointed out that policy makers in analysing debt overhang in the context of debt crisis ascribe it to the problem of solvency or liquidity. Liquidity problem is a short term problem which arises when a country fails to service its current debt according to specified terms of the debt contract while solvency problem is a long run phenomenon, a situation where a country's total debt liability cannot be paid at any period of time (Ajayi, 1997).

Secondly, external debt dampens economic growth through human capital development effect. Debt service burden on government reduces public spending as well as spending on social investments such as education and health which are crucial for economic growth. It is well established that access to education and quality health delivery systems are necessary for producing quality human resources. Therefore, government failure to invest in health and education reduces human capital, productivity slows down and hence a fall in economic growth (consistent with endogenous growth model). Serieux and Samy (2001) noted that slower physical capital growth may have indirect effect on growth by reducing productivity of new investment.

Moreover, heavy debt burden implies that government short term revenue must be used to service the debt thereby denying public investment into some sectors of the economy vital for economic growth. Thus, there may be crowding out effect on investment in the domestic economy (*ibid*). Reduction in public investment can lead to decrease in private investment since some private investments are complements to public investment (Diaz-lejandro, 1981; Taylor, 1983). Inadequate infrastructural facilities caused by crowding out effect could lead to reduction in investment productivity.

The growth effect of very high debt burden through balance of payments account is what is referred to as liquidity constraint hypothesis (LCH) or import compression effect. Countries with high debt burden require enough inflow of foreign exchange so as to service the debt especially when the nation's currency is not tradable in the international market. A situation where a country has low export and capital inflow, and inadequate reserves, debt service becomes problematic hence may resort to devaluation/depreciation or/and import restriction to encourage foreign exchange inflow. Serieux and Samy (2001), Ndulu (1997) and Taylor (1983) argued that this situation makes imported inputs expensive and shortage of capital goods which can lead to low investment and hence low growth.

Moreover, debt-growth channel can be traced to Direct Effect of Debt Hypothesis (DEDH) as hypothesized by Fosu (1996). Both DOH and LCH and crowding effect suggest an indirect negative effect of external debt on economic growth through reductions in investment levels. However, Fosu (1996) argues that even if external debt is inconsequential in the savings and investment function, it can still influence output growth through its effects on factor productivity and investment mix. While a drag in investment rate would reduce economic growth, external debt may stifle the productivity of production factors in economic growth (Fosu 1999). Pattillo et al. (2003) argued that high debt burden creates uncertainty and biases investment towards short term investment opportunities in detriment to long term ones necessary for growth. Thus, investors would be reluctant to invest in projects with long term gestation periods because of high sense of uncertainty that heavy debt burden may create in their expectations about the distant future.

Furthermore, Debt Laffer Curve theory seeks to explain the relationship between debt and economic growth. The theory postulates a nonlinear relationship between debt and growth on the assumption that there is an optimal level of debt that promotes growth and beyond that threshold further debt contraction impedes investment and growth efforts. Cohen (1993)

stated that Debt Laffer Curve can be used to show the relationship between face value of debt and investment since the curve explains that as the outstanding debt increases beyond a certain threshold expected repayment begins to fall. Better still, when a country borrows to finance its budget deficit, it makes resources available for capital investment which helps to achieve its growth objectives. However increase in borrowing beyond a certain level creates debt overhang and debt service challenge and ultimately retards economic growth. Reasonable levels of external debt help finance productive investment and that may be expected to enhance growth, but beyond a certain level additional indebtedness may reduce growth Pattillo, Poirson and Ricci (2002).

### ***3.3.5 Risk Elements of External Debt***

There is a risk attached to external debt and it is basically concerned with exchange rate fluctuation. External debt can turn to be most costly if raised in a currency whose value consistently appreciates relative to the domestic currency. Moreover, countries whose currencies are non-tradable in the international financial market often would have to devalue their currencies to solve BOP imbalances. In free market system, most local currencies frequently suffer currency depreciation which makes external debt expensive. Exchange rate risk is difficult to calculate while hedging against future risk over a long period of time could be challenging.

### 3.3 Empirical Literature

Studies on the effect of external debt on economic growth have mainly sprung up following the beginning of the debt crisis in early 1980's. Most of these empirical investigations focus on group of countries whilst few are country-specific. Moreover, while some of these research works found positive relationship between external debt and growth, others obtained negative relationship whereas some found no significant relationship between them. Some of these previous studies are reviewed below:

#### *3.3.1 Studies which Found Positive Contribution of External Debt to Economic Growth*

Warner (1992) using Least Square Estimation carried out an experiment on 13 Less Developed Countries for the period 1982-1989 which was characterized by debt crisis. Warner estimated two different regressions by analysing the effect of decrease in export prices, high international interest rate, and low growth rates in the developed economies as exogenous variables determining investment in less developed countries and another regression involving dummy variable for the debt crisis to capture external debt effect on growth.

For him, if the decline in export prices, increase in foreign interest rate, and recession variable in developed economies are statistically significant then debt crisis is not critical. Warner's panel analysis on the two models established a positive and significant relation between external debt and investment which was attributed to an era when foreign loan provided investible funds. Similarly, Jayaraman et al. (2008) centred their investigation on 6 pacific island countries which heavily depended on foreign aid and external borrowing until early 1980s when political turmoil in those countries threw their economies into fiscal and

current account deficits problems. Their study revealed significantly positive contribution of external debt to real GDP growth whiles fiscal deficit adversely affected real GDP growth.

### ***3.3.2 Studies that Found Negative Contribution of External debt to Economic Growth***

Bauerfreund (1989) investigated the cost of foreign borrowing on the Turkish economy by employing computable general equilibrium model. Using a multi sector, non-linear general equilibrium model, he attempted to explain the cost of foreign borrowing through the mechanism of debt overhang. Findings from Bauerfreund's work established a negative relationship between external debt and investment in the Turkish economy for the year 1985. Lag distributional model was used by Geiger (1990) to assess the effect of external debt on economic growth in 9 South American countries covering a 12-year period (1974-1986). The study found significantly negative relationship between external debt and economic growth.

Rockerbie (1994) proffered some criticisms against the work of Warner (1992) on the grounds of methodology. Rockerbie argued that Warner failed to conduct nested and non-nested test to compare the two models he propounded, and the models did not include debt variables. He further argued that debt crisis within the period of 1982-1989 in the less developed economies could be ascribed to massive structural changes that occurred within the period of 1960-1981 hence Warner's hypothesis could not hold if a dummy is created for the debt crisis. Rockerbie (1994) hence adopted Ordinary Least Square Estimation for the same 13 less developed countries for the period 1965-1990. His model captured variables which represent world economic condition, monetary and fiscal policies, and debt variables. Rockerbie's study established a negative relationship between debt and investment.

Gerald (1994) used simple neoclassical model to assess whether capital imports can increase real output and whether there are sufficient available exports to service the debt in 31 Sub

Saharan African countries. His findings suggested that there are very little export proceeds available for debt servicing and this may cause debt overhang problem. Elbadawi et al. (1996) used ratios such debt-GNP, debt to export, debt service-export ratio to as a measure of debt burden to investigate the impact of external debt on economic growth in Kenya. They concluded that external debt impedes economic growth through debt overhang effect.

Another study was conducted by Deshpande (1997) in his effort to investigate the debt overhang hypothesis tracing the effect of debt on growth via investment in 13 Highly Indebted Poor African countries. He argued that debt overhang hypothesis can be best explained using the total debt payable rather than normal debt obligation. His study employed panel data regression using Ordinary Least Square Estimation for the period 1975-1983 and 1984-1991, all established negative relationship between external debt and investment. This is in addition to an earlier exercise by himself in 1993 where he tried to address the problem of debt overhang both theoretically and empirically. The result was that over the 20-year period between 1970 and 1990, the investment to GDP ratio was found to exhibit an inverse U-shape, with the negative relationship holding only after a certain debt to GDP ratio has been reached.

Fosu (1996) conducted empirical analysis on the impact of external debt on economic growth in Sub-Saharan Africa for the period 1970-1986. He modified the augmented production function into “continuous interactive model” based on assumed endogeneity between debt and capital and “discontinuous interactive model” derived from analysis of covariance model to examine the direct and indirect effect of external debt on economic growth. The study used annual values of several debt measures for a sample of 29 Sub-Saharan African Less Developed Countries. Regardless of the debt measures and model used, the study found direct adverse effect of debt on economic growth (through the reduction in the marginal productivity of capital) but the result did not support the ‘indirect’ effect of debt (no adverse

effect of debt via investment levels). The study also found a nonlinear relationship between debt and growth that it is positive at low levels of investment, but negative after a threshold of 16 percent of GDI/GDP.

Fosu (1999) applied Ordinary Least Square estimation technique on augmented production function to analyse the effect of external debt on economic growth in Sub-Saharan Africa for the debt crisis period 1980-1990. His main focus was to test the Direct Effect of Debt Hypothesis (DEDH) using average data on 35 Sub-Saharan African countries. He used net debt computed as total outstanding debt less total reserves (as a proportion of GNP) as a measure of debt burden and found that external debt negatively affects economic growth even with no or little impact on investment.

Fosu (1996, 1999) however, fail to account for the sub-regional groupings of SSA countries based on their levels of per capita income. Failure to investigate the influence of such country groupings on the countries' external debt may lead to misleading policy prescriptions. For instance, if there is evidence that the effect of external debt on economic growth differs across the country groupings: thus if external debt affects some countries negatively but affects others positively, a country that should benefit from loans from abroad may rather resorts to domestic source of borrowing which may result in declining economic growth rates.

Iyoha (1999) evaluated the effect of external debt on economic growth using simulation approach with small macro-economic model on data collected on Sub-Saharan African countries for a 24-year period from 1970-1994. The study employed Two-Stage Least estimation method on simultaneous equations model involving output and investment demand functions, and four identities. Her findings confirmed debt overhang hypothesis and crowding out effect of external debt and hence concluded that large stock of external debt and

heavy debt service payments is detrimental to investment and economic growth in SSA but also failed to account for the effects of country groupings on external debt, and its implication for external debt-growth relationship for SSA.

Were (2001) used time series data for the period 1970-1995 in her quest to analyse the effect of debt overhang on growth in Kenya. She found no evidence of negative effect of debt service on growth but established crowding effect on private investment. Mohamed (2005) similarly used time series data on Sudan for 1978-2002 to investigate the effect of external borrowing on growth in Sudan. He adopted inflation rate as a measure of macroeconomic policy and the real return on export earning as a proxy for export promotion strategy as the determinants of growth. His findings suggested that real export positively and significantly promotes growth whiles external debt and inflation undermines growth.

Adepoju et al. (2007) employed time series data for Nigeria over the period 1962-2006 to investigate the contribution of external indebtedness to growth in Nigeria. They concluded that foreign borrowing impedes growth effort of Nigeria. Similarly, a study conducted by Hameed et al. (2008) on the dynamic effects of external debt servicing, capital stock and labour force on economic growth for Pakistan using time series data for 1970-2003 established a negative effect of external debt servicing on productivity of capital and labour which undermines economic growth.

Butts (2009) also analysed the causal relationship between short term external debt and GDP growth in some 27 Latin American and Caribbean countries for 33 years over 1970-2003 and found that granger causality holds: thus external debt Granger causes GDP growth in 13 countries out of the 27 countries. The paper however fails to explain the mechanism through which external debt causes economic growth and if such causal relationship is linear or otherwise.



Reinhart and Rogoff (2010) analyses the development of public debt (measured as central government debt) and the long-term real GDP growth using simple correlation statistics with a sample of 20 developed countries for two centuries 1790 to 2009 finds that for GDP to Debt ratios below 90 percent, relationship between debt and growth was insignificant whilst ratios above 90 percent worsens median growth by 1 percent and considerably more for mean growth. This finding was consistent with that of Kumar and Woo (2010).

Similarly, Musebu Sichula (2012) examined the paradox of debt overhang in the Heavily Indebted Poor Countries (HIPCS) of the Southern African Development Community (SADC) in order to show debt overhang existence and the effect of debt relief (HIPC) on these countries. The study was carried out over the period 1970-2011, the period within which countries used for the study accumulated debt and reached the completion point of the HIPC initiative. While using debt to GNI ratio and Debt Service to GDP ratios as measures of debt burden, He adopted Solow Growth Model, and employed Granger Causality test on an investment function to explore the debt overhang relationship. His finding reveals that GDP growth granger causes private investment and debt service, private capital Granger causes GDP growth and debt service, but debt service does not Granger causes GDP growth and private investment. Musebu Sichula (2012) concluded that external debt does not promote economic growth and in HIPC SADC counties. However, his study fails to examine the possibility of a non-linear relationship between external debt and economic growth in those countries.

### ***3.3.3 Studies that Found Mixed/No Relationship between External Debt and Growth***

Chowdhury (1994) conducted granger causality test for Asian and Pacific nations for the period of 1970-1988 as an attempt to establish cause-effect relationship between external debt and economic growth. He detected that an increase in Gross national product leads to increase in external debt but found an insignificant causal effect of external debt on economic growth.

Afxentiou and Serletis (1996) attempted to probe the relationship between external borrowing and productivity in 55 developing countries. They grouped these countries under four categories based on their similarities in terms of debt level and level of per capita GNI; 14 as indebted middle-income countries, 10 as moderately indebted low-income countries, 12 as severely indebted middle-income countries and the rest 19 as indebted low-income countries. The time periods covered under this investigation are 1970-1980 and 1981-1990 which represent a period of astronomical growth in foreign borrowing and an era characterized by problem of debt service respectively.

Results for the period 1970-1980 showed no inverse relationship between foreign borrowing and national productivity for all the four categories of the countries formed from the 55 developing countries. They explained that these countries were using the external debt to ameliorate the shocks of oil price increase. Results for the 1981-1990 established a negative relationship between external debt and national productivity for indebted low-income countries and severely indebted middle-income countries. Afxentiou and Serletis (1996) explained that foreign borrowing was misused by these countries and were facing debt service challenges.

Cohen (1993) also used Ordinary Least Square Method to estimate investment equations for 81 developing countries for the periods 1965-1973, 1974-1981 and 1982-1987. He found that the level of external debt does not provide any explanation on the declining level of investment and for that matter the growth of GNP in those countries.

Schclarek (2004) found no evidence that external debt negatively affect total productivity after evaluating the effect of external debt on economic growth using data from 24 industrialized countries and 59 developing countries for 32 years period spanning 1970-2002. He noted that high economic growth moves with lower level of only public external debt but not private external debt in developing countries while for industrialized nations the inverse relationship between public external debt and growth never holds.

Frimpong and Oteng-Abaye (2003) estimated the impact of external debt on economic growth in Ghana for 1970-1999. They used long-run growth equation to investigate the long-run effect of debt on growth and vector error correction model (VECM) to estimate the short run effect. Their results indicated that external debt inflows positively influences GDP growth but the debt servicing revealed a negative effect on GDP growth. The study also revealed that the negative effect of external debt on debt is found through its deleterious impact on domestic investment.

### **3.4 Summary of Literature Review Findings**

Empirical investigations have divergent findings in their attempt to unravel the nature of relationship that exist between external debt and growth. Most of these studies differ in terms of methodology, geographical area monitored, and time period covered. However, majority of them have established negative relationship between external debt and economic growth, few proffered positive relationship whilst some posit no correlation between debt and growth.

Lack of unison in the findings of previous studies clearly suggests ambiguity in existing literature requiring more enquiries into the external debt-growth nexus.

Moreover, many studies on debt-growth nexus have been conducted on country specific (individual country) and cross-country (group of countries) basis but it is worth mentioning that most of these studies especially the cross-country investigations were done on developed economies and recent studies such as Kumar and Woo (2010), Reinhart and Rogoff (2010) were much concerned about determining the debt to GDP thresholds that impedes growth in the developed countries. Literature on Sub-Saharan Africa is scant with the most recent by Fosu (1999) and Iyoha (1999). Fosu (1999) applied augmented production function to analyse the effect of external debt on economic growth for the debt crisis period (1980-1990) and found negative relationship between debt and growth. Similarly, Iyoha (1999) also found negative effect of external debt on economic growth after employing simulation approach in his study for the period 1970-1994.

Although these empirical studies have provided some explanation on the relationship between external debt and economic growth in Sub-Saharan Africa, they are unable to provide any explanation on external debt and growth on group of countries within the region that have different characteristics with respect to per capita income levels. Even though countries in Sub-Saharan Africa share common characteristics, their level of per capita incomes varies hence World Bank classifies these countries as low-income, lower-middle-income, and upper-middle-income. The main contribution of this study is to probe whether classification of countries based on their per capita income (low-income and middle-income economies) have any influence on debt-growth relationship in SSA.

## **CHAPTER FOUR**

### **METHODOLOGY**

#### **4.1 Introduction**

This chapter presents the theoretical framework and empirical model employed in this study to investigate the effect of external debt on economic growth in Sub-Saharan Africa. It also discusses the statistical methods and necessary diagnostic tests within panel regression that are employed to analyse the effect of external debt on economic growth.

#### **4.2 Data Source and Scope**

This study uses secondary data mainly drawn from World Bank (World Development Indicators, International Financial Statistics) and IMF (World Economic Outlook) 2015 online data bases. Sub-Saharan Africa is made up of 48 countries however, due to data unavailability on some important variables for some countries, annual data for 39 SSA countries is used in the study for empirical analysis. Data on external debt for the remaining 9 countries in the Sub-Region is unavailable. Possibly, their participation in external debt activities in the region is insignificant hence the empirical results based on the 39 countries in the Region is expected to reveal the external debt situation in SSA. The SSA countries are categorized into low-income and lower-middle, and upper-middle-income and high-income countries according World Bank based on their level of per capita income.

The study covers a time period of 24 years (1990-2013) which captures the long-term impacts of 1982 global debt crisis, the effect of 2008 financial crisis and the current economic downturn, on external borrowing and economic growth. However, data unavailability for

some of the years served as a constraint for choosing the time period of 24 years for the empirical analysis.

### 4.3 Theoretical Perspective

#### 4.3.1 *Basic identity*

The main rationale for countries opting for external debt instead of domestic debt is espoused in the dual gap theory. The theory explained that investment is a function of savings but there is insufficient level of savings and investment for economic growth therefore external savings is required to complement the domestic one. This study uses Gross Domestic Product (GDP) identity following Root (1978) to explain the rational for external borrowing to finance investment in an economy. Gross Domestic Product is defined as the market value of total goods and services produced within the national borders of a country within a period of time and it is assumed to be equivalent to national income spent on consumption of goods and services (C), savings (S) and the identity is specified as:

$$\mathbf{GDP = C + S} \quad (1)$$

Alternatively, on the assumption of no government influence in the domestic economy, GDP is made up of the sum of expenditures incurred by economic agents in an economy, namely, household consumption of goods and services, and firms' investment (I), and net export of goods and services (X-M) obtained by subtracting imports (M) from exports (X) and also specified as:

$$\mathbf{GDP = C + I + (X - M)} \quad (2)$$

However, total domestic investment comprises private sector investment ( $I_p$ ) and public sector investment ( $I_g$ ) and is expressed as:

$$\mathbf{I = I_p + I_g} \quad (3)$$

By solving equations (1) and (2) simultaneously, we have:

$$\mathbf{I} = \mathbf{S} + (\mathbf{M} - \mathbf{X}) \quad (4)$$

The implication from the relationship derived from equation (4) is that when domestic savings is insufficient to finance domestic investment, import balance on current account which is financed by net borrowing from abroad (M-X) is used to fund the deficit. Thus demand for total domestic investment is the sum of domestic savings and net foreign loan.

#### **4.3.2 Output Function**

Sala-i-martin (1997) claimed that economic theories are not enough to unravel exact factors determining growth so methodologies used by empirical growth researchers involves trying the variables that are thought to be potential determinants of growth. He further suggested a cross sectional regression model in the form:

$$\gamma = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_n x_n + \varepsilon \quad (5)$$

Where,  $\gamma$  represents vector of economic growth rates,  $x_1, \dots, x_n$  represent Vectors of explanatory variables which can vary from one researcher to another,  $\varepsilon$  is the error term.

This study however adopts augmented production function used by Fosu (1996) citing labour, capital and exports as essential determinants of growth. The importance of labour and capital in the growth function is attributable to the neoclassical theory of growth whilst robustness of export in the growth model is based on its generally avowed significant contribution to growth (Ram, 1985; Fosu, 1990) as quoted in Fosu (1996). The production function is specified as:

$$q_i = b_1 + b_2 l_i + b_3 k_i + b_4 x_i + e_i \quad (6)$$

Where,

$q$  is Growth rate of output,  $l$  denotes Growth Rate of Labour Force

$k$  represents Growth Rate of Capital,  $x$  is Growth Rate of Exports

$b_1$  is constant,  $b$ 's are Coefficients to be estimated

$i$  represents a Particular country, and  $e_i$  is the error term

#### 4.4 Empirical Model Specification

The study employs dynamic panel regression model in estimating the effect of external debt on economic growth in SSA. The predetermine variables in the model comprises lagged values of the dependent variable (growth rate of GDP) and independent variable (specifically debt to GDP ratio) and debt-dummy interacted variable to capture the effect country groupings. The inclusion of the lagged value of GDP growth rate aimed at incorporating the persistence of the variables in the estimation whilst lags of debt to GDP ratio captures the effect of external loans acquired in the previous years on current economic growth. Furthermore, the use of dynamic panel model would help account for temporal serial correlation, and minimize the likelihood of estimating spurious regression model.

Generally, a dynamic panel regression can be specified as:

$$q_{it} = \alpha q_{it-1} + \beta x_{it} + \mu_i + v_{it} \quad (7)$$

Where  $q$  represents output growth,  $x$  is the matrix of all the explanatory variables,  $\mu_i$  denotes unobserved country-specific time-invariant effect,  $v_{it}$  represents the stochastic error term,  $\alpha$ ,  $\beta$  are the parameters to be estimated,  $i$  stands for a particular country, and  $t$  is time.

Debt overhang hypothesis and liquidity constraint hypothesis emphasizes investment as the main channel of debt-growth nexus. Debt overhang hypothesis posits that when a country



accumulates huge debts, it beacons an eroding fiscal space, creating uncertainty in the minds of investors thereby discourages investment. Liquidity Constraints binds on a country when external debt service requirements reduces financial resources available for investment into crucial sectors of an economy. Otherwise, a fall in current debt service should result in a rise in current investment for a given level of future loan (Cohen, 1993).

Several empirical studies on debt growth-debt nexus were much concerned about tracing the effect of debt through investment and savings (*See* Fry, 1989; Faini and DeMelo, 1990; Hoffman and Reisen, 1991; and Savvides, 1992) and scanty work however exists on the direct impact of debt on economic growth (Fosu, 1996, 1999; and Iyoha, 1999) hence this study seeks to investigate the direct impact of external debt burden on economic growth in Sub-Saharan Africa. External debt may exert direct negative impact on economic growth even if it is not deleterious to the level of investment (Fosu, 1999). This direct effect of debt is tested by allowing for direct entry of debt variables into the production function.

Fosu (1996) stated that although there may be a need for further investigation into the effect of external debt on growth, it should not necessarily be traced through level of investment since results have shown that the effect may be less important than the direct one for Sub-Saharan African countries. Hence in analysing the debt-growth nexus the traditional research emphasis on effect of debt on investment is not completely advisable (Fosu, 1996). This study therefore seeks to investigate the direct effect of external debt on economic growth by adopting a modified version of Fosu's augmented production function specified as:

$$q_{it} = b_0 + b_1q_{it-1} + b_2q_{it-2} + b_3lnl_{it} + b_4k_{it} + b_5x_{it} + b_6d_{it} + b_7d_{it-1} + b_8d_{it-2} + b_9d_{it}^2 + b_{10}middle + b_{11}d*m + u_{it} \quad (8)$$

Where:

**q** denotes Growth Rate of Output, **lnl** is natural log of Labour Force

**k** Investment as a percentage of GDP, **x** is Growth Rate of Exports

**d** stands for External Debt as a % GDP, **d<sup>2</sup>** is Squared of External Debt as % of GDP

**middle** (dummy assumes 1 for middle-income country and 0 for low-income country)

**d\*m** denotes debt\*middle income, **b<sub>0</sub>** is a constant

**b**'s are Coefficients of the Explanatory Variables, **u** is Error term

**t** is time, **i** represents Particular Country

Equation (7) aims at investigating the direct effect of external debt on economic growth in SSA. In order to ascertain the independent effect of external debt on growth, the restricted form of the dynamic model in equation (7) would also be estimated using the system GMM estimation technique. The restricted model excludes the lags of debt to GDP ratio, debt to GDP ratio squared, and debt-dummy interacted variable from the dynamic model. The variables used in the empirical model were selected based on empirical and theoretical justifications so as to present the analysis in a logical and consistent manner. However, data availability on some variables was a determining factor. Aside from debt burden indicators included in the augmented production function, a dummy variable (assuming the value 1 if a county is a middle-income country and 0 if it is a low-income country) is incorporated into the growth model to investigate the effect of debt in these country groupings.

#### 4.5 Econometric Technique

In undertaking an empirical investigation into external debt-growth nexus, this study employs panel regression analysis with STATA 13 as the main analytical software. Formal regression analysis involves the use of model estimation techniques including Ordinary Least Square Estimation (OLS), Fixed Effect and Random Effect (FE & RE), Instrumental Variable Method (IV), Two-Stage Least Square Estimation (2SLS), and Generalized Methods of Moments (GMM). However in panel regression analysis, biases exist which may render coefficient estimates inconsistent in different techniques. The System GMM estimation technique would be employed in estimating the dynamic panel model so as to deal with any possible biases.

Literature has identified two major estimation techniques as effective tool as the GMM technique, namely, the Instrumental Variable (IV) and Two-Stage Least Square Estimation (2SLS) methods but have a weakness as they use “external” instrument. These methods use “external” variables as instruments to correct for potential endogeneity among variables however those instruments hardly meet the condition of “validity and relevance” of a good instrument, and are usually weak. Thus both IV and 2SLS techniques rely on obtaining another variable that is correlated with the explanatory variable causing the endogeneity, but uncorrelated with the error term. It is however difficult to satisfy exogeneity and relevance property of a good instrument when using an external instrument because one could hardly find an instrument that is correlated with the explanatory variable and the same time uncorrelated with the error term. Baum et al. (2003) stated that in the presence of heteroscedasticity, the GMM estimation techniques yield more efficient estimates than the 2SLS and the IV.

If errors are heteroscedastic, the class of instrumental variable estimators that use linear combination of the instrument no longer becomes efficient but the efficient estimator is the Generalized Methods of Moments (Stock and Watson, 2007). The GMM technique uses lags of endogenous variables as instruments; in which instance the endogenous variables are predetermined hence are not correlated with the error term. Generally, GMM technique produces consistent and efficient estimates of parameters in view of the following characteristics within data generating-process:

- When instruments employed to deal with the presence of endogeneity among some variables are lags of the explained regressors. However, the validity of the instruments depends on the source (variable) of endogeneity.
- The data sample contains small time periods and large entities (countries).
- There exist country-specific fixed effects which are randomly distributed.
- No autocorrelation across countries but with country-specific autocorrelation and heteroscedasticity in the error term.
- When lagged dependent variable influences the dependent variable.

There are two forms of GMM estimators identified in literature, namely, the Difference GMM and System GMM. The difference GMM presented by Arellano and Bond (1991) seeks to solve the problem of inconsistency as a result of endogeneity among some variables in the model by using the first difference of the equation being estimated. Generally, differencing equation 7 would yield the functional relation of the form:

$$y_{it} - y_{i,t-1} = \alpha_1(y_{i,t-2} - y_{i,t-2}) + \alpha_2(x_{it} - x_{i,t-1}) + (v_{it} - v_{i,t-1}) \quad (9)$$

Equation 9 hence eliminates country-specific effect thereby resolving inconsistency and biases due to endogeneity by using lags of the endogenous variables as instruments. The

difference GMM technique hinges on moment condition with the assumption of weak exogeneity of regressors and no serial correlation respectively specified in the equations below:

$$E[y_{i,t-1}(v_{it}-v_{i,t-1})] = 0, t=3,4,\dots,T \quad (9.1)$$

$$E[x_{i,t-1}(v_{it}-v_{i,t-1})] = 0, t=3,4,\dots,T \quad (9.2)$$

Although the difference GMM helps solve endogeneity among variables, it has some limitations. The process out rightly eliminates time-invariant country-specific effect which may be of interest leading to model misspecification. The difference estimator may suffer weak instrument problem when the regressand is highly persistent given that the difference method poses some serious biases. Weak instrument undermines the asymptotic properties of the differenced estimator and may be harmful for small sample resulting in increased variance of the coefficient and biases the coefficient of the small samples.

System GMM technique was designed by Arellano and Bover (1995) and Blundell and Bond (1998) to address the problem of weak instrument associated with the difference GMM technique using level equation and differenced equation. Efficiency of the equation under estimation is improved if moment conditions of its level form and the differenced forms are combined (Roodman, 2009). The system GMM is designed within additional moments condition specified as:

$$E[(y_{i,t-1} - y_{i,t-2})(\mu_i + v_{it})] = 0, t = 3, 4, \dots, T \quad (9.3)$$

$$E[(x_{i,t-1} - x_{i,t-2})(\mu_i + v_{it})] = 0, t = 3, 4, \dots, T \quad (9.4)$$

Lagged differences are used as the instruments for the endogenous variables in the level equations since these values become the suitable instruments in view of additional moment conditions. The additional moment conditions are based on the assumptions that there may be

a correlation between the country-specific fixed effects and the predetermined variables in the equation, and there are no correlation between the lagged differences and the country-specific fixed effects.

The system GMM is considered the most appropriate panel regression estimation technique due to the following characteristics inherent in its process:

- i. It resolves endogeneity problem by the use of lagged values of explanatory variables as instruments.
- ii. It allows the use of level and lagged values of the variables used in the equation under estimation.
- iii. The problem of information loss associated with cross-sectional regression is eliminated since the system GMM make use of multiple observations for each entity (country) across time.
- iv. System GMM is able to produce consistent and unbiased estimate of parameters even with small time period (T) and large countries (N).

According to theory, dynamic panel GMM estimator solves the problems of endogeneity, omitted variables bias, measurement error within panel OLS estimation but portrays weak instrument problem (Bazzi and Clemens, 2009; and Roodman, 2009). Hauk and Wacziarg (2009) and Kumar and Woo (2010) claim that system GMM is the most preferred technique despite that it sometimes exhibits weak instrument drawback. To ensure the validity of instruments within the system GMM, Sargan Test of over-identification would be conducted to test the hypothesis of valid over-identifying restrictions. Moreover, Arellano-Bond Test would be used to test the hypothesis of no serial correlation.

## 4.6 Sensitivity Tests

This study undertakes some diagnostic tests to ensure that the estimated model does not suffer any biases within panel regression analysis. Pre-estimation sensitivity test such as Unit Root Test as well as post-estimation tests including autocorrelation, heteroscedasticity, multicollinearity and endogeneity test is conducted in order to ensure general aptness of the model and variables.

### 4.6.1 *Unit Root Test*

Gugarati (2003) stated that a stochastic process is said to be stationary, if its mean, and variance are constant overtime and the value of covariance between two time periods depends only on the distance between the two time periods and not on the actual time at which the covariance is computed. In order to ensure that variables are stationary and to prevent the occurrence of spurious regression, unit root test is conducted. Among stationarity tests employ in panel regression analysis includes Levin and Lin (LL) Test (1992), Im, Pesaran and Shin (IPS) Test (2003), Breitung's Test (2000), Levin-Lin-Chu Test (2002) and the Fisher Test. This study however adopts the Fisher Test in analysing the stability of variables due to the following reasons as cited by Maddala and Wu (1999), Choi (2001), Hlouskova and Wagner (2006).

Unlike the (IPS) Test, the Fisher Test does not require a balanced panel data to produce a robust outcome. Moreover, Fisher Test allows the use of different lag lengths in the separate Augmented Dicky-Fuller Regressions and can be conducted for any unit root test. Furthermore, the Fisher Test does not demand simulation adjustment factors that are peculiar to sample size and specification. The Fisher Test adopts p-values from unit root test for each cross sectional entity and it is obtained by Monte Carlo simulations which can be seen as a major disadvantage of the Test (Choi, 2001).

#### **4.6.2 Endogeneity**

Endogeneity is said to occur in a multiple regression model when there is a correlation between any of the exogenous variables and the error term. Thus  $\text{Cov}(X_j, u_{it}) \neq 0$  for some  $j = 1, \dots, k$ . The endogeneity problem is caused by omitted variable, measurement error and simultaneity in the regression model.

Omitted variable bias occur when OLS is applied to a regression model that excludes a key variable due to data unavailability and the excluded variable has a correlation with one of the explanatory variables and in part, determines the dependent variable. Measurement error often arises because of reporting and/or coding errors but when the error is with dependent variable the zero mean assumption is not violated thus no endogeneity. But when the error occurs with the independent variable endogeneity arises.

Simultaneity arises when one or more of the explanatory variables is/are jointly determined with dependent variable typically through an equilibrium mechanism. In other words, simultaneity is said to occur when there is reciprocal causal relationship between endogenous and exogenous variables in a model. There is a possibility of reversed causal relationship between investment and GDP growth and this may violate OLS's weak exogeneity assumption rendering parameter estimates non-robust. Durbin-Wu-Hausman test would be conducted on the residuals to establish the existence or otherwise of endogeneity among variables so as to employ the appropriate estimation technique.

#### **4.6.3 Heteroscedasticity and Autocorrelation**

One of the assumptions underlying OLS is homoscedasticity thus constancy of variance of the error term but within panel regression analysis such assumption breaks down as a result of the presence of unobserved variables that varies across countries but constant over time within panel data. Heteroscedasticity is said to occur when the variance of the unobservable



error  $\mu_{it}$ , conditional on independent variable is not constant and the variance may be a function of independent variables specified as:

$$\text{Var}(\mu_{it}|X_{it}) = \sigma^2 \mathbf{h}(X_i) \quad (10)$$

Although heteroscedasticity does not affect the unbiasedness of OLS, it renders parameters and variance inefficient.

Autocorrelation refers to a situation where the random error term  $\mu_{it}$  is correlated over time for a given entity. Error terms are said to be auto-correlated if and only if  $\text{Cov}(\mu_i, \mu_j) \neq 0$ , for  $i \neq j$ . Autocorrelation is caused by model misspecification, data manipulation, event inertia, and spatial ordering. For likelihood of autocorrelation and heteroscedasticity within panel data, robust one-step estimate of the standard error will be conducted. The dynamic panel model in equation 7 is associated with persistence as a result of the introduction of lagged dependent variable as a regressor, and the presence of heterogeneity among countries due to individual country specific effects.

Introduction of lagged value of the dependent variable as a regressor creates autocorrelation bias in the model because if the dependent variable is a function of a component of the error term, then its lag is also a function of the error term. Taking the first lag of equation 7 gives the following:

$$q_{it-1} = \alpha q_{it-2} + \beta x_{it-1} + \mu_i + v_{it-1} \quad (10.1)$$

From equation 7 and 10.1, it can be observed that the dependent variable and its lag are both functions of the country-specific time-invariant component of the error. Thus  $q_{it} = f(\mu_i)$  and  $q_{it-1} = f(\mu_i)$  indicating that the lagged dependent variable is correlated with the error term in the model. Secondly, the presence of country-specific time-invariant effect in the panel data set may result in the problem of autocorrelation in the model. SSA countries have distinctive social, economic and geographical features which need to be considered in the estimation

process. The presence of these sources of persistence indicates the existence of serial correlation that would render the OLS parameter estimates biased and inconsistent.

#### 4.6.4 Fixed Effect (FE) Versus Random Effect (RE)

Fixed effects regression method controls for omitted variables in panel data when the omitted variables are time-invariant but country-variant. Thus fixed effect method controls for omitted variables that varies across countries but do not change over time, for instance, institutional quality, cultural, historical and geographical differences. The fixed effect regression method has  $n$  different intercepts for each country which is represented by binary variable to absorb the influence of all omitted variables that are country-specific and time-invariant. The introduction of country-specific time-invariant variable would produce fixed effects regression model as:

$$Y_{it} = \beta_1 x_{it} + \alpha_i + \mu_{it} \quad (10.2)$$

Where  $\alpha_i = \beta_0 + \beta_2 z_i$ ,  $z_i$  = unobserved country-specific time-invariant variable and  $\alpha$  is the entity-fixed effects and its variations come from omitted variables  $z_i$ .

The presence of unobserved country-specific and time-invariant variables causes endogeneity problem and biases the estimated coefficients hence the FE method seeks to resolve the problem through the process of “entity demeaned” OLS algorithm. The process uses two steps to address the endogeneity problem by subtracting average of country-specific effect from each variable after which the regression is estimated using the entity demeaned variables. Taking the average of country-specific effects ( $\bar{Y}_i = \beta_1 \bar{X}_i + \alpha_i + \bar{\mu}_i$ ) from both sides of equation (9) gives us:

$$\tilde{y}_{it} = \beta_1 \tilde{x}_{it} + \tilde{\mu}_{it} \quad (10.3)$$

Where,  $\tilde{y}_{it}$ ,  $\tilde{x}_{it}$  are the country-demeaned variables that are used in fixed effects estimation model. NB:  $\bar{Y} = \frac{1}{T} \sum_{t=1}^T y_{it}$ ,  $\bar{X}$  and  $\bar{\mu}$  are similarly defined.

The process hence eliminates the country-specific effect from the model and the mean value of the error term ( $\bar{\mu}_i$ ) remain the same as the actual value of the country-specific error terms ( $\mu_i$ ) since the error term does not change over time. The FE model estimation technique assumes heterogeneity in the error term across countries and hence suitable to deal with heteroscedasticity in panel regression estimation. Unlike pooled OLS estimation technique, fixed effect estimation addresses the omitted variable bias by controlling for fixed effects but has the tendency of compounding the problem of measurement error (Hauk and Wacziarg, 2009).

Random Effects model on the other hand assumes that there is no correlation between unobserved country-specific time-invariant effects and explanatory variables. Thus  $Cov(\mu_{it}, x_{it}) = 0$ . The model postulates that although country-specific time-invariant and the explanatory variables are uncorrelated, influence of such unobserved variables must be specified into the regression model. RE model therefore uses all available data, produces unbiased parameter estimate and smallest standard error, but the unobserved country-specific time-invariant variable would produce omitted variable bias.

#### 4.7 Additional Diagnostic tests

In order to confirm that the system GMM produces a valid estimate of the model, some additional diagnostic tests are conducted. These tests include autocorrelation test and test for validity of over-identifying condition. Results from system GMM estimation is deemed to be robust if there is no evidence of higher order autocorrelation within the error terms therefore the study adopts the Arellano-Bond test for second order autocorrelation in first differenced errors to ascertain whether the idiosyncratic error terms are serially correlated.

Moreover, it is required that system GMM results prove the validity of instruments used in the estimation. The validity of the instruments requires that there must be a correlation between the endogenous explanatory variable and the instrument, and the instrument must be uncorrelated with the error term. Thus, the instrument must satisfy the condition of relevance and exogeneity. Hansen (1982) proffered a process for testing the validity of instrument however the test becomes weaker if the number of instruments increases. Sargan test is employed in this study to test for the validity of over-identifying restriction since it is considered more appropriate for testing the validity of instrument.

#### **4.8 Variable Description**

Before embarking on the empirical investigation of the effect of external borrowing on economic growth in Sub-Saharan Africa, description of some variables in the intended model is outlined below in order to present some preliminary explanation to the relationships between some key regression variables.

##### ***4.8.1 Economic Growth ( $q$ )***

Economic growth is defined as the positive trend in a country's total output over a long period of time (Lipsey, 1956). Schiller (1999) also defined economic growth as an increase in output or real GDP over time. The definitions above implied a sustained rise in production in a particular economy over a period of time. Empirical studies that investigated debt growth-nexus used GDP growth, Real GDP growth, GNP growth, GDP per capita growth as a measure of economic growth. This study adopts GDP growth as a measure of economic growth, consistent with works of (Iyoha, 1999; Schelarek and Ramon-Ballester, 2005; Ayadi and Ayadi, 2008; Sichula, 2012; and Akram, 2013.)

#### **4.8.2 *Labour Force (l)***

The role of efficient use of labour resource endowment in economic growth and development process of countries cannot be overemphasized. The relevance of labour resource in economic growth is firmly espoused by neoclassical growth models, for instance, the Solow growth model. Number of workers, population growth rate, employment rate, and number of hours worked are some of the variables used for labour force. Number of workers/labour force would be used in this study and it comprises people ages 15 and above who meet ILO definition of economically active population (see Iyoha, 1999).

#### **4.8.3 *Capital (k)***

An addition to existing stock of capital goods within a certain period of time is what is called investment. Gross capital investment includes net investment and replacement investment to keep the level of capital constant (Froyen, 2009). Investment occurs in the private and the public sector of the economy hence total gross investment comprises government sector investment and private sector investment. Aside from empirical justification for capital being a robust determinant of growth (see Pattilo, Poirson and Ricce, 2002; Mankiw, Romer and Weil, 1992; and Abbas and Christensen, 2007), the accelerator model asserts that the amount of net investment required within a given period of time depends on amount of capital needed to produce a unit of output. Thus capital has a direct effect on production of goods and services. Among variables used as proxies for capital in literature includes gross capital formation, domestic investment to output ratio, capital stock calculated by using hedonic valuation and perpetual inventory methods. Total domestic investment as percentage of GDP, is employed in this study following studies of Fosu (1999), Clements et al. (2003), Shabbir (2009), and Pattilo et al. (2011).

#### **4.8.4 Export**

Export Led-Growth Hypothesis postulates that advancement in the production of export commodities is a key indicator economic growth. Export expansion is believed to facilitate improved allocation of resources, economies of scale, enhancement in production techniques as a result of technology transfer, job creation and economic growth. Empirical studies such as Balassa (1985), Ram (1987), and Khalifa Al-Youssif (1997) found that export positively affects economic growth although literature on export and growth remains a controversy. Export is expected to contribute foreign exchange earnings and help improve external imbalances of developing countries. Following Fosu (1990, 1996, 1999), growth rate of export is used in the study as a proxy for export.

#### **4.8.5 External Debt Burden (*d*)**

Debt to GDP ratio quantifies debt burden of a country by taking in account current productive capacity of the country. Debt amortization is made out of imposition of taxes on current production of goods and services hence debt to GDP ratio varies proportionately with debt burden. In measuring the effect of debt burden on economic growth, some ratios are used in literature notably external debt-export ratio, total external debt to GDP ratio, and public and publicly guarantee external debt to GDP ratio, external debt to reserves ratio. The study adopts external debt to GDP ratio as a measure of debt burden. External debt to GDP ratio measures solvency problem and it signifies general resource constraint. In considering total debt burden, fiscal revenue and GDP should be considered (IMF, 2001). Some studies have proposed non-linear relationship between debt and economic growth (see Reinhart, Rogoff and Savastano, 2003; Presbitero, 2008; and Pattilo et al. 2011). In an attempt to analyse such

relationship, this study uses stock of external debt to GDP ratio squared to capture non-linear effect of debt.

#### ***4.8.6 Dummy Variable***

In addition to debt indicators, external shocks and domestic macroeconomic variable, the model to be used in this study incorporates dummy for low-income and middle-income economies in Sub-Saharan Africa with low-income economies assuming the value zero (0) whilst middle-income ones assuming one (1). The aim is to evaluate the effect of external debt on low-income and middle-income economies in SSA. Low-income countries have the tendency to borrow rapidly than middle-income ones to supplement their meagre incomes. Moreover low-income countries frequently contracts debts because they are in the early phase of development and need extreme support in this regard (Gohar et al., 2009). Additionally, unlike middle-income countries, low-income countries borrow at concessional interest rate from the foreign financial market (thus cost of borrowing is comparatively low) hence may have high propensity to borrow than the middle-income countries *ceteris paribus*. This study therefore investigates whether effect of external debt varies across these categories of countries.

**Table 6: Summary of Variables, Expected Signs of their Coefficients and Data Sources**

Variable	Indicator	Expected Sign	Data Source
Economic growth (q)	GDP Growth Rate		World Bank
Labour Force (l)	Labour Force	Positive	World Bank
Capital (k)	Gross investment as a % GDP	Positive	IMF
Export (X)	Growth Rate of Export	Positive	World Bank
External debt Burden (d)	External debt as a % of GDP	Negative	World Bank
External Debt Burden2 (d2)	External Debt as a % of GDP2	Negative	World Bank
Country Dummy	Middle	Negative	
Debt*middle income		Negative	World Bank

Source: Author

#### 4.9 Concluding Remarks

Within panel regression analysis, there exist certain biases which are likely to cause inconsistency in the model. Such biases include endogeneity, autocorrelation, heterogeneity, heteroscedasticity among others. The main model estimation technique adopted to evaluate the effect of external debt on economic growth in Sub-Saharan Africa is the system GMM technique to ensure efficiency of the estimated equations. Sensitivity tests on variables, presentations and discussion of results would be conducted in the next chapter.



## **CHAPTER FIVE**

### **PRESENTATION AND DISCUSSION OF RESULTS**

#### **5.1 Introduction**

Results from the estimation of the effect of external debt on economic growth for Sub-Saharan Africa is presented and analysed under this chapter. The empirical analysis uses annual data on 39 Sub-Saharan African countries for a 24-year period (1990-2013). There are five sections under this chapter. The next section presents descriptive statistics of variables used in the model whilst section 5.3 reports the outcome of diagnostic tests conducted. Results from the estimated model are presented and discussed in section 5.4. Section 5.5 concludes the chapter.

#### **5.2 Descriptive Analysis**

The descriptive statistics considered are mean, standard deviation, maximum and minimum values of the variables. The statistics is based on selected 39 Sub-Saharan African countries out of the total of 48 in the region for the time period 1990-2013 due to the unavailability of data on some variables for some of the countries. The mean represents the average value of the variables whilst standard deviation indicates how variables are distributed around their mean values. Table 7 shows the descriptive statistics of the variables.

**Table 7: Descriptive Statistics of Variables**

<b>Variables</b>	<b>Mean</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Standard Deviation</b>
Real GDP Growth Rate (%)	3.73	-51.03	106.28	7.41
Investment as % of GDP	19.96	2.48	76.68	9.49
Labour Force*	6.02	0.12	54.20	7.59
Export Growth Rate (%)	7.91	-61.06	233.07	8.36
External Debt as a % of GDP	87.99	0.31	1829.49	9.87

Source: Author's Computation using STATA 13. \*Unit of measurement in millions of persons.

Real GDP growth rate for the selected Sub-Saharan African countries used in the empirical analysis averaged 3.73 percent between 1990 and 2013 ranging from negative 51.03 percent to positive 106.28 percent. This growth disparity among countries in the region may be attributed to occurrences in their domestic economies and external factors such as the extent to which countries were affected by continuous deterioration in terms of trade, falling commodity prices, global economic downturn and financial distress in the international economies.

The average of investment as a percent of GDP is 19.96 percent. The ratio ranges between 2.48 percent and 76.68 percent with standard deviation of 9.49 for the same period. The disparity among countries in terms of their level of domestic investment relative to their GDP could be attributed to differences in their levels of growth. Low-income countries may be motivated to undertake intensive infrastructural investments so as to catch up with the relatively higher income ones. This phenomenon may explain the recent use of the bond market by some emerging economies in the region to support road and energy infrastructural needs.

In the same period, labour force has an average of 6.02 million persons with a minimum value of 0.12 million whilst the maximum stood at 54.2 million for the same period. The standard deviation for labour force is 7.59.

Export growth averaged 7.91 percent per annum for the group of countries considered under the study from 1999 to 2013. Some countries recorded minimum growth of export as low as negative 61.06 percent whilst others have a boom of 233.07 percent within the same period. The difference in export growth among the countries may be attributed to variations in the nature of export commodities. Discovery of natural resources notably oil, and diversification of export commodities in some of the countries and continuous reliance on traditional exports commodities with declining output by others may cause the difference among the countries. Adoption of industrialization policy to increase the volume of manufactured exports would help promote export growth in the region.

The level of external debt in the region remains high averaging 86.94 percent of GDP for the period 1990 to 2013. The minimum level of external debt as a percent of GDP stood at 0.31 with the maximum hitting 1829.49 percent for the same period. This is an indication that countries heavily depend on external borrowing to finance their activities. It however remains unclear whether these foreign loans are directed towards long term productive investments or for consumption. The descriptive statistics table shows that GDP growth rate has the least standard deviation of 7.41 whilst debt as percentage of GDP has the largest standard deviation of 9.87.

### **5.3 Diagnostic Tests Results**

To ensure that the data used in the model estimation is suitable, unit root, endogeneity, heteroscedasticity, autocorrelation, over identification tests are conducted. Hausman test is also conducted to detect the characteristics of the data set which would reveal whether it fits the fixed effect or random effect estimation based on which the selection of System GMM estimation technique in the empirical analysis may be justified. This section hence presents results and analysis of the diagnostics tests conducted.

### 5.3.1 Unit Root Test

Unit root test is generally considered as time series phenomenon however testing stationarity for panel dataset may help prevent estimating unrelated regressions. Augmented Dicky Fuller Test is widely used in testing stationarity of variables. However, Choi (2001) argues that the inverse Chi-squared test is applicable and more potent when number of panels is definite. The inverse chi-squared statistic has a chi-squared distribution with a degree of freedom  $2N$ . Decision rule for the test implies that if the probability of the inverse chi-squared of a variable is less than the level of significance, the  $H_0$  is rejected with a conclusion that the variable is stationary. Table 8 presents the results of Fisher type unit root test.

**Table 8: Results of Fisher Unit Root Test of Stationarity**

Variables	Inverse chi-squared		Inverse normal		Inverse logit		Modified inverse chi-squared	
	Statistic	Prob	Statistic	Prob	Statistic	Prob	Statistic	Prob
GDP growth rate	210.5609	0.0000	-7.1303	0.0000	-7.8768	0.0000	10.6134	0.0000
Ln of labour force	555.8800	0.0000	11.1950	0.0000	-21.7506	0.0000	38.2610	0.0000
Investment % of GDP	139.8574	0.0002	-4.6836	0.0000	-4.7345	0.0000	5.1795	0.0000
Export growth	225.3758	0.0000	-8.4528	0.0000	-9.1508	0.0000	11.7995	0.0000
Debt as a % of GDP	197.8712	0.0000	-5.6376	0.0000	-6.5721	0.0000	9.5974	0.0000
Debt as a % of GDP2	641.9709	0.0000	-20.8838	0.0000	-28.3261	0.0000	45,1538	0.0000
(d*m) <sup>1</sup>	196.6536	0.0000	-6.6885	0.0000	-7.3703	0.0000	9.4999	0.0000

Ho: all panels contain unit roots

Ha: at least one panel is stationary

Source: Author's computation using STATA 13 <sup>1</sup>Debt\* middle income

Note: The Fisher Unit root test was conducted using ADF regression at 1<sup>st</sup> lag with panel means and time trend included.

On the basis of inverse chi-squared test, the null hypothesis that all panels contain unit roots is rejected in favour of the alternate hypothesis that at least one panel is stationary. The results of inverse normal, inverse logit and the modified inverse chi-squared test statistics are

also presented to affirm the strength of the inverse chi-squared test. The result shows no presence of unit roots in panels since the p-values are all less than 1 percent significant level.

### **5.3.2 Endogeneity**

The OLS produces a consistent estimate of parameters if there is no correlation between the explanatory variables and the error term. The study employs Durbin-Wu-Hausman test to check the validity of the null hypothesis that the regressors are exogenous. Rejection of the null hypothesis indicates the presence of endogeneity which would render OLS estimates inconsistent. From Table 9, DWH test for endogeneity indicates that Ln of labour force, investment as a percentage of GDP, growth rate of exports, external debt as a percentage of GDP, and the squared of External debt as a percentage of GDP are correlated with the error term at 5 percent significance level. We therefore reject the null hypothesis and conclude that those regressors are endogenous. However the p-value for debt-dummy variable is higher than 10 percent significant level hence we fail to reject the null hypothesis and conclude that the debt-dummy variable is exogenous. In the presence of endogeneity, System GMM would produce consistent estimate than OLS since the former assumes strict endogeneity assumption.

**Table 9: Durbin-Wu-Hausman (DWH) Endogeneity Test**

Variable	Durbin Chi2(1)		Wu-Hausman F(1,589)	
	Statistics	Prob.	Statistics	Prob.
Ln of labour force	5.92483	0.0149	5.86319	0.0159
Investment as a % of GDP	6.58492	0.0103	6.52265	0.0109
Export growth rate	5.95751	0.0147	5.89499	0.0154
External debt as a % of GDP	10.1398	0.0015	10.1119	0.0015
Squared of external debt as a % of GDP	12.1206	0.0005	12.1048	0.0005
Dummy-debt interacted variable	2.64156	0.1041	2.60539	0.1070

Source: Author's computation using STATA 13

### 5.3.3 Heteroscedasticity

The presence of heteroscedasticity violates unbiased property of OLS and threatens the consistency of the parameter estimates. The implication is that results from OLS estimation with the presence of heteroscedasticity would produce false and unreliable outcomes. The study adopts Breusch-Pagan/Cook-Weisberg test to test the presence of heteroscedasticity. Table 10 shows the outcome of Breusch-Pagan/Cook-Weisberg test rejecting null hypothesis of no heteroscedasticity at 1 percent significant level.

**Table 10: Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity**

Ho: Constant variance	
Chi2 (1)	= 224.10
Prob>chi2	= 0.0000

Source: Author's computation using STATA 13

#### **5.3.4 Autocorrelation**

Arellano-Bond test is carried out to test for autocorrelation among the first difference errors. The test fails to reject the null hypothesis of no autocorrelation in second order (see Table 14) implying that error terms are uncorrelated with one another. The System GMM fits for the presence of no autocorrelation since the technique assumes the condition of no autocorrelation. Moreover, the System GMM has the capacity to produce unbiased and consistent estimates even in the presence of heteroscedsticity and autocorrelation in the data set.

#### **5.3.5 Validity of Over-Identification Restrictions**

The use of system GMM calls for validity of instruments used in the estimation in order to ensure robustness of the model. The study hence tests the hypothesis that the over-identifying restrictions are valid using the Sargan test. From the result of Sargan test of over-identifying restriction presented in Table 14, we accept the null hypothesis and conclude that over-identifying restrictions are valid for the model. System GMM estimation technique is therefore expected to yield consistent and unbiased outcome.

#### **5.3.6 Fixed effects Versus Random Effects**

The presence of heteroscedasticity indicates the existence of heterogeneity across countries, and thus implying the assumption of fixed effects model which states that unobserved country-specific effects vary across countries. The System GMM technique is most suitable for data that fits fixed effects model hence Hausman test is performed to ascertain whether the data fits random effects or fixed effects model. The null hypothesis tested is that the data

conforms to random effects model. Results from the Hausman test as shown in Table 11 suggests that the null hypothesis is rejected in favour of the alternate hypothesis. We therefore conclude that the data conforms to fixed effects model.

**Table 11: Hausman Test for Fixed and Random Effects**

Ho: Difference in coefficients not systematic (Random effect)	
$\chi^2(4) = (b-B)'[(V_b - V_B)^{-1}](b-B)$	
=	43.35
Prob>chi2	= 0.0000

Source: Author's computation using STATA 13

From all the diagnostic tests conducted it is clear that the System GMM estimation technique would produce consistent and reliable estimate of the model under the study.

## 5.4 Results and Discussion

This section presents the outcome of the random effects, fixed effects and system GMM estimations on the empirical model stated in chapter four as well as the system GMM results on the restricted model. The regression results are based on a sample of 39 SSA countries for the 24 years period (1990-2013). Moreover, discussion of the regression results centres on the results obtained from the System GMM estimation of the complete model.



**Table 12: Results of Random Effects Estimation on the Dynamic Model**

Variable	Coefficient	Standard error	z value
Constant	-3.5728	2.3649	-1.51
First lag of GDP growth	0.0589	0.0361	1.63
Second lag of GDP growth	0.1004***	0.0351	2.86
Log of labour force	0.4178***	0.1494	2.80
Investment to GDP ratio	0.0499**	0.0205	2.43
Growth rate of Exports	0.0646***	0.0079	8.16
Debt to GDP ratio (%)	-0.0510***	0.0154	-3.32
First lag of debt to GDP ratio	0.0397***	0.0125	3.18
Second lag of debt to GDP ratio	-0.0033	0.0094	-0.36
Squared of debt to GDP ratio	-0.00001	0.0001	-0.12
Debt*Middle-income country	0.0034	0.0070	0.49
Middle-income countries	-0.2727	0.6048	-0.45
Wald chi-squared (11)		179.80	
Prob>F		0.0000	
Number of observation		936	

Author's Computation Using STATA 13

\*\*\* and \*\* denotes statistical significance of estimates at 1% and 5% respectively

The results from random effects estimation indicate that a percentage point increase in debt to GDP ratio inhibits GDP growth by 0.05 percentage points in SSA. The first lag of debt to GDP ratio promotes GDP growth by 0.04 percentage points holding other factors affecting GDP growth constant. The random effects estimation results suggest that current and previous year's debt stocks affect GDP growth at 1 percent significant level. External debt is 0.003 percent less growth-inhibiting in the middle-income economies than in the low-income economies but such effect is statistically insignificant.

**Table 13: Results of Fixed Effects Estimation on the Dynamic Model**

Variable	Coefficient	Standard error	t value
Constant	-24.5852	22.3297	-1.10
First lag of GDP growth	0.0120	0.0374	0.32
Second lag of GDP growth	0.0423	0.0364	1.17
Log of labour force	1.8635	1.4736	1.26
Investment to GDP ratio	0.0618**	0.0270	2.28
Growth rate of Exports	0.0594***	0.0081	7.32
Debt to GDP ratio (%)	-0.0517***	0.0181	-2.85
First lag of debt to GDP ratio	0.0380***	0.0124	3.07
Second lag of debt to GDP ratio	-0.0041	0.0098	-0.42
Squared of debt to GDP ratio	0.00001	0.0001	0.07
Debt*Middle-income country	0.0019	0.0089	0.21
Middle-income countries	0	omitted	omitted
F(10, 638)		12.80	
Prob>F		0.0000	
Number of observation		936	

Author's Computation Using STATA 13. Dummy for middle-income countries omitted due to collinearity.

\*\*\* and \*\* denotes statistical significance of estimates at 1% and 5% respectively.

Table 13 shows the results of the fixed effects estimation. Coefficients of the explanatory variables are not much different from those from the random effect estimation. The fixed effects estimation results shows that 1 percentage point increase in external debt to GDP ratio retards GDP growth by 0.05 percentage points at 1 percent significant level. Also, the first lag of external debt to GDP ratio augments GDP growth by 0.04 percentage points at 1 percent significant levels. Moreover, the negative impact of external debt on GDP growth in middle-income economies is comparatively less relative to that of the low-income economies by 0.002 percent but statistically insignificant.

**Table 14: Results of System GMM Estimation on the Dynamic Model**

Explanatory Variables	Coefficient	Robust standard error	z value
Constant	-3.6290	2.3404	-1.38
First lag of GDP growth	0.0458	0.0359	1.28
Second lag of GDP growth	0.0950***	0.0348	2.73
Log of labour force	0.4267***	0.1479	2.89
Investment to GDP ratio	0.0513**	0.0203	2.53
Growth rate of Exports	0.0650***	0.0078	8.29
Debt to GDP ratio	-0.0515***	0.0152	-3.38
First lag of debt to GDP ratio	0.0392***	0.0123	3.17
Second lag of debt to GDP ratio	-0.0027	0.0093	-0.29
Squared of debt to GDP ratio	-0.000004	0.00004	-0.11
Debt*Middle-income country	0.0031	0.0069	0.45
Middle-income countries	-0.2536	0.6004	-0.42
Wald chi-squared (prob>chi squared)		0.0000	
Arellano-bond AR(2, prob>2)		0.841	
Sargan Test (Prob>chi-squared)		0.358	
Number of observation		936	

Source: Author's Computation Using STATA 13

\*\*\* and \*\* denotes statistical significance of estimates at 1% and 5% respectively

Table 14 reports the system GMM estimation results on the complete dynamic model, the Wald Chi-squared and F-statistics for all the regressions are significant indicating the joint significance of the explanatory variables. The Arellano-Bond test AR (2) in first differences accepts the null hypothesis of no two-period auto correlations in the residual terms. Furthermore, the dynamic model specified in equation (8) is restricted by excluding the first and second lags of debt to GDP ratio, debt-GDP ratio squared, and debt-dummy interacted variable, to ascertain the independent effect of external debt on economic growth. Table 15 shows the system GMM estimation results of the restricted dynamic model.

**Table 15: Results of System GMM Estimation on Restricted Dynamic Model**

Explanatory Variables	Coefficient	Robust standard error	z value
Constant	-3.6025	2.2309	-1.61
First lag of GDP growth	0.0349	0.0349	1.00
Second lag of GDP growth	0.0919***	0.0345	2.66
Log of labour force	0.4495***	0.1443	3.11
Investment to GDP ratio	0.0517***	0.0198	2.61
Growth rate of Exports	0.0675***	0.0077	8.71
Debt to GDP ratio	-0.0208***	0.0032	-6.48
Middle-income countries	-0.0624	0.3819	-0.16
Wald chi-squared (prob>chi squared)		0.0000	
Arellano-bond AR2, (prob>chi squared)		0.841	
Sargan Test (Prob>chi-squared)		0.482	
Number of observation		936	

Source: Author's Computation Using STATA 13.

\*\*\* denotes statistical significance of estimates at 1%.

The results of the system GMM on the restricted model shows that the estimates are similar to those of the complete model despite the reduction in the coefficient of the debt variable. The results indicates that an increase in external debt to GDP ratio by 1 percentage point impedes economic growth by 0.02 percentage points at 1 percent level of significance. Thus, the coefficient of debt remains negative and significant, implying that adverse effect of external debt on growth is independent of the inclusion of first and second lags of external debt to GDP ratio, external debt to GDP ratio squared, and debt-dummy interacted variable in the model thereby providing further support of robustness of the debt coefficient. The results of the system GMM estimation on the complete model in Table 14, showing the relationship between the dependent variable (output growth) and the independent variables (labour force, export growth, investment growth rate, external debt and debt-dummy interacted variable for middle income countries) are discussed below.

#### ***5.4.1 External Debt as a Percentage of GDP***

According to Direct Effect of Debt Hypothesis (DEDH), high external debt to GDP ratio reduces the productivity of factors of economic growth, biases the investment mix towards the short term investments hence leading to deterioration in the level of economic growth. The coefficient of total external debt as a percent of GDP is negative and significant at 1 percent. The system GMM estimation reveals that 1 percentage point increase in external debt to GDP ratio reduces GDP growth by 0.05 percentage points. The empirical results from the random effects, fixed effects and the system GMM estimations, therefore, indicates a negative relationship between economic growth and SSA's external debt in a particular year. The negative contemporaneous effect of external debt on growth, perhaps, suggests a reverse causality between external debt and growth. Thus, low growth performance elicits the need for more debt acquisition in the current period. The result is in agreement with the findings of Fosu (1996, 1999), and Iyoha (1999).

Evaluation of the effect of previously contracted external loans was done by using first and second lagged values of debt to GDP ratio in the growth model. The system GMM result shown in Table 14 indicates that, coefficient of the first lag of debt is positive and significant at 1 percent whilst that of the second lag is negative but insignificant. The first lag of debt to GDP ratio (in percent) stimulates GDP growth by 0.04 percentage points. We can therefore extrapolate that greater debt acquisition in the previous period makes more resources available for higher growth in the next period but such positive effect is lower than the negative contemporaneous effect of debt. The Squared of external debt as a percentage of GDP assumes the value of negative 0.00003 but statistically insignificant. This result suggests no nonlinear relationship between external debt and GDP growth contrary to the findings of Fosu (1996) although differing in the measure of nonlinearity. Fosu (1999) suggests a non-linear long term impact of external debt claiming that external debt and

growth have a positive relationship at low levels of investment whilst the relationship is negative after investment to GDI/GDP ratio threshold of 16 percent.

#### ***5.4.2 Debt and Dummy Interacted Variable (Debt\*middle income)***

The dummy variables for middle-income and low-income countries were interacted with external debts to capture the impact of external debt on growth within such country groupings. The coefficient for debt\*middle income indicates that external debt in middle-income countries is 0.003 percent less detrimental on growth than in low-income countries. Possibly, this situation can be attributed to the fact that middle-income countries increasingly resort to external borrowing to support their relatively more investment-dominated annual budgets and projects that generate some returns towards defraying the debt in the future. Although low-income countries access external loan at a concessional rate, those loans, perhaps, are used to supplement their relatively low national income for the provision of basic public goods that do not yield much returns for repayment of the debt.

#### ***5.4.3 Country Dummy (Middle)***

The estimation result indicates that, being a middle-income country decreases the country's rate of growth by -0.2536 percentage points relative to a low-income country but the effect is statistically insignificant. This result conforms to expectation and also akin to the findings of Solow (1957) and Taskin and Zaim (1996). Solow (1957) in analysing the conditional convergence of growth among countries avers that countries with relatively lower per capita income tend to grow faster than those of higher per capita income. According to Solow growth model, low savings and investment in the low-income countries implies low capital

accumulation hence there would be higher capital productivity in those countries than in the higher income countries culminating in higher rate of growth (Todaro and Smith, 2006).

#### ***5.4.4 Labour Force***

The coefficient of natural log of labour force is positive indicating that 1 percent increase in the labour force encourages growth of output by 0.43 percentage points. This result derived from the system GMM estimation is in consonance with the hypothesis of neoclassical growth models that affirm labour force as an important determinant of economic growth.

#### ***5.4.5 Domestic Investment as a Percentage of GDP***

Neoclassical growth models such as Solow (1956), Cass (1965), Koopmans (1965) hypothesized that capital is a crucial determinant of growth. The coefficient of capital variable in the estimation results presented in Table 14 shows that domestic investment as a percentage of GDP has a positive effect on GDP growth at 5 percent significant level implying that, an increase in investment as a percent of GDP by 1 percentage point will on average encourage GDP growth by 0.05 percentage points holding constant other explanatory variables affecting the growth of GDP. This result agrees with the expectation of the study.

#### ***5.4.6 Growth Rate of Export***

Moreover the outcome of the system GMM shows that 1 percentage point increase in export growth promotes GDP growth by 0.06 percentage points at 1 percent significant level indicating high statistically significance of export growth. Moreover, random effects and fixed effects estimation results also show a positive relationship between export growth and

economic growth at 1 percent indicating strong significance of export growth in the growth of SSA's economy, consistent with findings of Fosu (1996, and 1999). The positive coefficient of exports also supports the findings of previous empirical studies such as Ram (1989) and Fosu (1990) as confirmed in Fosu (1999), and Khalifa Al-Youssif (1997) who cited exports as an important growth augmenting variable.

#### ***5.4.7 Lag of GDP Growth***

Previous years' output growth may affect the current one hence the study incorporated first and second lagged values into the dynamic model to access such impact in SSA. The system GMM result shows that first lag of GDP growth promotes current GDP growth by 0.05 percentage points but such effect is statistically insignificant. The second lag positively and significantly affects GDP growth at 1 percent significant level. The result indicates that the second lag of GDP improves current GDP growth by 0.10 percentage points (see Table 14).

### **Section 5.5: Concluding Remarks**

Hausman test conducted suggests that the data used for the estimation favours fixed effects estimation technique which is a pre-requisite for employing system GMM in the model estimation process. Moreover, other diagnostic tests undertaken namely: autocorrelation and heteroscedasticity, endogeneity, over-identifying restrictions yielded results that support the use of the system GMM. The results from the system GMM estimation indicate that external debt negatively affects economic growth in SSA. Additionally, findings of the study therefore support Direct Effect of Debt Hypothesis (DEDH) for SSA. The study provides no evidence in support of nonlinearity of the effect of external debt on economic growth. Country grouping into low-income and middle-income does not have any significant influence on the



effect of external debt in SSA. Control variables: labour force, investment, and export growth positively and significantly influences GDP growth in SSA.

## **CHAPTER SIX**

### **SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS**

#### **6.1 Introduction**

This chapter presents the summary, conclusions and policy recommendations based on the findings from the study. Summary and conclusions from the estimated results is presented in the next section whilst section 6.3 presents policy recommendations on the basis of the findings of this study. Section 6.4 presents the limitations of the study and recommendation on areas for further research.

This study sought to analyse the effect of external debt on economic growth in Sub-Saharan Africa for a period of 24 years (1990-2013) using a sample of 39 selected countries from the region. The study employed the system GMM as the main estimation technique on a dynamic model derived from the augmented output equation of Fosu (1996) to investigate the effect of external debt on economic growth from the theoretical foundation of the Direct Effect of Debt Hypothesis (DEDH).

#### **6.2 Summary of Key Findings**

Over the past decades, the region has relied heavily on foreign loans to solve what is known as the “financing gap” problem in the region. Scarcity of domestic financial resources has remained persistent resulting in huge external borrowing to supplement low domestic savings for economic take-off. Borrowing from abroad to finance the savings and investment gap in developing countries is based on the assumption that such foreign capital inflows would promote economic growth.

Moreover, the concept of “financing gap” is based on the Harrod-Domar growth model that basically predicts that growth would be proportional to the rate of investment. However, the level of savings and investment in developing countries are woefully insufficient thereby necessitating the need for foreign capital inflows to pluck the savings and investment gap.

Empirical literature has provided varied conclusions regarding the relationship between external debt and economic growth. Whilst some studies posit that external debt is detrimental to economic growth, others claim that external debt is beneficial to economic growth. Other studies also suggest that there exists no such relationship between the two variables and hence concluded that external debt has no influence on the growth of an economy. Moreover, earlier studies on debt-growth nexus differ in terms of statistical method used, time period and geographical area covered as well as in their findings.

Furthermore, most empirical studies on external debt and economic growth focused on developed economies whilst those on LDCs concentrated on Latin America. Still, most of these studies generally sought to investigate how external debt indirectly affects economic growth through its influence on savings and investment (see for instance, Savvides, 1992; Hoofman and reisen 1991; Fiani and DeMelo, 1990) but very little attention has been given to examining the direct effect of external debt on economic growth. Whiles a strain on investment and savings rate would reduce economic growth, external debt could directly affect growth through the productivity of factors of production (Fosu, 1999).

Also, very little empirical studies on have been conducted on SSA with the most recent traceable to Iyoha (1999) and Fosu (1999) whose investigations cover the periods 1970-1994 and 1980-1990, respectively. The ensuing controversy in the literature about the effect of external debt on economic growth and the very limited studies on SSA has been the inspiration for this study.

Besides, the study distinguishes itself from previous studies by using more recent data (1990-2013) to analyse the external debt-growth nexus in SSA considering the rapid growth of external debt stocks of many countries in the region in recent years. The study employs system GMM instead of Ordinary Least Square, Fixed Effects, Random Effects, Instrumental Variable, and other traditional panel estimation techniques used by earlier studies, in estimating a dynamic panel model since it has the capacity to overcome biases in panel data.

The outcome of the system GMM estimation shows that external debt negatively affects economic growth indicating that Direct Effect of Debt Hypothesis (DEDH) holds for Sub-Saharan Africa. The DEDH hypothesizes that an economy facing high debt burden, relative to its available resources would possibly experience relatively low productive investment combination. Thus, even if onerous debt service payments do not reduce savings and investment levels substantially, they could, however reduce output growth directly as a result of adverse change in investment mix (Fosu, 1996). The finding satisfies the first objective of the study thus to analyse the effect of external debt on economic growth. The empirical result shows that country groupings in the region into low-income economies and middle-income economies have no significant influence on the effect of debt on growth in those countries.

### **6.3 Policy Recommendations**

Empirical facts have clearly shown a support for theoretical predictions for Direct Effect of Debt Hypothesis (DEDH). The major conclusions drawn from the outcome of the estimation are that external debt impedes economic growth in SSA. High debt burden does not produce any congenial atmosphere for factor productivity growth, and hence, worsens the financing gap problem leading to low growth. Debt contracted in the previous year (first lag of debt to

GDP ratio) rather significantly promotes economic growth. The positive first lag effect of external debt can be attributed to the fact that higher external debt acquisition in the previous year makes resources available for higher growth in the next year. The estimation result rejects the proposition that some level of external debt could be helpful for growth (no nonlinear relationship between debt and growth). Country classification in terms of their levels of per capita income has no bearing on such relationship. Low-income countries grow faster than middle income countries but such difference is statistically insignificant.

The situation where economic growth is negatively affected by external debt in SSA could be explained within the Direct Effect of Debt Hypothesis (DEDH) hypothesized by Fosu (1996). Debt overhang may raise the discount rate of prospective investors due to the expected increase in tax that would accompany the outstanding debt burden. Consequently, short-term investments would be favoured (due to its relatively faster returns) over the longer-term ones that might otherwise be more productive in terms of higher net present discounted value. Additionally, in situations where liquidity constraint is binding, loans are given to generate short-term export earning that is basically used for debt repayment. For instance, longer-term infrastructural maintenance that generates better returns is postponed for cursory improvements to inject enough funds into mineral extraction that would yield faster foreign exchange for loan repayment (Fosu, 1999). Many countries in the region obtain external loan to raise funds for settlement of previously contracted loans that have matured.

The policy implication of the DEDH is that external debt can only be depended upon for economic growth if the borrowed funds are channelled into long-term investment projects that would otherwise be undertaken by the private sector. Furthermore, it would be in the best interest of governments in the region to continue negotiating with their creditors especially the IMF and the World Bank for more debt relief programmes, undertake reforms targeted at solving structural imbalances in their economies, and adopt prudent fiscal policies that would

institute fiscal discipline in public expenditures to reduce their budget deficits which is a major reason for borrowing in the region.

The estimation results suggest that foreign capital should be invested in self-sustaining projects. Thus governments in the SSA region should ensure that funds that are borrowed from external sources are invested in projects that would eventually generate enough returns to defray the interest accruing and the principal amount borrowed. Borrowed funds from abroad should not be diverted into expenditures on consumables, payment of workers' emoluments, refinancing of previous loans, and unproductive projects. Likewise, there is the need for government revenue mobilization agencies in the region 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.

The primary objective of foreign debt in SSA is to boost economic growth and development. This could be achieved through increased in export earnings spearheaded by export-led growth strategy. SSA countries need to diversify their export commodities and wean their economies off heavy reliance on traditional export commodities. Establishment of new industries and empowering the existing local ones through financial and technical support schemes to expand and produce commodities in which countries have comparative advantage would help maximize export earnings and create employment opportunities to absorb the growing labour force that would contribute meaningfully to the developmental process.

Policymakers should adopt policy framework consistent with availability of external finance that is credibly maintained. Ensuring macroeconomic stability (such as good fiscal stance, stable exchange rate, lowering interest rate, inflation among others), guaranteeing policy credibility and political stability, and the fight against the growing phenomenon of terrorism

in the region would spur investor confidence to attract both local and foreign investment in order to get rid of heavy reliance on external debt.

#### **6.4 Limitations of the Study and Areas of Further Research**

The study sought to analyse the effect of external debt on economic growth using a sample of 39 Sub-Saharan African countries from 1990 to 2013. The study is limited by data unavailability on some important variables such as labour force and external debt for some of the countries in the region. The study did not test causality between external debt and economic growth mainly due to the small time scale of the study (24 years) since causality test requires a panel time series of at least 30 years. Admittedly, this limits the knowledge gained about the relationship between external debt and economic growth in SSA. Thus the study does not explain whether external debt cause economic growth or the vice versa. A future study can adopt other estimation technique for instance, Vector Autocorrelation Regressions (VARs) to test the causal relationship between external debt and economic growth in Sub-Saharan Africa as tested for other counterpart economies (see Sichula, 2012; Butts, 2009; and Chowdhury, 1994).

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**APPENDIX****Appendix I: List of the 39 SSA Countries used in the Study, their Per Capita Income and Income Status**

Country	GNI per Capita <sup>1</sup>	Income Status
Angola	5300	Upper-Middle-Income
Benin	810	Low-Income
Botswana	7880	Upper-Middle-Income
Burkina Faso	710	Low-Income
Burundi	270	Low-Income
Cameroon	1350	Lower-Middle-Income
Central Africa Republic	330	Low-Income
Chad	1010	Low-Income
Comoros	840	Low-income
DR Congo	410	Low-Income
Congo Republic	2680	Lower-Middle-Income
Côte d'Ivoire	1550	Lower-Middle-Income
Eritrea	530	Low-Income
Gabon	9320	Upper-Middle-Income
Gambia, The	450	Low-Income
Ghana	1620	Lower-Middle-Income
Guinea	480	Low-Income
Kenya	1280	Lower-Middle-Income
Lesotho	1350	Lower-Middle-Income
Liberia	400	Low-Income
Madagascar	440	Low-Income
Malawi	250	Low-Income
Mali	720	Low-Income
Mauritania	1650	Lower-Middle-Income
Mauritius	9710	Upper-Middle-Income
Mozambique	620	Low-Income
Niger	430	Low-Income
Nigeria	2950	Lower-Middle-Income
Rwanda	650	Low-Income
Senegal	1050	Lower-Middle-Income
Sierra Leone	720	Low-Income
South Africa	6800	Upper-Middle-Income
Sudan	1740	Lower-Middle-Income
Swaziland	2700	Lower-Middle-Income
Tanzania	920	Low-Income
Togo	580	Low-Income
Uganda	660	Low-Income
Zambia	1760	Lower-Middle-Income
Zimbabwe	860	Low-Income

Source: World Bank, Country and Lending groups 2015

<sup>1</sup>calculation based on World Bank Atlas method.

**Appendix II: GDP Per Capita Growth (Annual) and External Debt Per Capita (Annual Percentage Change) in Sub-Saharan Africa<sup>1</sup>, 1990-2013**

Year	GDP per Capita growth (Annual)	Percentage Change in External Debt per Capita
1990	-1.5	-
1991	-1.92	0.85
1992	-3.56	-0.30
1993	-1.65	3.84
1994	-0.83	10.75
1995	1.01	3.75
1996	2.24	-4.48
1997	0.94	-5.13
1998	-0.25	-1.32
1999	-0.07	-7.64
2000	1.00	-4.13
2001	1.19	-7.21
2002	0.76	4.75
2003	1.59	6.53
2004	3.57	3.09
2005	2.94	-10.47
2006	3.44	-20.42
2007	3.71	9.19
2008	2.30	0.47
2009	-0.25	9.90
2010	2.51	6.62
2011	1.47	7.68
2012	1.07	8.37
2013	1.33	8.03

Source: World Development Indicators 2015, Author's Computation

<sup>1</sup>Developing countries only

**Appendix III: External Debt, External Debt as a % of GDP and Real GDP Growth in Sub-Saharan Africa<sup>1</sup>, 1990-2013**

Year	External debt (US\$ billion)	External debt as % of GDP	Real GDP growth rate
1990	176.36	58.21	1.55
1991	182.84	58.71	-0.08
1992	182.30	59.48	-1.69
1993	194.54	66.94	-0.02
1994	221.38	78.23	2.02
1995	235.94	71.95	3.46
1996	231.49	68.10	4.99
1997	225.55	64.15	3.52
1998	228.56	68.90	2.25
1999	216.78	65.01	2.28
2000	213.44	59.72	3.37
2001	203.35	61.29	3.54
2002	218.70	61.85	3.73
2003	239.11	53.07	4.28
2004	253.02	45.16	9.33
2005	232.55	35.48	5.49
2006	190.00	24.91	6.80
2007	213.02	24.04	6.88
2008	217.71	21.51	4.98
2009	245.73	25.58	2.14
2010	269.08	20.77	5.32
2011	297.60	20.41	4.22
2012	331.23	21.74	3.80
2013	367.51	22.87	4.07

Source: World Bank Online Database, Author's Calculations

<sup>1</sup>Developing countries only