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UNIVERSITY OF THE WITWATERSRAND

DOCTORAL THESIS

Twin Deficits and the Sustainability of Public Debt in Sub-Saharan Africa

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Prof. Paul Alagidede

A thesis submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, Johannesburg, in fulfillment of the requirements for the degree of Doctor of Philosophy

3rd July 2018

Declaration of Authorship

I declare that this thesis entitled "Twin Deficits and the Sustainability of Public Debt in Sub-Saharan Africa" is my own unaided work done under the supervision of Prof. Paul Alagidede. It is being submitted for the Degree of Doctor of Philosophy at the University of the Witwatersrand, Johannesburg.

The contents of this thesis have not been submitted and will not be submitted either in part or in full, for the award of any other degree in this or any other university.

Signed: Gchwa/kwa

Date: 04/07/2018

To Him who is able to do immeasurably more than all we ask or imagine, according to His power that is at work within us. Our Lord and Saviour Jesus Christ.

Ephesians 3:20

Abstract

Sub-Saharan African (SSA) debt has attracted attention since the 1980s. Countries in the region moved from healthy debt levels in their formative years, to become one of the most heavily indebted regions in the world relative to their size of gross domestic product. Policy response to the debt has been unfolding the same way as the debt. First, countries adopted a wait and see attitude in the late 1980s and early 90's, then swung to debt forgiveness in the 2000s involving 30 out of 48 nations.

This research adopts a three-tier approach to an investigation of debt in the region. First, it examines whether internal debt has a relationship with the external debt by evaluating a twin deficit hypothesis by use of a trend analysis and a panel generalized method of moments. Secondly, it controls for the high debt regime and examines whether debt relief managed to bring debt sustainability back to the region using cross-country autoregressive distributive lag models. Lastly, it evaluates the performance of debt relief in the region with respect to its fiscal space effects. Here, the study investigated whether debt forgiveness crowded out aid and grants, increased consumption expenditure, or affected poverty alleviation through education and health expenditure.

This thesis reports that there exists a positive relationship between the current account and the primary balance and that the relationship is twined so that an increase in one deficit leads to an increase in the other. Specifically, a percentage point increase in the primary deficit leads to a 0.3 percentage point increase in the current account deficit. It also finds that by reducing debt from the high debt regime of the 1990s, debt relief had managed to bring back sustainability to the region. Debts had fallen to levels below the formative years of independence, and the two low debt regimes had sustainable debt with the exception of Zambia whose debt remained unsustainable and relatively high as a fraction of GDP. On the impacts of debt relief, this study finds that debt relief partly improved the fiscal space by increasing government expenditure, domestic revenue, and education expenditure, but found no effects on recurrent and health expenditure.

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Place: University of the Witwatersrand

Date: 3rd July 2018 **JAMES GICHUKI**

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Abbreviations

ARDL	**A**utoregressive **D**istributed **L**ag
CAB	**C**urrent **A**ccounts **B**alance
CAR	**C**entral **A**frica **R**epublic
CEEC	**C**entral and **E**astern **E**uropean **C**ountries
EU	**E**uropean **U**nion
GDP	**G**ross **D**omestic **P**roduct
GLS	**G**eneralized **L**east **S**quares
GMM	**G**eneralized **M**ethod of **M**oments
HIPC	**H**ighly **I**ndebted **P**oor **C**ountries
IMF	**I**nternational **M**onetary **F**und
MDRI	**M**ultilateral **D**ebt **R**elief **I**nitiative
PIGS	**P**ortugal, **I**taly **G**reece and **S**pain
PVC	**P**resent **V**alue **C**onstraint
RE	**R**andom **E**ffects
SSA	**S**ub-**S**aharan **A**frica
TDH	**T**win **D**eficit **H**ypothesis
UNCTAD	**U**nited **N**ations **C**onference on **T**rade (and) **D**evelopment
USA	**U**nited **S**tates of **A**merica

Dedicated to my sons Ashley and Lyle. You inspire me to do more.

Chapter 1

Introduction

1.1 Background

The 2007 global financial downturn which started in the United States mortgage market and culminated in debt distress in the Eurozone catapulted macroeconomic instability to the center stage of economic debate. Furthermore, the subsequent spillover to the Eurozone especially in Greece raised questions about the role of internal and external policy and related balances in the run up to the crisis both in the affected countries and the developing world (Sipko, 2013). The effects of these imbalances were felt far and beyond their places of origin. In Africa the imbalances were felt in the form of slowdowns in capital flows and debt repayment struggles. Internal balance is represented by the fiscal balance and the external balance by the current account balance.

Majority of the countries in Sub-Saharan Africa have had a serious challenge in maintaining favorable balances in the two accounts. This has lead to the subcontinent going through rough patches in their debt history where majority have had to restructure debt frequently (Das, Papaioannou and Trebesch, 2012; Cruces and Trebesch, 2013). They have also had to borrow excessively to cover budget and external deficits. The situation got out hand until the region got the lions share of debt relief compared to other parts of the world. They also continue to feature negatively in the books of credit rating agencies which cements their position as high risk borrowers (Olabisi and Stein, 2015; Tyson, 2015).

Public debt arises from an accumulation of fiscal deficits which are an excess of government expenditure over its revenue (McDermott, 1997). Public debt is attractive to lenders because of the high liquidity and high earning capacity which come with the high credibility of the state (Komarkova, Dingová and Komárek, 2012). When government expenditure exceeds its revenues, then it needs to borrow so as to finance the difference. Borrowing gives the government access to much needed resources to carry out its programs, while giving investors an opportunity to earn a return at minimum risk. It also gives an opportunity for intergenerational transfers, where todays investment projects benefiting future generations can be financed by the future generations. Yet, whether governments benefit from borrowing depends on the view the creditors have about the level of debt and the government itself as a borrower. If creditors are of the opinion that government may not meet its

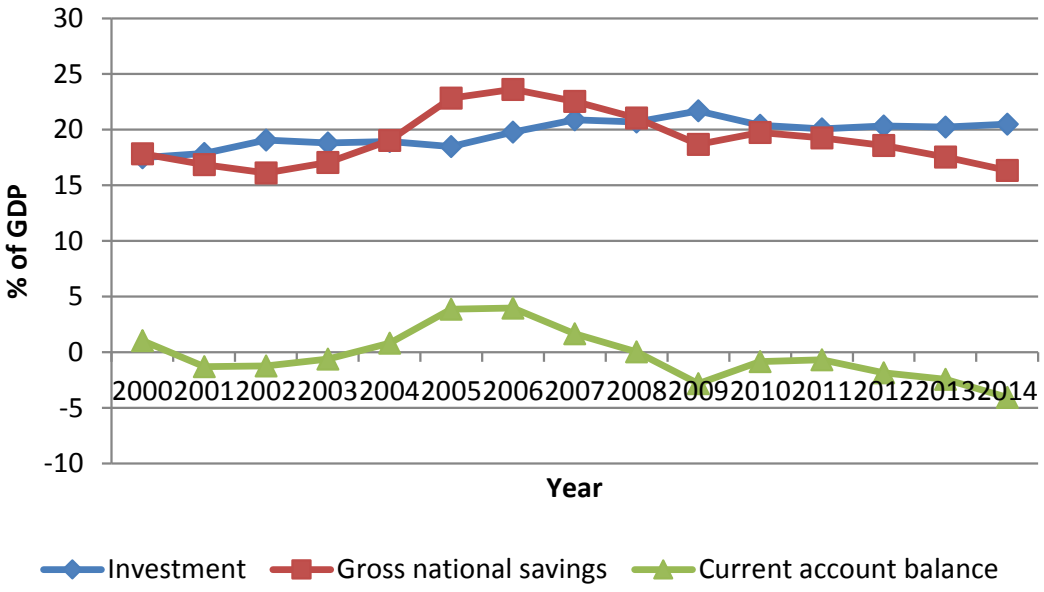
obligation in the long run, they will not respond positively to the government issuance of debt.

A careful analysis of data reveals that the debt overhang in most SSA countries and the region as a whole coincides with current account and fiscal deficits. A simultaneous deficit in external and the internal account holds important implications for macroeconomic stabilization. The two accounts show the investment-savings gap that needs to be bridged with external resources, particularly in terms of the difference between planned national savings and investment. This is because in the national income accounting model, current account can be defined as equal to national saving less investment plus statistical discrepancy. This relationship can be broken down further into private savings less the primary deficit plus government net interest receipts less investment plus the statistical discrepancy.

Figure 1.1 shows the saving investment gap and the current account balance for SSA between 2000 and 2014. The trend shows that savings were lowest during the global financial crisis after which they went up marginally and thereafter took a declining trend. On the same period, the investment needs have been on a gradual rise since 2007 mainly for infrastructure projects (IMF, 2014b). The savings gap considered together with the strong growth trend in the past five years suggested that Sub-Saharan Africa had been using the funds to make capital investments (IMF, 2014b).

The current account acts as a barometer of the state of an economy.

FIGURE 1.1: Trends in Saving-Investment and the Current Account in SSA



Source: (Imf.org., 2016)

First, huge deficits are an indicator of external debts which need to be paid sometime in future. They signal to agents the possibility of future increase in taxes to finance it. Secondly, evidence has demonstrated that high current account deficits increase the likelihood of a currency crisis (Edwards, 2003). Third, huge current accounts deficits are a pointer to the possibility of unsustainability of debt. When external debts are suspected to be unsustainable, investors avoid holding assets denominated in the currency whose current accounts sustainability is in doubt. This decrease in demand for assets denominated in a countrys currency may lead to a reversal. Finally, current account deficits may predict future changes in a floating exchange rate regime and therefore its sustainability becomes a major concern not only for policy makers but also market analysts (Osakwe and Verick, 2007).

The sustained coexistence of the two deficits raises the possibility of a twin deficit. But, researchers and policy makers are yet to agree on the direction of causality between the two variables. A section of research has found evidence of a twin deficit (Darrat, 1988; Abell, 1991; Ibrahim and Kumah, 1996; Bartolini and Lahiri, 2006; Gruber and Kamin, 2007). Others have found evidence of twin divergence (Cavallo, 2005; Kim and Roubini, 2008; Rafiq, 2010; Tosun, Iyidogan and Telatar, 2014). Yet another thread of evidence exists for no relationships between the two accounts (Reitschuler, 2008; Tosun, Iyidogan and Telatar, 2014; Wheeler, 1999).

On causality analysis, part of the literature finds that causality runs in the opposite direction with current accounts influencing the fiscal deficits (see Kearney and Monadjemi, 1990; Argimon and Roldán, 1994; Lau, Mansor and Puah, 2010). The proposition here is that poor performance in the current account slows the pace of economic growth and therefore increases the budget deficit (Tang, 2013). This puts the policy maker in a dilemma: should he fix the fiscal deficits and hope the current account will adjust automatically or should he fix the current account and hope the fiscal deficit automatically adjusts or address the problems simultaneously? These policy questions make up the twin deficit hypothesis. This hypothesis proposes that lingering budget deficits are usually the major cause of increasing current account deficits (Lau, Mansor and Puah, 2010; Baharumshah, Lau and Khalid, 2006).

When debt both internal and external grows large faster than the growth

in capacity to repay the debt, a country risks defaulting their obligation to repay. The consequences of default are grave for both the lender and borrower. The borrower will face high cost of borrowing because the risk profile will have worsened, thereby increasing interest rates. Investors both local and international will avoid assets denominated in the defaulter countrys currency further worsening its internal borrowing needs and leading to even harder possibility to repay as debt becomes foreign currency denominated.

Debt default implies that a country is insolvent and may no longer have fiscal and monetary control in its grip. When a countrys policy is forced to change every so often due to the pressure of debt on the economy, then the country risks its debt becoming unsustainable. When countries find that their debt is unsustainable and not serviceable in the short run, they may be forced to restructure their debt with the agreement of their creditors. Restructuring mainly involves forgiveness of part of the debt, but mainly implies the retiring of the earlier agreement on repayments and coming up with new terms.

A majority of the countries in the Sub-Saharan Africa (SSA) region benefited from debt forgiveness. Debt forgiveness was aimed at restoring sustainability back to countries whose debt portfolios had risen beyond sustainable levels. But in the process, it changed the structure and trend of debt so that countries got regime shifts in the data. Debt moved from former high levels to lower levels. Sustainability analysis therefore required the accommodation of these regime shifts present in the data. This is important

because most debt sustainability analysis rely on the rate of growth of debt among other indicators. Sudden changes in trend or levels or structure affect the analysis. Furthermore, some countries like Ghana, Mozambique, Gambia and Senegal have seen their debts rise threefold since debt forgiveness. Some of these countries have engaged in sovereign bond issues acting to increase the amount in interests they have to pay over and above the principal. This study therefore evaluates sustainability controlling for the forgiven debt period to establish if sustainability came back to the region and benchmark for a period when debt was assumed to have returned to sustainability.

Despite optimism about debt forgiveness and its intended positive effects, another thread of literature was skeptical about both the process of debt relief and the outcomes that the initiatives stood to deliver (Bamford, 2000; Ranis and Stewart, 2001; Cherunilam, 2008). These authors accused the debt relief initiative of among other things not being enough, lacking intent on canceling debt but rather ensuring that it is repaid, being incapable of freeing up resources, and the lack of the depth to tackle poverty.

As if to confirm their fears cracks in the performance of the HIPC/MDRI initiative started emerging in the year 2006 where it was projected that some of the countries whose debt had been forgiven would have surpassed the 150% debt to export threshold set under the program (Lala, Ranganathan and Libresco, 2006). Panizza (2008) found that Ghana, Cape Verde, and Eritrea, had already reached their former debt levels. By the year 2013, completion point

countries were seen to be accumulating debt too fast through bond issues, bilateral borrowing, and domestic borrowing (Merotto and Thomas, 2015). According to Gunter (2016) a debt boom riding on newfound higher growth and the need for better investment opportunities for Europe seemed to be getting out of hand.

This study investigates the existence of the twin deficit in a sample of 12 Sub-Saharan African countries with a view to disentangling the direction of causality of the two accounts using both individual trend analysis and panel data. It also seeks to assess the sustainability of debt in the region while probing into the nature of regime shifts occasioned by debt forgiveness and debt cycles. It further seeks to assess the impact of debt forgiveness under the HIPC/MDRI program on the fiscal space effects and expenditure in poverty reduction through education and health.

1.2 Statement of the Problem

Macroeconomic stability has been thrust into the center of economic debates the world over by the occurrence of the 1997 Asian crisis, the Eurozone debt crisis, and the recent global recession. Despite the interest that this issue has generated, a large section of Sub-Saharan African countries continue to suffer heavy debt burden surpassing the 60% threshold Reinhart and Rogoff (2010) and heavy current account deficits surpassing the 5% threshold both in percent

of GDP. Indeed, two thirds of the 45 countries in the SSA bore current account deficits in excess of the 5% threshold with only a third of them managing to stay within this threshold between 2007 and 2014.

Alongside the current account deficits, SSA countries have continued to operate huge public debts. Most of these debts were noted by the World Bank and IMF to be unsustainable. This led to debt forgiveness under HIPC/MDRI initiative with a view to ensuring that no nation suffered a debt burden beyond which they could bear while at the same time giving the beneficiary nations a second chance at better management of their debt. However, a few years after the end of this program, the ten worst performers in SSA are still among the beneficiaries. A majority of the other recipients have had an upward trend in their debt accumulation as a fraction of GDP. This casts doubts on whether indeed the objectives sought by debt forgiveness especially on sustainability were achieved. Forgiveness changed the structure of the debt by introducing regime shifts and as such a novel analysis necessary. Furthermore, a comprehensive analysis on the achievements of the program especially on poverty reduction touching on education and health is yet to be conducted. Furthermore, the regions performance may be attributed to some extent if not wholly to a knowledge gap between the drivers of debt in the countries on one hand and a lack of appreciation of the sustainability levels of the debt in the nations on the other.

Twin deficits and their policy implications has been the subject of debate

for policy makers and academics for the past few decades. Some researchers contend that the fiscal deficit drives the current account deficit (Erceg, Guerrieri and Gust, 2005; Baharumshah, Lau and Khalid, 2006; Marinheiro, 2008) so that fixing the fiscal deficit automatically fixes the current account while the opposing group holds the opposite view that the current account drives the fiscal deficit (Khalid and Guan, 1999; Normandin, 1999; Piersanti, 2000; Saleh, Nair and Agalewatte, 2005) so that fixing the current account deficit automatically fixes the fiscal deficit. This has put the policy maker in a dilemma with regard to the choice of which account to act on and which to leave alone or whether to act on both accounts simultaneously.

The outcome for at least 2/3 of the continent in relation to policy actions or omissions on the two deficits reveal a possibility of missing information. An understanding of causality or lack thereof between the two accounts would help sort out this dilemma. The sustainability of debt post forgiveness controlling for regime shifts is yet to be conducted and an evaluation of the impacts of debt relief on education and health is yet to be conducted.

1.3 Research Questions

The public debt problem in Africa and Sub-Saharan Africa has had serious ramifications. According to the IMF (2016c) before the HIPC Initiative, eligible countries were, on average, spending slightly more on debt service than on

health and education combined. A number of questions that require the attention of further research and empirical investigation with respect to debt in the Sub-Saharan Africa region include;

1. What is the relationship between fiscal deficits and current account deficits in Sub-Saharan Africa?
2. What is the sustainability of Sub-Saharan African countries debt post forgiveness controlling for its regimes?
3. What was the impact of the HIPC debt relief on fiscal space, aid flows, and poverty reducing expenditures in form of education and health?

1.4 Objectives of the Study

Given the wide range of crosscutting issues in the CAB and fiscal accounts, this study limits itself to the examination of the twin deficit hypothesis, the sustainability of fiscal deficits and an evaluation of the performance of the HIPC post completion point Sub-Saharan African countries. the aim is to unearth the succinct relationships that exists between the two deficits and the policy implications that this heralds for the region. It goes further to evaluate the sustainability of debt and the effects of debt forgiveness. The particular objectives of this study include;

1. To determine the relationship between the current account and fiscal account in Sub-Saharan Africa.

2. To examine the sustainability of debt for selected Sub-Saharan African countries controlling for its regimes.

3. To evaluate the impact of the HIPC debt relief on fiscal space, aid flows and poverty reducing expenditures in form of education and health.

1.5 Conceptual Definitions

Since the Asian crisis in the 1990s and the resultant turmoil in several emerging economies, the relevance of good public debt management has gained prominence. A thread of literature has found that the external and internal imbalances through the exchange rate and the interest rate instruments and policy pursuits played an active role in the run up to a crisis (Ahrend and Goujard, 2012; Joyce, 2011; Rodrik and Velasco, 1999). This has underlined the need for countries to consolidate and support the efficient management of credit by the use of prudent policy. Yet for a debt instrument to play its role effectively the holders of the debt need to believe that policies are such that their contracts will be fulfilled when they are due. This underlies the concept of debt sustainability. This chapter attempts to put some of the terms of this study into perspective as will be used in this study.

Neck and Sturm (2008) contend that even though it is intuitively clear that a sustainable policy must be such as to eventually prevent bankruptcy, there is no generally agreed upon definition of what precisely constitutes a sustainable debt position. Jacobs, Schoeman and Van Heerden (2002) in a research on the impact of the definitions of fiscal debt presented fifteen different definitions of budget deficits.

According to Draksaite et al. (2015) there exist about three major different ways of defining sustainable public debt. First, government debt is considered to be sustainable if government is solvent. This definition falls short of explaining the time duration of consideration and is thus wanting. Second, government debt is considered to be sustainable if debt induced burden is not increasing. In this manner, a government debt is said to be unsustainable if over time, an uncontrollable increase of a debt is noticed and the government is no longer able to meet its debt obligations. Third, government debt is considered sustainable if debt levels do not exceed the economic growth, and that the funds are used in an effective manner. They summarily define a sustainable government debt as one that is a result of sound governmental debt management, which guarantees the achievement of government borrowing demands, does not negatively affect creditability of the government and the ability to meet the long-term debt obligations.

According to da Costa (2010) public debt is considered sustainable when the government budget constraints can be met without disrupting fiscal and

monetary policies. In accounting terms this means that the amount of public debt should not exceed the present value of all future balances. This ascribes a mathematical expression to the circumstances under which the government budget constraints can be met by acknowledging circumstances in which the debt may not be repaid or when monetization will occur. This is not to be assumed to mean that the model predicts with certainty the occurrence of debt default. Certainty in prediction fails because the values involved in the calculation of the sustainability of the debt are choice variables whose values are hard to determine a priori. This makes the exercise one of assessing the willingness and ability of the governments ability to raise the requisite surpluses.

This study proposes to use the definition proposed by da Costa (2010) since it captures the policy and the empirical approach to the estimation of public debt sustainability.

Turning to the twin deficit hypothesis, this is a theory that seeks to explain the relationship between the current account deficit and the fiscal deficit. It can be defined as a positive causal relationship between the budget and current account deficits. It asserts that other things being held constant; a budget deficit is a decrease in national saving, which is the sum of private saving plus the government fiscal balance. When national saving falls below domestic investment that the government does not have sufficient saving to finance its investment, then it must borrow from abroad which amounts to the current

account deficit (Cavallo, 2005). The truth is that the ceteris paribus assumption does not hold in the real world and as a result we need to estimate the strength of the relationship allowing for interferences.

Given the above definition of a twin deficit, then an implied fiscal policy would be a tax raise. The tax raise would be hoped to increase government revenue leading to a decrease in public borrowing and thus lowering the interest rates, reducing the budget deficit and indirectly reducing the current account deficit by avoiding huge capital inflows. However this approach is seriously contended by the Ricardian hypothesis which asserts that a tax increase would decrease the budget deficit, but would not alter the current account deficit. This means that by merely changing the form of finance, we should not expect any change in behavior from rational agents. These arguments have sparked a serious debate, which is yet to be settled.

The rest of the study organized as follows; chapter two presents the first essay on the twin deficit hypothesis, chapter three assesses the sustainability of debt for the region, chapter four presents the fiscal space and poverty reduction effects of the HIPC/MDRI programs. Chapter six summarizes the study, analyses its policy implications, and outlines the limitations of the study.

Chapter 2

An Evaluation of the Twin Deficit Hypothesis in Sub-Saharan Africa

2.1 Introduction

As the world recovered from the global financial crisis, attention quickly shifted to possible causes of the next crisis. This brought sharp focus on the role of the internal and external balances in the build up to the global meltdown. The ramifications of the 2008/09 global recession were felt in the Sub-Saharan African region through slowdowns in capital flows and international trade (Macias and Massa, 2009; Allen and Giovannetti, 2011). These sudden stops and reversals, introduced significant imbalances in both the internal and external accounts. Indeed, Neaime (2015) noted that the world over, balanced budgets had virtually disappeared, and government deficit financing prevailed.

Fiscal and trade balances have been on the negative for Sub-Saharan Africa as a whole in the last few decades (Imoh and Ikechukwu, 2015). Between 2007 and 2014, Sub-Saharan Africa recorded deficits in the current account as a percent of GDP estimated at between 0.67% and 4.1%. While this may seem benign, compared to two decades before the crisis, the fiscal account also recorded deficits as a share of GDP ranging between 27.1% and 30.3% in the same period. Where the two deficits occur together, there arises a possibility of a strong twin deficit link the confirmation of which is an empirical question.

A review of literature on the link between previous crisis and the imbalances returns a near unanimous agreement on the link to the current account (Milesi-Ferrett and Razin, 1998; Kamin, 1999; Stiglitz, 2002; Edwards, 2003). Furthermore, the nature of relationships between the two accounts has very important implications, so that different schools of thought propose diverse policy actions spanning from non-intervention to radically changing a countrys trade policy. Literature has identified crowding out effects, where the budget deficits take up private saving leaving too little for domestic investment and by extension diminish national growth, while the twin would also eat into the foreign savings too as main drawbacks of a twin relationship (Wray, 2006).

Research in Sub-Saharan Africa on this subject has primarily focused on the individual country analysis (see Bakarr, 2014; Chaoneka, 2014; Chege,

2016; Mandishekwa, Tambudzai and Marufu, 2014; Ngakosso, 2016; Njoroge, 2014; Onafowora and Owoye, 2006; Oseni and Onakoya, 2013; Senadza and Aloryito, 2016; Shuaibu and Oyinlola, 2017). Research on a panel front is fairly recent and does not sufficiently exploit the individual heterogeneity in the countries nor try to link the twin deficit to the commodity prices (see Ahmad, Aworinde and Martin, 2015; Ahmad and Aworinde, 2015; Aloryito, Senadza and Nketiah-Amponsah, 2016; Imoh and Ikechukwu, 2015; Kouassi, 2016; Malindretos and Arize, 2008). Sub-Saharan Africa therefore presents a fertile ground to examine both the twin deficit and twin divergence hypothesis and their related policy responses. This need arises more potently upon the recent conclusion on debt forgiveness under the Highly Indebted Poor Country (HIPC) and Multilateral Debt Relief Initiative (MDRI).

Despite the interest generated and the lessons learned on the need for prudent management on both fiscal and external balances arising from the recent 2008/09 economic crisis, some of the nations that received debt forgiveness are still the worst performers on the two accounts in the region. Furthermore, that these two accounts are both operating deficits surpassing the 5% threshold for the current account and 60% for public debt in most countries of the region, raises the possibility of the two deficits being related. Indeed an in-depth data analysis of International Monetary Fund (IMF) data used for this study reveals that the outcome for 2/3 of the subcontinent is operating the two deficits side by side.

Researchers, academics, and policy makers are concerned about the policy issues that emerge in the management of the two accounts in Sub-Saharan Africa. They are concerned about the possibility of a relationship between the two accounts especially soon after most nations have reached completion point in debt forgiveness. They are concerned about the role of commodity price changes on the current account deficits in the region. An understanding of the relationship between the two accounts would help to determine which account if any, the policy maker needs to act on, and whether they can be acted on together or not. Majority of the studies which have looked at this subject hereto have focused on single country analysis leaving majority of nations unattended to in terms of empirical estimations. This study therefore examines the twin deficit hypothesis, and the contribution of commodity prices to the current account performance in the Sub-Saharan African region using a sample of twelve countries. The paper aims at examining whether the historical data reveals a twin deficit, a Ricardian hypothesis or a twin divergence hypothesis. On a methodological front this paper chooses between the static models to identify one that brings out the closest result to the unbiased consistent dynamic generalized method of moments.

The study is organized as follows; section 2.2 presents the evolution of fiscal and current account balances for the region, section 2.3 presents a review of literature on the twin deficit hypothesis, section 2.4 introduces the model, section 2.5 presents the results and their discussion and finally, section 2.6 presents the conclusion.

2.2 Evolution of the Current Account and the Primary Deficit in Sample Countries

Sub-Saharan Africa region has posted current account deficits and fiscal deficits side by side for a long period of time. Not only have the fiscal deficits led to a crisis where they were noted to be unsustainable for 33 out of 45 countries of the region, but it also led to the international lenders deciding to cancel them under the HIPC initiative, MDRI and the Paris Club of Donors. These debt cancellations turned out to be an important feature of the macroeconomic stabilization policy in that it was intended to return the accounts to sustainability. But as will be shown below, countries which underwent the debt relief program maintain bigger deficits compared to those which did not participate and the magnitude of the two deficits still remains relatively high. The summary statistics in performance of the current account balance and the primary balance in the sample nations is shown in table 2.1.

Table 2.1 shows the summary statistics for the CAB and primary balance in the twelve countries in the sample for the decade ending 2014. The results indicate that two countries Gabon (15.5%, 8.58%), and Zambia (2.32%, 0.04%) managed to maintain an average surplus in both the current account and primary balance pairs respectively. There is a remarkably bigger challenge in maintaining healthy CABs in the region because beside the above two, only two other countries had means above the 5% threshold namely Cameroon

TABLE 2.1: Summary statistics of CAB and Primary Balance in the last decade

	CAB				PRIMARY BALANCE			
Country	Mean	Sd	Min	Max	Mean	Sd	Min	Max
Cameroon	-2.53	2.14	-4.78	1.40	3.49	9.00	-4.77	33.76
CAR	-6.43	2.55	-9.93	-2.86	0.34	3.54	-5.68	9.99
Eritrea	-4.91	1.35	-7.83	-3.20	-15.78	5.44	-27.29	-10.85
Gabon	15.55	5.37	6.44	23.00	8.58	4.24	2.59	16.65
Ghana	-8.99	2.23	-11.89	-5.17	-3.50	2.67	-8.65	0.87
Kenya	-6.00	3.29	-10.59	-1.17	-1.13	1.95	-4.81	2.16
Mauritius	-8.86	2.63	-13.87	-4.99	-0.46	0.93	-2.11	1.10
Mozambique	-20.17	13.24	-42.62	-8.55	-3.21	1.96	-9.23	-1.40
Senegal	-9.11	2.66	-14.07	-4.56	-2.56	2.04	-4.57	2.24
South Africa	-4.12	1.62	-5.79	-1.46	1.09	2.29	-2.43	3.74
Uganda	-5.65	2.72	-8.94	-0.10	-0.84	1.66	-4.82	1.84
Zambia	2.32	5.01	-4.07	9.42	0.04	5.39	-4.95	18.54

the table presents the mean, standard deviation(SD), Maximum(Max), and Minimum(Min) values for the Current account Balance and Primary balance. All variables are in percent of GDP.

-4.78% and south Africa -4.12%. Only three countries remained within the threshold in the decade as shown in the minimum values of the CAB. The other nine surpassed the threshold with 6 countries running double digit CAB deficits. This renders the repayment of debt and importation of necessities for these countries tricky to do from their exports.

The fiscal account was better managed as Cameroon 3.49% Gabon 8.58% and South Africa 1.09% recorded surpluses with another three CAR 0.34%, Zambia 0.04%, and Mauritius -0.46 barely managing a balanced budget. The other seven countries presented primary deficits. Nine of the twelve countries in the sample had deficits exceeding 4% which is above the threshold for the account. Considering that only two countries that achieved surpluses on the CAB average, this means that most countries in the sample had both deficits in the life of their accounts.

A further scrutiny of the data reveals that debt forgiveness helped to push

most of the countries in the HIPC program to surpluses, but after that in the last five years of the sample, they ran persistent deficits. Between 2010 and 2014, only Gabon (3.49%) managed a surplus on average. This may be interpreted to mean that the countries which were required to maintain fiscal discipline in the run up to their completion point status are casting off the discipline they had probably trying to take advantage of the new found fiscal space. HIPC countries like Cameroon, CAR, Zambia, Senegal and Uganda all managed to achieve surpluses while in the program. Eritrea which is yet to reach completion point in the HIPC program recorded the biggest deficit at -10.5% in primary balance.

These deficits which occurred side by side, led to huge external borrowing with a number of the countries in the sample entering the sovereign bond markets to borrow for development projects and/or retire old debts. Most of the countries in the sample ran side by side deficits, at some point in their lives and others for the whole span. Sovereigns that bore surpluses in one account performed better in the other account like Gabon, Cameroon, South Africa and Zambia as shown above. The existence of side by side deficits across most countries in the sample raises the possibility of a twin deficit. Yet we cannot call the existence by eyeballing the relationship.

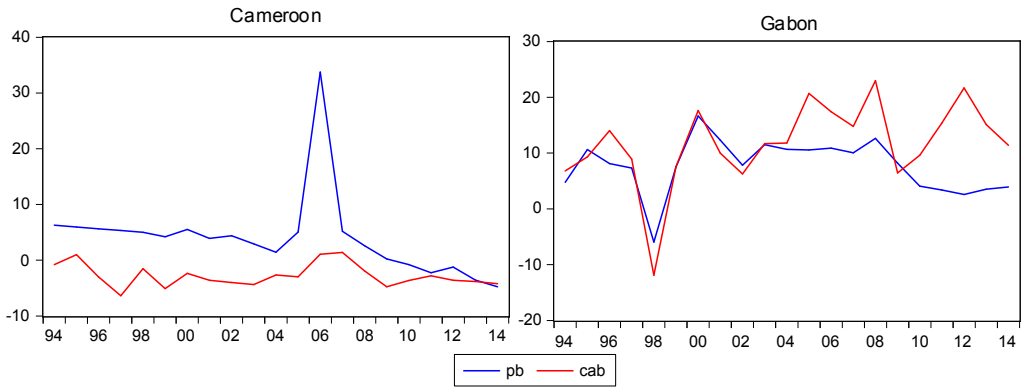
The sure way to establish whether the two accounts are twinned is an empirical investigation to demonstrate the relationship between the external account and the fiscal policy. The evolution of the two accounts over time is

also important to follow for each country in the sample so as to understand the interplay of historical and economic eventualities in the sample nations building up to the outcome of our investigation. The next section looks at the trend of the current account and the primary balance for the economies in the sample.

2.2.1 Central African Economies

Central Africa was represented in the sample by three countries; Cameron, Central Africa Republic (CAR), and Gabon. These countries operate under the Central African Economic and Monetary Community (CEMAC) which coordinates fiscal and monetary policy under a fixed exchange rate under a common currency CFA Franc (IMF, 2014a). Cameroon and CAR were HIPC countries which had reached completion point.

FIGURE 2.1: CAB and Primary Balance for Cameroon and Gabon.



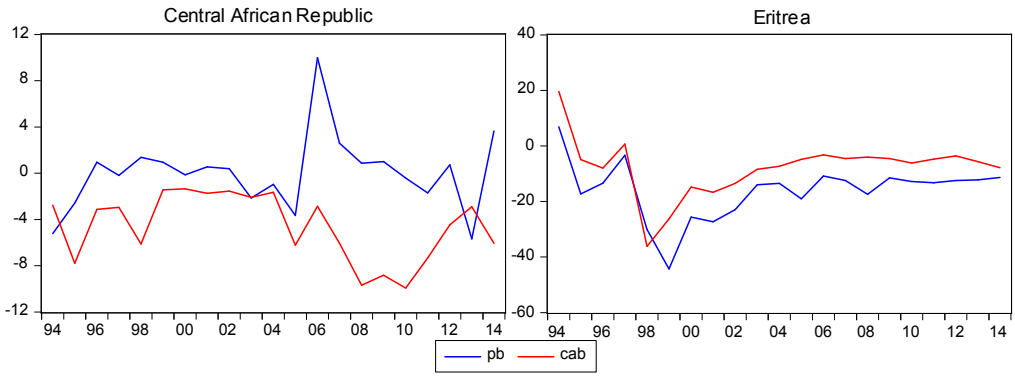
Source: International Monetary Fund Data

Cameroon grew at an average rate of 5.2% in the five years ending 2015. Being the economic engine for the Central African region, the economy posted this positive growth in a backdrop of the stagnation in the organization for Economic Co-operation and Development (OECD), slowdown of demand from china, and mounting insecurity from Boko Haram insurgents. This performance was mainly upheld by oil exports, as the countrys major exports are tuna, Wood, fish and oil according to (African Development Fund, 2016). The performance of the CAB and primary balance are as shown in figure 2.1. Cameroon predominantly recorded surpluses in its primary balance in the sample period, while maintaining the CAB within healthy thresholds. This can mainly be attributed to prudent macroeconomic management as was required in the build up towards its completion point status where it was one of the requirements. The nation reached completion point and debt forgiveness in the year 2006. Having achieved the full debt forgiveness, balances started falling back to deficits in both accounts starting in the year 2006. The country recorded a huge primary surplus on reaching completion point mainly due to the saved interest rate and principal from debt forgiveness.

Gabon managed a growth rate of 5.3% over the five years ending 2015, with the highest growth in the period coming in the year 2012 and the lowest at 4.2% in 2015. This recent fall in performance was attributed to a fall in commodity prices mainly oil. Nevertheless, the country succeeded to maintain it balances on the positive save for the year 1998. The performance of the CAB and primary balance for Gabon are as shown in figure 2.1. This was a

marked difference from the other countries in the sample in that the country had a current account that outperformed the primary balance by maintaining surpluses. The deficit in the year 1998 was attributed to massive explorations which were being carried out for crude oil which made the current account receive more foreign investment, thereby tilting the balance towards deficits. Thereafter the country maintained surpluses buoyed by crude oil, manganese, and wood exports.

FIGURE 2.2: CAB and Primary Balance for CAR and Eritrea.



Source: International Monetary Fund Data

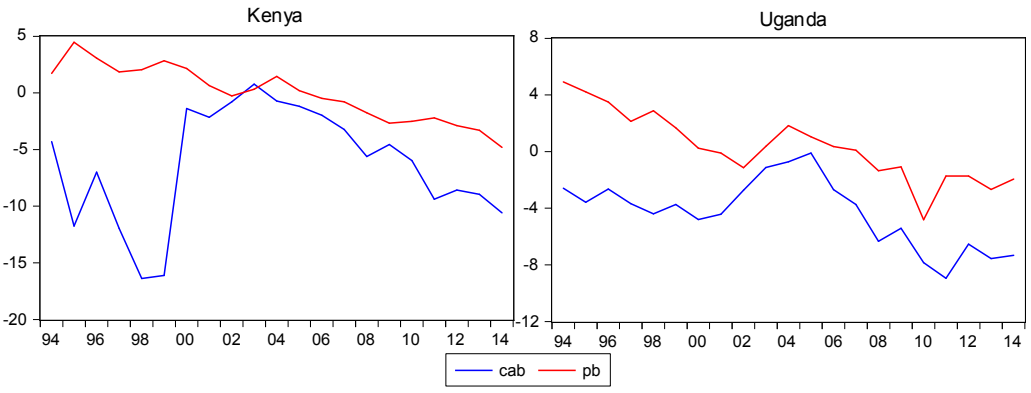
Central Africa Republic grew at the rate of -4.2% in the last five years of the sample. The negative performance was mainly attributed to the -36% growth rate recorded in the year 2013 which was due to a civil war. The nation which depends on diamond, cotton, and wood, recorded deficits in the current account albeit mild apart from the years after debt forgiveness which recorded surpluses. The performance of CAR is shown in figure 2.2. Again, both accounts reacted to debt forgiveness in the year 2006 with an improvement in both accounts due to Emergency-Post Conflict Assistance in

2004 and 2006 and approved a three-year Poverty Reduction Growth Facility (PRGF) arrangement in 2006 (IMF, 2007). The country reached completion point in 2009 but the deficits did not show any marked change at that point (IDA/IMF, 2016). Just like Cameroon the primary balance reflected a declining performance after the relief period.

2.2.2 East African Economies

East Africa was represented in the sample by three economies; Kenya, Uganda and Eritrea. Two of these were in the HIPC initiative namely Uganda and Eritrea. Kenya and Uganda had primary balances and current accounts which had the same trend. This could be since the two countries did the largest part of their foreign trade between them with Uganda importing majority of her manufactured goods from Kenya. Both countries also depend on agricultural exports coffee and tea, common to both nations.

FIGURE 2.3: CAB and Primary Balance in Kenya and Uganda



Source: International Monetary Fund Data

Eritrea was one of the countries which recorded the worst performance in the fiscal debt in SSA. The country recorded an average of 142% of GDP fiscal debt in the sample period and as such has a primary balance below the current account most of its life. The countrys performance in the CAB and the primary balance was as shown in figure 2.2. Its worst performance was in the year 1998 where the deficits in both accounts were in excess of 35%. This performance was occasioned by serious drought which reduced crop and animal production down to a quarter of its normal coupled with a war with Ethiopia which relocated most of the population (AFRODAD, 2006). The country was in the HIPC program but was yet to reach completion point and was struggling with the necessary conditions so her debt remains not forgiven.

Kenya grew at a rate of 5.4% for the five years ending 2015 with the highest growth in the year in 2011 at 6.1% and the lowest at 4.2% in the year 2012. The countrys growth had cycles around election time in every five years where it rose from the falls in GDP growth to built up to a high in the year ahead of the election. Kenya's performance as shown in figure 2.3 was worst in the year 1998 where the country suffered El Nino rains (Planning et al., 1998). This decreased tea and coffee output, leading to a poor performance in the CAB. The main exports for the country in the past five years were tea, cut flower, and petroleum oils which were sold to the region after refining imported crude. Thereafter, there was a strong recovery which led to a surplus in the year 2004 buoyed by the resumption of aid and growth in its main exports tea and

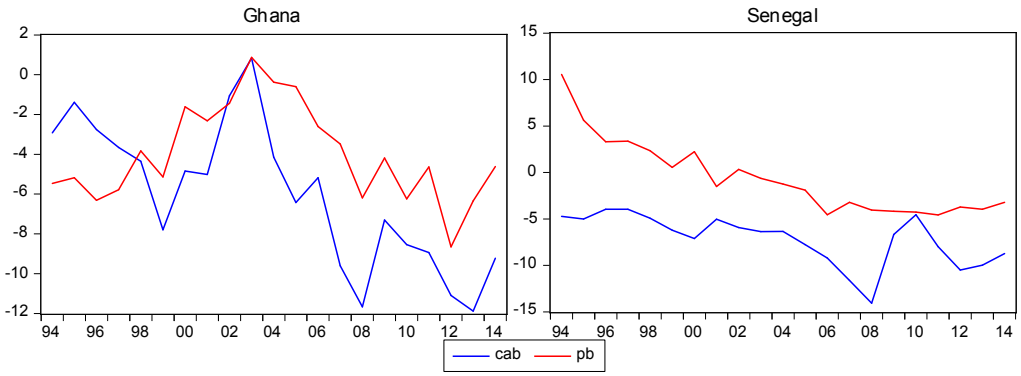
horticulture (Statistics, 2004). After this the CAB was on a downward trend in performance but mainly within the 5% threshold.

Uganda posted one of the best growth performances in the East African region enjoying a 7.3% between 2000 and 2010 but the underperformed later to grow at 4.8% in the last five years ending 2015. The highest in this medium term was 6.8% in 2011 and the lowest as 2.6 in the year 2014. The fall in growth was blamed in global economic instability, unanticipated weather changes affecting agricultural output, and a fall in demand from China. The countrys performance in CAB and Primary balance is shown in figure 2.3. According to Statistics (2015) the poor performance in the CAB was occasioned by a decline in exports by 7.5% paired with a decline in inflows from services which declined by 14.5% as outflows grew by 20.7%. The countrys major exports are coffee, sesame, and cement according to (Outlook, 2016). The country reached completion point in the year 2001 to get full debt forgiveness. There was marked improvement in the year 2004 when the balances were positive for both accounts but since then it generally went on a decline.

2.2.3 West African Economies

West Africa was represented by Ghana and Senegal, both participants in the HIPC debt forgiveness program. Both countries registered a downward trend in performance of the two accounts, which were more pronounced after commencement of debt forgiveness in year 2001.

FIGURE 2.4: CAB and Primary Balance for Ghana and Senegal



Source: International Monetary Fund Data

In the last five years of the sample, Ghana grew at the rate of 7.7% with the highest growth in 2011 at 14% due to the inclusion of oil in the GDP after starting the production of crude. After this, the growth rate declined to a low of 3.7% in 2015 blamed on a severe energy crisis and unsustainable domestic and internal debt. Ghana reached completion point in the year 2004 and recorded a surplus that year. In the subsequent years, the two accounts went on a persistent decline with the CAB falling below the threshold in the year 2008 and getting worse over time. Ghana's performance in the CAB and primary balance was as shown in figure 2.4. It would have been expected that the country would record a surplus when it became an oil exporter but this was not to be due to the ongoing investments in more wells and thus needing more foreign investment.

Mauritius represented the Island nations and is located on the Indian ocean along the East Coast of Africa. The nation grew at an average of 3.5% for the past five years ending 2015. Ranked one of the best performers

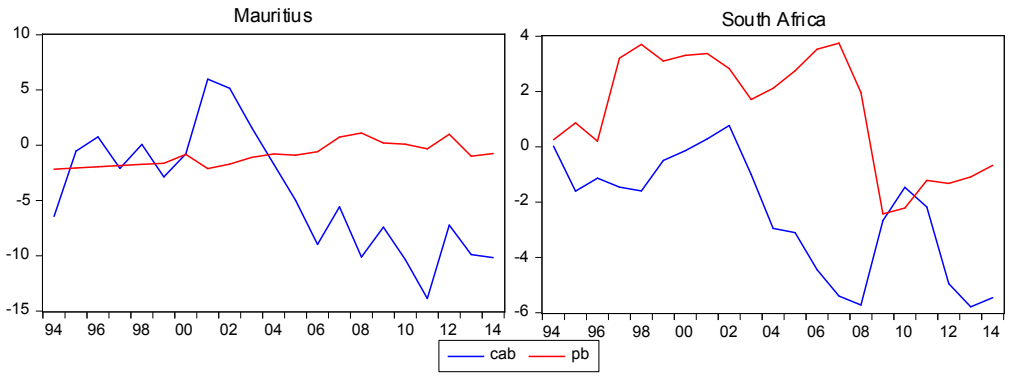
on competitiveness according to African Economic Outlook (2016) her main exports included textile, tuna, and sugar and has been attempting to diversify her exports in a bid to gain more from them. As shown in figure 2.5, the countrys current account balance was negative for the past five years with an average of -6.32% representing an improvement from the previous high of 7 in the previous medium term. The trade balance had been particularly under-performing at an average of 17% in the same period. On the fiscal front, budget deficits were mild averaging -3.25% of GDP and the primary balance on -0.175% of GDP. The countrys primary balance was on a state of relatively good health in the sample period but the current account went through a tough patch starting in the year 2004.

2.2.4 Southern African Economies

The South African region was represented by three countries; Mozambique, South Africa (SA) and Zambia. Mozambique and Zambia were in the HIPC/MDRI program and as such were beneficiaries of debt forgiveness. These two countries were among the worst performers in the CAB in this sample recording double digit current account deficits.

South Africa grew at an average of 2.1% in a growth slowdown which was characteristic for the last six years of the sample. The highest growth rate in the medium term was in 2011 (3.2%) and the lowest in 2015 (1.5%). The poor performance was blamed on difficult labor relations, infrastructure

FIGURE 2.5: CAB and Primary Balance for South Africa and Mauritius



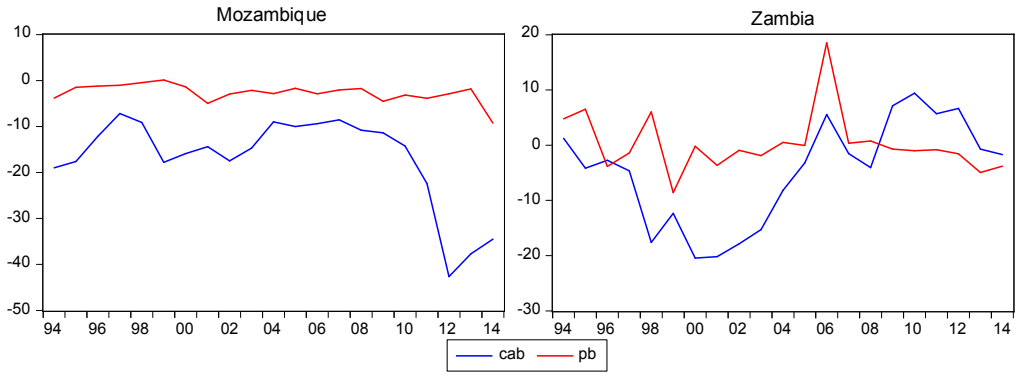
Source: International Monetary Fund Data

gaps for example weak electricity supply, weak domestic demand and low investment rate in an environment of policy uncertainty according to Outlook (2016). South Africa bore the record of being the strongest performer in the early 2000s with regard to the current and fiscal account as shown in figure 2.5 recording surpluses in the primary balance and healthy deficits at less than 2%. This solid performance was anchored on low demand for imports, manufacturing exports for the region, and good commodity export prices internationally (IMF, 2011). But this performance deteriorated between 2010 and 2014. This was attributed to an overvalued currency and growing import volumes due to demands of infrastructure projects, competitiveness problems, coupled with low domestic savings (IMF, 2013).

Mozambique grew at an average rate of 7.1% in the past five years with the highest growth rate on 2011 (7.4%). This made Mozambique the second fastest growing economy in the region after Ethiopia (not in the sample). The economy depends on tuna, aluminum, diamond rubies, and sapphire

among others. The challenge in this country was in the huge current account deficits at -41.6% in 2014 as shown in figure 2.6. The budget balance was healthy albeit negative with an average of -4.5% in the last five years of the sample. Mozambique lived in deficits for the longest time of the sample in both the current account and the primary balance. The worst deficit recorded in the current account was in the year 2012 attributed to heavy foreign direct investment for mega-projects (IMF, 2014b). The country reached completion point in the year 2001 according IDA/IMF (2016) and since then primary balance stabilized, but the current account kept getting worse over the time.

FIGURE 2.6: CAB and Primary Balance for Mozambique and Zambia



Source: International Monetary Fund Data

Zambia grew at the average rate of 5.7% per annum for the past years with a high of 6.3% in 2012 and a low of (3.7%) 2015. The economy depends on copper and tobacco for export. The economy is right now faced with mini-crisis with falling copper prices and slowdown in demand for goods by china. Zambia has over the time recorded mixed fortunes in performance of its balances in the two accounts. As shown in figure 2.6, the primary balance

recorded relative health in the sample period with a big surplus recorded on the year it reached completion point in 2005. The country built on this momentum since then to maintain a healthy state of the balances since buoyed by cooper exports and debt relief. It however recorded the worst performance in the year 2001 attributed to a mix of factors. First, the government lost development grants from the European Union and latter engaged in a rapid expansion of the mining sector alongside maize which drove the deficit to increase (Outlook, 2003).

2.3 Literature Review

The history of public debt effects on economies has a long tradition starting in 19th century with the Ricardian hypothesis by David Ricardo. This hypothesis is propagated by the neoclassical school of thought with a spirited defense put up by (Barro, 1974; Barro, 1989). It proposes that there is no relationship between the budget balance and the CAB. It thus opines that a switch from taxes today to budget deficits implies higher taxes in the future so that when a government reduces the taxes without altering present or future public spending, then rational agents increase savings now (so that total demand remains unaffected) in readiness to meet future tax demands (Greiner and Fincke, 2009). Its thrust was that public debt characterized by low public savings is always met with an equal increase in private savings (Eldemerdash, Metcalf and Maioli, 2014). Empirical evidence supporting this theory includes

the works of (Dewald and Ulan, 1989; Enders and Lee, 1990; Kaufmann, Scharler and Winckler, 2002; Xie and Chen, 2014). The Ricardian hypothesis faces a lot of limitations; it is a closed economy model, the real world has imperfect capital markets, future taxes are uncertain and not necessarily lump sum, bequests may not occur, full employment is not supported by empirics, and it has little empirical support (Salvatore, 2006).

The need for government interference was seen as the start of huge public debts (Greiner and Fincke, 2009). This need was justified by Keynes, who attacked the classical school in the 1970s by stating that market economies are inherently unstable and in particular, not capable of generating an aggregate demand that is high enough to guarantee full employment in an economy. This set the stage for the twin deficit hypothesis which posits that an increase in fiscal deficit worsens the current account balance. Channels through which this happens are the subject of empirical investigation, but theory proposes that when government replaces tax financing with debt, this leads to an increase in domestic interest rates. The rise in interest rates leads to an influx of foreign capital when capital mobility is high thereby appreciating the local currency. When the local currency appreciates, it makes it hard for domestic exporters to sell abroad, leading to the worsening of the trade balance and the current account. In an open economy with capital mobility, the outcome of fiscal policy depends on the relative strength of the elasticity of interest rates and the exchange rate through their impact on investment and capital flows.

The theoretical link between fiscal deficits and the CAB boils down two opposing schools of thought in the Ricardian equivalence hypothesis (REH) and the twin deficit hypothesis (TDH) and an offshoot in the twin divergent hypothesis. They individually have important policy implications. If the substance of a rising current account deficit is indeed fiscal debt then decreasing government expenditure or increasing taxes should fix the current account.

However, if this view is erroneous or not unique then a reduction in budget deficit would not resolve the current account but would act to prevent resources from freely flowing within the economy (Eldemerdash, Maioli and Metcalf, 2012). The jury is still out on the conclusive determination of these relationships in Sub-Saharan African countries and this study aims at filling this gap. Globally, past research between the three opposing views has failed to settle the debate and as a result missing the one size fit all recommendations for the vast economies of the world. On the Sub-Saharan African continent, the main source of current account incomes is sale of commodities whose price effects on the current account are yet to be investigated. The two studies that have investigated the twin deficits overlook the importance of commodity prices on the current account. This necessitates an investigation for the unique circumstance that the Sub-Saharan African region finds itself in.

Research findings on twin deficit hypothesis are mixed since the various studies provide contrasting and sometimes conflicting results. According to

Bagnai (2010) one of the most researched economy in terms of the twin deficits is the United States of America where different studies find divergent results. One strand of literature has established a positive causal relationship running from the budget balance to the CAB (Abell, 1991; Hatemi-j and Shukur, 2002; Baharumshah, Lau and Khalid, 2006; Trachanas and Katrakilidis, 2013; Neaime, 2015). Another strand finds that causality runs from the CAB to budget balance (Hatemi-j and Shukur, 2002; Kim and Roubini, 2008; Marinheiro, 2008; Nikiforos, Carvalho and Schoder, 2014). This causality that runs from CAB to the budget balance is named the Current Account Targeting Hypothesis by (Summers, 1988). Yet another thread of literature finds a reverse causality between the two deficits (Sobrino, 2013; Xie and Chen, 2014).

Apart from the Ricardian and twin deficit divide, there exists the twin divergence hypothesis which proposes that budget deficits lead to an improvement of the CAB so that their relationship is negative. According to (Cavallo, 2005; Çatık, Gök and Akseki, 2015) a surge in productivity leads to an increase in private investment which reacts faster than private savings. This leads to deterioration of the current account. But this increase in output will lead to an improvement of the budget balance. Another reason was suggested by Kim and Roubini (2008) who found that in the short run, budget deficits improve the CAB because government borrowing increases interest rates, which crowds out private investment. Nevertheless, the increase in private saving and the decline in domestic investment are more than enough

to offset the decline in government saving in the short run and contributes to the current account improvement (Cavallo, 2005).

The relationship has been investigated for several groups of countries using panel data. Bagnai (2010) investigated the relationship for the Central and Eastern European Countries (CEEC) and the so called PIGS which include Portugal, Italy, Greece and Spain (the Mediterranean Eurozone countries). The study found a coefficient less than unity meaning that in a strict sense they were not twins based on recent open macroeconomics (Makin, 2004).

Normandin (1999) considered the twin deficit hypothesis for the USA and Canada in a panel framework using responses of the external deficit to increases of the budget deficit from a tax cut. The study found positive significant links for the two accounts. Furthermore, they found a positive relationship of the external balance to budget deficit albeit not a one for one. The result was confirmed by the unit root tests, co-integration tests, and Granger-causality tests.

A vast majority of research find a relationship hovering around 0.3 for among them (Bagnai, 2006; Salvatore, 2006) implying that the relationship is not one for one and thus the problem of external deficits may not be entirely solved by fiscal consolidation. Other studies have reported lower magnitude findings (Bussière, Fratzscher and Müller, 2010; Chinn and Ito, 2007; Gruber and Kamin, 2007) which report less than the 3%. It thus calls for a careful analysis for Sub-Saharan Africa, which has been plagued by the problem of

external debt. At the same time the analysis needs to be careful since there is evidence that the relationship is subject to a unit root (Fidrmuc, 2003).

On an African context, analysis of the relationship between current account balance and the fiscal deficit has been conducted on a regional, national and the entire subcontinent panels but panel research has been obscure and sparse. Aloryito, Senadza and Nketiah-Amponsah (2016) investigate the twin deficit hypothesis using the system generalized method of moments to find a negative relationship between the current account balance and the fiscal balance. This result thus implied the existence of a twin divergence rather than twin convergence for 41 of the 45 countries in SSA using annual data between 2000 and 2012.

Imoh and Ikechukwu (2015) investigated the relationship between the fiscal deficit and the current account using the dynamic GMM estimation technique. The study found that unit increase in fiscal balance increased the current account by 0.6 units. They thus found a less than unity coefficient but a twin deficit verdict. The impact of foreign growth to the continent was found to be insignificant while lagged trade balance, terms of trade, GDP growth rates and degree of openness returned significant results. These two preceding studies have shown serious omissions for variables despite using System GMM which acted to bias the estimate of the relationship upwards especially for (Imoh and Ikechukwu, 2015). The Aloryito, Senadza and Nketiah-Amponsah (2016) study contradicted the Imoh and Ikechukwu (2015)

by finding a twin divergent hypothesis using the same approach with one additional variable. This study seeks to use a more detailed list of determinants of the current account in an attempt to clinch the consistency of the coefficient in the relationship.

The empirics involved investigating the twin deficit hypothesis span across several methods starting from single equation models (Bryant, Holtham and Hooper, 1988; Bernheim, 1989) which inform whether a twin deficit, divergence or Ricardian relations obtain, without inferring the direction of causality; cointegration investigations which accommodate structural breaks relationships and allow for investigation of short term and long-term relations beside helping to determine the direction of causality (Bagnai, 2006; Daly and Siddiki, 2009; Grier and Ye, 2009); vector auto-regressions with impulse response functions and forecast error variance, and threshold models which accommodate regime changes in the data series (Çatık, Gök and Akseki, 2015) among other methods.

2.4 The Model

2.4.1 Theoretical Model

All analysis of the twin deficit hypothesis is borne out of the national accounting identity where the planned expenditure must equal the planned

output;

$$Y_t = C_t + I_t + G_t + X_t - M_t \tag{2.1}$$

Where Y_t represents the national output, C_t consumption, I_t investment, and G_t government expenditure. The current account can be defined as the difference between exports $X_t - M_t = NX_t$ plus the Net transfer payments represented as;

$$CAB_t = NX_t + NFA_t \tag{2.2}$$

Substituting equation 2 into equation 1 yields;

$$Y_t = C_t + I_t + G_t + CAB_t \tag{2.3}$$

But the national income can also be obtained through the planned output as;

$$Y_t = C_t + T_t + S_t \tag{2.4}$$

Where S_t and T_t represent savings and taxes at a time t respectively. Equating the above two expressions yields;

$$CAB_t = [S_t^p - I_t] + [T_t - G_t] \tag{2.5}$$

This expression means that the external balance is the sum of the government savings $T_t - G_t$ and the private savings (S^p) less investment $S_t^p - I_t$ and $S^n = S^p + S^g$ where S^n represents national savings. This means that external

balance can be improved upon by increasing private savings and/or taxes or by reducing the investment and/or the government expenditure. But $T_t - G_t$ can also be termed as the budget deficit if the difference is negative so that;

$$CAB_t = [S_t^p - I_t] + BD_t \tag{2.6}$$

This relationship represents the twin deficit hypothesis in that external balance depends on private savings less investment plus the budget deficit. This means that holding savings and investment constant, then the external balance will worsen when the budget deficit worsens and improve when it improves. This also shows the importance of private savings to the health of the external balance.

However, when the difference between tax revenue and government expenditure is positive, this can be termed as government savings so that;

$$S_t^g + [S_t^p - I_t] = CAB_t \tag{2.7}$$

Adding the government savings S_t^g to private savings gives national savings which makes the relationship;

$$CAB_t = S_t^n - I_t \tag{2.8}$$

This means that external balance is given by national savings less investment

and that if the current account is operating in deficit, then investment is greater than savings.

The twin deficit hypothesis is borne out of policy innovations whereby the government changes the fiscal stance by improving on tax performance, or reducing government expenditure which act to reduce the budget deficit. However, these policy innovations impact on household consumption and firm investment behavior. By reducing taxes to finance government budget by fiscal deficit, the interest rates domestically must increase and become greater than world interest rates. As a result, the exchange rate appreciates so that imports rise and exports fall, worsening the CAB.

In the Ricardian case, if for example the government enacts a tax cut as an innovation, rational households will react by increasing their savings in anticipation that taxes will rise in future. Where the Ricardian assumptions hold, that is where taxes are not distortionary, there are no financial frictions, and heavy burden goes to those who benefited from the tax cut, then private savings acts to balance off any change in public savings that may arise from a change in tax policies. The twin hypothesis proposal is that the response of the private sector to innovations in fiscal policy in no way completely offset the effect of public dis-saving on the current account balance so that it deteriorates alongside the budget deficit (Corsetti and Müller, 2006).

2.4.2 Empirical Model

This is a panel study that emanates from historical time series observations of the individual countries between 1994 and 2014. Panels help to uncover the existing regional performance as opposed to that of individual countries in time series estimations. Extant literature on twin deficit hypothesis has predominantly concentrated on individual country analysis for SSA countries. This research gives us an opportunity to evaluate the regional outcome.

Emanating from but not restricted to equation 2.8 above, and adding variables to control for omitted variable bias, the relationship between the current account balance and the budget balance can be specified as;

$$CAB_{it} = \alpha_i + \alpha_1 PB_{it} + \alpha_2 E_{it} + \alpha_3 OPEN_{it} + \alpha_4 INV_{it} + \alpha_5 FG_{it} + \alpha_6 COMP_{it} + \\ + D_1 HIPC_{it} + \alpha_7 GE_{it} + u_{it} \tag{2.9}$$

Where; $(i = 1, ..., N)$ is a country index and the n in this study is 12. $(t = 1, ..., T)$ is time observations from $1 = 1994$, $T = 2014$.

CAB_{it} is the current account balance, PB_{it} is the Primary balance, E_{it} represents the real exchange rates, $OPEN_{it}$ represents trade openness, INV_{it} is the gross investment, FG_{it} is the foreign growth represented by the growth rate the major trade partners of each of the countries in the sample, $COMP_{it}$ represents the commodity Prices, $HIPC_{it}$ represents a dummy with 1 being a

HIPC beneficiary country and 0 otherwise, GE_{it} is government expenditure, u_{it} is the error term.

The main interest in assessing the twin deficit hypothesis and the Ricardian equivalence depends on the sign on the coefficient of PB_{it}. This coefficient is the response of the current account balance to an increase in the primary balance PB_{it}. Should the coefficient of the relationship be positive then the twin deficit hypothesis is upheld. The Ricardian equivalence is supported by $\alpha_1 = 0$.

Panel data analysis demands that we first establish the presence of the unit root along the time series dimension to establish what level of differencing will be needed to avoid a spurious result. To this end, the panel unit root tests are conducted. After this, the fixed effects and random effects regressions are run to form a basis of model choice. To this end the F test for fixed effects are conducted and the Breuch Pagan LM test for random effects are conducted. Based on the results of these tests, the model choice is made between the two using the Hausman test. Thereafter, the dynamic panels are estimated to help arrive at estimates which control for endogeneity and to guarantee the purity of the estimates.

2.4.3 Estimation Technique

The estimation strategy was to use statistical tools to arrive at the best estimation method first among the static models and then the dynamic panel

models. First, this involved a choice between a pooled regression and a fixed effects (FE) model using a test for best fit and poolability test. Second a choice between pooled regression and random effects (RE) model using the Breuch and Pagan Lagrangian multiplier test. The choice between the fixed effects and the random effects would then be carried out using the Hausman test. Having these estimations would help to establish the limits within which dynamic estimator would lie.

The time series nature of the series involved was incorporated in the static model by running an estimation that accommodates serial correlation. Tests for autocorrelation would then reveal the underlying dynamic relationships in the data. Running the dynamic model after finding the correlation was expected to push the result further by allowing for the past realizations of the dependent variable to affect it so that this in part helps to deal with endogeneity. This estimator would be expected to be the best unbiased estimator whose results would be an improvement on the static models.

2.4.4 Data

This study uses a twelve-country sample for the period between 1994 and 2014. The sample of nations was selected purposively to reflect the four sub-regions in Sub-Saharan Africa based on the participation in the HIPC/MDRI initiative, the paucity of research on the subject on countries and the availability of data. In each region, the strength in the two accounts was balanced against the

weakness of the partners to avoid a one-sided analysis. In this regard, some countries with healthy balances were included from the regions to ensure that the sample was representative enough.

TABLE 2.2: Data definition and sources

Variable	Definition	Source
Current account balance (CAB)	The sum of net exports of goods and services, net primary income, and net secondary income in % of GDP.	IMF database.
Commodity Prices (COMP)	The log of real commodity price (2010) for main export per unit measure per country.	World Bank Commodity Price Data (The Pink Sheet).
Investment (INV)	Gross domestic investment) consists of additions to the fixed assets of the economy plus net changes in the level of inventories as % of GDP	IMF database.
Primary Balance (PB)	Government net borrowing or net lending, excluding interest payments as % of GDP.	IMF database.
Foreign Growth (FG)	Real GDP growth rates of each countrys Main trade partner (mode) for the past 10 years	IMF database.
Openness (OPEN)	The sum of exports plus imports, as a percentage of the countrys Gross Domestic Product.	The UNCTAD database.
Real Exchange Rate (E)	The log of real exchange rate to the US Dollar.	The UNCTAD database.
Government Expenditure (GE)	Total expense and the net acquisition of nonfinancial assets on accrual basis as a % of GDP.	IMF database.
DHIPC	Dummy Variable representing whether a country was in the HIPC/MDRI program.	IMF fact-sheet.

The data for this research was mainly obtained from the World Economic Indicators and United Nations Conference On Trade and Development (UNCTAD) databases. All the variables were in percent of GDP save for the

dummy variable, foreign growth and commodity prices. The variable foreign growth used the growth rate of the leading export destination for each of the countries in the panel. The commodity prices were in logs to scale them. Trade openness was a percentage obtained by adding the exports to imports and then dividing by the GDP. The details of the variables used in this study are summarized in table 2.2.

2.5 Results and Discussion

2.5.1 Panel unit root tests

We begin by establishing the time series properties of the data. This is because the time element in the series was the main emphasis of the data. Furthermore, it would help to determine the use in the dynamic estimators later in the study. Three tests were conducted for the unit root. The first was Breitung (2000) test which bears the strength of transforming the data prior to computing the regressions so that the standard t statistics can thereafter be used to evaluate the unit root. It accommodates a common autoregressive parameter and is good for a balanced panel.

The Fisher ADF test has the advantage of performing each panel test individually and then combining the result to get a chi-square measure. It relaxes the assumption of balancedness of the panel and acts well to

supplement the Breitung test. The above two tests approach the test from the null of presence of unit root in panels, which imposes a strong requirement for finding a unit root. The third test is the Hadri (2000) test which approaches the test from the opposite direction (Null of stationary panels) to the preceding two tests. Thus this is a good confirmation of the previous two tests. It however comes with the limitation of having a high affinity for rejection of stationarity where there exists high autocorrelation. These three tests supplement each other and help to verify the results. The unit root results were as shown in table 2.3.

TABLE 2.3: Unit Root Test Results

	Levels			First difference		
Variable	Breitung	Fisher ADF	Hadri Z-stat	Breitung	Fisher ADF	Hadri Z-stat
CAB	-3.384	-1.937	4.774	-5.526	-5.557	-0.842
	(0.00)	(0.026)	(0.000)	(0.000)	(0.000)	(0.8)
PB	-0.781	-3.967	5.064	-3.105	-10.552	0.512
	(0.217)	(0.000)	(0.000)	(0.001)	(0.000)	(0.304)
Open	-0.132	-1.431	7.362	-2.905	-5.313	1.189
	(0.447)	(0.076)	(0.000)	(0.002)	(0.000)	(0.117)
Inv	-3.475	-3.006	4.774	-5.988	-6.75	-2.707
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.997)
FG	-5.203	-5.515	3.146	-7.625	150.679	0.858
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.435)
E	-0.233	9.806	9.337	-5.986	65.84	0.899
	(0.408)	(0.174)	(0.000)	(0.000)	(0.000)	(0.184)
Comp	-0.487	-0.4955	6.133	-3.629	-4.792	-0.261
	(0.681)	(0.31)	(0.000)	(0.000)	(0.000)	(0.603)
GE	-0.321	-0.194	5.156	-4.368	-6.195	0.164
	(0.437)	(0.423)	(0.000)	(0.000)	(0.000)	(0.435)

[1] Probabilities in brackets. Breitung refers to the Breitung (2000) test, Fisher ADF refers to the Fisherian type Augmented Dicky Fuller test. These two approach the test from the null of nonstationarity panels as the Hadri approaches the test from the null of stationary panels. The Hadri z-stat refers to the Hadri (2000) test. Variables names are as defined in table 2.2

The first two tests reveal the presence of a unit root in three variables openness, Commodity prices, and government expenditure. The other

variables are stationary at levels. The variables with a unit root are however stationary at first difference implying that they are I(1).

The Hadri test thus reveals the presence of a common unit root in all the variables but finds all of them stationary at first difference. On one hand the results of the panel Hadri test do not show any variable as stationary at levels where the other two tests show only three are nonstationary. This means that there is a possibility of high autocorrelation which leads to rejection of the null (Stata Press, 2009). On the other hand, the Hadri test confirms that all the variables are stationary at first difference.

These findings impose some requirements on the variables that are nonstationary at levels. There was need to accommodate the unit root in the variables that bore it. Differencing the affected variables would suffice to correct for this among other techniques that are more detailed. This made it necessary to difference the I(1) variables before doing the GLS estimation of the random effects and the fixed effects estimator. Where the form of autocorrelation was established, then its structure was accommodated in the modeling.

2.5.2 Model selection

This section reports the results of model selection process involving a choice between the various models. First, a selection was carried out between the pooled regression and the fixed effects model based on best fit comparing

the (R^2) between the two whose underlying estimation is the same, and supplementing this with the poolability test. The pooled regression resulted in an R^2 of 0.3694 which was less compared to the fixed effects model which had a within R^2 of 0.4176. Furthermore the poolability F test that $u_i = 0$ was rejected with F(11,209) =5.22 and Probability > F = 0.0000. This implied that the fixed effects model had a better fit than the pooled regression and thus was more preferable. After running the random effects model and running the Breusch and Pagan Lagrangian multiplier test for random effects, the chibar value was 354.2 with a probability 0.000. the results therefore failed to reject the null of $\sigma^2 = 0$ indicating that the random effects were present. This meant that the random effects model was preferred to the pooled regression.

To choose between the fixed and random effect models, the Hausman specification test was conducted. Its results revealed a $chi^2 = 4.08$ and Probability > $chi^2 = 0.7701$ was large enough to fail to reject the null hypothesis that the difference in the errors was not systematic. This suggested that the random effects estimator was preferable compared to the fixed effects model.

The estimations of both the fixed and random effect models revealed significant autocorrelation with the Durbin Watson (dw) correlation coefficient both for the random and fixed effects at 0.697. This was achieved by running the two models while assuming an AR(1) error process along the cross-sectional time series. Furthermore, the modified Bhargava, Franzini and Narendranathan (1982) Durbin-Watson test revealed a correlation of

0.77121469, while the Baltagi and Wu (1999) LBI resulted in 0.90055418. This meant there was a serious level of auto correlation in the series that needed to be accommodated in the modeling and the dynamics of the models.

2.5.3 FE and RE Robust and RE GLS Estimates

This section reports the findings from the static estimations. The estimates in the first column of table 2.4 show results from fixed effects estimation followed by the Random effects estimator both incorporating autoregressive error process of order one AR(1). The RE robust, and the generalized least squares (GLS) estimates test the outcome that would accrue assuming both autocorrelation and heretoskedasticity in a robust mode. The final estimation shows the result of a GLS estimate which assumes cross-sectionally correlated errors of type AR(1). This closely describes the evolution of the error process which the unit root process and correlation tests revealed, arising from the time series nature of the variables in the regression.

Four models were estimated to ensure robustness in the estimation of the relationship. Results across the models reveal a significant positive relationship between the primary balance and the CAB. The strength of the relationship varied depending on the estimation technique. As expected, there was little to tell apart between the fixed effects and the random effects model with the autoregressive error process, with three of the seven estimates in both models posting significant results and the correct signs. The magnitudes of the

TABLE 2.4: Static Estimation Results

	Dependent Variable: CAB				
	FE	RE	Robust	GLS	GLS
Exp. Variables			Levels	iid	Correlated
Primary	0.235***	0.239***	0.424**	0.298***	0.247***
Balance	(-4.07)	(-4.19)	(-3.28)	(-4.93)	(-6.91)
R. Exchange	2.279	0.583	-0.745	0.456	0.490***
Rate	(-1.05)	(-1.00)	(-1.03)	(-1.65)	(-3.86)
D.Openness	0.0377	0.0271	-0.00448	-0.00603	0.0473
	(-0.56)	(-0.4)	(-0.06)	(-0.08)	(-1.36)
Investment	-0.562***	-0.506***	-0.393**	-0.399***	-0.398***
	(-8.20)	(-7.68)	(-3.80)	(-6.18)	(-11.10)
Foreign	0.0834	0.0696	0.311***	0.0165	0.125**
Growth	(-0.71)	(-0.61)	(-4.5)	(-0.14)	(-2.96)
Commodity	2.942*	3.133*	3.004**	3.726*	2.543***
Prices	(-2.33)	(-2.47)	(-3.94)	(-2.55)	(-3.88)
1.hipc		-5.559		-5.366***	-4.983***
		(-1.71)		(-3.79)	(-8.13)
D.Govt	-0.369***	-0.327***	0.0303	-0.291***	-0.142**
Expenditure	(-5.15)	(-4.68)	(-0.18)	(-3.61)	(-2.75)
_cons	-2.204	7.201	-9.511*	5.599*	4.743***
	(-0.79)	(-1.88)	(-2.66)	(-2.53)	(-4.55)
N	228	240	252	240	240

t statistics in parentheses $^{*}p < 0.1$,$^{*}*p < 0.05$,$^{***}p < 0.01$

coefficients is also not marginally different in these two models. More robust estimation in the form of robust random effects estimation and independent and identically distributed generalized estimate (GLS) improves upon these results with the primary balance, investment, foreign growth, and commodity prices being significant at 0.05 level of significance. As expected from the static estimations, the generalized least square controlling for correlation performed best to return the maximum number of significant estimates that were correctly signed. We therefore report the findings based on this estimation technique.

The positive relationship between the two main variables of interest point to the existence of a twin deficit across the models. A percentage point increase in the primary deficit has the effect of increases the current account

deficit by 0.25 of a percentage point. This means that holding other factors constant a fiscal expansion leads the weakening of the current account. A possible explanation for this result is the high interest rates in the region which have resulted in capital inflows from abroad to meet government expenditure in infrastructure including road, health, education and power generation as illustrated by the recent increase in sale of sovereign bonds by some of the countries in the region included in the sample like Kenya, Ghana, South Africa, Cameroon, Mauritius, and Senegal. Alongside the effect of high interest rates attracting foreign investment in the country is the fall of commodity prices which ensured a further fall in balance of payments.

The exchange rate returned a significant positive effect on the current account. This result vindicates the use of this method which accommodates autocorrelation. This was expected since this variable has high autocorrelation because it is a high frequency variable collected daily and then averaged for the year. A percentage point devaluation of the exchange rate is associated with an improvement of the current account by 0.49 percentage point significant at 0.05 level. The channel through which this eventuality occurs is that when the exchange rate depreciates relative to the foreign currency the exports of the region become cheaper internationally therefore leading to an improvement of the trade balance and by extension the CAB.

Being an HIPC beneficiary has a negative effect on the CAB compared to countries that did not participate in the debt forgiveness program. An HIPC

beneficiary has a current account which is 4.983 percentage points lower on average than a non-HIPC. This means that even though the HIPC initiative got these countries out of a huge size of their foreign debt, their capacity to staying out of external debt with huge needs of foreign currency for imports is still under threat. Their need for foreign exchange for imports is likely to push these countries to indebtedness in future compared to countries which were not beneficiaries. This reveals that most countries that were involved in the program had an underlying structural problem which made their deb grow faster since they were not able to raise enough exports to cover their imports compared to those which never participated.

Commodity prices had a significant positive effect on the CAB. A unit increase in export commodity prices is associated with a 2.543 percentage point improvement in the balance of the CAB. This is expected to happen where commodity price increases imply higher revenue per unit of export leading to an increase in the revenues of the country and thereby improving the CAB. This was also expected because between the years 2000 and 2010, the real energy and metal prices doubled while real precious metal prices tripled. Real agricultural product prices improved by more than 60% based on data from the World Bank Commodity Price Data. However with the recent fall in commodity prices effective 2012, which peaked in 2016, the current account has been getting worse for countries in the sample including oil and agricultural countries which registered a 50-70% fall. Since the year 2012 only

the Mozambican current account some growth thus helping to maintain the positive relationship.

Increasing public investments have a negative effect on the current account. This is hardly surprising since the CAB equates to the difference of savings and investment meaning that an increase in investment causes a fall in the CAB. The robust estimation reveals that a percentage point increase in investment is associated with a 0.398 percentage point decrease in the CAB. Possible channels through which this happens is that increasing investment puts upward pressure on the on domestic interest rates above interest rates of trade partners. Some additional capital, flows from abroad to finance the increase in investment making the capital flow negative so that starting from a position of balanced trade, a rise in investment ends up causing a current account deficit. While this is what theory would suggest, this outcome is only possible where there exist perfect capital mobility and markets are developed enough to absorb the inflows. Latest sovereign bond issuances may demonstrate growth towards this direction but this is hardly complete for the vast majority of the countries. The most likely channel therefore is that a rise in interest rates arising from the government borrowing of in the economies leads to crowding out of private investments, which creates market distortions, which spill over to the current accounts. These distortions may be in the form of decreased private investments leading to a decrease in output for export leading to the worsening of the exports and thus trade balance.

Foreign growth is significant in the preferred random effects model so that the growth rate of the main export partners in the sample has a positive effect on the CAB. A percentage increase in the foreign growth improves the CAB by 0.125 of a percentage point. Possible channels that this happens through is that an increase in incomes of the trade partners implies more disposable incomes for foreigners, which increase their marginal propensities to import. This means that the regional economies then get ready markets for their produce and thereby improve their trade balances and the current account by extension.

An increase in government expenditure has the impact of deteriorating the CAB in the panel. A percentage point increase in government expenditure is associated with a percentage point fall in the CAB. The channels that this could have happened is that government spending holding other factors constant leads to a deterioration of the fiscal balance. Since tax do not increase in the current period, agents realize that the will have to pay more taxes in future thus they save more and increase their hours worked. This improves the productivity of capital, which promotes private investment. The increase in investment partially takes away from the private savings leading to the current account deficit. This effect is however temporary because permanent government spending in an intertemporal substitution effect exactly offset each other with the investment result noted above meaning that the net effect of these two cancel each other out and neutralize the effect. But this will largely depend on the elasticity of substitution between the two.

On the models choice, the use of fixed effects does not deliver the required result probably because of the correlation between error terms and the removal of the time invariant characteristics, which wipe out even the dummy. While this model is an improvement by accommodating the time invariant characteristics, but also assumes but suffers the omitted variable bias. Between the two the random effects delivered an improvement as given by the Hausman test. GLS delivers a consistent result by appropriately controlling for the serial correlation thereby delivering a relatively improved result.

2.5.4 Dynamic Effects Estimation of the Model

According to Baum (2013) static regressions such as the ones carried out in the preceding section have several shortcomings. First, they overlook the need to accommodate the dynamic effects where a variable depends on its past realizations. Secondly, these estimations overlook the endogeneity that may arise from omitted variables, miss-measurement, among other issues, which are common in economic data. Endogeneity in this model for example could arise from omission of an important variable and reverse causality between CAB and the primary balance. This reverse causality may make the errors to be correlated with the variable. This necessitated an endogeneity test using a two-step procedure involving first an instrumental variable estimation using the lagged variables of the endogenous variables. The identifying restrictions were valid.

The Arellano and Bond (1991) GMM one step estimator was used for the purpose of trying to put the results above beyond doubt while also addressing the issues arising from endogeneity and dependence on past realizations. This estimator removes the fixed effects by first differencing and then goes ahead to construct instruments for the endogenous variable starting from the second lags of the dependent variable plus all the feasible subsequent lags. Furthermore, all the explanatory variables except the lagged dependent variables are taken as instrumental variable (IV) style instruments as the lagged dependent variable becomes the GMM-style instrument along with all its available lags.

Since the first difference estimation must be carried out at levels and at the same time, keeping in mind that the estimate would be inefficient due to the correlation with the error, estimation is run in a robust model. Testing for autocorrelation of the residuals rejected autocorrelation of order one but failed to reject for order two indicating the satisfaction of the Arellano-Bond model assumptions. The results of this estimation are as shown in table 2.5.

First, the current account responds positively to the changes in the primary balance so that a percentage point fall in the primary balance all else held constant is associated with a 0.33 percentage point fall in the CAB. This positive relationship therefore upholds the twin deficit verdict but again without the one for one relationship between the cab and primary deficit. The estimates also return a robust result on the influence of the lagged variables of

the current account on the present value of the current account implying that the dynamics matter and are persistent at with a coefficient of 0.3 at 0.01 level of significance. The second lag however was insignificant meaning that the CAB relied on a short memory with a lag order one.

TABLE 2.5: Dynamic Estimation Results

	Dependent variable	
	CAB	CAB
L.cab	0.348***	0.330***
	(2.73)	(2.63)
L2.cab		0.0947
		1.37
Primary Balance	0.309***	0.329***
	(2.94)	(2.79)
Openness	-0.163	-0.12
	(-1.39)	(-1.20)
Public Investment	-0.381***	-0.415***
	(-2.85)	(-3.34)
R. Exchange Rate	(2.71)	(2.29)
	1.19	1.04
Foreign Growth	0.215***	0.239***
	(2.85)	(3.2)
Commodity Prices	3.470**	3.440**
	-2.13	-2.21
Government Exp.	0.187*	0.242**
	(1.88)	(2.32)
_cons	-21.48	-20.88
	(-1.57)	(-1.59)
N	228	216

t statistics in parentheses $^{*}p < 0.10,^{**}\ p < 0.05,^{***}\ p < 0.01$

A percentage increase in commodity prices all else held constant is associated with at least a 3.4 percentage point improvement in the CAB, which is in tandem with results given under the static models. This confirmed that this region's economies were still highly dependent on the sale of commodities to boost the performance of their current accounts. In contrast to the static outcome the dynamics model returns insignificant result for the exchange rate and the degree of openness. A percentage rise in investment is associated

with a 0.4 percentage point increase in the current account deficit just as in the static models while a percentage point increase in government expenditure was associated with at least 0.2 percentage point increase in the current account deficit. These results prove that while dynamics matter to the current account there are very subtle changes in the results of the overall outcome from the two models provided the autocorrelation and the endogeneity bias are corrected for.

2.6 Principal Findings and Conclusion

This paper set out to investigate the TDH for a sample of twelve Sub-Saharan African countries and the role of commodity prices on the current account. The results adduced using both the GMM method and the static models confirm the presence of the TDH where the impact from the fiscal policy is not very persistent compared to that in industrialized countries but rather weak at 0.3. This study found trade openness, and exchange rate fail to explain the CAB while foreign growth explained it. While more studies need to be carried out to establish the strength of the relationships, the TDH is upheld for the region. In terms of the variables of the model, the role of commodity prices in the model featured prominently.

Commodity prices have a positive and overwhelming impact on the current account where a percentage change in commodity prices results in a

3.44 percent point change in the CAB all else held constant. It confirms that falling commodity prices would act to aggravate both the fiscal and current accounts of nations and the growth of the Sub-Saharan African economy. This therefore calls for a paradigm shift for the sub-Saharan African economies if they are to continue gaining from balance of trade. The key solution for them must lie in value addition of their exports. Instead of exporting the primary commodities, the economies could seek to process the commodities and export them. Among commodities that could gain in price from this include coffee, tea, and cocoa and even metal ores. Beside this, the countries could choose destinations where they could sell these commodities by entering into futures contracts, which could cover them from huge variations in prices especially for metal exporters whose demand for exports is mainly to countries in the industrialized world. The countries also need to diversify their exports away from commodity exports to service sector, or even different commodities whose production does not mainly rely on cyclical commodity price. This implies the use of manufacturing and technology, which may help them value add and help keep prices above fluctuations.

Government expenditure was found to have a negative effect on the CAB. It was found that an increase in the government expenditure leads to the worsening of the CAB. While fiscal consolidation may not look like a viable option for countries which are on a drive to improve their infrastructure and economic growth, ending fiscal extravagance and corruption could go a long way into ensuring that what is spent consolidates long-term gains for the

region. That government investments have a negative relationship to the CAB means that there is need to improve the savings in the private sector so as to avoid the event where the investments have to take the plunge for huge current account deficits. This arises from the identity which says that current account equals savings less investment. Saving culture needs to be encouraged by other means other than pension. The private sector can do this by reducing dividends on invested savings or even encouraging savings schemes which can be targeted using tax incentives.

Foreign growth was also seen to have a positive impact on the current account. This was expected because when an importing country experiences good productivity, then it is expected that this income could help them to purchase foreign goods thus impacting the current account of the exporting country positively. While this may indicate the need for the region to produce more and diversify their exports, there is also an implication for countries with trade partners in the region. There is need to improve cross border trade by the countries in the region. Only a small fraction of the economies were trading in main exports and imports with their neighbours. If this was improved on, then the region would act to insulate itself from the contagion effects of financial crisis emerging from other regions while at the same time exploiting the comparative advantage between them.

Being an HIPC country is associated with the worsening of the current account. This means that while the HIPC/MDRI program conditions of among

others prudent management of the economies was observed during the road to forgiveness, nations did not consolidate their gains along the set path. This is not without exceptions, since there were countries such as Uganda and Rwanda whose balances are much improved and continue to get better. It also underscores the need to complete debt forgiveness for the remaining countries such as Eritrea, Somalia and Sudan, and continued aid and grants to the majority of countries still sagging under unfavourable terms of trade. There is also need to harmonize the debt restructuring process such that both debtors and creditors can be able to resolve unsustainable debts without occasioning defaults or doing too little too late. If responsibility in the part of the lender and borrower in the restructuring process was clear this would help forestall many debt crisis and ensuing loses for both creditor and debtor.

Going by the results of this study, the link between the exchange rates and the current account seems to be elusive. To the best of my knowledge no research has tested the link using the interest rates in a panel framework in Sub-Saharan Africa. The link between the twin deficit and consumption in and the effect through savings needs to be investigated to settle the debate by showing whether indeed consumption and saving behaviour changes with the change in budget balance and including the commodity prices in the models.

In conclusion, the Current Account deficits are correlated to the fiscal deficits, in a way that requires a policy mix that is unique for each of the countries in the study. There are collective measures that can to improve CABs

mutually that the regions needs to attend to, but there is overarching need for the countries to rethink what they sell to the world while also attempting to maintain internal balance through fiscal policy. This is so that nations free themselves from fluctuations in commodity prices, contagion effects of world crisis, heavy borrowing, and the twin deficits. This study acknowledges that deficits are not problematic in their own rights. The magnitude that goes beyond set healthy limits and their contribution to public debt is what should concern policy makers in the region moving forward.

Chapter 3

Sustainability of Public Debt in Selected Sub-Saharan African Countries

3.1 Introduction

Following the 2008 global financial downturn, public debt has gained illustrious attention in the fields of economics and finance. Formerly seen as an unavoidable tool for securing much needed development funds and covering short-term imbalances between revenues and expenditures, public debt is increasingly being seen as a tool, which needs close monitoring to mitigate against it turning against the bearer. In no region of the world has the issue of debt and its sustainability been at the core of economies than in Sub-Saharan Africa. The region has for a long time suffered high external debt averaging 218.4% (between 1986 and 2000) of her exports with debt service to exports at 32.8% in the same period. The region has just come from debt forgiveness

under the heavily indebted poor countries (HIPC) and Multilateral Debt Relief Initiative (MDRI) where 30/48 countries have had their debts forgiven. The region has again of late gained huge attention because its involvement in borrowing away from institutions which forgave debt but rather directly from the market using sovereign bonds. The puzzle therefore becomes; did the region recover its debt sustainability after debt relief? Is the debt situation better and has policy improved post debt forgiveness compared to the period immediately before the high debt regime?

There is a big variation in the extent of public debt between the countries of the region spanning 6.8% in Equatorial Guinea to 142.88% of Gross domestic Product (GDP) in Eritrea on average between the years 2007-2014. Eritrea is particularly interesting because it was one of the participants of the HIPC and Multilateral Debt Relief Initiative (MDRI) debt forgiveness programs even though the country is yet to reach completion point. One of the requirements of this program was that the countries reflect an improvement in debt management. While these programs managed to reduce the size of debt by a huge margin, speculation had been rife that the forgiveness alone would not be sufficient to return the countries to debt sustainability (Sachs et al., 1999; Easterly, 2002; Birdsall and Deese, 2004).

Of the 36 countries that benefited from this program 30 were from Sub-Saharan Africa. Ten worst performers according to IMF Data in the region based on debt to Gross Domestic Product (GDP) received debt forgiveness.

Despite the interventions to reduce the indebtedness, some of these countries like Eritrea, Ghana and Cape Verde have been noted to return to their pre-HIPC debt levels Panizza (2008). This casts doubt on whether debt relief really worked as planned. Among the countries, which have shown some improvement in debt management, are Zambia, Rwanda, Cameroon, Chad and Uganda. Even in these countries, debt is generally on the ascendancy. Research on sustainability after debt forgiveness is scanty on the Sub-Saharan Africa region. Yet an inquest into this subject would allow for innovative ways of evaluating debt by accommodating the nonlinearities and structural changes introduced by debt forgiveness.

Sustainability of debt is vital to the financial and macroeconomic wellbeing of an economy. Sustainability thresholds are used to flag a countrys slip into a dangerous debt level thereby acting to trigger fiscal and monetary policies to correct them. Just as the case for individuals, government debt is the excess of government expenditure over its revenue. It is important since it is regarded as risk free in that it is highly liquid with high earning mainly due to the high credibility of the state (Komarkova, Dingová and Komárek, 2012). When government expenditure exceeds its revenues, then it needs to borrow to finance the difference. Borrowing gives the government access to much needed resources to carry out its programs while giving investors an opportunity to earn a return at minimum risk. It also gives an opportunity for intergenerational transfers where today's investment projects benefiting future generations can be financed by those future generations.

In the end, whether governments benefit from borrowing or not depends on the view of creditors about the level of debt and the government itself as a borrower. If creditors are of the opinion that the government may not meet its obligation in the long run, they will not respond positively to the government issuance of debt. This is the concept of solvency of the debt. But fiscal deficits and their accumulations are also a high stakes game in politics and the economy since it affects macroeconomic variables such as national savings, investments and thus by extension the current account.

When debts have reached levels where policy has to be adjusted every now and then to avoid debt growing too large and bringing about unintended consequences, then this signals unsustainable debt levels. This makes governments to try as much as possible to stay within their inter-temporal budget constraint to avoid the size of debt exploding at a rate faster than the real growth rate of the economy. Therefore, solvency refers to the capability to service the debt while sustainability is concerned with capacity to maintain policy without need for abrupt changes in reaction to debt size. Huge debt size relative to the size of an economy has been identified to have negative consequences for the economy (Mitchell, 2005; Checherita-Westphal and Rother, 2012).

Huge debt size relative to the size of an economy has been identified to have negative consequences for the economy. Yet debt size is not a tell it all factor in deciding the sustainability. Factors such as the maturity structure of

debt have been identified to affect debt outcomes Tobin (1963). The divide of debt held locally and externally also matters in that domestic debt can be eroded away by inflation and also keeps resources within the economy which is not the case with foreign debt which may sometimes grow as interest rate payments accrue to foreigners. The prospects of the balance of payments also play an important role in that they are important in maintaining reserves in months of import cover while also indicating the capacity to repay debts. The effect of debt on the privates sector is also an important consideration as is countrys record of fiscal adjustments.

An influential paper on sources African debt crisis by Fole (2003) notes that though African debt has been smaller in absolute numbers over time compared to other regions of the world, it was sensitive because it was based on smaller economies. The study identified the causes of African debt crisis to have been multiple and interlinked, making it hard to attach appropriate weights to their prominence. It went ahead to group the causes of the debt debacle in Africa as boiling down to three paradigms; first, the world bank view that notwithstanding the external shocks and population pressure, the main force propagating indebtedness was policy failure on the part of governments. Second, the alternative frameworks to structural adjustments programs which argued that the cause was the inadequacy of the basic social and economic infrastructure compounded by the social political organizational problems which could not be solved through structural adjustment programs as proposed by the policy school.

Lastly, the academics with Marxist orientation who proposed that African debt problems emanated from economic dependence based on long-term under-development, dependency and short term vulnerability.

Despite identifying these impediments, little has changed both in the structure, infrastructure and dependency; even with information technology having broken many barriers to trade, industrialization and modernization. Sub-Saharan Africa has enjoyed favorable conditions in the recent past for borrowing with high economic growth and easy donor lending conditions. This has enabled economies like Kenya, Zambia, Ghana, Malawi, South Africa, and Nigeria among others to enjoy successful sovereign bond issues further pushing debt into unchartered territories of debt of direct borrowing from private lending markets. Arising from this, (Services and Rating, 2015) predicted that majority of the sovereigns would soon be faced with an increasing share of their revenues going to debt repayment just as was the case before debt forgiveness.

Adams (2015) blamed this eventuality on the end of quantitative easing programs in advanced economies, the strength of the US dollar, China's economic slowdown and lower commodity prices for the expected rise in unsustainable increases in government expenditure, often linked to the electoral cycle. Kraay and Nehru (2006) adduce strong evidence that institutions, policies, and external shocks, are key in determining the levels at which the countries will experience distress. This raises questions on the debt

sustainability of these sovereigns. Have SSA countries rallied to overcome the unsustainability after debt forgiveness? Has the threshold of sustainable debt come down or increased after debt forgiveness? Has policy been helpful in bringing sustainability to the debt?

The issue of nonlinearities in econometric relations has a very important bearing on the outcome of sustainability analysis. This is because policy changes affect debt outcomes and also intervention by the global community which completely altered the trajectory of debt for nations by introducing regime changes, switches, or structural shifts. A good case in point is the debt forgiveness program which has reduced significantly the size of SSA debt which has afterwards assumed an upward trend. These changes call for variant in approaches in sustainability analysis away from the traditional linear assumption where debt cumulatively maintains its growth path meandering around a trend whose departures from equilibrium can be assessed and sustainability determined by whether they converge or diverge. This therefore calls for nonlinear approaches in estimation.

This paper investigates the sustainability of debt in Sub-Saharan African countries. It seeks to investigate how post debt relief debt level compares with the period before the crisis with a view to assessing whether forgiveness restored sustainability enjoyed before the high debt regime. This study controls for the high debt regime to assess the sustainability of debt in the region, with a view to establishing whether relief restored sustainability.

This study contributes to debt analysis in the following ways; first, we combine both individual country analysis with regime shifts for a selected sample of African countries. Second, we exploit a longer data series for the countries in the sample between 1980 and 2014. Third, we use threshold co-integration under the ARDL model to estimate the sustainability using public debt and primary deficit. This third method springs from the need to accommodate the effect of debt forgiveness reducing debt to lower levels and then subsequent gradual increasing trend for countries under HIPC. It is assumed that when debt thresholds are stable then there is no policy interventions. We further assume that when debt thresholds are breached then action is taken and the best way to observe fiscal policy actions is through the primary balance.

The study is organized as follows; section two reviews the literature, section three presents an individual country analysis of the debt sustainability and their results. Section five presents the findings and the policy recommendations.

3.2 Literature Review

Debt thresholds have been developed along two lines. First, there has been research based on the growth-debt nexus which has found debt levels beyond given levels lead to the deterioration in the growth of the GDP. This thread

of research made popular by Reinhart and Rogoff (2010) who introduced nonlinearities in debt and resultant thresholds that found that countries lost one percent GDP growth beyond a debt level of 60%, and dropped 2% beyond the debt levels of 90%. The second approach has been the fiscal debt sustainability perspective. This criterion uses diverse methods of assessment to come up with the decision whether a country has surpassed its debt thresholds. One of the most famous thresholds has been the one agreed for in the Maastricht treaty for Europe at 3% for the fiscal deficit and 60% level for public debt.

The drive for debt forgiveness arising from the African debt crisis, the 1997 Asian financial crisis and the recent Eurozone crisis have brought tremendous focus on debt and its sustainability. According to Bagnai (2010) in Thailand where the Asian crisis originated, public debt to GDP was at 4% and had an external debt at 50% of GDP. In all the countries where the crisis occurred it was found that there were rising external debt and a falling public debt.

According to Hussain, Mlambo and Oshikoya (1999) the coexistence of small domestic public debt with large external debt meant that private debt financed by external capital inflows, played a major role in the crisis. But even prior to these crises, the African debt crisis that led to debt forgiveness was traced to massive borrowing which was estimated to have been three times the size of the continents exports and amounted to about United States $230 (Danso, 1990). Since then, and for the last three decades this subject has gained

traction as one of the factors which have significant impact on growth and development in the continent.

Notwithstanding the early identification of the impact of debt on growth, the world came to act on the crisis remarkably later. The 1990s and 2000s campaign for debt forgiveness by several nongovernmental organizations, which culminated in debt forgiveness for 30/45 Sub-Saharan African countries underlined the importance of government debt in the region. This was done under the auspices of the International Monetary Fund (IMF), the World Bank and the Paris Club who initiated the HIPC and the Multilateral Debt Relief Initiatives (MDRI).

It was estimated that before the debt forgiveness programs, some countries in Sub-Saharan Africa spent slightly more on debt service than on health and education combined IMF (2015) . It would have been expected that having gone through a difficult time trying to service debt, Sub-Saharan Africa (SSA) would have learned her lesson and would rise from the ashes to manage her resources prudently. But according to UNCTAD (2004) and Cavallo (2005) it seemed to be an emerging consensus, that many African countries would continue to suffer from a debt overhang despite the HIPC initiative and various actions in the context of the Paris Club.

Elsewhere in the globe, the sustainability and debt levels had long started with the 1980s Latin American debt crisis, the Asian crisis in the 1990s and the resultant turmoil in several emerging economies and the crisis in the Portugal,

Italy Greece and Spain (PIGS). This has underlined the need for countries to consolidate and support efficient management of credit by the use of prudent policy. Yet for a debt instrument to play its role effectively the holders of the debt need to believe that policies are such that their contracts will be fulfilled when they are due. Neck and Sturm (2008) propose that even though it is intuitively clear that a sustainable policy must be such as to eventually prevent bankruptcy, there is no generally agreed upon definition of what precisely constitutes a sustainable debt position. Jacobs, Schoeman and Van Heerden (2002) in a research on the impact of the definitions of fiscal debt presented fifteen different definitions of sustainable budget deficits.

According to Draksaite et al. (2015) there exist about three major different ways of defining sustainable public debt. First, government debt is considered to be sustainable if government is solvent. This definition falls short of explaining the time duration of consideration and is thus wanting. Second, government debt is considered to be sustainable if debt induced burden is not increasing. This way government debt is said to be unsustainable if over time, an uncontrollable increase of a debt is noticed and the government is no longer able to meet its debt obligations. Third, government debt is considered sustainable if debt level does not exceed the economic growth, and that the funds are used in an effective manner.

Arising from a summary of the preceding definitions, a sustainable government debt is one that is a result of sound government debt

management, which guarantees the achievement of government borrowing demands, does not negatively affect creditability of the government, and the ability to meet the long term debt obligations. According to da Costa (2010) public debt is considered sustainable when the government budget constraints can be met without disrupting fiscal and monetary policies. In accounting terms this means that the amount of public debt should not be greater than the present value of all future balances. This ascribes a mathematical expression to the circumstances under which the government budget constraints can be met by acknowledging circumstances in which the debt may not be repaid or when monetization will occur. This is not to be assumed to mean that the model predicts with certainty the occurrence of debt default. Certainty in prediction fails because the values involved in the calculation of the sustainability of the debt are choice variables whose values are hard to determine a priori. This makes the exercise one of assessing the willingness and ability of the government's ability to raise the requisite surpluses. This study proposes to use the definition proposed by da Costa (2010) since it captures the policy and the empirical approach to the estimation of public debt sustainability.

Research on sustainability of debt owes its origins to Domar (1944) who laid a solid foundation of the necessary conditions for debt sustainability although his analysis missed some important variables such as interest rates and GDP growth in the model. A careful review of debt sustainability identifies three approaches to the analysis of debt sustainability. First is the use of stationarity tests to determine the sustainability of debt where the

finding of stationary public debt or deficit is associated with sustainability while nonstationarity of the variables implies unsustainability. This analysis was identified as akin to testing whether the debt contained a bubble term. Here a stochastic series is said to be stationary if it tends to its average or to its trend after a shock. In this case the government fiscal position is that following a shock which changes the value of the debt, a surplus is raised to force the debt to gradually return to original return to its original value. This method has been used by among others (Hamilton and Flavin, 1986; Trehan and Walsh, 1988; Smith and Zin, 1991; Buiter and Patel, 1992; Ahmed and Rogers, 1995; Rocha, 1997; Getzner, Glatzer and Neck, 2001).

The second and third approach are borne from the observation that stationarity in itself is a weak condition for identification of sustainability in that debt variables, that is revenue and expenditure will be nonstationary and this will bias the sustainability tests towards unsustainability even where it is in the nature of data comprising of a trend term. Bohn (2007) contested the use of stationarity tests method claiming that if they were used, then a debt integrated of any order was sustainable. Since any series will be stationary after infinite number of differentiations then rejection of sustainability is impossible.

This study proved that if the relevant debt variable is stationary after any finite number of differencing operations, then the intertemporal budget constraint is satisfied. Furthermore, the intertemporal budget constraint is

also satisfied if revenues and with-interest spending are difference-stationary of arbitrary order without the requirement of cointegration. These findings therefore implied that a rejection of low order difference stationarity and cointegration are therefore in keeping with the budget constraint. The study therefore recommended the use of an error correction mechanism to analyze the problem. Stationarity tests have also been criticized for they can only be used for observed time series and even if the researchers used the past to forecast the future, the resulting stationarity tests are simplistic in that regard.

Proponents of this second method therefore proposed taking the test further to include cointegration test of the resultant I(1) series. In this case a series was said to be sustainable if the revenues and the expenditures were cointegrated and unsustainable otherwise. This method has been used by among others (Hakkio and Rush, 1991; Quintos, 1995; Papadopoulos and Sidiropoulos, 1999; Afonso, 2005; Alagidede and Tweneboah, 2015).

The third approach employed cointegration but instead of revenue and expenditure it used the primary balances and the government debt. Proposed by Bohn (1995) it suggested testing whether the primary surplus relative to GDP was a positive and at least linearly rising function of the debt to GDP ratio so if this property holds, a given public debt policy can be shown to be sustainable. This test is considered very plausible because it has a nice economic intuition that is; if governments run into debt today they have to take corrective actions in the future by increasing the primary surplus otherwise

public debt will not be sustainable (Greiner and Fincke, 2009).

Proponents of this policy view it a closer approximation since by using debt level and its policy variable which is the primary balance, the consistency of fiscal policy with the intertemporal budget constraint can be checked both by the use of unit root and then cointegration (Prohl and Schneider, 2006). In this case cointegration between primary balance and public debt implies that policy converges regularly to its mean value while lack of cointegration means that it diverges. Other researchers other than the above have been (Haug, 1991; Ahmed and Rogers, 1995; Mendoza and Ostry, 2008).

Prizzon and Mustapha (2014) set out to evaluate the achievements of the HIPC and MDRI and to assess the extent to which new debt flows may affect the debt sustainability results achieved. They found that debt ratios had fallen, and identified four sources of possible conflict with the debt reduction strategy. These were; the upgrade of nations to middle income status by IMF opening new avenues for debt sourcing, financing infrastructure via international capital markets, reemergence of new sovereign donors with possibility of harder financial terms, and the rise of domestic debt.

Muhanji and Ojah (2011) set out to derive sustainable external debt thresholds that would be more appropriate for African economies. They computed debt ratios and recommended debt to GDP ratios of 60%, debt-to-exports ratio of 80%, and short term debt to reserves ratio of 80%, while the IMF and World Bank recommended 250%, 150% and 130% as their ratios

respectively. The thresholds they obtained seemed to show negative growth for the countries in the sample which violated the their recommendation. Generally literature comes short of reaching a consensus on the criteria for government debt sustainability based on debt ratios and the assumptions for sustainable debt (Draksaite et al., 2015).

Fedelino and Kudina (2003) assessed the link between fiscal policy and sustainability in a number of African countries that participated in the HIPC initiative. The study found that on the basis of the prevalent fiscal policies in the economies the debts would remain unsustainable even after the countries graduated from the HIPC initiative. Kraay and Nehru (2006) find strong evidence that institutions and policies, as well as external shocks, are important in determining the levels of debt at which countries experience distress.

From the above review of literature, there are about three approaches to estimating the sustainability of debt. One approach uses the stationarity tests between revenues and expenditure, the second uses cointegration of revenues to expenditures in the way of (Trehan and Walsh, 1988; Hakkio and Rush, 1991; Ahmed and Rogers, 1995) the other approach uses cointegration between the primary balance and public debt in the way of (Bohn, 1995). While these methods have dominated debt analysis in the literature, their applicability within the SSA context requires innovation due to structural shifts in data and the need to identify the equilibrium to which debt converges to arising from

structural changes.

This paper aims at bridging this gap for the region. SSA debt is peculiar unlike the rest of the world where the preceding analysis are done. First, the Sub-Saharan countries African countries rarely experience surpluses in their budget balances. This means that the accumulation of these deficits may be the contributing factors of the growth in public debt akin to the experience of the European countries in the 1970s (Ballabriga and Martinez-Mongay, 2006). In this case the public debt can be assumed to be the function of the private balance that have been accrued in the history of the debt. Second, the trend of debt in SSA has transitions from low occasioned by the end of commodity boom in the late 1970s and early 1980s to high during the structural adjustment programs in the late 1980s and early 1990s and following recent debt forgiveness from high to low. The transitions from one level to another has not been abrupt but smooth rise to the high debt and then a slow decline as debt forgiveness went in stages.

This study therefore first follows in the work of Garcia and Perron (1996) to characterize and unearth regime shifts of debt that allow for changes in both the mean and variance. The main question that has driven debt sustainability literature towards stationarity, and intertemporal models has been the desire to find out whether a given data series converges or diverges from its equilibrium values in the short run or long term. Our method allows for the interrogation of the individual country analysis to allow for statistical analysis of the growth

process of debt and its structure as the variations around the mean inform how policy has rallied to maintain the debt around equilibrium at different stages. This will latter inform the break dates that are to be used as high debt regimes in an ARDL model.

Based on the graphical analysis of the data, this study first carries out the multiple break unit root tests. Once the break dates have been established, then a breakpoint regression analysis is done to confirm break dates for the series and the variations accruing from debt accumulations obtained analyzed and then traced to history of debt in the countries. Based on the standard errors around the means, this would then inform on government action or inaction on policy to maintain the debt at a certain level. Once this has been done, the analysis of the autoregressive distributive lag model (ARDL) will be carried out involving the influence of primary deficits on debt, by first determining the integration of the public debt and the primary balance, then based on whether both variables are I(1) or integrated of different levels, appropriate analysis of the group will be carried out.

3.3 Theoretical Model

Where all uncertainty is wished away, a fiscal debt is sustainable when the present value of future revenue flows minus debtor expenses can pay for all that has been contractually agreed. The values specified in the contract are

important to avoid the circularity associated with the use of a market value. Furthermore, there is need to consider the debt in real terms because the price level can act as a variable and introduce circularity similar to that related to the use of a market value (da Costa, 2010).

Following Cafiso (2012) the intertemporal budget constraint consists of the sequence of all taxes and expenditures that guarantee that the contractual obligations of the government are met. But it is important to divide the budget constraint into two parts, namely; the government flow constraint and the transversality condition. A combination of these two can then be shown to equate to the PVC.

For each period the budget constraint evolves according to the rule;

$$B_t = (1+r)B_{t-1} + G_t - T_t \tag{3.1}$$

B_t represents the value of government debt at time t, r is the interest rate assumed to be constant, T_t government revenues and G_t is government expenditures excluding interest payments. If Tt is greater than government expenditure Gt then we call this a primary surplus. If $G_t > T_t$ then we call this a primary deficit. Equation (1) must hold for all time periods so that in the next period after t we have;

$$B_t = (1+r)(1+r)B_t + (G_t + G_{t+1}) - (T_t + T_{t+1}) \tag{3.2}$$

By recursive substitution using (1) and (2) we get;

$$B_{t+2} = (1+r)(1+r)(1+r)B_{t-1} + (G_t + G_{t+1} + G_{t+2}) - (T_t + T_{t+1} + T_{t+2}) \tag{3.3}$$

This way B_t becomes;

$$B_{t-1} = \frac{B_{t+2}}{(1+r)^{t+2}} + \frac{(T_t + T_{t+1} + T_{t+2})}{(1+r)^{t+2}} - \frac{(G_t + G_{t+1} + G_{t+2})}{(1+r)^{t+2}}. \tag{3.4}$$

By summing this series s times ahead obtains;

$$B_{t-1} = \frac{B_{s+1}}{(1+r)^{s+1}} + \sum_{i=0}^{s} \frac{T_{t+i} - G_{t+i}}{(1+r)^{i+1}} \tag{3.5}$$

Likewise, $T_{t+i} - G_{t+i}$ represents the primary deficit in period with G assumed to be greater than T. This equation states that the present value of the future primary surpluses must exceed the present value of future primary deficits by an amount that is enough to cover the gap between initial debt stock and the present value of terminal debt stock. If the first term in the expression above approaches zero as the number of periods become large, then this will satisfy the no-Ponzi constraint represented by;

$$\lim_{s\to\infty} \frac{B_{s+1}}{(1+r)^{s+1}} = 0 \tag{3.6}$$

This constraint is also called the intertemporal solvency condition. It states that the present value of government debt in the infinite future converges to zero.

Note that this condition holds with equality because the agents in an economy cannot end up being indebted to the government. It cannot also finance interest payment by continuously issuing debt. Also, note that the transversality does not rule out large primary deficits or large debts. It only requires that the debt in the numerator to grow more slowly than the interest rate in the denominator. When equation 3.6 is not violated, then equation 3.5 becomes;

$$B_{t-1} = \sum_{i=0}^{s} \frac{T_{t+i} - G_{t+i}}{(1+r)^{i+1}} \tag{3.7}$$

Assuming that the public debt grows overtime at a constant rate , so that $B_{t+i} = (1+\alpha) B_{t+i-1}$ then the no-Ponzi condition can be expressed as follows;

$$\lim_{s\to\infty} \left(\frac{1+\alpha}{1+r}\right)^{s} B_0 = 0 \tag{3.8}$$

For this equation to converge, then the growth rate of debt should be less than the growth rate of real interest rate.

In practice, fiscal sustainability is usually evaluated using debt to GDP ratio. This is because debt in itself is not informative unless the size of the economy is known since the potential size of the future surpluses will depend among other things on the output of the economy. After all assessment of sustainability is based on assumption about a countrys capacity to make the sacrifices needed to generate surpluses which can ensure that equation transversality condition is fulfilled. The current period GDP can be modeled

as a growth rate (g) above the previous years GDP;

$$Y_t = (1+g)Y_{t-1} \tag{3.9}$$

By letting $W_t = T_t - G_t$ and expressing the debt as ratios of GDP yields;

$$\frac{B_t}{Y_t} = (1+g)\frac{B_{t-1}}{Y_t} - \frac{W_t}{Y_t} \tag{3.10}$$

By substituting the GDP growth relationship into the debt equation appropriately yields;

$$\frac{B_t}{Y_t} = \frac{(1+r)}{(1+g)}\frac{B_{t-1}}{Y_t} - \frac{W_t}{Y_t} \tag{3.11}$$

By letting the lower case letters represent ratios to GDP;

$$b_t = \frac{(1+r)}{(1+g)}b_{t-1} - w_t \tag{3.12}$$

Expressing the debt in ratios allows meaningful comparison of debt across countries. It is also important in helping to decide when debt ratios are explosive and when they are sustainable. If the debt is stable then the it would not grow overtime so that $b_{t-1} = b_t = \overline{b}$ so that;

$$w_t = \frac{(r-g)}{(1+g)}b_{t-1} \tag{3.13}$$

This result requires that the interest rate on average be greater than the GDP growth rate. If the growth rate was greater than the interest rate, then the

right hand side expression becomes negative. This means that the government could operate under deficits in its entire history and debt as a percentage of GDP would fall permanently. Furthermore, situations where growth rate exceeds the rate of return on capital are dynamically inefficient cases and such an economy will be characterized with excessive capital accumulation. In this case it would mean that consumption can be increased without any trade off of the income available for the future generations. In this kind of economy the solution would be to increase the debt thereby putting pressure on the interest rates so as to slow down the expansion of output and by extension the capital accumulation thus putting the economy on an efficient path (da Costa, 2010).

3.4 Empirical Model

Following Bai and Perron (2003) we consider a linear regression with m breaks corresponding to $(m+1)$ regimes and in matrix notation write;

$$Y = X\beta + \overline{Z}\delta + U \tag{3.14}$$

Where; $Y = (y_1, ..., y_T)'$, $X = (x_1, ..., x_T)'$, $\partial = \partial_1', \partial_2', ..., \partial_{m+1}')'$, $U = (u_1, ..., u_T)'$, with $\overline{Z}$ as the matrix which partitions Z diagonally at $(T_1, ...T_m)$. We can obtain the true values of the parameters, which we can denote with a 0 superscript as $\delta^0 = \delta_1^{0'}, \delta_2^{0'}, ..., \delta_{m+1}^{0'})'$ at time $(T_1^0, ...T_m^0)$. The aim is to estimate unknown regression coefficients together with break points (dates) given T

observations of Y, X and Z. we estimate a pure structural model because the coefficients of the models will change with the regimes. The variance need not be constant as breaks in variance are allowed provided they change at the same time with the breaks in the parameters of the regression.

By use of matrix notations and keeping matters simple the least squares estimates associated to each regime can be obtained by minimizing the sum of squared residuals;

$$(Y - X\beta - \overline{Z\partial})'(Y - X\beta - \overline{Z\partial}) = \sum_{i=1}^{m+1} \sum_{t=T_i+1}^{T_i} \left[y_t - x_t'\beta - z_t'\partial_j \right]^2 \tag{3.15}$$

The breakpoint estimators are global minimizers of the objective function and the parameter estimates are strictly associated with the m-partition. This paper considers only the regression comprising of the dependent variable and its lags. This assumes that in any regime the debt growth depends on the momentum generated by the previous accumulation of debt so that todays debt value depends on the memory of the debt values in that regime. This makes sense in that borrowing mainly depends on hey may vary from year to year.

$$PB_t = \alpha + \gamma Trend + \beta_t GD_t + \varepsilon_t \tag{3.16}$$

Should the two series are found to be cointegrated then the government budget constraint will be assumed to be binding. The ARDL regression, cointegration, and Bounds test will be used to test for short run and long run relationships

since the order of integration for primary balance was found to be I(0) and public debt with breaks was I(1).

3.5 Results and Analysis

This section aims at developing the necessary conditions for testing the sustainability of each countrys debt, based on time series properties of the data. Long-term relationships between time series variables regarding cause and effect, cointegration among other relationships depend on the stationarity of the variables involved in the relationship. These variables must first be tested for the level of integration.

This study uses the primary balance and public debt of the individual countries to analyze the individual countries sustainability. A careful inspection of the graphs of the countries reveal that there have been level shifts in the public debt of the countries. Some level shifts arising from the change in policy by themselves especially for those that did not get debt relief, or by the intervention of the lenders such as the HIPC/MDRI debt forgiveness. Given this data outlook, the normal analysis followed in the unit root and the eventual cointegration estimation may not suffice. Alternative tests and estimations that accommodate the structural breaks are called to bear.

3.5.1 Unit Root Tests

This study uses the breakpoint unit root tests (table 3.1) to accommodate more than one break and take advantage of two main strengths of the structural break tests namely; forestall a test result which is biased towards non-rejection Perron (1989) and also help determine whether the occurrence of the breaks has important implication on the history of debt. To mitigate against the loss of information that may accrue to the use of single break models, and to establish the threshold that the debt converges to in either of the regimes, public debt is subjected to the chow test in the way of (Garcia and Perron, 1996; Bai and Perron, 2003). This test allows us to accommodate the serial correlation in the model which varies across the various regimes of the model while providing for the determination of a suitable number of breaks and resultant regimes using the Andrews bandwidth selection technique for each of the country debt series. The level of integration of the two series for each country in the sample is as shown in table 3.1.

The table 3.1 shows that public debt and primary deficits are mainly integrated of different levels for all countries apart from Burkina Faso whose debt is integrated at the same level. Public debt for most countries is integrated of level I(1) and primary deficit is integrated at I(0) for all countries apart from Kenya, Mauritius, Senegal and Uganda which are integrated of order I(1). The determination of the level of integration leads to estimation of the multiple breakpoint regressions. These regressions will help to identify the

TABLE 3.1: Breakpoint Unit root Tests Public debt and Primary Debt

Country	Public Debt			Primary deficit		
	Level + constant	First Diff. + trend	Break Date	Level + constant	First Diff. + trend	Break Date
Burkina Faso	-6.21***	-6.09***	2007	-8.0***	-10.12***	2006
Cameroon	-3.18	-5.66***	2006	-13.3***	-13.28***	2006
CAR	-4.6	-6.15***	2008	-5.79***	-11.02***	2006
Ethiopia	-3.58	-5.23***	2004	-4.71***	-8.18***	2000
Gabon	-2.31	-7.00***	2008	-4.36***	-4.91***	1998
Ghana	-2.88	-4.91**	2006	-5.70***	-8.72***	2011
Kenya	-2.99	-7.26***	1992	-3.52	-5.53***	1998
Mauritius	-3.73	-6.20***	2005	-4.03	-7.70***	2006
Senegal	-3.93	-6.37***	2005	-4.19	-7.63***	2004
S. Africa	-4.90*	-5.90***	1992	-5.10***	-4.75***	2008
Uganda	-3	-6.42***	2006	-3.02	-7.40***	2010
Zambia	-5.07	-8.44***	2003	-4.01***	-9.13***	2006

The table presents rejection of the null of unit root at $^{*}p < 0.05$,$^{**}p < 0.01$,$^{***}p < 0.001$.

debt regimes pre-debt forgiveness and post debt forgiveness in the form of debt averages. These can be taken as equilibriums to which the debt converges in the countries debt cycle. Using this criteria the following debt regimes were identified for the countries in the sample and the resultant residual graphs are contained in Appendix A.

TABLE 3.2: Breakpoint Regressions for Burkina Faso and Cameroon

BURKINA	Dep. Var: Public Debt		
Variable	Coef.	S. Error	t-Stat.
1980-1993	28.98	2.50	11.61***
1994-2005	51.47	2.12	24.24***
2005-2014	27.04	0.95	28.57***

CAMEROON	Dep. Var: Public Debt		
Variable	Coef.	S. Error	t-Stat.
1980 - 1993	36.27	4.37	8.29***
1994 - 2004	90.60	7.19	12.61***
2005 - 2014	17.50	3.87	4.52***

The table presents rejection of the null of unit root at $^{*}p < 0.05$,$^{**}p < 0.01$,$^{***}p < 0.001$

Table 3.2 shows the breakpoint regression output for Burkina Faso and Cameroon. The corresponding graphs are represented at appendix A, figure 1. Burkina Faso returned two states of debt in the sample period. The low state 1980-93 averaging 28.98%, high state 1994-2005 averaging 51.47%, and low state 2005-2014 averaging 27.04%. The country reached completion point in 2002 but the true impact of debt forgiveness under the HIPC was felt in 2006

when the debt fell to 23% of GDP. The appearance of the debt forgiveness made the grant element of debt disappear for the country. During debt forgiveness debt service increased to a high of 20.3% of exports but later fell to around 6% by 2006. This translated debt levels to low state, and with residuals moving out of the error band only thrice in the countries debt history. This demonstrates that debt forgiveness has helped to consolidate the gains on debt sustainability of the Burkina Faso economy and the country has embraced prudent management after debt forgiveness as represented by less volatility of the debt around the mean value in the low regime after debt forgiveness. The point of concern however remains the low percentage of debt service.

Cameroonian Public debt returned two debt regimes. First, a low debt state which lasted between the years 1980-93 averaging 36.27% and lasting 14 years. Public debt grew out of a combination of factors; falling government revenues, adverse terms of trade shocks and fall in value of exports (commodity prices of exports) in the high debt state between the years 1994-2004 averaging 90.57%. This period saw the country absorb huge debt from the multilateral institutions including African Development Bank, European Union (EU) and World Bank and Islamic Development Bank. Finally, the low debt state which was been achieved after debt forgiveness when the country reached completion point in 2006 occurring 2005-2014 and averaging 17%. The country seems to be enjoying a healthy debt state since then, as the debt variability minimized around the average debt implying an attempt of policy to restrict its growth. This indicates a continuity of prudent debt

management as envisaged in the Poverty Reduction Strategy Paper for the HIPC program.

TABLE 3.3: Breakpoint Regressions for Central African Republic and Gabon

CAR	Dep. Var: Public Debt		
Variable	Coef.	S. Error	t-Stat.
1980-86	37.97	2.74	13.88***
1987-1993	55.97	3.18	17.60***
1994-2008	93.91	3.39	27.69***
2004-2014	37.45	2.44	15.37***

GABON	Dep. Var: Public debt		
Variable	Coef.	S. Error	t-Stat.
1980-1986	30.44	2.23	13.65***
1987-2004	76.30	3.15	24.22***
2005-2014	27.28	4.45	6.13***

The table presents rejection of the null of unit root at $^{*}p < 0.05$,$^{**}p < 0.01$,$^{***}p < 0.001$

Table 3.3 shows the breakpoint regression output for CAR and Gabon the resultant regime graphs are graph is shown in Appendix A, figure 2. The CAR debt resulted in four public debt regimes. The first and last regimes can be termed as low debt regimes lasting between 1980-86 averaging 37.88% and 2004-2014 averaging 37.44%. The last low debt regime for the country coincides with debt forgiveness whose effect judging from the statistics was to restore the debt to sustainable levels enjoyed in the formative years of the nation. The medium state 1987-1993 was represented by one regime with an average 55.97% representing a period of debt growth towards the high debt state. This coincided with the one party rule regime which increased the debt through recurrent government expenditure whose use included payment of salaries. The highest debt was recorded in 1994 after the first multi-party democratic election. The country has also gone through relentless conflict which made revenue collection impossible thus resorting to borrowing. Finally the high debt state came between the years 1994-2008 averaging 93.91%. This was a period of democracy and conflict in which the debt became unsustainable in

the lead up to debt forgiveness. Debt forgiveness reduced debt to below 20% and policy has rallied well to keep it there.

Gabonese debt returned two states of debt, a high debt regime 1987-2004 averaging 76.30% and two low debt regimes 1980-1986 averaging 30.44% after independence and 2005-2014 averaging 27.28% after oil price increases. High debt was attributed to terms of trade shocks affecting the GDP. Between 1986 and 1994 the country accumulated heavy debts due to the construction of the Trans-Gabonese Railway as the economy expanded by only 1.5% due to a fall in oil prices (African Development Bank, 2002). The devaluation of the CFA Franc only acted to make matters worse. The high state had an average of 76.30% 1987-2004 but managed to drop to 16.73% in 2008 as oil prices increased and stayed below 35% ever since. The high state of the debt demonstrated the danger of over-reliance of an economy on commodity prices with low diversification of revenue sources for government. The low debt regimes have only been sustained while oil prices were high 1980-1986 and 2004-2014.

TABLE 3.4: Breakpoint Regressions for Mauritius Republic and Ethiopia

Mauritius	Dep. Var: Public Debt		
Variable	Coeff.	S. Error	t-Stat.
1980 - 1986	61.78	2.77	22.27***
1987 - 2014	50.37	1.15	43.87***

Ethiopia	Dep. Var: Public Debt		
Variable	Coeff.	S. Error	t-Stat.
1980 - 1986	53.51	2.63	18.67***
1987 - 2005	106.09	13.51	6.04***
2006 - 2014	29.81	1.92	15.74***

The table presents rejection of the null of unit root at $^{*}p < 0.05$,$^{**}p < 0.01$,$^{***}p < 0.001$

Table 3.4 shows the breakpoint regression output for Mauritius and Ethiopia. The resultant regime graphs are shown in Appendix A figure 3. Mauritian debt has had two states in its history. One high debt state 1980-1986 averaging 61.78% and the other a medium debt state 1987-2014 averaging

50.37% of GDP. Majority of the debt has been mostly domestic cushioning off the economy from external shocks even though the debt has been growing in magnitude both domestically and externally. On the other hand debt service has been falling from an average of 7.67% in 2000-2006 of exports to 2.33 the years after. The debt in the two states has had minimum variation representing a policy stance that can be said to be relatively stable in that one debt does not lead to higher debt in the two regimes. The key to this economy's performance has been the achievement of diversification moving away from reliance on sugar to textile and expansion of manufacturing sector while at the same time embracing prudent management of debt (AEO 2002).

Ethiopia has lived through three states of debt with a tough patch of high debt in her history coming in the lead up to her HIPC status 1987-2005 averaging 106.09%. The mild debt regime, 1980-1986 averaging 53.51% of the GDP occasioned by a history of conflict and drought alongside a heavy dependence on rain fed agriculture which made the country prone to drought. The high debt state lasted 19 years and was occasioned by limited capacity to service previous debt and new incoming debt from the multilateral donors with huge expenditure on defense. It is reported that by 1998, 54% of Ethiopian debt was spent on defense (AFRODAD, 2006). Debt forgiveness restored debt to sustainable at historically lowest levels in the nations history at 29.80% of GDP in the years 2006-2014. The country still faces problems with debt servicing which has averaged 4.3% between 2007-2014.

TABLE 3.5: Breakpoint Regressions for Kenya and Uganda

KENYA	Dep. Var: Public Debt		
Variable	Coeff.	S. Error	t-Stat.
1980-1992	37.93	3.43	11.06***
1993-2001	60.72	2.97	20.42***
2002-2009	46.73	0.98	47.92***

UGANDA	Dep. Var; Public Debt		
Variable	Coeff.	S. Error	t-Stat.
1980 - 1986	35.58	6.81	5.22***
1987 - 2006	82.55	5.18	15.93***
2007 - 2014	25.95	2.98	8.70***

The table presents rejection of the null of unit root at $^{*}p < 0.05$,$^{**}p < 0.01$,$^{***}p < 0.001$

Table 3.5 presents the multiple breakpoint regression output for Kenya and Uganda. Their respective regime graphs are shown in Appendix A figure 4. Kenya has lived through two debt regimes, the highest being 1990-2004 at 60.72% of GDP in the post economic liberalization period. The latest low debt regime lasted 13 years 2004-2014 at 46.73%. The lowest debt regime was 1980-1989 with 37.93% ratio but had the highest variation in debt compared to the other regimes as the debt grew to the next regime. Overall the country has continued to enjoy a healthy debt status relative to GDP and its debt has come down from the previous highest threshold to moderate levels. The countrys stock of debt is mainly from multilateral donors and the debt size seems to grow with declining debt service which has fallen from 21% in 2000 to below 5% since 2010. The medium debt regime which is also latest represents moderate debt variability indicative of prudent debt management compared to the preceding two. Most Kenya's debt problems spring from weak revenue mobilization and lack of diversification of exports. This in turn makes debt servicing debts difficult especially in the high debt regime.

Uganda presents the case of one unsustainable debt regime and two sustainable periods. the first sustainable debt came soon after independence with debt at 35.58% on average. This was followed by the high debt regime

1987-2006 at 82.55% with relatively high variation in debt. This must have been the cause for the countries inclusion in the HIPC program. According to Bigsten and Kayizzi-Mugerwa (1999) country had serious inflation at 200% in the year 1987/88, coffee prices fell, balance of payment worsened making debt repayment impossible and raising debt to the highest level 119% of GDP in 1992. But this was reversed by austerity measures aimed at minimizing the debt but did not make it sustainable. Even in the period preceding debt forgiveness, 1980-1986 with 35.58% of debt the variation in the series was high in the build up to the high debts as during this period exchange rates were liberalized, producer prices for exports increased and increased public sector accountability but political instability would defeat all these reforms. Debt forgiveness led to a return to health of the public debt and minimized the variations around the new equilibrium of 25.95% indicating a spirited attempt to keep debt at manageable levels.

TABLE 3.6: Breakpoint Regressions for Ghana and Senegal

GHANA	Dep. Var: Public debt		
Variable	Coeff.	S. Error	t-Stat
1980-1993	27.20	4.52	6.02***
1994-2003	88.28	4.94	17.87***
2004-2014	45.94	4.16	11.05***

SENEGAL	Dep. Var: Public Debt		
Variable	Coeff.	S. Error	t-Stat.
1980 - 1984	58.66	8.22	7.14***
1985 - 2002	74.73	2.69	27.81***
2003 - 2014	39.13	4.53	8.64***

The table presents rejection of the null of unit root at $^{*}p < 0.05$,$^{**}p < 0.01$,$^{***}p < 0.001$

Table 3.6 presents the breakpoint regression output for Ghana and Senegal. Their corresponding graphs are shown in Appendix A, figure 5. Ghanaian public debt has undergone two debt regimes in the period under review. The high debt regime that put it under the HIPC debt forgiveness was in the period 1994-2003 with an equilibrium of 88.28% of GDP and with

the highest variation among the regimes 4.16 standard error. This indicates unsettled policy with debt changing hugely over the period. The succeeding phase was the post debt forgiveness which acted to restore debt health in the period 2004-2014 with 45.94% as the average debt. This continued to be a period of high debt variability and the debt has risen from the post debt forgiveness minimum of 26.21% of GDP in 2006, to 72.20% by 2014. This is the fastest rise to high debt among the HIPC countries and the residual graph show a debt whose residual has overshot the convergent zone meaning that it is diverging. Ghana is the only country whose post debt forgiveness debt regime has an equilibrium higher than the medium debt regime corresponding to the pre-high debt regime. This indicates that a lot needs to be done policy arrest the runaway indebtedness in the country. The main cause of escalating debt has been blamed on reliance on commodity prices, overoptimistic projections, poor debt repayment record and lack of fiscal discipline (AFRODAD, 2014).

Senegalese debt has undergone three states, the high one recorded in 1985-2002 had an average of 74.73% of GDP but with minimum variation among the regimes. This may imply that the county tends to keep increasing the size of debt below the high regime only to result in prudent management when sustainable debt thresholds have been passed. Senegalese debt is noted to have been high for most of the sample period with two highest debt levels in 1985 and 1994. Blamed on the failure of structural adjustment programs involving liberalization of the economy, export led growth and huge arrears which by year 2000, 40% of bilateral debt was arrears. The country reached

completion point in 2004 and thus the low debt regime ensued. The medium term threshold was in the period 1980-1984 at 58.66% of GDP with very high variation of the debt as the debt was on the rise. The low debt regime was represented by the post HIPC debt forgiveness period 2004-2014 which is the period with minimum variations of debt in the sample period. The country is set back by lack of diversification and imports noted to have been 80% food in 2002 (African Development Bank, 2002).

TABLE 3.7: Breakpoint Regressions for South Africa and Zambia

S. Africa	Dep. Var:Public Debt		
Variable	Coeff	S. Error	t-Stat
1980 - 1992	30.89	1.29	23.92***
1993 - 2001	44.65	0.59	75.65***
2002 - 2009	33.06	1.89	17.50***
2010 - 2014	41.81	2.07	20.21***

ZAMBIA	Dep. Var:Public Debt		
Variable	Coeff	S. Error	t-Stat
1980 - 1985	122.83	11.96	10.27***
1986 - 2003	202.35	8.20	24.68***
2004 - 2014	27.08	1.66	16.33***

The table presents rejection of the null of unit root at $^{*}p < 0.05$,$^{**}p < 0.01$,$^{***}p < 0.001$

Table 3.7 shows the breakpoint regression output for Zambia and South Africa. The corresponding regime graph is shown in figure 6, Appendix A. South African debt has been the most stable historically among the countries in the sample. While in general it has followed almost a similar trend as the other African countries in the sample, the debt has managed to stay below 50% of GDP throughout the period. Indeed the residual graph shows that the variations have always been around the mean and rarely go beyond the 5% error band of the regime means save for the most recent period since 2011 when it has gone beyond the higher band and this period was noted to be related to sovereign bond activity of the country. The high regime was the 1993-2001 with a mean of 44.65% a period which coincides with the lowest variation in the sample with standard error of 0.59%. The only other regime with high debt

is the 2010-2014 with a mean 41.81% but with the highest variability in the history of the country indicating a red flag on the growth of debt and the need to manage it if treasury wishes to maintain it at the historical thresholds.

Zambia was one of the countries which benefited from the HIPC debt forgiveness. The debt regimes preceding the debt forgiveness regime were too high. The first period 1980-1985 had a mean of 122.83% of GDP which was highest among all the countries this early period. In the following period 1986-2003 the debt increased further by around 80% to a new average of 202.35%. The greatest variation for the debt was registered in the first regime at 11.96% standard error and even in the second regime the variation continued to be high at a standard error of 8.20%. The post HIPC variability however has been minimized around the new found lower average indicating an attempt to maintain the new found sustainable debt level. Zambia remains the only country in the sample whose standard error in debt was in double digits throughout its history meaning that policy never stabilized even after debt forgiveness. This is a signal of poor debt management.

3.5.2 Individual Country Autoregressive Distributed Lag Models

This study uses the ARDL approach to determine the co-integration between the public debt and the primary balance. This is because the two are integrated of different orders with public debt I(1) and primary balance I(0) as shown in

the unit root result table 3.1. Furthermore, the use of breakpoint regression analysis for the unit root tests revealed that the public debt statistics for countries in the sample bore structural breaks, which tended to shift the level of debt. Majority of the countries reveal a high debt regime and a low debt regime whose transition can be termed as innovation outliers in that it rises gradually and also decreases gradually as the process of debt forgiveness goes through the stages. To accommodate these breaks which as shown by figures in Appendix A are debt level shifts, a dummy will be introduced to test for the influence of the high regime on the sustainability of the debt. The results of the estimation were as displayed in table 3.8.

Since the aim of this study was to investigate the sustainability of debt, we report the co-integration results and the effect of the high debt regime to the sustainability analysis. The high debt regime was modeled as a dummy variable where a country was at regime zero in low debt and one in the high debt regime.

Using an ARDL(1,5), Burkina Faso returned a negative and highly significant long term relationship. The relationship had a speedy adjustment at 0.90 and a Bounds test which is significant at 21.17>5.15 all at 5% level of significance. This means that the system corrects its previous value of disequilibrium at a speed of 90%. This points to sustainability of public debt in the country. The breakpoints for this country were between 1993 and 2006 which are the high debt regime. This being in the high regime is associated

with an increase in debt by 21% over the low regime. From the regressions previous lags of public debt do not explain the debt but it is explained by lags primary balances 2 to 5 periods back to fit a model. Political uncertainty has limited external sources of debt as the profile goes down. The unrest and large informal sector continues to hamper revenue collection and public investment. The country faces risk from having a real interest rate greater than the growth rate. There is therefore need to improve on growth, ensure debt taken up is concessional at low interest and diversify economy from mining to improve the current account deficit.

Using an ARDL(3,2) Cameroon had a significant error correction term at 0.05 and a Bounds F statistic at 5.67>5.15 both at 5% percent level of significance. This result even though pointing at sustainability of debt, takes too long to return to equilibrium after being shocked since only 5% of the disequilibrium between the primary balance and the public debt is corrected per period. The country had a high debt regime between the years 1993-2005 which insignificant despite the high values posted over the period. The threat to public debt sustainability remains in the form of a twin deficit, fall in oil price, and short term maturity structure of her debts (Felino and Pinto, 2017). The country has a strength in that the growth rates exceed the interest rates on loans. Cameroon could therefore target concessional loans with longer maturity structure to finance her huge investment needs.

TABLE 3.8: ARDL Individual Country Results

Eq Name:	Burkina	Cameroon	C.A.R.	Ethiopia	Gabon	Ghana	Kenya	Mauritius	SA	Senegal	Uganda	Zambia
					Dep. Var: Public Debt							
ECM-1	-0.90***	-0.05***	-0.57***	-0.41***	-0.05***	-0.38***	-0.59***	-0.58***	-0.18***	-0.50***	-0.94***	-0.38**
	(-8.34)	(-5.94)	(-6.06)	(-4.17)	(-5.94)	(-4.22)	(-4.40)	-3.33	(-12.09)	(-10.17)	(-7.85)	(-2.24)
PUB D(-1)	0.1	0.64**	0.43**	0.94***	0.47**	0.9	0.23	0.75***	0.16	0.09	0.4	0.62
	-0.48	-2.78	-2.38	-5.27	-3.17	(4.45)***	-2.01	-2.99	-1.84	-0.59	(2.38)**	(2.88)*
PUB D (-2)		0.001		-0.35**	-0.03	-0.28	0.27*	-0.33	0.31	0.58	0.04	
		-0.004		(-2.20)	(-0.20)	(-1.91)	-2.05	(-1.07)	(4.18)***	(3.59)**	-0.31	
PUB D (-3)		0.36**			0.17		0.16	0.77	0.12	-0.17	-0.06	
		-2.79			-1.46		-0.88		-1.29	(-1.43)	(-0.31)	
PUB D (-4)					0.34***		-0.25**		0.23		-0.33	
					-3.83		(-2.31)		(2.98)**		(-2.41)**	
P BAL	-0.13	-1.45***	-1.30**	-1.17	-1.47***	-0.62	0.25	-1.28	-0.82	3.7	-2.88	-0.17
	(-0.77)	(-7.92)	(-2.33)	(-0.70)	(-4.60)	(-0.59)	-0.54	(-0.87)	(-3.92)***	(3.72)**	(-2.46)**	(-0.11)
P BAL (-1)	0.16	-0.68***	-0.46	1.23	0.42	-0.81	0.28	-0.5	-1.07	4.59		
	-1.44	(-2.56)	(-0.76)	-0.74	-1.48	(-0.74)	-0.26	-1.5	(-4.66)***	(3.75)**		
P BAL (-2)	0.25**	-0.54*	-1.47**	-3.16*	-0.94***		-3.77**	-0.43	-0.49	-2.41		
	-2.48	(-2.13)	(-2.84)	(-1.99)	(-3.58)		(-2.04)	(-0.27)	(-2.30)	(-2.46)		
P BAL (-3)	0.44***		-1.16*		-0.91***		2.75***	2.48	-0.58	-4.35		
	-4.06		(-2.06)		(-3.32)		-2.55	-1.27	(-2.51)**	(-5.46)***		
P BAL (-4)	0.47***				-0.03			-4.5	0.17	-3.25		
	-3.24				(-0.11)			(-1.97)*	-1.06	(-3.91)**		
P BAL (-5)	0.42***				-1.00**			5.32**		1.53		
	-3.25				(-3.68)			-2.8		-2.44		
BREAK	21.54)***	-26.67	31.31***	20.22**		17.02**	10.14		6.15	22.12	30.56	
	(4.30	(-1.58)	-3.15	-2.15		-2.33	(3.57)**		(11.37)***	(6.85)***	(4.03)***	
C	26.72***	89.69*	21.95**	16.78	25.79***	11.38**	26.13***	32.4*	9.81***	23.8	100.36***	169.81
	-4.22	-2.08	-2.51	-1.43	-4.19	-2.21	-4.06	-2.17	-4.42	-1.78	-4.17	-1.81
@TREND		-2.89**		-0.33							-2.5	-5.42
		(-2.23)		(-1.11)							(-3.69)***	(-1.74)
Bounds Fstat	21.17	5.67	10.96	5.36	9.62	5.54	9.27	2.88	36.55	24.67	17.8	1.5
Max 5%	5.15	5.15	4.16	5.15	4.16	4.16	5.73	4.18	4.16	4.16	5.15	5.15
R-squared:	0.96	0.98	0.92	0.9	0.99	0.86	0.89	0.8	0.99	0.99	0.97	0.86
Observations:	30	19	24	33	20	33	30	16	17	16	21	21

The table presents rejection of the null of unit root at $^{*}p < 0.05$,$^{**}p < 0.01$,$^{***}p < 0.001$

Using an ARDL(1,2), CAR returned a significant negative speedily adjusting result with an error correction term of 0.57 and a Bounds test statistic

10.96>4.16. This result pointed to a sustainability of debt where debt policy as represented by primary deficits is sustainable in the long run in that it does not diverge to high numbers. The convergence speed is such that 57% of the disequilibrium between the debt and primary balance is corrected each period. The high debt regime occurred between 1994 and 2008 with a break significant and 31.31% higher than the lower debt regime. Public debt for the country is growing fast from 38.5% (2013) to 51% (2014) and the country is approaching distress status again. CAR needs to improve on her exploitation of her gold, uranium, and iron deposits by putting an end to civil conflict. Her growth rates are high and interest rates low but remain a high risk borrower due to conflict.

Using an ARDL(2,2), Ethiopia had an average adjustment process at 0.41 and a F statistic for the Bounds test of 5.36>5.15. This way the two statistics point to a sustainable debt policy for the country. Public debt was explained by two of its own first lags and the second lag of the primary balance. Disequilibrium between public debt and primary balance adjusted by 41% between the actual and equilibrium value. The high debt regime for this country was 20.22% higher compared to the low debt regime at 5% significant level. Ethiopian debt is growing at a fast rates growing 9% in the year 2014-2015 (Felino and Pinto, 2017).The country has growth rates averaging 10% between 2013 and 2015 and this exceeds the real interest rates to keep debt at sustainable path. Public investment is also high in an overvalued currency regime which will hurt exports.

The country has growth rates averaging 10% between 2013 and 2015 and this exceeds the real interest rates to keep debt at sustainable path. Public investment is also high in an overvalued currency regime which will hurt exports. The debt growth resulted from a sovereign bond issue at 6.625% interest. The country will stay safe if it moves away from market borrowing and improves its current account performance through prudent management of exchange rate. The growth momentum and proper use of borrowed funds should however act to reward the country in the long term ensuring debt serviceability.

Gabon had an ARDL(4,5) with an error correction term of 0.05 and a Bounds F statistic of 9.62>4.16 all at 5% significance level. This pointed to a very slow adjustment process to the equilibrium after a shock away from equilibrium at the rate of 5% per annum. This notwithstanding, debt was found to be significant for the period of debt under investigation. The seasonal break dummy was found to be insignificant and as a result omitted from the regression. The debt was explained by the first and fourth lag of public debt as primary debt had significant estimates and signs for the current time and the second and third lags of the primary balance. While the debt has been healthy, over-reliance on oil seems to be a serious threat to debt management. Other threats include, falling commodity prices and real interest rates currently above the real GDP growth rates meaning should the prices continue the debt will grow. The solution must therefore be export diversification, prudent management of exchange rate to stem over-valuation

which hurts competitiveness and fiscal consolidation. Since under the current oil price drops the country will eventually borrow, then it would be prudent to borrow from concessional sources at cheaper costs considering her good debt profile.

Ghana's debt was sustainable for the period under consideration with a significant negative error correction term of -0.38 and a Bounds F statistic at 5.54>4.16. This pointed to a sustainable public debt while controlling for the break period which was significant at 5% level of significance and revealed that the high regime debt was on average 17.02% higher than the average of the low debt regime all else constant. The Ghanaian result was however curious in that the primary balance did not return any significant coefficient for the primary balance thus it was hard to attribute this result to the primary balance having a stable equilibrium with the public debt. Ghana's debt faces threats from fast growth trajectory growing by 15.70% between 2013 and 2015, huge current and primary account deficits, and real interest rates greater than real GDP growth which make the debt explode. The country needs to move from expensive market borrowing using sovereign bonds, manage her currency better and avoid relying on borrowing expecting commodity exports to cover the deficits and debt service. Concessional borrowing should be sought at lower interest rates and funds put up in proper investment projects which diversify the economy away from commodity exports.

Kenya's debt was characterized by an ARDL (4,3) model and returned a

speedy adjustment process at 0.59 and a Bounds test F statistic of 9.27>5.73. This pointed to a sustainable debt which adjusted to its equilibrium with the primary balance at a speed of 59% per annum. Public debt was 10.14% higher in the high debt regime compared to the low debt regime as reflected by the break variable in the estimation. The second and fourth lag of public debt were explained the public debt and primary balance explained it through the forth and third lags. Even though Kenya's debt is sustainable for risks abound in the new loans that are being taken from the market and the interest rates. The Eurobond taken up in 2014 had a 6.9% interest rate. The yield as at March, 2016 had risen to 9%. This risks the interest rates catching up with the growth rates and then the debt would become unsustainable. Other risks are in the primary deficit which by 2014 was at -5% as the current account performed worse at over 10%. There is need to restrict the borrowing to low interest rates most preferably concessional and cheaper bilateral and multilateral sources. This will ensure the investment needs in infrastructure and energy are done at manageable risk contrasting the floating rates in the market. Diversification of exports would also ease the pressure on repayments and exchange rate variations.

The Mauritius debt had speedy adjustment process at -0.75 and an F Bounds test of 2.88<4.16. This result means that there was a speedy adjustment process for the debt. And there existed no long run relationship between the public debt and primary balance. These results are therefore point to an unsustainable debt for this country. Mauritian debt has relatively remained

healthy between 1987 and 1990 but between 2012 and 2014 the debt to GDP has grown to 59.6%. This country need to diversify her earnings away from tourism and textiles and invest more on growth. This will guarantee more solid debt management which is mostly internal, enhance competitiveness, and consolidate public sector efficiency. There is need to develop the financial markets and extend the maturity structure of her internal debt to gain more and improve on her public investments.

South African had a slow adjusting debt with an error correction term of -0.18 and a Bounds F statistic of 36.55 making it highly significant in both statistics at 5%. This also points to a significant debt policy with each departure from equilibrium between the two variables adjusting very slowly at the rate of 18% per year. The high debt regime for the country was between the years 1993 and 2003 characterized by a break in the regression. The high debt regime had 6.15% a higher debt level on average relative to the low debt regime and was highly significant at 1% level. Public debt is explained by its second and fourth lags as primary balance explained debt in the current period, the first and third lag. South African debt increased by 9% between 2013 and 2015 and faces further risk from current account and primary deficits, falling commodity prices and real interest rates greater than real GDP growth rates which project a higher debt growth. The downgrading by international ranking agencies have acted to make market borrowing expensive and thus the country needs to avoid borrowing there. Fiscal discipline and sound macroeconomic management targeted at improving growth and investor confidence is called

for. In the long term the country needs to diversify to cushion herself from external shocks.

Senegal has an average adjustment process with an error correction term of -0.50 significant at 1% and a Bounds F statistic at 24.67 > 4.16. This indicates that there was a long term relationship between public debt and primary deficit. The debt adjusted to the equilibrium at the rate of 50% per annum after a departure from the equilibrium. The high debt regime had 22.12% higher debt higher compared to the low debt regime. Public debt was explained by its own second lag and the primary balance explained the debt by the current period, first, fourth and fifth lag. Senegalese debt faces threats from deficits in primary balance and the current account, borrowing through floating sovereign bonds, higher interest rates to real GDP growth which are bound to make the debt explode. The country could be better off considering concessional borrowing and also improving internal debt markets to reduce on external debt fraction which stands at 72%. The nation needs to avoid using new found room for borrowing by borrowing from the international markets but borrow from official institutional sources which are less costly.

Uganda has an error correction of 0.94 significant at 1% and a Bounds F test statistic of 17.80>5.15. This implies that 94% of the disequilibrium arising in debt was adjusted per year between the public debt and the primary balance. The break for Uganda was highly significant and the high debt regime had a 30.56% higher than the low regime. Public debt was accounted for by lags of

the dependent variable and the contemporaneous term of the primary balance in in an ARDL(4,0) model.

The country however faces multiple threats in, higher real interest rates than GDP growth meaning debt could explode, current account and primary deficits, and majority of her debt being external with exchange rate risks. Macroeconomic stabilization needs to be embraced to rise above these challenges. Export diversification away from agricultural exports to oil and gas paired with good management are expected to improve this performance.

Zambia had an error correction term of -0.38 and a Bounds F test was 1.50. This meant that Zambias debt was convergent but did not have a long term relationship. This meant that the debt for Zambia was unsustainable. The debt was not explained by any lag of the primary balance and only one lag of the dependent variable explained the debt itself. This was indicative of the possibility that fiscal policy was ineffective in arresting the level of debt and that debt grew on its own independent momentum. This economy exemplifies the danger of expecting much from commodity prices. The fall in copper prices have made the debts grow worse with deficits in both the primary and current accounts.

The interest rates far exceed the growth rates meaning that the debt ratio is exploding and the country continues to borrow through sovereign bonds at high interest rates at 9.375% in 2015. Shorter maturity periods of the loan and floating nature of these loans will make the loans very expensive. There

is therefore need to move away from market borrowing, develop internal financial markets to take in domestic debt and reduce international, and refrain from market borrowing. Export diversification would also help to cushion the economy from debt crisis in terms of repayments.

Summarily, out of a sample of twelve countries involving 8 HIPC countries and four non-HIPC only Zambia returned a straightforward case of unsustainable public debt. This could have been occasioned to the inclusion of the medium term regime with an average of 122.83% of GDP in the regression and also the eleven observations that make the low debt regime were not enough to swing the convergence through surpluses. Ghana returned a result that was inconclusive on sustainability in that even though the Bounds test barely returned a sustainable outcome, the debt is only explained by its lags. This is barely surprising looking at the breakpoint regression since even though the debt came down after debt forgiveness, the variation in the observations of debt is still very high. It would be useful to note that Ghana is one of the countries that has accumulated debt quickly compared to others in HIPC and has also been active in the sovereign bond markets.

Countries which returned a barely sustainable debt among the HIPC countries also include Cameroon and Ethiopia whose bound test statistics were very close to the margin although Ethiopia had a rapidly adjusting debt with a faster rate of return to equilibrium. The other countries including Burkina Faso, CAR Senegal and Uganda seem to have come out of the woods

to join countries with healthy and well managed debt in the period under consideration. Countries that did not participate in debt forgiveness remained largely sustainable.

3.6 Summary and Concluding Remarks

This study set out to investigate the sustainability of debt in a sample of twelve countries in SSA. Results indicated that there were basically three regimes of debt in the region. Healthy debt regimes in the formative years of independence, high debt regime from 1980s and debt relief, and finally low debt regime after debt forgiveness. Even the countries outside the debt forgiveness showed marked improvement in debt after relief. Results indicate that after controlling for the high debt regime which came just before debt forgiveness, public debt was largely sustainable in the region. Eleven countries in the sample were found to bear a sustainable public debt in the sample period, and one country Zambia, was found to have an unsustainable debt. This indicates that debt relief acted to return the participating countries into sustainable path in that out of the eight countries that participated, only one was found to be still struggling with sustainability.

Controlling for the high debt regime however, masked so much information about what was happened within the countries. Based on the variation around the equilibrium of the new found debt equilibria, there were

different indications on the performance in policy for the countries. For the HIPC countries, Zambia and Burkina Faso, Cameroon Ethiopia and Uganda had stabilized their debt around their new lowered debt thresholds with as they stay within their error bands. The rest of the HIPC countries bore debts which had a sharply increasing trend that breaks out of the error band and seemed to be trending higher. These countries include CAR, Ghana and Senegal whose debt is accumulating relatively faster than normal.

For the non-HIPC countries, the debt structure follows the same structure as the HIPC with debts falling for and Gabon around the same time the HIPC forgiveness happened. For these countries, Gabon and Kenya have shown a stabilization of debt around the new low levels and they stay very close to the new equilibrium. South Africa and Mauritius bear a debt which in the past five years has overshot the error bands and is growing faster than even the high debt period. South African debt is at the highest departure from its equilibrium in the last year of the sample. The above results indicate that SSA is yet to get out of the woods in matters debt. Even countries like South Africa, Gabon and Mauritius, which have had no debt problems have their debts increasing beyond their historical error bounds. The countries mentioned to be performing poorly in the last regime have been participating in the Eurobond market including Zambia, CAR, Ghana, Senegal, and South Africa. This indicated need for a review of the policy positions that these countries have taken in the recent past to ensure the sustainability of their debt in the long term. This borrowing away from traditional institutional

lenders to the market presents a new challenge as, interest rates are higher (not concessional), and in the event of hardship the multicity of creditors present a looming challenge if restructuring was needed. Hold outs and even sale of the loans to vulture funds are among dangers that they expose themselves to. Judging from a trace-back of the events that led to high debt and eventual debt forgiveness, are weaknesses which cut across the countries in the sample. First, the lack of structural diversification of exports and economic activities leaves some countries in the sample exposed to external shocks. This is because the countries still rely hugely in one or two main exports which once hit by commodity price shocks bring ramifications long into the countries debt history through debt defaults, roll over of debt and delayed repayment which all act to increase the indebtedness of the countries. Secondly, weak institutions that have failed to monitor debt effectively and draw policy recommendations that befit the countries. This exposed the countries to the same mistakes that they had made in the past after debt forgiveness. Thirdly, the countries are mostly exposed to external shocks which occur every time the international markets are on the downswing. This denies the countries much needed finance and also forces them to borrow in order to continue the development programs that they had planned during the better economic times. The solution to these challenges is diversification of economic activity along with value addition of exports which would go a long way to securing the prices of commodities which are currently subject to global financial volatility which also depends on investor perception and real demand for the commodities. Countries need to

engage in a good mix of activities so that as prices change in one the can fall back to the others.

The countries also lack competitiveness in the international market. Competitiveness both in terms of the value of the primary products and currency plus the failure of economic integration still hurts the region. The irony of the region is that there is very little trade between the countries in the region even where mutual gain is higher. The countries need to see each other not as competitors but as partners so that they can leverage on comparative advantages that each individual country has in production. A good example is the marketing of tourism in the African region where Kenya and Tanzania come together to make one tourism circuit. Competitiveness in terms of the exchange rate with respect to debt does not work for the region as the countries currencies have been devalued too much to allow for borrowing in the national currencies. The nations need to rethink whether indeed the gains of further loss of value are greater compared to stronger currencies.

The results reveal that indeed, debt forgiveness helped to return solvency to debt but doubt abounds on the long term sustainability given the fast debt re-accumulation in the last regime with the same structure of the economy and capacity to pay getting worse. This is further worsened by some countries high affinity for debts from the market whose interest rates are higher and floating. The countries need to refocus on cheaper borrowing on concessional basis where the interest rates are lower.

That debt forgiveness helped majority of the countries in the region recover their control is not in doubt. There is further need to complete forgiveness for the two remaining countries Chad and Eritrea and if possible include more countries which struggle with high debt. The lenders also need to be engaged in ensuring that debt goes to the countries whose debt is managed prudently as was during the debt forgiveness program, and also that currently hardened conditions for lending by multilateral lenders be re-looked into so that the region stops going for more expensive sovereign debt from the international markets. The debt sustainability framework currently put together by the World Bank- IMF is a well-intentioned move to guide borrowing, lending and grant allocations for low income countries. While it also tries to balance the macroeconomic stability objectives of the countries versus the growth needs of the poor nations by carrying out sustainability analysis, more needs to be done by the nations themselves. A peer review mechanism under New Partnership for Africa's Development for example would be more helpful. This is because the country policy and institutional assessment done by the Debt sustainability framework maybe frustrating the countries in the region due to poor performance, pushing them to secure loans from alternative sources which may in the end hurt them.

In conclusion, debt relief helped to lower debt levels in the region but did not overwhelmingly manage to enforce discipline after debt relief. Whether this is an effect of moral hazard is a subject that needs interrogation. Two things are however certain. The countries in the region need to improve their

fiscal policy in revenue collection to move away from deficits, and there is need for international community to include hold out clauses that bind countries to disciplined expenditure after debt restructuring such as HIPC/MDRI debt relief. The timely and expeditious resolution of debts before they become unsustainable or nations default is needed to safeguard the interests of both the lender and the creditor.

Chapter 4

HIPC Debt Relief's Fiscal Space and Poverty Reduction Effects

4.1 Introduction

Debt forgiveness has become a major subject in macroeconomic stabilization since the 1980s when a great debate ensued on debt overhang. By the end of that decade, it was noted that developing countries were struggling with a heavy debt burden which acted to disincentivize the debtor nations from growth and pursuit of reforms which could help them move ahead (Sachs, 2002). As a solution, debt relief was passionately contended for by non-governmental organizations as a way of saving poor nations from the grip of poverty and slow growth.

This plight led multilateral donors and Paris club creditors to forgive poor heavily indebted countries of $117 billion in nominal terms to 35 of them by 2009 accounting to about 50% of their GDP, and which reduced their debt

by an estimated 80% (Braga, 2009). This marked the start of interventions through; the Highly Indebted Poor Countries (HIPC), Enhanced HIPC, and the Multilateral Debt Relief Initiative (MDRI) programs all concentrated on the worlds highly indebted poor countries. The intention of this round of debt relief was to return the countries to sustainability and ensure poverty reduction. With most of the countries having reached the end of the forgiveness process, a reflection on the outcomes of both the process and the deliverables is currently ongoing and for good reasons.

According to IMF (2014c) only two out of eleven market access countries have recorded narrowing fiscal deficits. Some HIPC countries are even reputed to have fallen back to debt levels they were in before debt forgiveness. These countries include Eritrea, Ghana and Cape Verde according to (Panizza, 2008). Mozambique has defaulted on the payment of her sovereign bond leading to the restructuring of the debt (Nhawire and Hill, 2017). According to Merotto and Thomas (2015) eight countries which had been noted to have low levels of public debt immediately after completion point had gone on a more rapid debt accumulation since then.

On the objective of improving public debt management, the participating countries have reverted to their old ways of debt accumulation with 9/15 countries taking the largest share of sovereign debt issues accounting for 63.08% of the sovereign bonds amounting to 17.854 billion dollars of 28.302 borrowed in the region. Panizza (2008) found that Ghana, Cape Verde, and

Eritrea, had already reached their former debt levels by 2006.

Despite the optimism about debt forgiveness and its intended positive effects, skepticism abounds both about the process of debt relief, and the outcomes that the initiatives delivered (Bamford, 2000; Ranis and Stewart, 2001; Sachs, 2002; Cherunilam, 2008). First, these authors accused the debt relief initiative of among other things not being enough, nor intent on canceling debt but rather ensuring that it is repaid, being incapable of freeing up resources, and lacking depth to tackle poverty.

The firing shot in the round of skepticism was by the eventual implementers International Monetary Fund (IMF)/ World Bank before later embracing the program. They faulted debt forgiveness on the grounds that; there were only eight heavily indebted poor countries which suffered debt overhang, in those countries remedial action was already being done by International Financial Institutions, if debt was forgiven it would serve as a disincentive for further concessions and gains on policy reforms would retrogress (Mistry, 1996).

Early studies on the issue of debt relief have so far yielded mixed results. Depetris Chauvin and Kraay (2005) find relief to have done little to affect public expenditure and no evidence that relief has an effect on investment, and policy in recipient countries. Cassimon et al. (2013) in evaluating the fiscal responses of debt relief found it to have positive impact on domestic revenue and public investment. Sub-Saharan African countries provide a rich field for

the evaluation of debt relief impacts since it contributed 30/36 countries that received forgiveness.

This study evaluates the performance of the HIPC/MDRI debt relief programs on Sub-Saharan African countries. First, we test whether debt relief freed up resources for development spending through increased primary expenditure, investment, controlling for domestic revenue. Secondly, we test the poverty reduction objective by investigating whether the program freed up resources to the target areas of expenditure in education and health. We also examine if it crowded out development assistance, grants, and loans. It is our argument that success in achieving the objectives as set, should have led to a better debt management, otherwise the nations obeyed the conditionalities while harboring divergent goals. The nations had laid out development plans before taking up the conditionalities of the program. The program needed to be rewarding enough to incentivize them to abandon their initial plans. Otherwise, it would only serve to add confusion in the system like happened in the structural adjustment programs (SAPS) of the 1980s, leading suboptimal outcomes.

Using innovative econometric techniques, which allow for testing for granger causality, while mitigating against endogeneity and more observations than studies hereto, this study hopes to add its voice to this debate. This study is from here organized as follows; section two retraces the history of debt in Sub-Saharan Africa, section three reviews literature on the impacts

of debt forgiveness, section four introduces the data and the model, section five presents the results and section six concludes with the policy findings and recommendations.

4.2 Review of Sub-Saharan Africa's debt crisis

The buildup towards heavy indebtedness in Sub-Saharan Africa can be defined as a long and winding road which started back in the 1970s building up to heavy debts in the early 90s and ending up in being classified as heavily indebted and needing relief (Krumm, 1985). First, there were commodity booms which brought high expenditures which governments could not move out of so that when bursts came, the only source for these governments funding was borrowing in the hope that that the prices would improve again and pay debts. Second, expanded access to sources of lending for resource rich countries like oil exporters and agricultural producers which borrowed from Europe at lower interest rates from both public and private lenders. Third, expanded government expenditure arising from the boom carried on to new requirements for major public investment projects. Other factors included; drought, rising interest rates, exchange rate risks, repeated rescheduling of loans, Structural adjustment programs, protectionist policies on world markets, growing deficits, wars, and poor governance among other reasons (Mistry, 1991).

In economic circles, the 1980s and 1990s are known as the lost decades for the development for less developed countries located in Africa and Latin America. Coming soon after the commodity boom and huge capital flows in the late 1970s, huge debts in this period were handled by restructuring in the form of roll overs, bridge loans, without any debt write offs according to (Reinhart and Trebesch, 2014). Debt forgiveness started with the Brady plan agreements 1990-1997, which settled for negotiated debt reduction. By 1994 the plan was able to only able to deliver 30-35% of debt forgiveness for about 18 countries (Cline, 1995).

According to Dijkstra (2007) African countries dealt with the crisis by postponing payment obligations (rescheduling) making interest rates recapitalized and the net Present Value (PV) of loans remained unchanged. Nominal values of loans therefore grew. Countries also adopted import substitution where they tried to move away from imports to developing their own industries. The structural adjustment programs of the 1980s made matters worse as they increased the debt.

Loans from multilateral institutions and bilateral lenders at this time were given not based on the ability to repay, but for the purpose of promoting the developed countries exports. The announcement of default of debt by Mexico 1982 was the start of a crisis and this was quickly followed by restructuring of debt mainly through rescheduling by many African countries. Debts grew for many developing countries. As oil prices increased, USA, UK and other

lenders then tightened their monetary policy by increasing the interest rates leading to a recession which decreased demand for African exports. This was therefore the origin of the African crisis characterized by decline in terms of trade and capital flight.

Debt relief gained traction in the 1990s and then went full scale in the early 2000s with the HIPC/MDRI debt relief initiatives under the IMF World Bank and the Paris Initiative. Between them the three committed and indeed forgave $100 billion dollars 85% of which went to African nations (Merotto and Thomas, 2015). The HIPC initiative started in the year 1996 with an aim of reducing to sustainable levels, the debts in most heavily indebted poor countries (with an income per capita below $380) and eliminating the debt overhang problem. It was followed in 1999 by HIPC II and the MDRI in the year 2005 (Teunissen and Akkerman, 2004).

By 1980s and 90s the debt owed by the less developed countries had shifted from being owed to commercial banks to being owed by official lenders who included the donor governments and the International Financial Institutions (IFIs) (Teunissen and Akkerman, 2004). This meant that debt had now evolved to largely international debt owed to bilateral debt by donor governments and multilateral debts owed to the IFIs and the domestic debt was relatively small and unreliable. According to Presbitero (2008) by 1980 when the stock of debt became unmanageable, the Paris club started providing progressively easier repayment terms for poor countries struggling with debt

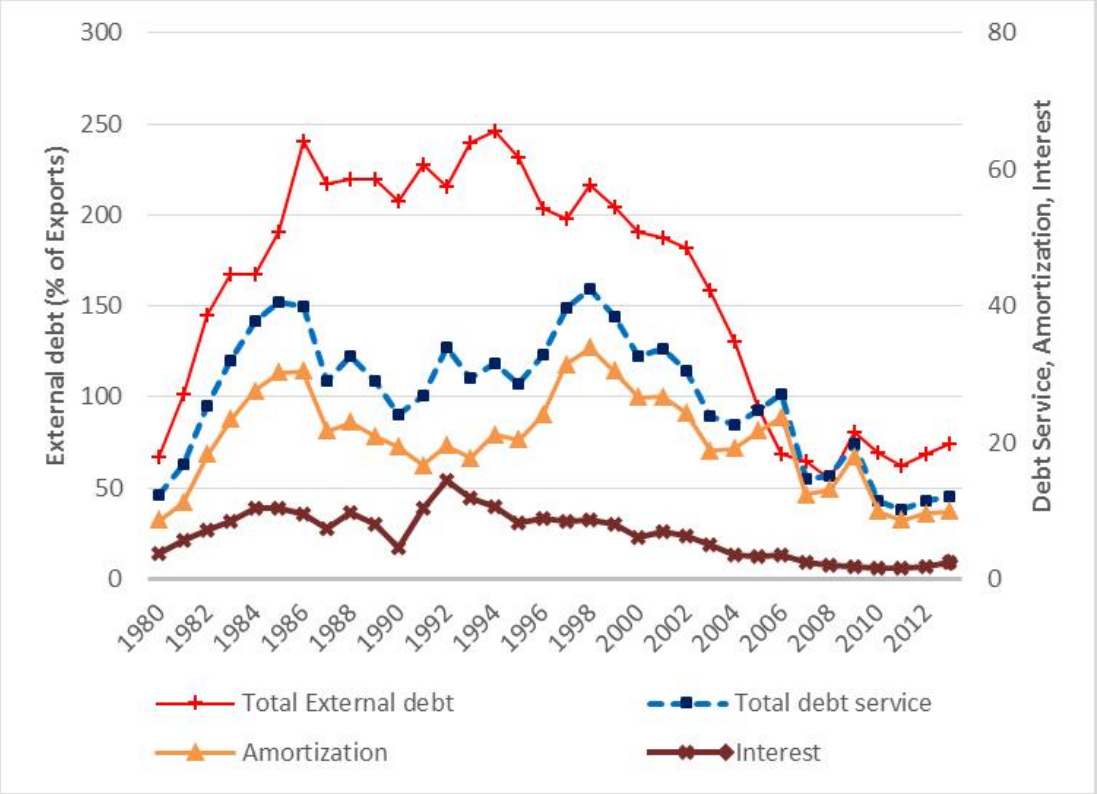
and the same time providing policies to promote growth. This started with concessional relief, which did not seem to succeed in stemming the runaway debt. By the 1990s the Paris club alongside the NGOs started to negotiate debt reduction first by decreasing the debt repayment flows and latter debt stock reductions. Out of this and after a long tug and pull the HIPC initiative was started in 1996 and the enhanced HIPC in 1999.

Figure 4.1 shows the evolution of sub-Saharan Africas total external debt as a percentage of exports, total debt service to exports, interest rates payments and amortization as ratios of GDP. External debts and debt service were low in the early 1980's only to rise rapidly and peak by 1984 where they went beyond the 200%. Figure 4.1 shows that debt and its total service peaked to 245% and 42.4% respectively in the year 1986 and maintained its high up to the year 1996 when the debt started falling at the start of the HIPC/MDRI programs. Debt service and amortizations increased alongside debt size to teak at 1984 after which they declined. This decline indicated default and rescheduling judging from the increased interest rates at around the same time. This acted to further increase the debt.

The onset of debt relief increased debt service initially as was required by the conditionalities only to fall back as the countries reached completion point. By 2007, external debt as a percent of GDP fell to 68.77% in the region as total debt service and amortization fell to below 20% in the same period. By the end of 2013 period the debt ratios had fallen well into the sustainability levels and

service components to their lowest ever with total debt falling to 10.15% and amortization to 8.5% by 2011. This demonstrates how debt relief had reduced the debt alongside decreasing foreign exchange outflows for the region.

FIGURE 4.1: Evolution of External Debt to Exports Ratios in Sub-Saharan Africa



Source: World Development Indicators

The process under HIPC and MDRI was a multi-step process. Countries had to fulfill the HIPC eligibility criteria, for them to reach decision point. After this, they would be required to prepare a poverty reduction strategy paper (PRSP) and maintain macroeconomic stability under the poverty reduction growth facility at the IMF for at least one year. This would lead to a reduction of 90% Paris club debt. Other creditors would give comparable treatment as multilateral institutions proceeded to offer enhanced support. Third, the

country would reach completion point and receive further reduction from Paris club, bilateral and commercial creditors would follow suit. Multilateral Financial Institutions (MFIs) would choose from a menu of options to ensure broad and equitable participation by all the creditors involved in the process (IMF, 2017).

According to (Ranis and Stewart, 2001; Cherunilam, 2008) the European Network on Debt and Development (EURODAD) found the HIPC program unlikely to free up resources to tackle poverty for three reasons. 1)Threshold levels to measure debt sustainability were arbitrary and still too high so that several less developed countries with significant debt burdens had not been included in the HIPC initiative. 2) The debt reduction on offer was too small and as such, they cited Zambia and Niger as examples of countries, which would end up paying more debt after the program than before debt cancellation. 3) The piling up of different sets of conditionalities slowed down the process. Watkins (September 22, 2004) while questioning claims of debt sustainability after relief claimed that due to complexities in the debt eligibility criteria, some countries debt relief were either repeatedly delayed or cut off as they failed to meet the IMF loans conditions. The mix of these factors and others according to these authors would act to derail, and curtail the achievements of the HIPC program.

By the year 2013, debt for 28 HIPC countries in present value terms was 40% (Merotto and Thomas, 2015). This debt fell to 20% after the MDRI program

but by the year 2013, the average debt had risen by about 10 percentage points over six years. Lala, Ranganathan and Libresco (2006) predicted that five of the HIPC countries had debt to export ratios projected to surpass the 150 percent threshold beyond completion point. The report mentioned Mauritania, Ghana, Burkina Faso, Mali, and Tanzania as projected to experience vulnerabilities to policy slippages and external shocks.

Isar (2012) opined that the debt forgiveness under this program was laden with a number of shortcomings that made it hard to decide whether it was a success or failure. This study faulted the program for among other reasons; failure to take care of internal debt, delayed cancellation of debt until a country reached completion point, requiring privatization of public utilities, which came with a rising servicing costs, and finally that the funding allocated development was insufficient for long-term progress.

Debt in sub-Saharan Africa has taken a new twist post forgiveness, with most countries using their newfound sustainability, and improved debt profiles to borrow from the international market through sovereign bonds. Post-HIPC debt in sub-Saharan Africa had changed both the sources and the debt outlook for the HIPC countries. While debt before relief was mainly concessional and sourced from the multilateral and bilateral creditors, the HIPC countries have been increasingly relying on sovereign bonds for their financing. These resources mainly finance capital investments both human and infrastructural, to help exploit the demographic transition especially the

youth bulge and to maintain the growth momentum currently experienced in the region.

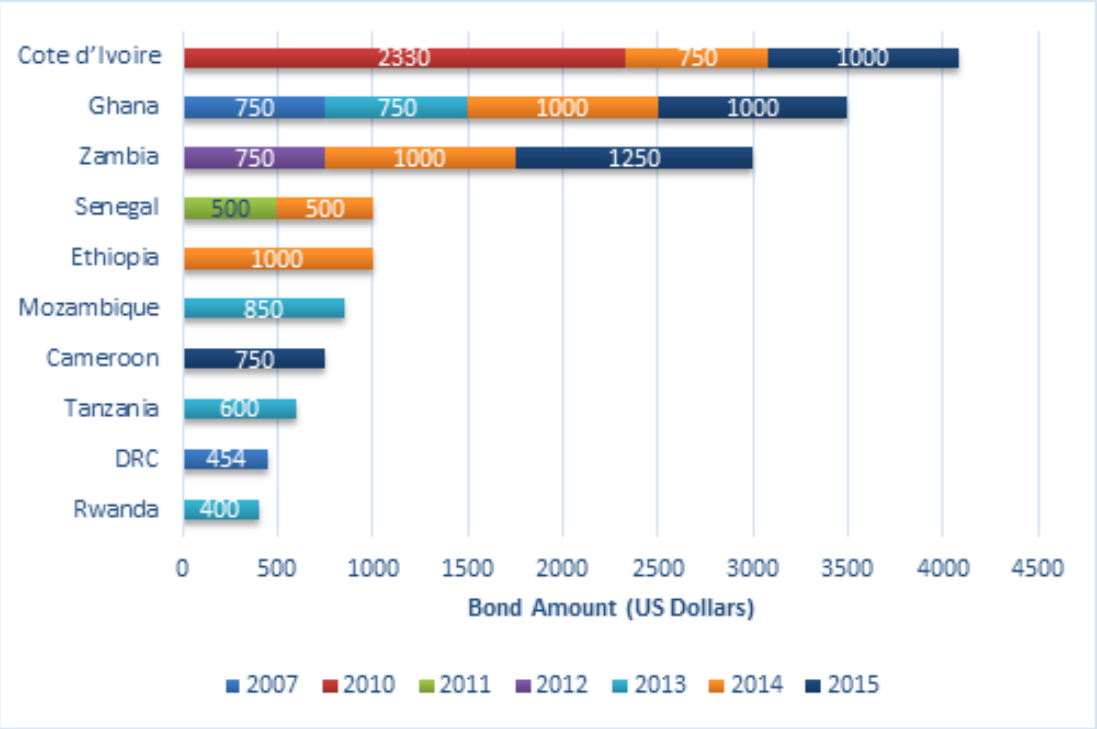
In a region characterized by low savings and poorly developed financial markets, raising this much-needed finance from domestic sources is difficult. This has made sovereign bonds come in handy. Out of the $26.08 billion in sovereign bonds issued between 2006 and 2015 in SSA excluding South Africa, $15.6 billion have been issued by the HIPC countries accounting for about 60% of the bonds issued (Imf.org., 2016).

Figure 4.2 shows the sovereign bond issuances post HIPC by the HIPC countries in the region. The first country within the HIPC/MDRI to issue an Eurobond was Ghana raising $750 million at a yield rate of 8.5% on offer. The country has since borrowed four times through Eurobonds. Successive borrowing for the country in the market has however been getting more expensive for the country obtaining debt at 10.75% on offer in 2015. Cote d'Ivoire has borrowed the highest cumulative amount ($4080) in three issues and Rwanda ($400) the smallest amount. The largest ever bond issue in a year was by Cote dIvoire in the year 2010 valued at million.

The reasons behind this new drive of borrowing have been many, some unique to the countries but the main collective reasons abound. First, Sub-Saharan Africa has emerged as one of the fastest growing regions in the world post financial crisis. Second, new found debt sustainability after relief has improved the risk profiles of the countries thereby enabling them

borrow from the market. Third, low interest rates and less diversified opportunities for investment in developed countries beyond the debt crisis compared with the high interest rates offered as yield rates of the bonds act as pull factors for investors. Fourth, the hardened lending conditions under the concessional lending facility (African Development Fund, 2016). These factors among others collectively and individually make these countries attracted to borrowing from the international markets.

FIGURE 4.2: Sovereign Bond issues by HIPC countries 2007-2015



Source: Bloomberg, The Financial Times

While these bonds seem to be financing much needed infrastructure projects, energy, restructuring of debt, among other uses, it is hard to assume that they can deliver a good outcome for growth, development, and sustainability in the long term. They instead have the effect of exposing

countries in SSA to external shocks the worst of which is the vulture funds, which may demand higher returns for the bonds. Furthermore, bonds even at low interest rates will rarely raise enough capital to cater for development needs beside their increasing costs at each successive issue and their foreign exchange risk. They also have shorter maturity at around 10 years on average, which are comparatively short compared to concessional lending that multinational and bilateral lenders may offer. In this regard, it would look better for the countries to improve at their self-finance by increasing their savings and targeting at building up CAB surpluses, which remains a toll order.

4.3 Literature Review

Literature on the impact of relief has so far concentrated on diverse issues of the program. Some have concentrated on the process, others on the fiscal space effects and yet others on growth effects. A few of the studies have taken one issue for example health and assessed its performance but where this has been done, the analysis has been qualitative. On the methods of analysis, three strands emerge. First is the world bank/IMF Debt Sustainability Analysis (DSA) framework that uses ratios and trend analysis and projections. The second approach has been the use of cross correlations between countries and most recently the quantitative analysis using mainly regressions and vector auto-regressions.

According to Dijkstra (2007) the original objective of the HIPC program was to get the countries a permanent exit from rescheduling by putting an end to what was termed as debt overhang. Even though the debt situation improved with forgiveness, the HIPC countries still lagged behind compared to countries at the same level of development. The projections for growth of revenues, exports, and income had been too optimistic mainly due to highly projected commodity prices. New loans have also acted to complicate the outcomes of debt forgiveness. This study also identified more negative outcomes of the program; it affected the aid distribution, and allocation because other low income countries with pressing needs and better policies got less than the HIPC countries. Relief also acted to perpetuate the debt problem in HIPC countries where new aid was accompanied by loans. Another thing that debt relief brought was increased conditionalities. Before relief countries with unsustainable debts only needed to request relief from official creditors affiliated to the Paris club, provided they agreed on structural adjustments with the IMF. HIPC came with stronger requirements for eligibility; countries needed to be poor, have high debt levels with ratios of debt to export greater than 150% and debt to revenue greater than 250%.

Asiedu (2003) assessed the need of quality institutions for the uptake of debt relief. The study found that there was some threshold of institutional quality needed for a country to maximize gain from debt relief. The analysis found that most of the HIPC countries had weak institutions that needed improvement to maximize on gains from debt relief. IMF and World

Bank went about by imposing conditionalities to enforce improvement in institutional quality and also spent over $380 million on judicial and legal reform in 84 countries. This formed a good foundation to leverage the countries to good policy in readiness for the uptake of debt relief.

According to Sachs (2002) health and education investments are needed for private investments to take root in a country. Nevertheless, these investments are rarely made because they are considered as consumption expenditures. This research argued that the only way that HIPC countries would get into the growth path again would be to have their debts forgiven. However, this research observed that debt forgiveness had done little to reduce debt burdens but rather did just enough to ensure that multilateral debts were repaid. They did little to see that economic growth was restores nor did enough to restore normal relations with the creditors. To them the need to do the minimum to prevent disaster guided debt relief for the past twenty years but never did enough to end the crisis. The study argued that rather than basing the debt relief on arbitrary ratios and formulae, it should have been based on targets set clearly under the millennium development goals. These goals targeted on reducing hunger, poverty, disease burden among other targets by 2015, if used as the baseline model would have helped to establish the resource need that would have helped the countries get back to a healthy growth path. These findings could have informed the inclusion of poverty reduction in the MDRI program.

According to Bird and Milne (2003) despite the optimism that debt relief would undoubtedly lead to poverty alleviation through health and education expenditure, a careful analysis revealed that net resource flows in the form of net lending and development grants less debt service were positive for all HIPC countries. They pointed out that for each 3 dollars of new money to from official creditors to HIPC countries, 1 dollar went to debt service. This raised questions whether indeed these resources went to debt cancellation, or formed a new wave of lending and development grants. The study argued that debt relief was unlikely to deliver much needed poverty reduction but was a way for the involved institutions to show that something was being done while being fundamentally uncommitted to improving resource transfers to poor nations. The study also identified a conflict of interest between the conditionalities of the programs and initial government plans. It identified the conditions as amounting to loss of sovereignty, which could only be overcome by more resources than the relief programs offered. The only option left for poverty reduction therefore according to this study was for the HIPC countries to access the private capital markets. This was unlikely and therefore debt relief was unlikely to deliver its promise.

Berthélemy (2004) investigated the effect of HIPC program on economic adjustment and reform. The study found that HIPC improved economic governance by creating new public spending obligations on poverty reduction, as there needed to be positive incentives only in good economic governance and only if external shocks were accounted for. He found that HIPC would

promote better aid policy for donors as aid agencies concentrated on selective financial assistance to countries implementing good policies. This would go a long way into cushioning both the borrower and lender. There was however no recapture clauses for the HIPC initiative meaning that the debt was treated by creditors involved as bad debts written off. The requirements that came with the HIPC was that they commit to PRSP, which was a redistribution effect. Note that by enforcing poverty reduction HIPC did not enhance capacity to pay. The study also found that countries, which had laid out plans to expend funds on poverty reduction in advance, ended up achieving better outcomes despite adversities such as bad states of nature.

Granville (2003) argued that there was no agreement on uniform treatment for the HIPC countries so that the participation and action would in effect remain voluntary. They found that aid conditionalities (procedures that member states were required to follow to get the resources from the initiatives) were justified on two grounds. First was aid effectiveness, which was in place mainly to reduce the moral hazard, and second, to make the relief more target specific. This way the participating countries were free to commit to the program or drop out of the program if they felt that the program was not in keeping with her aspirations. In the end, most countries would commit, but the conditionalities meant that some of them including chad, Somalia and Eritrea would take time to reach completion point.

Cline (2003) employed the constant debt ratio criteria to evaluate whether

the debt was maintained at a constant rate. This method was an improvement of the traditional IMF-world bank criteria in that it included the fiscal grants in the evaluation of fiscal sustainability. The aim was to find sustainability even where fiscal balance was not positive. Using this method the study demonstrated that a HIPC country need not run primary surpluses but rather with some levels of grants, the account could stay sustainable. To debt researchers this finding was important in that the aim of debt relief was not to clear the debt but to enable the countries run deficits without being unsustainable. Depetris Chauvin and Kraay (2005) put to test the impacts of debt forgiveness between the years 1989 and 2003. Using data from both published and unpublished sources, correlation and variance analysis the research found little effects of debt relief on public spending and none either for investment or for growth. This study had limitations in methodology, the reliability and paucity of data but it formed a good basis for the research on impacts of debt relief.

Dömeland and Kharas (2009) carried out a midterm analysis of the HIPC/MDRI program using detailed budget data and dynamics debt in a fiscal environment where it was assumed all borrowing was external. They found that despite the significant debt relief offered, beneficiaries had not been able to use the fiscal space provided to shore up their primary deficits. Debt forgiveness rather helped to stem the decline in resource transfers from a declining trend which they were on before the relief, alongside the provision of a better growth,stable exchange rates and improved contingent liabilities.

This research employed data between 2006 and 2006 and while the analysis captured the midterm effect, a study with more data would shed light on better average performance as more countries have reached completion point, and there are more degrees of freedom from more time.

Cassimon and Van Campenhout (2008) assessed the impact of the HIPC/MDRI on a group of 24 African countries to establish to what extent the debt relief had created fiscal space in the recipient countries. Using a VAR system with variables program grants, project loans, and debt relief, domestic government revenue (tax and non-tax), government current primary expenditure, public investment and government domestic borrowing all as shares of GDP, they found that debt provoked no or even perverse fiscal responses. They found that relief might influence public finance behavior in a desired way with effects being most similar to those of its most direct substitute, program grants. This study did not compare the individual country performance for the sample picked and furthermore they considered data up to the year 2006 with only four years since the first completion point countries got their debt forgiveness. With data for twelve years available to date, the analysis would be hoped to bring new outcome.

Cassimon et al. (2013) used a balanced panel covering 24 countries over the 16 years between 1996 and 2011. Using ten variables; four fiscal variables (total domestic revenue, current primary expenditures, government investments and domestic financing), three aid variables (the net ODA

received, total grants and total loans) and three debt relief measures (debt service savings from enhanced HIPC, from MDRI and these two aggregated into the debt relief variable). They used the a pseudo VAR, where the equations are estimated one after the other rather than simultaneously as is the case of a standard VAR. Though they eliminated the endogeneity by the use of generalized method of moments (GMM), the study did not attempt to evaluate the poverty reduction objective through expenditure on basic education and health expenditures.

From the literature above, investments in health and education were necessary if any gains in both private investment and poverty reduction were to succeed. Though the relief programs had no commitment on equal treatment in HIPC/MDRI, the countries were facilitated to raise their bar with regard to institutional quality. This was done to prepare participants for the uptake of relief resources and countries needed to demonstrate improvement before complete debt forgiveness. This means that these countries could be treated as in a way peers who stood to achieve certain expected outcomes together. But literature falls short of coming to consensus on either the expected outcomes or the evaluation result. The reliance on debt ratios or cross-country correlations may not deliver conclusive decision on the relationship between debt and the desired expenditure outcomes.

This means that research on impacts of debt relief has mainly relied on qualitative analysis in the form of IMF research and (Depetris Chauvin

and Kraay, 2005). (Cassimon and Van Campenhout, 2008; Cassimon et al., 2013) employed a much richer dynamic generalized method of moments which brought more consistency into the estimations but the estimations using pseudo vector auto regressions fail to exploit the benefits of estimating relationships as a system.

4.4 Data and Estimation Technique

A systematic study of impacts of debt forgiveness has for a large part been hindered by the paucity of data on the debt forgiveness program. Early research by Depetris Chauvin and Kraay (2005) had to rely on constructed datasets. The problem with these datasets is that their reliability cannot be verified. Cassimon et al. (2013) improved upon this by relying on the data from the statistical updates of the HIPC/MDRI programs to separate between the two and obtain very informative results but since the estimation was not run as a system but rather as a pseudo VAR, the reliability of the resultant granger causality tests may not be the best.

This study combines the advantages of panel VAR (PVAR) estimation with the generalized method of moments. This ensures consistent estimates while at the same time allowing for robustness. It also uses an expanded data between 1995 and 2014. Furthermore, it relies on the debt relief data on the World Development Indicators which minimizes on missing observations

which could arise from separating the relief into components and also helps accommodate bilateral debt relief besides being the original source of the main player in debt forgiveness. This was used on 21 out of the 30 HIPC/MDRI countries from the Sub-Saharan Africa region.The countries include; Benin, Burkina Faso, Burundi, Cameroon, Central Africa Republic, Chad, Congo Republic, Cote d'Ivoire, Ghana, Guinea, Guinea-Bissau, Madagascar, Malawi, Mali, Mozambique, Niger, Rwanda, Senegal, Sierra Leone, Tanzania and Uganda.

This study follows the work of Cassimon et al. (2013) but employs more and modified variables including; total grants, total loans, debt relief, domestic government revenue, government current primary expenditure, public investment, and spread of official development assistance, education expenditure, and health expenditure. All the variables were in percentage of GDP to enable comparison and avoid measurement bias.

Using a VAR will allow to investigate the interrelationships between variables by allowing the variables to reveal the nature of the relationship by taking turns as dependent and independent variables. The relationships that are of interest are eight and become;

$$TDR_{it} = GI_{it} + CPE_{it} + TL_{it} + TG_{it} + SPREADODA_{it} + Relief_{it} + \varepsilon_{it} \quad (4.1)$$

$$GI_{it} = TDR_{it} + CPE_{it} + TL_{it} + TG_{it} + SPREADODA_{it} + Relief_{it} + \varepsilon_{it} \quad (4.2)$$

$$TL_{it} = TDR_{it} + GI_{it} + CPE_{it} + TG_{it} + SPREADODA_{it} + Relief_{it} + \varepsilon_{it} \quad (4.3)$$

$$TG_{it} = TDR_{it} + GI_{it} + CPE_{it} + TL_{it} + SPREADODA_{it} + Relief_{it} + \varepsilon_{it} \quad (4.4)$$

$$TG_{it} = TDR_{it} + GI_{it} + CPE_{it} + TL_{it} + SPREADODA_{it} + Relief_{it} + \varepsilon_{it} \quad (4.5)$$

$$SPREADODA_{it} = TDR_{it} + GI_{it} + CPE_{it} + TL_{it} + TG_{it} + Relief_{it} + \varepsilon_{it} \quad (4.6)$$

$$TDR_{it} = GI_{it} + TL_{it} + TG_{it} + SPREADODA_{it} + HealthExp_{it} + Relief_{it} + \varepsilon_{i} \quad (4.7)$$

$$TDR_{it} = GI_{it} + TL_{it} + TG_{it} + SPREADODA_{it} + EDUCExp_{it} + Relief_{it} + \varepsilon_{i} \quad (4.8)$$

In these equations TDR represents total domestic revenue, GI government investment, (TL) Total loans, TG total grants, Spread ODA represents the spread of official development assistance, and Relief represents HIPC/MDRI relief. The sources and details on these variables are as shown in table 4.1.

The first two estimations were the foundation of this study. They estimated the effect of debt relief on Total Domestic Revenue and Government Investments indicating whether the savings made out of debt had a marked effect on these two. The third equation estimates the effect of debt relief on current primary expenditure which would indicate which direction consumption expenditure took in response to debt savings. The other equations likewise estimate the effect of debt relief on development assistance, total grants, education expenditure and health expenditure.

Note that since current primary expenditure includes education and health expenditures, then the current primary expenditure is replaced with the two in the second estimation to avoid multicollinearity and directly assess whether they received funding.

The estimation strategy was to first determine the lags to be included in the estimation using the MBIC, MAIC, and the MQIC selection criteria, then run the Panel VAR estimation and test the stability of the system, then run the PVAR using generalized method of moments. Once this has been done the granger causality would be done to confirm the relationships. This research therefore assumes that causality will have been established if the lags of a variable explain the other variable.

The data was mainly sourced from the World Development Indicators. Where this data was not complete, the Article IV and staff reports from the IMF were used. By use of the variables in a PVAR in a generalized method of moment framework, consistent estimates and granger causality results were obtained. However, since the time and individual series are not long enough and we could not rank the prioritization of the impacts of debt relief among the variables of the VAR, the impulse responses will not be a focus of this study. The aim of this research was thus limited to the study of the direction and significance of the estimates and the granger causality tests.

TABLE 4.1: Description of Variables Used in the Study

Variable	Description	Source
Dom Rev (total domestic revenue)	Total domestic revenues representing tax and nontax revenue of a country as a percentage of GDP.	World Development Indicators (WDI)
Cur Prim Ex (Current Primary Expenditure)	Uses final government consumption expenditure as a percentage of GDP.	World Development Indicators (WDI)
Gov Inv (Government Investment)	Refers to gross capital formation and changes in inventories and acquisitions less disposals of valuables percent of GDP	International Monetary Fund (IMF)
Tot Grants (Total Grants)	Refers to grants including technical cooperation as a percent of GDP.	World Development Indicators (WDI)
Tot Loans	This Total External Debt as a percentage of GDP.	World Development Indicators (WDI)
Spread ODA	This is the spread of net official development assistance(difference between Net ODA and average ODA for the countries in the sample) as a percentage of the Gross National Income	World Development Indicators (WDI)
Relief	Aggregate debt service savings. Consist of the reduction in debt stock due to debt forgiveness.	World development indicators and status implementation (IMF)
Educ Exp (Education Expenditure	Education expenditure including current operating expenditure in education.	World Development Indicators (WDI)
Health Exp (Health Expenditure)	Total health expenditure covering both private and public expenditure as a fraction of GDP.	World Development Indicators (WDI)

4.5 Estimation Results

We set off with the estimation of the panel VAR lag order selection. Based on the model selection criteria proposed by Andrews and Lu (2001) results indicated that a first order panel VAR is preferred since it minimizes the MBIC, the MAIC and the MQIC. The obtaining results were as shown in table 4.2. These were the best choices since the Hansens J statistic does not correct for degrees of freedom in the model compared to the ones listed above.

TABLE 4.2: Selection Order Criteria

Lag	CD	J	J Pvalue	MBIC	MAIC	MQIC
1	0.996619	104.4762	0.308482	-405.516	-91.5238	-218.812
2	0.999209	39.04985	0.844694	-215.947	-58.9502	-122.594

The model was then run in a PVAR framework and then based on it the stability of the model checked. This opened the way for the stability check of the resulting estimation whose results are shown in figure 4.3;

Figure 4.3 shows that all the roots of the PVAR were located inside the unit circle. However two of the roots were very close to the unit circle, meaning that the impulses that could be obtained maybe suspect or divergent. the estimation was therefore carried out in PVAR using GMM. The results of the first panel VAR involving the fiscal space variables was as shown in table 4.3;

Table 4.3 shows regression output on fiscal impacts of debt relief and the resultant granger causality tests are contained in Appendix B table 1. The columns show the results of the response variables named on top row from

FIGURE 4.3: Roots of the companion matrix

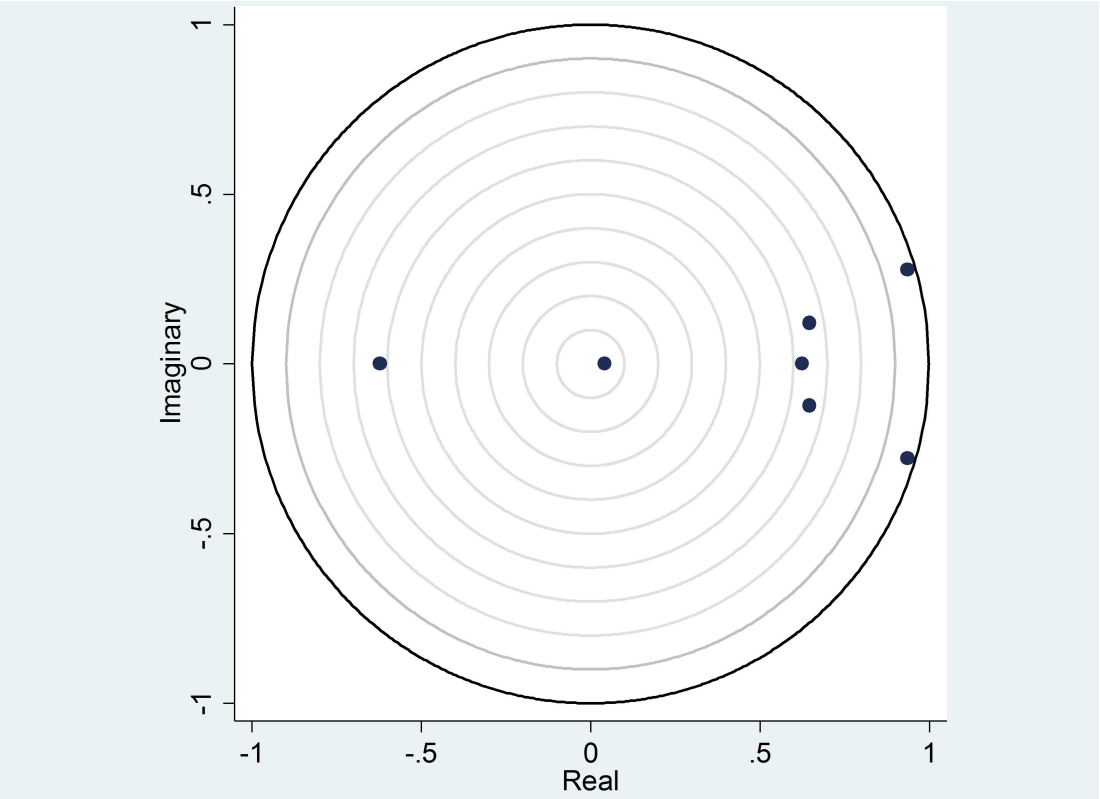


TABLE 4.3: GMM Panel Vector Autoregresssion Output (PVAR1)

	Dependent Variables of the System						
VARIABLES	Dom Rev	Cur Prim Ex	Govt. Inv.	Tot Grants	Tot Loans	Spread ODA	D. Relief
$DomRev_{t-1}$	1.057***	-0.0353	0.510***	5.944**	-0.751***	-0.503**	-0.519***
	(0.0859)	(0.0340)	(0.127)	(2.849)	(0.230)	(0.225)	(0.161)
$CurPrimEx_{t-1}$	-0.0669	0.750***	-0.199	3.452	-0.140	-0.157	-0.310
	(0.138)	(0.0787)	(0.210)	(5.518)	(0.409)	(0.329)	(0.293)
$Govt.Inv_{t-1}$	0.0152	0.0318	0.730***	8.936***	-0.452***	-0.145	0.470***
	(0.0283)	(0.0213)	(0.0745)	(2.065)	(0.138)	(0.0990)	(0.107)
$TotGrants_{t-1}$	0.00387***	0.006**	-0.005***	-0.548**	0.0190*	-0.00140	-0.008***
	(0.001)	(0.00273)	(0.00112)	(0.218)	(0.0112)	(0.00224)	(0.003)
$TotLoans_{t-1}$	0.124***	0.0675***	0.0644**	6.332***	0.603***	-0.127*	0.405***
	(0.0260)	(0.0150)	(0.0291)	(1.205)	(0.09)	(0.0692)	(0.0628)
$SpreadODA_{t-1}$	-0.0361*	0.00635	-0.0804***	0.231	0.0221	0.561***	-0.0793
	(0.0193)	(0.00900)	(0.0280)	(0.659)	(0.0524)	(0.0816)	(0.0496)
$D.Relief_{t-1}$	0.0408**	0.0137	0.0539**	1.004**	-0.00305	0.161***	0.0554**
	(0.0203)	(0.0124)	(0.0241)	(0.451)	(0.0496)	(0.0496)	(0.0264)
Observations	251	251	251	251	251	251	251

Parameters with standard errors in brackets $^{*}p < 0.05,^{**}\ p < 0.01,^{***}\ p < 0.001$.

a shock on the lagged variables on the first column. They are all lagged once as demanded by the results of the selection criteria in table 4.2.

4.5.1 Impacts on Domestic Revenue

The results indicate that debt relief impacts positively on domestic revenue and this is confirmed by the granger causality which shows two way causality. This implies that lags of debt relief have positive impacts on revenue mobilization from tax and the other means of revenue collection. This may be attributed to the improvement that may have arisen out of the conditionality for reform and sound policies and poverty reduction. This implied that the requisite improvement of institutions took place which translated to poverty reduction. The impact could have arisen along other dimensions for example public policy theories propose that when agents can verify the effect of taxes that they pay as a result of the proper public management, this increases the tax base through improvement in willingness to pay. The other reason that may have contributed to this could have been from appropriate use of debt relief savings through investments which could have ended up improving government revenues directly. These results were confirmed by the granger causality test.

Domestic revenue as expected was also positively impacted upon by total grants, total loans and negatively by the official development assistance at 10% level of significance. This may have happened due to the dependency syndrome where nations which receive this assistance fail to improve their domestic sources of finance and wait for handouts.

4.5.2 Impact on Recurrent Expenditures and Aid

This study found no impacts of debt relief on the final consumption expenditure. This is an interesting finding considering that it was expected that debt relief could affect elements of final consumption expenditure in education and health. Interestingly this has been the effect along the other external funding options official development assistance. However final consumption expenditure is positively affected by the other external funding mechanisms including grants and loans.

Debt relief has a significant positive effect on the spread of official development assistance at a significance level of 1%. This relationship may have arisen due to a good performance of some of the HIPC countries with respect to policies and macroeconomic management which could have inspired donor countries to donate more to the countries in the programs. This is interesting considering that under aid fungibility theories where donors would focus on improving their fiscal balances by cutting down taxes it would have been expected that donors would feel the pinch of debt forgiveness and reduce their development assistance.

4.5.3 Impact on Government Investment

Debt relief has a significant positive impact on government investment. This is a good indication that the savings generated out of the debt forgiveness indeed

went into development expenditure and that this has been felt in the added years of the study. There are two ways that the investment effects could have played out. Namely, a flow effect and a stock effect. The reduced debt service flow could have saved resources which then went into public investment in the flow effect. Alternatively, this could have happened as a stock effect where the reduction of the debt stock removed the disincentive effect that was hanging on the heads of the indebted countries investments so that they ended up increasing domestic public investment.

This effect can also be attributed to the increased fiscal space which from these results indicates that development aid also increases with debt relief. This implies that an increase in investment could have arisen out of confidence that could have been inspired by positive government policy performances which in turn motivated capital inflows increasing investment. If the funds went into investment then this may also indicate that the nations did not seriously follow the instructions of the program. The other reason why this could have occurred is through improvement in willingness to pay taxes by agents in the economy due to an improvement in pro-poor policies. This occurs when agents can verify that their taxes are being used properly and they can see the effect of their taxes in their lives so they respond with more tax compliance.

The finding that there were no consumption expenditure effects from debt relief raises curiosity. First this is the channel through which the

poverty reduction effects could have surfaced. Statistical insignificance of this coefficient means that the expenditures that could have made poverty go down did not appear in this variable, or there were confounding elements which soaked up the effect. This in effect puts serious doubt whether indeed education and health expenditures which are key in final consumption expenditures were really what the countries put their savings on. Being priority areas of directing debt savings according to the programs plan, there was need to pursue this further. To do this we remove the consumption expenditure in the PVAR and input education expenditure and health expenditure. The results adduced from this regression were as shown in table 4.4.

4.5.4 Impact on Health and Education Expenditure

The results in table 4.4 report the outcome of the second regression which involves health expenditure and education expenditure in place of current primary expenditure. Our focus on this regression was mainly on the response variables education expenditure and health expenditure because they were the main poverty reducing expenditure variables targeted by the relief program. An increase in debt relief increases educational expenditure. This implies that for the countries in the sample, debt relief increased the amount of expenditure that the sample countries allocated and spent on education. This result also means that the countries in the sample followed the policy suggestion of the

TABLE 4.4: Panel VAR Involving Education and Health Expenditures PVAR2

	Dependent Variables						
VARIABLES	Dom Rev	Tot loan	Govt. Inv	Tot Grant	Educ Exp	Health Exp	Spread ODA
$DomRev_{t-1}$	0.675***	-0.927***	0.0633	7.734***	0.00576	-0.0300**	0.0727
	(0.0588)	(0.115)	(0.0617)	(1.127)	(0.0164)	(0.0149)	(0.113)
$Totloan_{t-1}$	0.141***	0.829***	0.201***	3.622***	0.0125***	0.0238***	-0.198***
	(0.0156)	(0.0279)	(0.0205)	(0.337)	(0.00363)	(0.00420)	(0.0478)
$Govt.Inv_{t-1}$	-0.00212	0.0407	0.732***	2.515***	0.00329	-0.00106	0.0371
	(0.0174)	(0.0373)	(0.0353)	(0.487)	(0.00735)	(0.00503)	(0.0522)
$TotGrant_{t-1}$	0.00400***	0.0146*	-0.000452	-0.435***	-0.00301***	0.000987***	-0.007***
	(0.0004)	(0.00849)	(0.00130)	(0.145)	(0.000813)	(0.0002)	(0.00215)
$Relief_{t-1}$	0.0198*	0.0800***	0.07***	0.738***	0.0129**	-0.00216	0.139***
	(0.0117)	(0.0237)	(0.0157)	(0.181)	(0.00643)	(0.00493)	(0.0361)
$EducExp_{t-1}$	0.263	3.962***	1.332***	-54.57***	0.977***	-0.0171	-0.338
	(0.171)	(0.274)	(0.211)	(3.397)	(0.0846)	(0.0348)	(0.374)
$HealthExp_{t-1}$	1.395***	-2.847***	1.072***	34.19***	0.0591	0.891***	-0.533
	(0.216)	(0.392)	(0.207)	(3.958)	(0.0833)	(0.0548)	(0.448)
$SpreadODA_{t-1}$	-0.0159**	0.0448**	-0.060***	-0.113	0.000732	-0.00114	0.540***
	(0.00751)	(0.0182)	(0.0153)	(0.180)	(0.00146)	(0.00222)	(0.0392)
Observations	251	251	251	251	251	251	251

Parameters with standard errors in brackets $^{*}p < 0.05$,** $p < 0.01$,*** $p < 0.001$.

debt forgiveness programs to use the debt savings on education or had already earmarked extra necessary funding for this item before the program began. This reveals that indeed one of the variables targeted for poverty reduction was expended on from relief proceeds.

The impact of debt relief was not felt on health expenditure and the granger causality results revealed no causality running from debt relief to health expenditure. this meant that the variables lags did not explain health expenditure. This may be interpreted to mean that the governments had not followed through with the health policy prescription. This was possibly because health could not have been a priority area for the governments in their budget for their medium term plans, or that they had concluded on it so that resources went to education which was more emergent. Note that this variable was measured in both private and public expenditure because cover by hospital insurance funds would go to both sectors as it would in case of

the primary prevention mechanisms. This indicates that while the countries were expected to use the funds on the two variables that have impacts on the household expenditures, governments preferred to invest mainly on education and less on health. It could also mean that the change in expenditure on health arising from debt forgiveness was not large enough to be picked out or that the countries took the allocation for health and utilized it on another preferred investment of their choice. The absence of debt relief effects on health act to indicate that the poverty reduction expenditure was only half way accomplished as only education was affected.

No coefficients from the previous estimation changed their direction of impact on the response variable on the impacts of debt relief. This result means that an increase in either of the two variables had no effect on the various forms of expenditure and revenue. Total grants were negatively affected by education expenditure while positive impacts were registered from health expenditure. The spread of official development assistance was not affected by increase in either health or education expenditure. Education expenditure had positive impacts on total loans while health expenditure had negative impacts implying that donors would more willingly give loans for education since it have future returns while health may not. The other impact variable that changed was government investment on total loans, which became insignificant after previously indicating a negative relationship. This meant that expenditure on education and health possibly crowded out loans for government investments.

Overall this result indicates part compliance of the countries in the debt relief program from moral hazard with respect to the use of debt savings on education. On the other hand, the use on health funding was either ignored or transferred to another use.

4.6 Policy Findings and Conclusion

This study set out to investigate the fiscal effects of debt relief on the target variables of the debt forgiveness programs. Since data on the outcome variables was hard to come by, it relied on expenditure by governments in response to debt relief as a signal of where the money was spent. Evidence based on the PVAR and granger causality points out that debt relief led to an increase in domestic revenues, government investments, total grants, and the spread of official development assistance. This study also found debt relief effects did not find their way into the current primary expenditure and the health expenditure.

The results therefore indicate that while the impacts of debt relief have largely shown desirable impact on expenditure, there is still need to reduce the moral hazard problem that arises once grants, relief or aid has been given to the countries of the region. This will mitigate against the occurrence of what the results on health and current expenditure reflect. If current government expenditure was not really affected by debt relief, then it means that little was

done on poverty alleviation. With health and education having been targeted intervention variables and only education reflecting gains from debt relief, it means that the countries could have used funds for purposes other than the recommended uses.

Reduction of moral hazard in both debt, grants relief and aid needs to be effected in a more deliberate way than having a poverty reduction strategy paper moving forward. To this end the formation of independent debt management offices (DMO) like in Nigeria and Botswana can go a long way into properly appropriating borrowed loans and ensuring accountability for any funding received. These debt managers could then be fully equipped with professionals able to supervise and hold implementers to account for fund usages.

A point of concern from this research is failure to entrench the new found debt sustainability. On the run up to completion point, the countries in the debt relief programs kept a tight leash on their borrowing, but after this majority have been seen to run back to debt re-accumulation this reveals that there was a systemic problem that debt relief did not solve. This could be weak institutions, low productivity pitted against huge financing needs, or the need for regulation.

At the moment, Sub-Saharan Africas huge financing needs have been met through borrowing, aid, and grant flows. These sources of funding are unreliable. While the results indicate that debt relief increased domestic

revenue, it also revealed that government expenditure also increased indicating countries need to generate even more resources to finance their growth. This may call for the expansion of the tax base, or rate to meet demand for expenditure. This expenditure needs to go to areas that guarantee sustained productivity such as human capital development, health and infrastructure development.

Springing from the re-accumulation of debt, is a need for a debt monitoring mechanism. The IMF- World Bank DSF did well in the run up to debt forgiveness and the results showed good outcome. But the nations are back to their old ways. At national and subnational levels, there is need for the formation of debt management offices which can then be equipped with the capacity to monitor the debt. At regional level, there may be need for a peer review mechanism that can help consolidate gains from lessons learnt and best practices on policy. At an international level, there is need to develop a mechanism that is inclusive for both creditors and debtors with a clear debt resolution mechanism with more mandate than the DSF. This would help the problems of debt growing too fast, while also ironing out restructuring problems so that nations dont do too little too late or develop the debt to crisis level again.

In conclusion, one revelation of this study is that most of the region's economic growth is constraint by debt service, so that forgiveness for the remaining countries along the countries which needed forgiveness but were

out of the program would boost their performance. Official development assistance is still needed to get the countries in the region on a sustained growth path as they develop capacity to handle their own constraints to growth. However in the long-term, seeking ways that improve the regions productivity and competitiveness will be the way to get the region out of debt crisis that continues to afflict them.

Chapter 5

Conclusion and Policy Implications

5.1 Introduction

In the last few decades, the issue of debt in sub-Saharan Africa has taken center stage in macroeconomics and financial debates in the world and for good reason. Sub-Saharan Africa has gone through a difficult patch of high debt averaging 220% external debts as a fraction of exports with an average debt service of 32% of the exports. In addition, the region has just emerged from debt forgiveness where 33/48 countries were involved in HIPC/MDRI forgiveness program. Furthermore, some countries in the region have recently engaged in heavy borrowing away from their traditional sources to the international markets through sovereign bonds.

The puzzle that this report sought to unravel was whether the countries recovered sustainability after debt relief compared to the high debt regime and the period before high debt, whether or not debt relief yielded the anticipated fiscal space effects especially on health care and education which were the target variables for poverty reduction, and whether or not fiscal policy remained twined to current account.

5.2 Findings

This study reports that fiscal deficits were related to the current account deficits. It further found that debt forgiveness reduced the debt but did not manage to instill fiscal discipline post forgiveness. In addition, debt relief expanded fiscal space but failed to address poverty reduction touching on health expenditure.

There was a positive relationship between CAB and fiscal deficits. This relationship was less than unity meaning that it was impossible to fix the current account by causing a measured change that can fix one account leading to an automatic solution in the other. This by extension implied that fiscal consolidation by itself would not address the problem of twinned deficits but rather that the solution must lie in a cocktail of measures targeted at improving both accounts. In this regard, the fiscal deficit problem can be addressed through fiscal discipline and moving away from fiscal profligacy that has

plagued the region in the past few decades. The fiscal account therefore needs to be improved by cutting down on wastage while at the same time seeking to improve the revenues for the government. The countries would do well by expanding their tax base and/or increasing their tax rates so that they move towards balanced budgets. Taxes need to be balanced such that they inspire hard work among the citizenly. However, this is only possible if they the citizens see what their taxes do to improve their livelihoods.

On the variables effect on current account, this study found that commodity prices, and foreign growth positively affected the current account balances while government expenditure, and being an HIPC country were associated with a deteriorating CAB. The exchange rates and trade openness had no effect on the CAB.

The second contribution was on the sustainability of debt for the countries of the region. The study reports that controlling for the high debt regime, sustainability of debt was restored for majority of the countries in the region. Indeed, out of a sample of 12 countries both HIPC and Non-HIPC, only Zambia returned the case of an unsustainable debt. Zambia was a HIPC country which had reached completion point but her debt failed to return to sustainability. Cameroon and Ethiopia returned a result very close to the margin. The rest of the HIPC countries seemed to have consolidated their gains by moving away from debt unsustainability.

This study found that debt forgiveness was a game changer for the

countries of the region. Even countries that did not participate in the program had their debt ratios improving possibly through contagion effects. Most countries succeeded to have the debt ratios return to sustainable levels enjoyed before the high debt regime. But this is as far as the effects went in terms of level as immediately the countries received debt relief, most of these countries have massively re-stocked the debt indicating lack of support from the policy side. A section of literature on debt restructuring would interpret this as moral hazard on the borrower.

The third contribution was on the fiscal space and poverty reduction effects of debt forgiveness. This study reports that debt relief delivered positive impact on domestic revenue, the spread of official development, government investment, total grants, total loans, and education expenditure. However, it did not deliver significant impact on current primary expenditure, and health expenditure. To the extent that government investment expenditure, domestic revenue, and education expenditure were positively impacted by relief, this means that fiscal space effects were realized. To the extent that current expenditure and health expenditure did not register any significant impacts, the realization of poverty reduction effects remain doubtful. Current expenditure caries majority of the pro-poor section of expenditure and its statistically insignificant result was perplexing and pointed to a moral agency problem.

5.3 Policy Implications

Given the current drive for growth in the region, this study acknowledges the important role capital inflows play to the economies of the region. The use of the exchange rate and the interest rates as policy instruments to improve the performance is also not a good long-term strategy given the currencies are mostly devalued. The solution must therefore lie in structural transformation, on the export sector. This can mainly be done by shifting away from few primary exports to more diversification.

A shift from primary exports to value addition before exportation would help to cushion them from price fluctuations common with commodity exports while also earning more value for their investment. If this is done and then the countries especially those with complementary competitive advantage engage in cross border trade in these value added goods would help the countries to improve their current accounts together. This is supported by the finding that foreign growth had positive impacts on the CAB.

It is sensible to assume that borrowing would be allowed but at controlled levels to mitigate against running back to former high debt levels. While borrowing is a sensible thing to do given the huge investment needs of the continent and low saving rates by the sovereigns, a red flag has been raised in that some of them are borrowing too fast too soon and from sources that are unforgiving. Countries like Ghana, Mozambique and Zambia which

participated in debt relief up to completion point have run into debt problems with Mozambique briefly defaulting payment of Eurobond. Ghana has not only borrowed at unreasonable cost taking a bond with a maturity of 5 years at 9.25% but has emerged as one of the countries which has re-accumulated debt fasted with debt reaching 74% of GDP by 2015. Yet it is not all groom in the region. Some countries have picked up the challenge to emerge improved despite issuing sovereign bonds including, Cote dIvoire, Ethiopia and Rwanda.

The lesson here is that debt relief on its own was never going to be enough to safeguard the region from its debt growing large. Debt in the region is a symptom of an underlying problem. The twinness of the balances and the return to sustainability followed by a subsequent rise reveals gaps in policy, structural inadequacies, and at the least indiscipline.

There is therefore need for a more comprehensive approach to the debt problem. Future programs targeting restructuring of debt should be broader to include growth reinvigoration and inclusivity, diversification of export activities, and improvement of the competitiveness of the production in the region. In this regard, SSA countries need to strike a careful balance between structural adjustment and growth in their development plans. Now more than ever before, countries need to choose their development plans and stick them out, rather than trying to carry out plans coming from sources that are not in tandem with their agenda and which make them deviate from their original

plans and inflate debt.

Countries like Ethiopia, Uganda, and Rwanda have demonstrated that this is possible. There is also need to develop a mechanism to ensure that the debt does not diverge to levels where it becomes unmanageable once again. Another issue that has arisen from the post debt relief from the Sub-Saharan region is the huge appetite for sovereign bonds. While this may not be entirely wrong given the huge infrastructural needs, and some countries like Cote dIvoire, Ethiopia, Kenya, and Rwanda have borrowed at rates that do not interfere with their sustainability, there is need for more discipline.

SSA countries need to focus their attention on acquiring debt that is less costly. Going for debt from the market at interest rates of between 8.5% and 17.5% is not proper debt management. The countries are still best served by borrowing from bilateral and multilateral sources at concessional terms, which will not only lower their interest rates but also give them a longer time for repayment, which the market may not give. If then the funds are invested in projects, which grow the capacity to repay the debt, the countries solvency is improved, moving the debt repayment out of harms way.

There is need to strengthen, deepen, and sustain regional cooperation. The idea of a continental free trade zone is a great one. This would not only put together a large market for goods and services, but it would also ensure that countries share capacity for value addition. countries with competitive advantage in processing can value add before exporting across continents

thereby ensuring more value for goods as they leave the region. This will in part deal with the imbalance of trade today where the countries export raw materials only to import finished products at higher prices.

There is also need for a peer review on debt management too. This can be done through structural reforms born of and carried out willfully by the SSA countries themselves under supervision of institutions that they approve of such as New Partnership on Trade and Development (NEPAD), African Development Bank (ADB) or any other peer review institution that the countries may have confidence in. This will go a long way in drawing synergy and learning from each other on best practice. This is mainly because some countries have managed debt very well while others are in the opposite extreme. Relief that does not reform the underlying causes of debt problems will most certainly not address future risks. Beside this, SSA has maintained her 1970-1980 structure with primary exports forming the major source of foreign exchange. This needs to change. Export diversification, transforming the economies to rely on technology, among other changes need to drive their export policy. Countries need to seek value addition before exports, as those with overvalued currencies set them free.

Results show that debt relief delivered good results that worked best in countries like Rwanda, Uganda, and Ethiopia where social (education and health), institutional, and consolidated growth thats inclusive played a major role. It is our considered opinion that countries that paired the social,

institutional and poverty reducing strategy while pursuing inclusive growth will in the long run have laid a firm foundation for sealing their dent in matters debt. Countries that missed the opportunity to build on these foundations like Ghana, Zambia, Senegal, and Sierra Leone for whatever reasons lost an opportunity to build on the clean slate.

There is need for a bipartisan approach to maintain healthy debt levels. On one hand, its going to take prudent debt management from the debtor countries, while on the other its going to take even more discipline from lenders to refrain themselves from adverse selection. The good thing is that most countries in Sub-Saharan Africa are developing a database and liaison is becoming possible to be at the same level of information about debt levels. Country debt profiling is slowly taking shape so that selective lending based on economic fundamentals can be done. It is good that development loans are going to be following functions, policies programs, and plans, and in this way act to strengthen institutions both for the borrower and lender. This will act to cut down on possibility of a future crisis for the region by addressing moral agency and adverse selection problems.

The countries need to embrace the development of autonomous units like the debt management offices so that they can be charged with the responsibility of managing debt and the programs that come with it. Countries also need to develop their own financial debt markets to allow for domestic borrowing so that they can avoid exchange rate risk and its associated balance of payment

problems. This is owing to the observation that even in relatively developed financial markets like Kenya, bonds with a maturity rate of 10 years carry interest rates of over 21% in early 2014 (Central Bank Of Kenya Data). While this may have been the exception for Kenya, other countries have even higher domestic costs for bonds. Countries which have for a large part depended on domestic debt like Mauritius have had less contagion effects and healthier debts.

The success of debt relief among the HIPC countries shows that there is need to consider the role of principal and interest payments, in the continent and the less developed countries lagging behind in development. While these countries cannot always be getting themselves in debt hoping for the developed countries and IFIs to bail them out, there is a shared responsibility for bringing fairness and productivity in the third world through debt. Forgiving the past debts issued under dictatorships, and rudimentary reporting systems, would go a long way into securing long-term debt health for the African economies.

In conclusion, this thesis limited itself to three issues of debt in sub-Saharan Africa, the relationship between the CAB and fiscal balances, the sustainability of SSA debt post debt forgiveness, and fiscal responses of the region to debt forgiveness. This leaves a number of issues unattended like the role of sovereign bonds to growth and debt stabilization, the emerging role of China as a major lender and infrastructure developer in the region among

other debt issues. Other areas of concern include the role of debt restructuring in solving SSA debt crisis. Finally there is also need for research on sovereign debt management as a foundation of sound practice moving forward.

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APPENDIX A

FIGURE 1: Regime Graphs for Burkina Faso and Cameroon

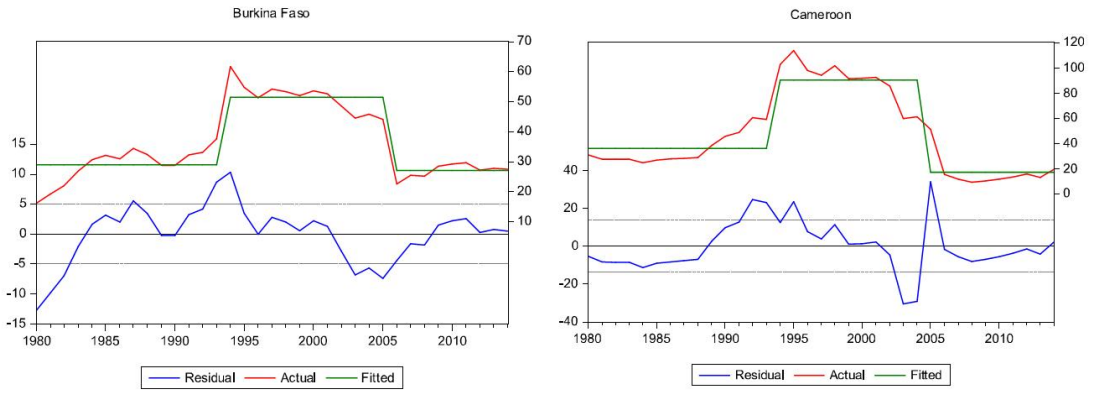


FIGURE 2: Regime Graphs for CAR and Gabon

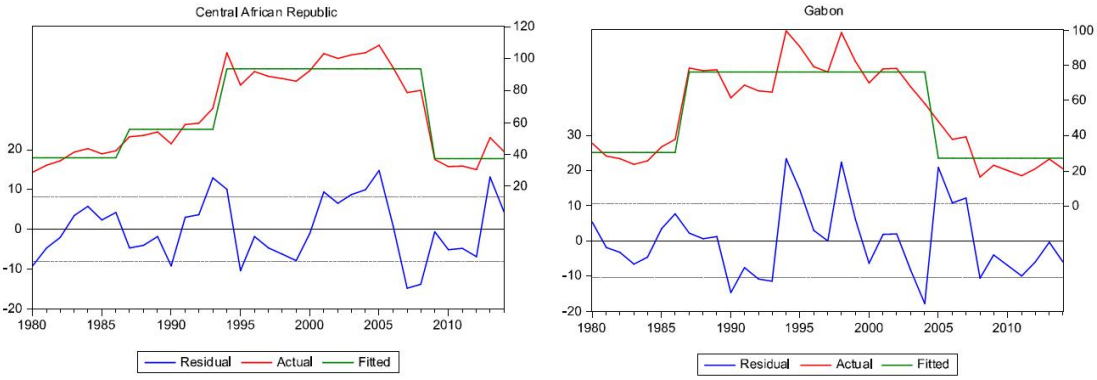


FIGURE 3: Regime Graphs for Mauritius and Ethiopia

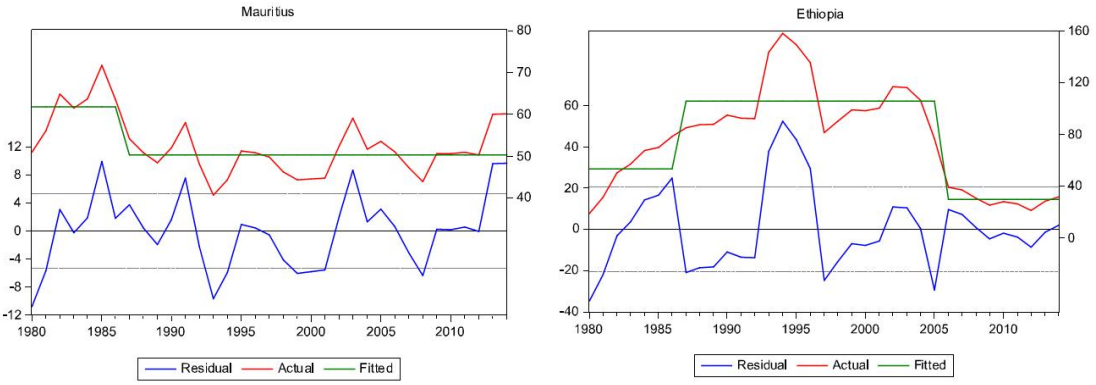


FIGURE 4: Regime Graphs for Kenya and Uganda

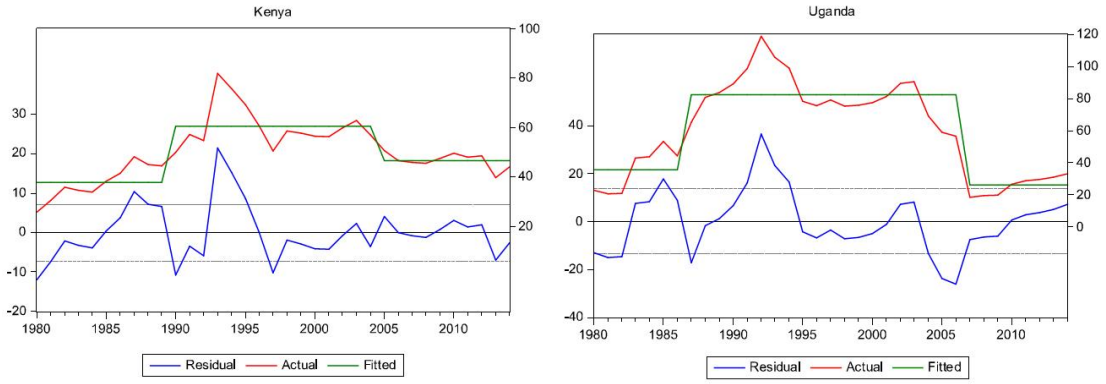


FIGURE 5: Regime Graphs for Ghana and Senegal

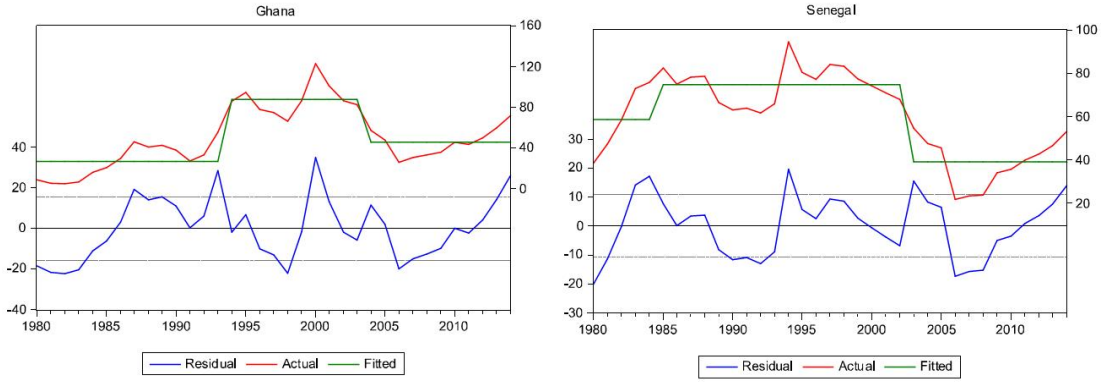
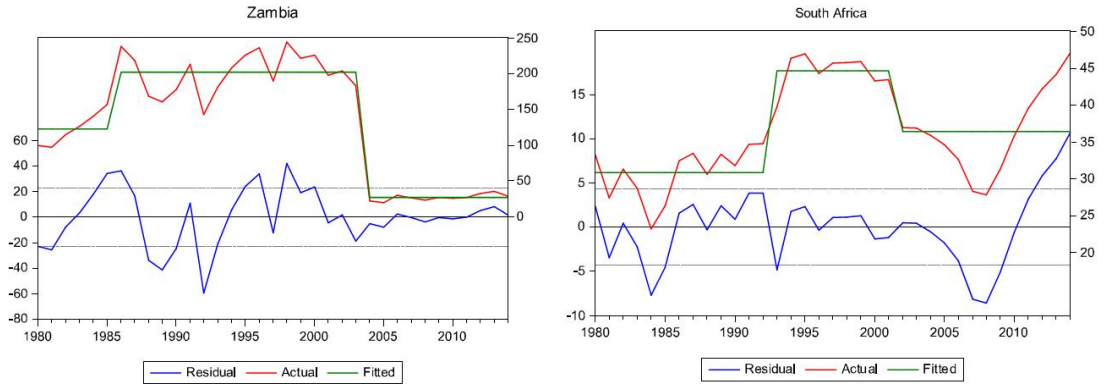


FIGURE 6: Regime graphs for Zambia and South Africa



AppendixB

TABLE 1: Granger Causality Test for PVAR1

		TO						
	Variables	Dom Rev	Cur Prim Ex	Govt. Inv.	Tot Grants	Tot Loans	Spread ODA	D. Relief
FROM	Dom Rev		0.235	15.986***	4.353***	10.627***	5.028**	10.541***
			(0.954)	(0.000)	(0.004)	(0.001)	(0.025)	(0.001)
	Cur Prim EX	1.076		0.892	0.391	0.118	0.228	1.12
		(0.300)		(0.345)	(0.532)	(0.732)	(0.633)	(0.290)
	Govt. Inv	15.986***	0.892		18.731***	10.763***	2.154	19.443***
		(0.000)	(0.34)5		(0.000)	(0.001)	(0.142)	(0.000)
	Tot Grants	4.3853**	5.132**	20.722***		2.859*	0.391	9.308***
		(0.037)	(0.023)	(0.000)		(0.091)	(0.532)	(0.002)
	Tot Loans	10.627***	20.266***	4.895**	27.623***		3.342*	41.634***
		(0.001)	(0.000)	(0.027)	(0.000)		(0.068)	(0.000)
	Spread ODA	5.028**	0.497	8.237***	0.123	0.178		2.561
		(0.025)	(0.481)	(0.004)	(0.726)	(0.673)		(0.109)
	D. Relief	10.451***	1.120	4.99**	4.956**	0.004	2.561	
		(0.001)	(0.290)	(0.025)	(0.026)	(0.951)	(0.109)	

Chi^2 parameters with probabilities in brackets $^{*}p < 0.10,^{**}\ p < 0.05,^{***}\ p < 0.01$.

TABLE 2: Granger Causality Test for PVAR2

		Response Variable							
		Dom Rev	Tot loan	Govt. Inv	Tot Grant	Relief	Educ Exp	Health Exp	Spread ODA
Impulse Variable	Dom Rev		65.013***	1.052	47.062***	0.862	0.123	4.042**	0.410
			(0.000)	(0.305)	(0.000)	(0.353)	(0.725)	(0.044)	(0.522)
	Tot loan	81.379***		96.167***	115.33***	13.27***	11.89***	32.277***	17.108***
		(0.000)		(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
	Govt. Inv	0.015	1.19		26.642***	172.312***	0.2	0.045	0.506
		(0.903)	(0.275)		(0.000)	(0.000)	(0.654)	(0.832)	(0.477)
	Tot Grant	99.104***	2.939*	0.12		72.633***	13.701***	29.64***	9.225***
		(0.000)	(0.086)	(0.729)		(0.000)	(0.000)	(0.000)	(0.002)
	Relief	2.86*	11.394***	20.089***	16.635***		4.033**	0.192	14.862***
		(0.091)	(0.001)	(0.000)	(0.000)		(0.045)	(0.661)	(0.000)
	Educ Exp	2.366	209.167***	39.936***	258.147***	6.49***		0.244	0.817
		(0.124)	(0.000)	(0.000)	(0.000)	(0.011)		(0.622)	(0.366)
	Health Exp	41.872***	52.634***	26.749***	74.639***	31.385***	0.503		1.412
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.478)		(0.235)
	Spread ODA	4.503**	6.056***	15.641***	0.391	34.835***	0.251	0.265	
		(0.034)	(0.014)	(0.000)	(0.532)	(0.000)	(0.616)	(0.607)	

Chi^2 parameters with probabilities in brackets $^{*}p < 0.10,^{**}\ p < 0.05,^{***}\ p < 0.01$.