



The Effect of External Debt on Private Investment in Sub-Saharan Africa

A Thesis Submitted to
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By

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Declaration

I, Antehun Eshetu, do hereby declare that this thesis titled: **The Effect of External Debt on Private Investment in Sub-Saharan Africa** is entirely my own original work and has not been presented for higher degree at any other University or institute anywhere for the award of any academic degree, diploma or certificate. All references made to works of other persons have been duly acknowledged.

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Abstract

This study investigate the Effect of External debt on Private Investment in Sub Sahara. The objective of the study is to investigate whether the SSA external debt burden has contributed to weak private investment in the country. For this purpose, two hypotheses need to be tested. First, the debt-service ratio is expected to have a negative effect on private investment. Second, public investment is hypothesized to have positive effect on private investment. The study is carried out using the GMM and FE the time series panel data analyzed cover the period 2000 - 2019. Gross private investment (PRI) is specified as a function of the debt-service ratio (DSR), gross public investment (PUI), External debt stock (ED), GDP rate (GDPr), credit to private sector (CPS). The empirical findings provided evidence for debt overhang problem of the external debt stock accumulation. However, the empirical analysis reveals that the debt service ratio crowds out private investment as hypothesized. This would mean that the scarce resources available in the country are being used to meet the external debt obligations instead of being allocated to productive investment. Moreover, the results confirmed the positive impacts of public investment on private investment. The positive impact of public investment on private investment could also be witness for the absence of crowding out effect of external debt servicing. The econometric finding with respect to private sector credit also suggested the positive contribution on the private investment in sub Saharan African countries. All in all, the study concludes that the external debt stock overhang and external debt service ratio crowds out private investment in Sub Saharan Africa. While the Government recognizes the private sector to be the key engine of economic growth and poverty reduction, policy makers should raise productivity of capital and increase the demand for the private sector output. To this effect, it is also suggested that more resources should be allocated to the areas of agriculture and infrastructure. These measures would help to enhance conditions meant to attract more private investment in the countries.

Key words: External Debt, Debt Service, private investment, Debt Overhang and Crowding-out Effects, Econometric Modeling, Sub-Saharan Africa.

JEL Classification: F34, H54, C33

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Acronyms

AB-GMM	Arellano Bond General Moments Method
ADF	African Development Fund
CPS	.....	Credit to private sector
DSR	.....	Debt Services ratio
EDS	.....	External Debt Stock
FE	.....	Fixed Effect
GDP	.....	Gross Domestic Product
GMM	.....	Generalized Moments of Methods
GNI	.....	Gross National Income
GNP	.....	Gross National Product
GATT	.....	General Agreement on Tariffs and Trade
HICs	.....	Heavily Indebted Countries
HIPCs	.....	Heavily Indebted Poor Countries
IMF	.....	International Monetary Fund
LDCs	.....	Least Developed Countries
MDGs	.....	Millennium Development Goals
MDRI	.....	Multilateral Debt Relief Initiative
OLS	.....	Ordinary Least Square
OPEC	.....	Oil produced countries
PRI	.....	privet investment
PUI	.....	Public Investment
RE	.....	Random Effect
RGDP	.....	Real Growth Domestic Product
SAPS	.....	Structural adjustment policy
SSA	.....	Sub-Saharan Africa
USD	.....	United States Dollar
WB	.....	World Bank
WDI	.....	World Development Indicators

1 INTRODUCTORY BACKGROUND

1.1 Background of the study

Over the last four decades from 1970, developing countries received very large amounts of loans from abroad, which could boost their investment. But within the 1980s, they realized that repayment of their huge debt wasn't only an obstacle to the economic performance but also virtually impossible.

The onset of Mexico debt crisis in August 1982 revealed that the problem of external debt has assumed critical importance and increased worldwide policy makers' attention. in line with Ajayi (1991), the main factors of debt crisis are the oil shocks of 1973/74 and 1979/80. The oil price increases led to the deterioration in terms of trade resulting in balance of payments deficits. They contributed to an incredible increase within the liquidity availability of international credit for developing countries at very low interest rates. This encouraged oil importing countries to borrow abroad to pay the upper oil bills (Sachs and Larrain, 1995)

The adjustment programmes adopted in compliance with donor conditionality may additionally have contributed to the slump in investment. It's been documented that these programmes didn't reverse the declining trends in investment. The world Bank (1994:124) argued that Governments cut capital spending as a part of their fiscal stabilization, while the private sector adopted a wait-and-see attitude during the first phases of adjustment mindful of the irreversibility of investment decisions and also the reversibility of key policy changes.

Sustainable debt inflows are expected to possess a positive effect on investment. In traditional neoclassical models the flexibility of a country to borrow increases growth through investment, Notwithstanding, the debt stock had kept increasing over time, and has led to true of debt overhang, which has been identified as a key deterrent to private investment. A debt overhang occurs when outstanding debt is so large that it'll dampen the investment unless the debt service is reduced (Claessens and Diwan, 1989). Elbadawi et al (1996) confirm that there's a limit at which external debt accumulation stimulates investment. They argue that there's a threshold at which more external debt is detrimental to investment, both public and private.

Debt overhang is predicted to discourage private investors as they anticipate increased taxes to finance debt service within the future, hence reducing the expected returns on projects. Furthermore, financing public investment through excessive foreign borrowing could crowd out private investment via its effect on inflation and debt accumulation, which render the business environment uncertain. However crowding-in effects of public investment would seem through the long term efficiency effects of its infrastructural

component on private investment.

Poor investment response in Sub Saharan Africa could be a particular disappointment to those governments, which have reformed policy with the intention of making an investor-friendly environment. The first objective of those reforms is developmental, and private investment is considered fundamental element in economic performance (Gardiner, 2000). Poverty is sort of invariably linked to rural and concrete unemployment. Investment, particularly private investment, is important for creating new job opportunities within the economy.

On the other hand, when external debt is accumulated beyond a particular limit, it could contract economic growth by hampering investment. Many analysts believe that the poor investment and growth performance of several developing countries (including those in Sub-Saharan Africa) since the onset of the world debt crisis in 1982 is attributed partially to the disincentive effect of their external debt burden. This phenomenon is usually named because the "debt overhang" problem hypothesis. The debt overhang hypothesis asserts that if there's a probability that a country's future debt are going to be over its repayment ability, then the anticipated cost of debt servicing can depress domestic and foreign investments and thus harm growth. The debt overhang concept implies that when external debt grows sufficiently large, investors lower their expectation of future returns in anticipation of upper and progressively more discretionary taxes to repay the debt obligation so both domestic and foreign investments would be disheartened which successively will hamper investment and growth.

The adverse implication of external debt on investment and growth has also been explained through the other channel called "crowding out" effect hypothesis. This implies if a greater share of external debt disbursements or foreign capital is employed for external debt servicing, the remaining amount can be too small to finance domestic investments and thereby, impeding output. In other word, a high debt burden generally implies that a big portion of recent external loan disbursements or export receipts are devoted for external debt service obligation. If options for brief term income increases are exhausted, other area of government's spending and productive public investments are move accommodate the debt service obligation. Reducing public investment, if complementary to private investment, can ultimately cause a lower rate of growth (krugman, 1988, and sachs, 1989).

According to the IL0 (1995: 3) Africa's external debt is that the highest within the world as a proportion of GDP; some countries within the region are spending more than half of their export earnings to service foreign debts. The debts of the many African countries are so large in relevancy their exchange earnings potential that it'd be impossible to pay them off whether or not growth resumed and was sustained at unrealistically high levels.

Largely as a consequence of debt servicing, flow of capital from Africa is significantly quite flow of recent capital to the region.

As a results of deterioration within the terms and conditions of SSA's debt within the 1980s sub-Saharan Africa's debt export ratio (measured because the ratio of debt outstanding and disbursed to exports of products and services) doubled between 1980 and 1985, when it rose from 78.6% to 173.3%, and almost doubled again between 1985 and 1991 when it further increased to 329.4%. The ratio of actual to scheduled debt service payments of SSA countries deteriorated during the 1980s-falling from 66% in 1983 to 47% in 1989. Between 1989 and 1995, the typical ratio of actual debt service due to 58.9%. Further evidence of debt distress is found within the proven fact that in 1986, of the 44 countries in Africa had payments arrears. Also, between 1986 and 1987, SSA countries renegotiated their official bilateral debt through the Paris Club. within the mid-1980s SSA countries were officially classified as "debt distressed" (Klein, 1987). Within the 1990s SSA countries are classified as heavily indebted poor countries (World Bank, 1996). Finally, the massive burden of SSA debt constitutes a heavy obstacle to employment creation and growth as "investment resources for productive pursuits are consistently accustomed meet external debt service obligations" (ILO, 1995: 3).

Sub-Saharan Africa's total external debt stock, which was US\$84.049 billion in 1980, had jumped to US\$164.981 billion in 1988 and US\$190.206 billion in 1990. By 1995, SSA's total external debt stock amounted to US\$223.298 billion (World Bank data). Note that between 1980 and 1995, the debt stock increased by US\$139.249 billion or at an average annual rate of 6.7%. Related to the rising external debt stock has been a crushing debt service burden. From grade of US\$6.374 billion in 1980, the overall debt service on future debt rose to US\$12.264 billion in 1990 and so dipped to US\$8.784 billion in 1995 (due largely to rescheduling's and a few amount of debt forgiveness). The debt service ratio (measured by the ratio of actual debt service payments to exports of products and services), which was a simple 5.4% in 1970, jumped to 21.3% in 1985 before falling to 14.7% in 1995.

The external debt levels of SSA countries are on the increase within the past two decades, generating concerns among analysts and policy-makers a few looming debt distress threatening the region. While Africa's current external debt ratios appear manageable, the rapid growth in several countries is of concern (UNCTAD, 2016). From A level of US\$176.36 billion in 1990, the overall external debt stock for SSA rose to US\$235.94 billion in 1995, representing a rise from 58.2 per cent of the regional GDP to 72.0 per cent. For the years under study (1990-2013), the highest external debt-to-GDP ratio of 78.2 per cent was recorded in 1994. Standing at US\$213.44 in 2010, the overall external debt stock rose by US\$55.63 billion to achieve US\$269.08 billion at the end of

2010. External debt witnessed a rapid build-up within the 3 years following, to succeed in US\$367.51 billion in 2013 (World Bank, 2015). As of 2019, the total external debt in Sub-Saharan Africa reached 625 billion U.S. dollars. Overall, the foreign debt load has been increasing in Sub-Saharan African economies. In 2015, external debt stock in the region was measured at 439 billion U.S. dollars (World Bank, 2019). Thus, high growth of debt and indebtedness, indicated by accumulation of interest and principal arrears, has changed the flexibility of the countries to fulfill its obligation; this paper examines the structure of external debt accumulation and its implications on private investment.

1.2 Statement of the Problem

At the beginning of the 1980s, the debt crisis hit most of the least developed countries (LDCs). As a result, these countries experienced great difficulties to generate enough resources to meet both their debt-service payment and investment needs. During that period, the LDCs had to implement adjustment policies imposed by the World Bank and the IMF. These programmes put emphasis on foreign trade and neglected private investment aspects.

During the past year, however, a number of papers have appeared on this subject, including studies by Helliner(1989), Humphreys and Underwood(1988), Lancaster(1989), Mistry (1988), Stymne(1988), the United nations(1988), and weerasinghe(1988). Perhaps more significantly, the Group of Seven countries have acknowledged the seriousness of the problem through their decision at the June 1988 Toronto summit and at the annual meetings of the Fund and therefore the IBRD in September 1988 to produce more extensive debt relief for very low-income countries. Under this initiative, low-income countries are able to reschedule their debt over longer periods, enjoy lower interest rates on rescheduled debt, or receive partial debt forgiveness as ways of reducing their increasingly severe debt burdens.

In recent study, Senadza, B. (2017), the effect of external debt on economic growth in Sub-Saharan Africa (SSA). The finding of a negative relationship between external debt and growth. Oladipupo, (2019), External Debt, Investment and Economic Performance in Sub-Saharan Africa. The estimated results showed that the growth effect of external debt is negative while positive for investment. Also, the result of the interaction between external debt and investment is negative. Kengdo,(2019), The effect of external debt on domestic investment in sub-Saharan Africa (SSA). The Results show that external debt has a positive effect on domestic investment in SADC and EAC.

The evidence on African debt and debt burdens clearly indicates that sub-Saharan African countries face a serious and growing external debt problem. External debt as a ratio to GDP or to exports of goods and services for sub-Saharan countries has risen more than threefold since 1980 and now exceeds the comparable ratios for countries with recent debt-servicing problems and for the 15 heavily indebted countries identified in the Baker initiative. During the past five years more than half the sub-Saharan countries have incurred arrears on debt-service obligations or sought debt rescheduling (Green, 2015).

In recently, SSA counter's external debt stock reached 37.7% in 2019/20, there's high probability of "debt overhang" problem to arise; which might increase the number of repayments by increasing the difference within the actual and contractual value of repayments, thus ultimately increasing the debt servicing burden of a countries. An economy which experienced a fiscal deficit can finance the general public deficit by borrowing

domestically from a personal sector through financial institutions or from other international sources. Because of lack of a powerful private sector and well established banking industry the number of cash domestically available is very insignificant. In spite of this and other reasons, many poor countries borrow extensively from international lenders and other external sources.

Sub-Sahara African countries are plagued with its heavy external debt burden. The debt crisis, compounded by massive poverty and structural weaknesses, has made rapid and sustainable growth and development difficult in the country. One of the major reasons is that private investment is very low in sub-Sahara African. Theory reveals that debt overhang significantly impinges on private investment (Oscar Masabo, 2004).

Based on this paper intends to the consequences of External Debt stock and repair on private Investment to look at the debt overhang and crowding out effect hypothesis problem of external debt on private investment within the case of sub Saharan African counter's, the study aims to fulfil this research gap by examining the effect of external debt on private investment in sub Saharan Africa.

1.3 Research question

Based on the problem of the statement above, the following research questions are set

1. What is that the effect of external debt stock and servicing on private investment in Sub-Saharan Africa?
2. Are there external debt overhang/crowding-out effects on private investment in Sub-Saharan Africa?

1.4 Hypothesis

External borrowing constitutes large share of the resources meant to finance development plans within the LDCs. Development activities include, among others, employment creation and poverty alleviation. Yet, external debt isn't free of charge and it's provided under certain constraints that lenders place on the financial system. As a matter of fact, the structural adjustment programmes of the World Bank and therefore the IMF were initially meant to stimulate private investment. In line with the world Bank and also the IMF, a reduced role of the govt. Within the economy meant a reduction of barriers to private initiatives. But these programmes haven't brought out the expected results. Most economists argue that government infrastructural spending wasn't affected within the areas that were complementary to private investment. Others documented that the event projects were too ambitious which they became the so-called "white elephants" (Chhiberand Dailami, 1993).

In Sub-Saharan Africa countries, private investment remains very low, and external debt is taken into account as a key deterrent of private investment opportunities. During this context, two hypotheses are going to be tested:

1. The debt-service ratio has a negative impact on private investment.
2. Public investment crowds in private investment.

1.5 Objective of the study

1.5.1 General objective

The general objective of the study is to examine the effect of external debt on private investment in Sub-Saharan Africa.

1.5.2 Specific objective's

In order to achieve this general objective, the study has the following specific objectives

1. To find the effect of external debt stock and service on private investment in Sub-Saharan Africa.
2. To determine the existence of external debt overhang and crowding out effect on private investment in Sub-Saharan Africa.

1.6 Significance of the study

The findings of the study try to illustrate the effects of external debt on private investment, with emphasis on Sub-Saharan Africa. By analysing the effect of external debt on Sub-Saharan Africa private investment, the study contribute to providing an econometric basis. Additionally, realistic policy conclusions are taken on the idea of the results of the report, which might be useful for policy makers, planners and researchrs.

1.7 Organization of the paper

This study is organized as follows: The next chapter, chapter two will deals with the review of theoretical and empirical literature. The third chapter presents data and methods. The fourth chapter presents empirical results. The last chapter presents conclusion and policy implications.

2 REVIEW OF THEORETICAL LITREATURE AND EMPIRICAL EVIDENCES

This chapter reviews theoretical and empirical literature in an effort to spot methodological model and important variables to be employed in the study. Firstly, theoretical literature was reviewed, and so relevant empirical literature highlighting variables and other studies were reviewed to identify the gap.

2.1 Theoretical literature

2.1.1 Definitions and Thoughts of External Debt

External debt by definition represents money borrowed by a countries or a government from foreign lenders with a liability to pay back the debt plus interest attached on the debt during a currency within which the loan was made. Country which borrowed money may need to export its goods and resources to the lender countries or to the international market, to earn that borrowed foreign currency and to pay back (Panizza, 2008). External debt presents the outstanding amount of its actual or current liabilities that need a particular payment of principal plus some interest attached to that in future. It includes debt securities, bonds, notes, market instruments, loans, deposits and currency (Dias, 2010).

The external debt is commonly used as a source of finance, giving a brand new access to resources. It's important in such some way that the attitude of nations towards government's development strategy and its respect to trade policy and capabilities that external debt may be beneficial and not as a burden. The external debt gives ability to use internal debt for other purposes if needed. It allows various entities to finance growth opportunities that it'd not be ready to try this with their own funds and resources; it plays a task for financing investments and imports, enabling the developing country to achieve economic growth and increase its consumption. However, the other side of the external funding sometimes results in loosing ownership, come of a required return on investment like interest on lend money (Pradhan, 2009).

Total external debt consists of private and public external debt. Short-term debt includes all debt having an original maturity of 1 year or less and interest behind on long-term debt. Public external debt comprises long-term external obligations of public debtors, including the national government, political subdivisions or workplace of either, and autonomous public bodies, and external obligations of private debtors that are guaranteed for repayment by a public entity. Private external debt is private nonguaranteed external debt comprises long-term external obligations of private debtors that aren't guaranteed

for repayment by a public entity (Schclarek, 2004).

Based on this attitude, it's important to know the differences between public external debt and private external debt and the way they affect economic growth. In line with the Elmendorf and Mankiw (1999), public external debt will be analysed through the traditional view perspective or Ricardian equivalence theory. The Ricardian approach emphasizes the irrelevance of the debt, while the traditional view highlights the mixture demand within the short fundamental quantity, while the effect of crowding out in the long term.

According to Elmendorf and Mankiw (1999) government debt analysis, the view is predicated on the idea that the tax reduction is adequate the rise in debt level. within the short-run, lower taxes can cause the rise in households' income and aggregate demand, which successively increases the value. Keeping both prices and wages constant, higher demand affects the assembly level. Thus government will make a correction which is caused because of the debt increase by the tax cut or government expenditure growth. Starting from the Keynesian value equation, the definition of the present account is predicated on the sum of net exports and investment. The present account is positive when the country becomes a net lender to the other economies and therefore the negative accounting is indicated when the country becomes a borrower from the international market. In additional details, negative accounting represents domestic investment undertaken by foreign residents (NFI) (Elmendorf & Mankiw, 1999). Thus, under the belief of net foreign investment is equal with the online export of a specific nation, the sum of personal saving plus government saving is equal with investment in domestic or foreign country. If the govt. decides to scale back taxes, it can affect private savings. so as to stay the balance, the private savings should increase by the precise amount of a decrease publicly savings and this assumption relies on Ricardian equivalence theory. However the traditional view claims that private savings increase less comparing to the decrease of public savings which is tax minus government expenditure and also the difference leads to the fall in national savings. If the sum of personal saving and public saving is low, then in line with the equality assumption and to stay the balance the sum of domestic investment plus net foreign investment should follow it or reduce. The decline in investment affects the domestic capital stock negatively and also the lower capital stock reduces the assembly level and also the value.

Additionally to the present, the marginal product of capital will increase yet because the interest rates and returns per capital. On the opposite hand, the decreasing labor productivity reduces wages and it implies that total income of the household are going to be lower. Furthermore, the equality between net foreign investment and net exports indicates that the changes in net foreign investment are the identical as changes within

the net exports (Elmendorf & Mankiw, 1999). Thus the lower net foreign investments implies that deficit is growing and it'll result in an financial condition called twin deficits (Mankiw, 2002).

Furthermore, high government debt can cause difficulties to borrow extra money so as to cover increasing deficit. When it's difficult to borrow money from the international lender countries and institutions government can attempt to increase revenues by using seignior age. Seignior age means monetary authorities issue extra money and increase inflation which may result in hyperinflation. Likewise, the upper level of government debt requires increasing taxes and this higher level tax will result in Dead Weight Loss. Thus another problem are present because of this tax increase. The high public external debt level can make country more at risk of the financial crisis within the international market and it can result in defaulting . Then it can form the poor image and low reliability of the country by the lender countries and institutions (Elmendorf & Mankiw, 1999).

2.1.2 Historical Background of External Debt Accumulation and Crisis

Between the Second war and early 1970s, the globe economy experienced rather a protracted period of expansion. During that point, developed countries and a few of the LDCs had high rates of growth. Beside high rates of growth, that they had low unemployment and inflation rates. Although there have been some short sub-periods of slumps, the final characteristic of the amount had not changed. In accordance with these, the degree of international trade was growing. Tariffs and other forms of trade barriers were abolished or reduced to facilitate the international movement of products. International organizations like the GATT and therefore the IMF tried to reduce the barriers on international movement of capital yet.

Of course, not all the LDCs kept pace with these developments. While some countries like South Korea and Singapore exceeded the growth rates of the developed countries, some other LDCs like Brazil, Chile couldn't do the identical. The beneficiaries of this world order were the countries that have reached a specific level of business production. These countries usually produced more labor intensive manufacturing products relative to the developed countries. They benefited from the growing import demand of the developed countries and from the final reduction in tariffs.

Labor-intensive production in some LDCs served two ends for the developed countries (Ndiaye A., 2002). First, LDCs earned considerable amount of foreign exchange that in turn financed LDC imports from the developed countries. Second, developed countries imported their needs for labor-intensive goods and therefore directed its resources towards capital-intensive production. The latter curbed the rise in real wages and kept the profit rates at high levels in the developed countries. Two other factors, namely multina-

tional companies and the direct import of workforce by developed countries, contributed to these developments. Multinational companies moved their labor-intensive production to LDCs where the wage rates were lower. By this way, profit rates were kept at higher levels. Besides, the exports of LDCs by means of these companies were increased. This parallelly increased the foreign exchange earnings of these countries (Krugman and Obstfeld, 2000). The import of workforce by developed countries was another important factor in keeping the wage level under a certain level in developed countries. On the other hand such a workforce movement decreased the unemployment rate and increased the workers' remittance earnings to LDCs.

During this period, developed countries accumulated a considerable amount of savings, which exceeded their investment needs. These savings were then transmitted to the LDCs in the form of long or medium-term loans at relatively low level of interest rates. This kind of capital movement, in turn, enabled the LDCs to invest more than their savings would have allowed. An important factor behind the high growth rates in some LDCs during that time was the supply of such foreign finance. Intensive public investment, which was usually financed by the foreign credit, became the engine of fast growth and industrialization process in the LDCs. The use of foreign savings for the government investment expenditures was appropriate since it would not crowd out the private investment.

Furthermore, by use of the external sources, LDCs governments were able to preserve domestic consumption and investment patterns and carried on their political popularity (Benerbaiha, 2002). The government was able to offset some of the side effects of the adjustment policies, which would have undermined its popularity.

However, the developments through the end of the 1960s showed signs of stagnation. The supply of the US dollar after the Vietnam War weakened the US dollar. It began to depreciate against the other major currencies. The stability of exchange rates has been lost. A period of speculation in money markets followed then.

However, the speculation spread also to the raw material markets. Oil market was one of these markets in which the speculation affected the world economy heavily. Oil producing countries benefited from that speculation. Through the end of 1973, OPEC countries declared that they increased their oil prices by fourfold.

OPEC began to gain enormous level of oil revenues after this price jump. They preferred to invest a considerable part of their oil revenue at international banks. Transmitting these funds to the government of LDCs as loans had been an important investment area for the international banks. As a result, huge amounts of funds were invested in LDCs (Ajayi, 1991). Low levels of interest rates combined with higher rates of (cost-push) inflation turned the real rate of interest negative. This process facilitated getting into debt

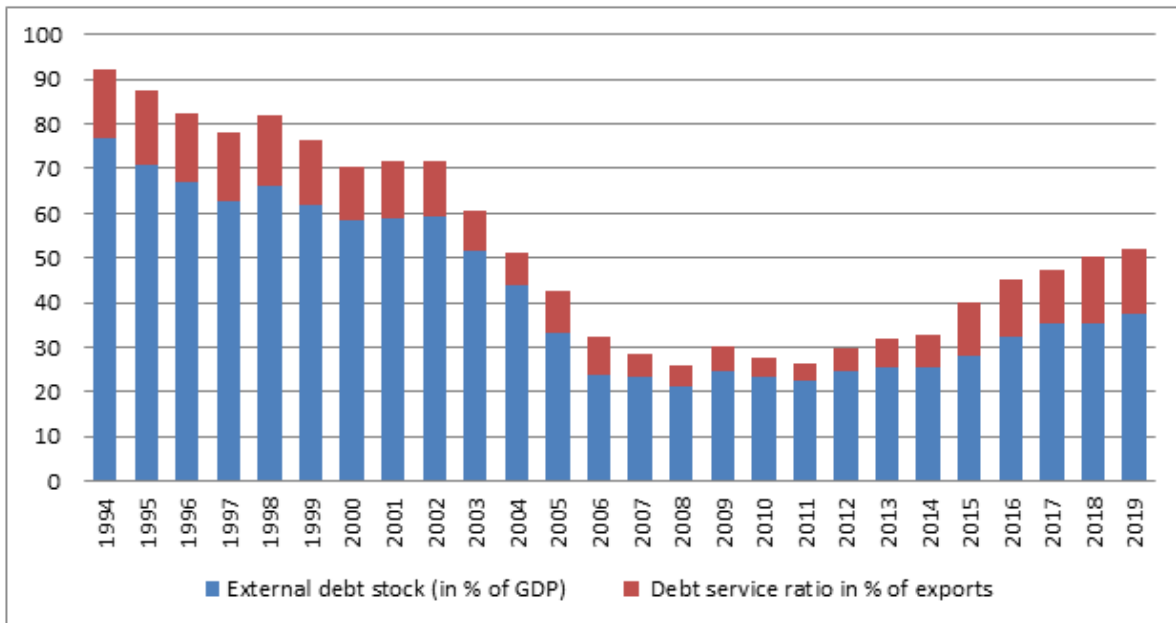
by LDCs. At first, while the new loans were easily available, the service of the former debts had not caused much problem. The international banks were not careful enough in that they had not considered the potential problems, which would have arisen in the near future if the indebtedness continued with that pace.

The second oil shock of 1979/80, however, put an end to this honeymoon. The growth rates of the developed countries began to decrease while inflation rates accelerated. The developed countries introduced contractionary policies. As regards to the LDCs, the important repercussion of these policies was the decline in the import demand for their exports. Besides that, the United States' growing budget deficits and tight monetary policy pulled the interest rates upwards. Which caused the appreciation of the US dollar with respect to the other major currencies. Increasing interest rates and the appreciation of the US dollar increased the service burden of the LDCs for two reasons. First, since LDCs loans were at floating interest rates, their debt burden would increase as the interest rates moved up. Second, since debts would be serviced particularly in US dollar terms, the governments of the debtor countries had to generate more of domestic resources to service a given amount of the debt.

As soon as the debt service problems emerged, international banks ceased to extend loans. This exacerbated the debt problem. The debtor countries, which had not found fresh foreign finance, could not service their debts appropriately. Uncertainty prevailed in international financial markets. At the end, the debt crises came into being officially recognized with the declaration of moratorium by the government of Mexico on August 1982.

2.1.3 Overview of Debt in Sub Saharan Africa Countries

Figure bellow presents the historical development of sub-Saharan counter's external debt stock and debt service with measurements of debt burden (1994-2019) (Figure 1).

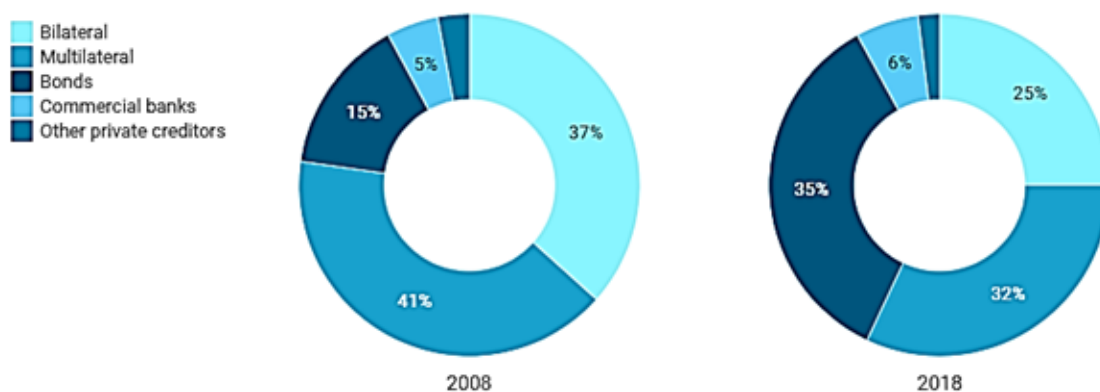


Source: World Development bank indicators

Figure 1: External Debt Stock and Debt Service in sub-Saharan countries (1994-2019)

2.1.4 Sources of Credit in Sub Saharan Countries

From Figure 2 in 2008, Sub-Saharan Africa's general government borrowed mostly from official creditors (multilateral at 41% and bilateral at 37%) with private creditors making up only 23% (15% bonds) of all general government borrowing. A decade later, general government is now borrowing 43% from private lenders, of which the largest share (35%) is coming from bonds, thus reducing the share from official creditors from 78% in 2008 to 57% (32%-multilateral and 25%-bilateral) in 2018.



Source: World Development bank indicators

Figure 2: Sources of Credit in sub-Saharan countries 2008 and 2018

2.1.5 Theoretical Concepts of Debt Overhang and Private Investment

Theoretical framework of investment behavior has been focusing on the neoclassical flexible accelerator model, accommodating the institutional and macroeconomic peculiarities of developing countries. The neoclassical flexible accelerator model suggested by Jorgenson (1967) combines the user cost of capital and therefore the accelerator effect to clarify investment behavior. This theory stems from views expressed by Keynes (1936) that fixed capital investment depends on firm's expectations of demand relative to existing capacity and their ability to get investment.

The development literature has long been concerned with investment thanks to its importance for the speed of growth of per capita output within the economy (IMF, 1989). However, variety of things are found to constrain private investment. Most of those are associated with uncertainty and risk induced by the debt overhang (Pindyck, 1991).

A debt overhang is defined as a condition where outstanding debt is so large that investment are going to be inefficiently low without debt service reduction (Claessens and Diwan, 1989). Claessens and Diwan (1989) recognize that debt overhang condition has two effects like the illiquidity effects and also the disincentive effects. The illiquidity effect refers to the conditions during which, given the burden of huge external debt with scarce liquidity around, capital formation reaches a minimum level after years of austerity and low-income growth. The disincentive effect refers to the depressed level of both public and private investment for future growth, as an oversized share of future income stream is predicted to be affected to resource transfer abroad. Thus the two effects combined could push the debtor country into a downward investment spiral.

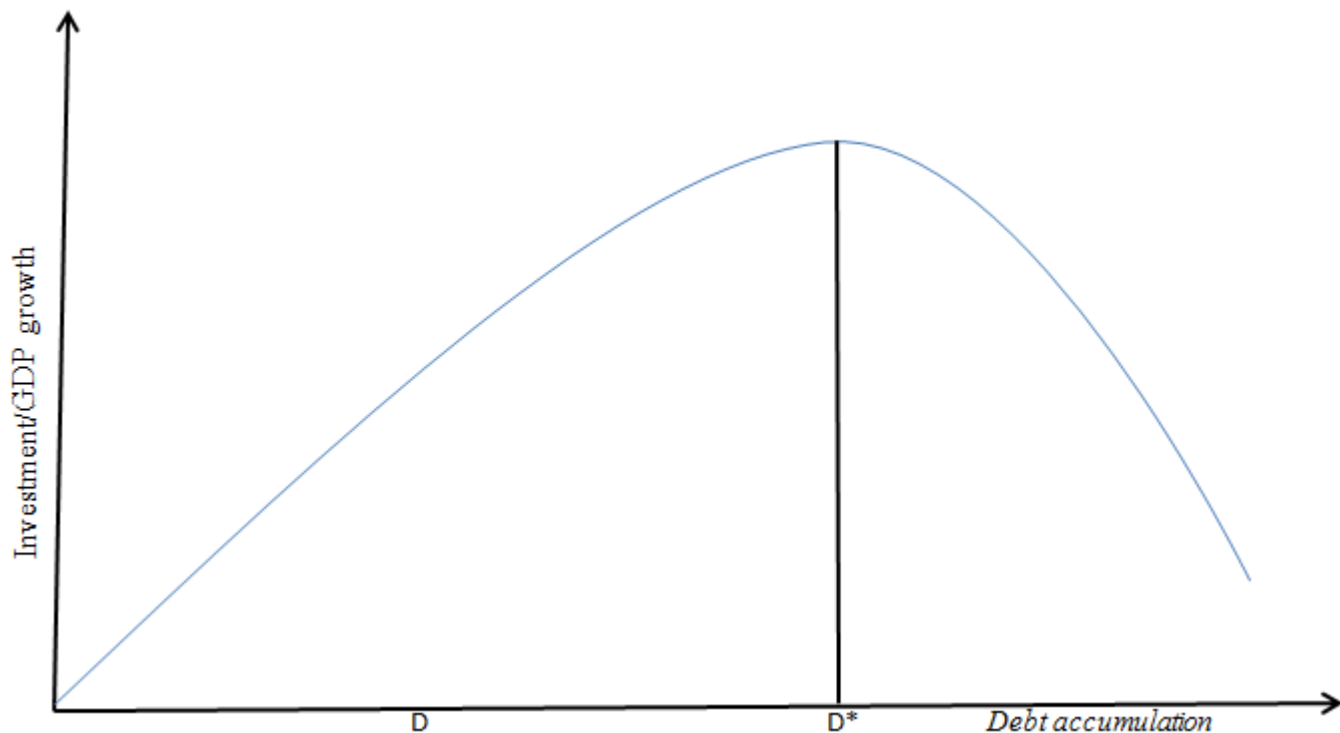
The theory of debt overhang implies that the fall in investment is that the existence of an important debt burden reduces the debtor country's incentives to invest. Krugman (1989) and Raffinot (1998) argue that this happens when the country is unable to totally service its debt and also the actual payments rely on its economic performance. If output increases as a results of higher investment, some additional proceeds accrue to creditors within the type of higher debt service payments. During this way, debt acts as a marginal tax on investment. If there's some likelihood that the longer term debt are larger than the country's repayment ability, then expected debt service are an increasing function of investment (Krugman, 1989 and Sachs, 1989). The investment returns would therefore face a high marginal tax by external creditors and both domestic and foreign private investment is discouraged being reduced by large debt stocks.

Krugman (1987) argues that a significant external debt has potential negative effect on private investment. In fact, private economic agents in an exceedingly debtor country yet as potential foreign investors see a very high debt burden as a future tax on the return to capital. this suggests that the govt should increase taxes within the future so as to

finance the high debt service payments. That increase in taxes means a lower after-tax return on capital and a reduced incentive to speculate and, as a result, results in slower growth. If the private sector expects to be taxed more heavily within the future, private domestic investment also will be depressed in a very way that investors will place their capital abroad. The flight from taxed sectors can result in panics within which expectations of a reduced assets feed expectation of upper tax rates, further increasing the incentives to drag out. Such unstable equilibriums can cause a flight from money causing capital flight (Ndikumana and Boyce, 2002) and rapid de capitalization of the economy (Eaton, 1987).

Because capital accumulated abroad by the private sector usually can not be tapped by the general public sector, liquidity constraints also can appear when the private sector has sizable foreign assets. Therefore the illiquidity and disincentive effects can push highly indebted economies into a downward spiral, which could further diminish debtor's commitment and capacity for debt repayment and, since debt acts as a tax on debtor's resources, profitable private investment opportunities are going to be depressed.

The concept of debt Laffer curve has been used with respect to a borrower's prospects for repaying loans after a critical limit of debt accumulation is reached (Krugman and Froot (1989); Elbadawi, 1997). The model assumes that the investment disincentives related to debt stock can be large enough to position a country on the incorrect side of the debt Laffer curve (Figure 3).



Source: Author

Figure 3: Debt Laffer curve

The theory predicts that debt below the critical point tends to stimulate investment and growth, because the resource flows help to finance imports of capital. Accumulated debt on the opposite hand, due partly to the necessity to fulfill outstanding interest payments, works against investment and GDP growth. At all points to the left of D debt generates new investments and GDP growth. At D , both investment and GDP growth increase until the peak point at D^* . After point D^* , additional debts entail a decline in both investment and GDP. D^* is therefore the limit at which further debt accumulation starts to affect negatively investment and growth.

The investment incentives required for debt reduction to be welfare improving are possible provided that the domestic tax structure is extremely distortive. In such cases, tax reductions would lead to higher welfare. Even when the creditor is assumed to be ready to extract the debtor Government's entire revenue receipts, investment, large enough to position a country on the incorrect side of the debt Laffer curve, are often present as long as the domestic legal system is very distortive. Bulow and Rogoff (1989) cite estimates of creditors' extraction ability to be between 3 and 15 percent of debtor country GNP. If these are interpreted as estimates of taxation, it seems difficult to believe that debtor countries can be on the incorrect side of debtor laffer curve. However, Bulow (1989) suggested that regardless of the case the existence of heavy debt burden deters private

investment.

According to Faruqee (1992), debt-service payments reduce the domestic resources available for investment, and poor international creditworthiness reduces access to foreign savings. For the domestic investors, the existence of huge debt overhang reduces the long run returns to investment because a high proportion of the forthcoming returns must be went to repay the existing debt (Borenzstein, 1990).

A debt overhang is additionally a significant source of uncertainty: the scale of future transfers to creditors is uncertain; macroeconomic policy is uncertain; and also the rate is uncertain. The combined risks of changes in relative prices, taxation and aggregate demand reduces investment by both domestic and foreign entrepreneurs. According to Rodrik (1989), the choice to speculate is intrinsically tied to the extent of uncertainty about the long run evolution of the economy. A high level of uncertainty will reduce the propensity to speculate of even risk-neutral entrepreneurs insofar because it increases the chance that highly productive capacity installed today are going to be of no use tomorrow if economic conditions deteriorate sharply. Under these circumstances, entrepreneurs would favor to attend for the uncertainty to dissipate instead of make decision to take a position today. In turn, low investment today increases the probability of economic deterioration tomorrow.

Because public investment is extremely important in developing countries, it becomes important to require account of its complementarity and substitutability with private investment. Theoretically, crowding in and crowding out effects of public investment could happen at the identical time and, a priori, the net effect on private investment is uncertain.

However, the crowding-out effect of public investment in developing countries might not be felt through higher taxes and increased interest rates as in industrial countries, rather it's likely to require one or all the subsequent three forms. Firstly, limited market-size in many developing countries implies that public investment in productive sectors may displace private ventures, causing the important crowding out. Secondly, final crowding-out may happen as both agents endure the identical and sometimes limited credit pool. Finally, financing public investment through its effect on inflation and debt accumulation may generate uncertainty within the business environment (Fitzgerald et al., 1992).

Theories on debt overhang have also suggested that inflation reduces private investment by increasing risk, reducing average lending maturities, distorting the informational content of relative prices, and indicating macroeconomic instability (Dornbusch and Reynoso, 1989; Oshikoya, 1994). Hjertholm et al (1998) argue that the long run high debt-servicing costs implied by the upper external debt increase the likelihood that the govt will engage in inflationary financing or precipitate currency depreciation thanks to excess demand

for foreign currency created by the debt-servicing needs. These uncertainties dampen the inducement to take a position and lead to lower investment and slow growth yet. A recent expanding strand of the literature on investment decision has emphasized on the irreversible nature of investment (Dixit and Pindyck, 1994). When investment is tough to reverse, uncertainty creates a worth to awaiting more information so on avoid getting cursed unprofitable and irreversible projects. During macroeconomic adjustment, the credibility of policy changes is a further problem (Rodrik, 1989), and therefore the possibility of policy reversal can have serious consequences for real private capital expenditures. Investors favor to hold financial capital, which is less complicated to comprehend if conditions end up to be adverse, and which retains the choice to get real capital if optimism continues. For this reason, there are frequently long lags within the investment response to adjustment (Servén and Solimano, 1993).

In conclusion, heavy external debt burden may have adverse effects on private investment through various channels. First, resources went to service the general public debt may force out Government investment in those areas where large complementarities exist between public and personal capital outlay. Second, domestic agents might want to transfer funds abroad rather than investing them due to the fear that future tax increase are needed to service the external debt. Third, foreign direct investment would be discouraged by the increasing likelihood that the govt. may resort to imposition of restrictions on external payments. And if foreign direct investment is complementary to personal investment, the latter will fall also. Fourth, when firms hold an oversized stock of foreign currency liabilities, they become liable to exchange rate movements. Lastly, when a nominal depreciation arises, the burden of debt and therefore the risk to default increase. this could lead domestic banks to tighten credit restrictions and thus depress private investment.

2.1.6 Theoretical Concepts of Crowding out effect and Private Investment

Liquidity and solvency of countries' are important indices in dealing with external debt impacts on economic growth (Ajayi, 1991). A liquidity constraint refers to the inability of a country to service its debts now in the amount initially contracted, due to lack of enough cash on hand to repay current obligations. While, the solvency refers to whether the value of a country's liabilities exceeds the ability to pay at any time; it also includes of incapability of country servicing its debt in the long run (Ajayi, 1991). If a country debt-service ratio and the debt-GDP ratio are high, the country will be illiquid and its ability to remain solvent will also be impaired. Therefore, the county needs to pursue accelerated growth in order to reduce its debt problems, and more importantly, to break out of its low income status.

A liquidity constraint represents a "crowding out" effect of external debt. An increase in external debt servicing reduces funds available (export earning) and leaves less avenues for expansion of investments. It indirectly also affects a country's ability to borrow further from external resources, thereby, put pressure on domestic borrowing and leading to crowding out (Taylor, L.1994). This liquidity constraint negatively affects a private investment as well a public and publicly guaranteed investments. The damaging impact of debt servicing on growth is attributable to the reduction of government expenditure, resulting from debt-induced liquidity constraints.

According to Fosu (1996: 19) a liquidity constraint which arises from the increase in debt servicing requirements may shift the budget away from the social sector or public investment to meet debt obligation. He underlined that public expenditure is a major determinant of the economic activities in many functional sectors. He also argued that debt can additionally influence economic growth via its effect on the productivity of investment and decrease output growth by diminishing productivity and as a result of the adverse changes in investment mix. Thus, crowding out effect discourages capital formation and encouraging capital flight due to tax increase expectation (Cohen, 1993). According to Claessens and his collaborators (1990: 108), the debt burden affects the current flows of resources available to the country. That is, resources used to service debt may crowd out public investment and hence discourage private investment, because of the complementarities between private and public investment. As debt servicing demands higher resources, so the share of public investment will shrink as most governments cannot lower consumption. When there is less public spending on basic infrastructure, private investment will also be discouraged. The stiff demand of high debt service payments on the budget results in forced reduction in public investment mainly reduced spending on education and health and private investments are also discouraged. This concept is related with the crowding-out effect which is common in most of highly indebted poor countries.

In order to repay external debt, courtiers are needed to convert the domestic resources into foreign exchange in which debt must be repaid. So the desperate demand for foreign exchange to service debt often results in foreign aid resources and other foreign exchange resources being routinely and frequently diverted to finance debt service payments.

2.2 Empirical Evidences

The IMF (1989) assessed the investment behavior and growth of gross domestic product (GDP) in heavily indebted countries before and after the beginning of external debt crisis. The investment-GDP ratios were found 10 percentage points lower in 1987 than in 1975-1979 and seven percentage points not up to those in 1980-1981. The study con-

cluded that poor investment performance in highly indebted economies and debt service payment problems were associated with the debt overhang disincentive effect.

Huitzinga (1987), Purcell and Orlanski (1988) have checked whether the disincentives of debt overhang are important enough to provide rise to a debt Laffer curve by relating the secondary market value of developing countries' debt and standard creditworthiness variables. These relationships may be to derive a country' debt Laffer curves supported market perceptions. The extent of debt, that the market price is maximized, may be compared with the particular outstanding external debt.

Borensztein (1990) found that debt overhang had an adverse effect on private investment in Philippines. He however argued that it's credit-unworthiness related to debt overhang that basically matters for private investment instead of the disincentive effect of mounting debt-to-GDP ratio, lyoha (1996) found similar results for sub-saharan africa. He concluded that heavy debt burden acts to reduce private investment through both the debt overhang and also the crowding out effect.

Elbadawi et al. (1997) empirically investigated the debt overhang disincentive and crowding out effects, using panel data for a cross section of 53 low and lower middleincome countries over the period of 1970-1990. The model used the investment-to- GDP ratio as a function of the speed of growth, the debt service-to-export ratio, the debt to-revenue ratio, the rate, the illiteracy rate which proxies for the amount of human capital underdevelopment, and therefore the lagged value of the speed of investment. The estimate results suggested that the coefficients for debt service-to-export and also the debt-to-revenue variables were significant. The debt service ratio had a significant negative coefficient. This result supports the crowding out effect on private investment.

Getahun (1994: 4), Ethiopian debt crisis isn't different from the remainder other Least Developed countries in line with (Berhanu Nega, 1999: 387), external debt wont to create a comparatively good macroeconomic environment and stable political condition, which successively used as leverage for crowding in investment.

Deshpande (1997) examined experience of 13 highly indebted countries from 1971 to 1992. He found a significantly negative relationship (1%) between external debt levels and investment. He argued that debt overhang impacts on private investment through two channels. the primary channel was an on the spot disincentive effect, which suggests a fear from appropriation of funds invested for debt servicing. The second channel is indirect effect via adjustment measures undertaken to face debt servicing difficulties like import cuts and decreased public sector investment. Hjertholm et al. (1998) found the identical results, using panel data for a cross section of 53 low and lower-middle income countries over the amount between 1970-1999.

Hailemariam (2010) investigated the existence of future relationship between external

debt and growth in Ethiopia. He explores that this level of external debt flow features a positive while the past debt accumulation includes a negative impact on growth and private investment. This confirms the existence of debt overhang hypothesis within the Ethiopian economy. Furthermore, within the future, both external debt stock in addition as total debt servicing features a negative and significant impact on economic growth and private sector capital accumulation activity.

Sahr (1998) concluded that debt overhang accounted for a large share of private investment slowdown over the period of study as hypothesized. The coefficient of debt service ratio was negatively significant at 1 percent confidence level. And a percentage increase in debt service payment causes private investment to decline by 0.23 percentage points. Empirical studies always include public investment in private investment with regard to external debt models for developing countries and most have found evidence in support in crowding in effect. Blejer and Khan (1984) estimated investment model during which the crowding-in infrastructural component of public investment is captured by its time trend and also the crowding-out effect by the deviation from this trend. They found a major positive coefficient on the previous and a significant negative coefficient on the latter suggesting that the non-infrastructural component of public investment has crowding out effect (Balassa, 1988 and Lauman, 1990).

Cohen's (1993) results on the correlation between developing countries (LDCs) debt and private investment within the 1980s showed that the extent of stock of debt doesn't appear to have much power to clarify the slowdown of investment in developing countries during the 1980s. It's the particular flows of net transfers that matter. He found that the particular service of debt crowded out private investment.

UNECA (1998) investigated the dynamic effects of external debt on private investment rates in Africa. The paper shows how once a rustic passes the critical threshold of external debt accumulation, negative effects on private investment develop. The empirical findings show that almost all African countries couldn't reverse this trend over the period 1970-1994. The paper argues that the external debt problem in Africa led to personal investment slump. Another finding of UNECA (1998) is that the channel through which the debt overhang affects private investment starts at a computed threshold of 33.5% of debt accumulation to GDP. The study further points out that "in addition to the debt accumulated, the debt-service burden which crowds out domestic expenditure needed for supporting productive capacity further compounds the matter, making it difficult to stimulate investment and subsequently reducing growth".

Sahr (1998) examined the debt overhang effect on private investment in Republic of Sierra Leone from 1970 to 1995. Private investment was defined as a function of external debt to GDP ratio (DOD), debt service to export ratio (DSR), public sector investment (PUI)

in percentage of GDP, real GDP growth (RG), credit to private sector (CD) as a ratio of GDP, foreign direct investment (FDI), and domestic inflation as a percentage of consumer price index (CPI).

Were (2001) assessed the impact of external debt on private investment in Kenya for the period of 1970-1999. The findings showed that current debt flows stimulate private investment while past debt flows deter investment. He also suggested that current debt service ratio crowds out private investment at a statistical significance. However variation in past debt service ratio was found to positively affect private investment at 3 percentage points. additionally the study revealed that public investment crowds privately investment though the coefficient isn't statistically significant.

Dawit W. and Yemisirach A. (2001: 7) using Engel-Granger ECM regression supported the cause and effect relationship between output equation, investment equation and import demand equation concluded that there's no evidence of debt overhang and a crowding out effect of debt on investment in Ethiopia.

Oshikoya (1994), in a regression analysis of private investment in 4 low and 4 middle income African countries over 1970s and 1980s, found that public investment is positively associated with private investment in both groups but with a stronger complementary impact within the middle-income countries. At the identical time, the study revealed that debt service ratio negatively affects private investment moreover because the macroeconomic uncertainty and instability during the 1980s. Cardoso (1993) reported negative effects of real rate and terms of trade on private investment. These results were corroborated by Faruquee (1992) and Hadjimichael and Ghura (1995) in their study for sub-saharan africa. Aizenman and Marion (1999) highlighted the similar results in a sample of 46 developing countries over the period of 1970 and 1992. the same was revealed by Mbang and Sikod (2001) in Cameroon.

Servén (1997) studied Sub-Saharan African private investment over the period between 1980 and 1990 and located that there was a strong negative effect of macroeconomic uncertainty on private investment particularly when macroeconomic uncertainty is measured by the important rate of exchange. In 1998, Servén extended the study on a large data series covering 94 developing countries over the period between 1970 and 1995 and found similar results. These are corroborated by Patillo (1998) in her study on Ghana.

Finally, various studies use proxies for political instability, and find them significant (Bleaney, 1993; Schneider and Frey, 1985). However, within the few models where the latter are used, their explanatory power is limited. as an example, Servén (1998) included seven indicators of political instability in an investment model for developing countries. None of which were statistically significant and only three of them had the expected negative sign. Hadjimichael and Ghura (1995) also found a positive and statistically

insignificant association between private investment and freedom for 32 developing countries during the period 1986-1992.

Gerald (1994) employed simple neo-classical model to evaluate whether capital imports can increase output; and whether there are enough exports to fulfill the external debt servicing in 31 Sub-Saharan African countries. His model suggested that actual surplus available for debt service could also be much smaller and will cause debt overhang. Focusing on one of the Heavily Indebted Poor Countries (HIPC), were (2001) analysed the debt overhang problem in Kenya and tried to search out evidence for its impact on economic growth. Using time series data from 1970-1995, this study failed to find any adverse impact of debt servicing on economic growth; however, it confirmed some crowding-out effects on private investment.

Audu (2004) examined the impact of external debt on economic growth and public investment in Nigeria from 1970-2002 using ordinary least square method. The result revealed that the external debt service features a negative impact on economic growth and there's a negative correlation between external debt overhang and public investment.

Alemayehu G. and Daniel Z. (1998) clearly confirmed that, the extent of Ethiopia debt is beyond the capacity of the country to its servicing requirements (existence of debt overhang problem). Although, the new debt initiative may have a notify lessen the debt problem, it by no means alleviated the crisis.

Argaw, H. (2013), investigated the impact of external debt on economic growth in Ethiopia employing a macro econometric model estimated for 2000 -2010. The empirical findings reveal that external debt doesn't affect economic growth. The results indicated that debt service payment has positive relation with gross domestic product in addition the interchange reserve has positive relation with GDP indicating that external debt in Ethiopian has positive impact on economic growth instead of depress it. Furthermore, the result also confirms that there's no sign of debt overhang which negatively affects economic growth.

Befekadu (2000: 24) used a technique of eye-balling to test the debt-overhang effect on investment. He argued that the debt-overhang hypothesis didn't seem to carry in Ethiopian case. Using similar methodology, Sesay (1998: 47) concluded that the effect of long-term foreign borrowing on growth had mixed results.

Eshetu and Mekonnen (1992: 24) estimated the determinate of private investment in Ethiopia using the Hendry (1983) approach of Error Correction Model supported general to specific approach and conclude that public investment, import and former level of investment are the most significant factors in explaining private investment in Ethiopia. Hence, they rejected the debt overhang hypothesis within the short-run with the possibility of its impact within the long- run.

Jonse G. (2002: 98-103) using structure of the Chowdhury Model analysed the impact of external debt on economic growth of Ethiopia. He discovered that the expansion of total external debt of Ethiopia has positive effect on growth of output, and debt overhang effect isn't hold in Ethiopian situation. Growth rate of total debt service ratio is statistically insignificant, which suggested that there's also no evidence of the crowding out effect of debt service payment on investment within the Ethiopian economy.

Senadza, B., Fiagbe, K., & Quartey, P. (2017), this paper examines the effect of external debt on economic growth in Sub-Saharan Africa (SSA) in view of an upsurge in the level of external debt in many countries on the continent Design/methodology/approach: The paper uses annual data for 39 SSA countries from 1990 to 2013 and employs the System Generalised Methods of Moments (GMM) estimation technique. The paper finds that external debt negatively affects economic growth in SSA. Categorization of countries based on per capita income however does not affect the external debt-growth nexus, neither does there exist a non-linear relationship between external debt and economic growth. The finding of a negative relationship between external debt and growth does not necessarily imply that SSA countries should cut back on foreign borrowing in order to boost growth.

Kengdo, A. A. N., Ndeffo, L. N., & Avom, D. (2019), this paper investigates the effect of external debt on domestic investment in sub-Saharan Africa (SSA) during the period 1980-2017. It focuses on four zones in SSA (EAC, ECOWAS, CEMAC and SADC) and the methodology adopted is the Generalized Method of Moments (GMM). The Results show that external debt has a positive effect on domestic investment in SADC and EAC, with bearable debt threshold, which account for 74.33% of Gross Domestic Product (GDP) in the EAC zone. For CEMAC and ECOWAS, the effect of external debt on domestic investment is rather negative, but for a debt threshold below 94.73% of GDP in CEMAC, the effect on investment is positive.

Mutiu Abimbola Oyinlola, Abdulfatai A. Adedeji and Rasheed Oluwaseun Oladipupo, (2019), the effect of external debt and investment on economic performance in sub-Saharan Africa. The study utilized a panel of 26 sub-Saharan Africa (SSA) countries between 1999 and 2014 using system General Method of Moments (GMM). The estimated results showed that the growth effect of external debt is negative while positive for investment. Also, the result of the interaction between external debt and investment is negative. The growth effect of inflation is negative while that of trade openness is positive. In addition, the growth effects of the interactions are positive and statistically significant for inflation and external debt, trade openness and external debt and crisis and external debt. More so, the non-linear effect of external debt is positive.

Table1:Summary of the literature

No	Author/s(year)	Methodology	Major findings
1	Elbadawi, I., Ndulu, B. J., & Ndung'u, N. (1997). Debt overhang and economic growth in Sub-Saharan Africa. <i>External finance for low-income countries</i> , 49-76.	Panel data model for FE &RE model	The estimate results suggested that the coefficients for debt service-to-export and also the debt to revenue variables were significant at the 1 percent level. The debt service ratio had a significant negative coefficient.
2	Fosu, A. K. (1996). The impact of external debt on economic growth in Sub-Saharan Africa. <i>Journal of economic development</i> , 21(1), 93-118.	Panel data model for FE &RE model	He also argued that debt can additionally influence economic growth via its effect on the productivity of investment and decrease output growth by diminishing productivity and as a result of the adverse changes in investment mix.
3	Deshpande, A. (1997). The debt overhang and the disincentive to invest. <i>Journal of development Economics</i> , 52(1), 169-187.	Structural model	He argued that debt overhang impacts on private investment through two channels. The primary channel was an on the spot disincentive effect, which suggests a fear from appropriation of funds invested for debt servicing. The second channel is indirect effect via adjustment measures undertaken to face debt servicing difficulties like import cuts and decreased public sector investment.
4	Mohanty, A. K. (2017). External debt and economic growth in Ethiopia: A time series econometrics approach. <i>International Journal of Research in Social</i>	OLS	He explores that this level of external debt features a positive while the past debt accumulation includes a negative impact on growth and private investment. Furthermore, within the future, both external debts stock in addition as total debt servicing features a negative and significant impact on economic

	<i>Sciences</i> , 7(10), 574-602.		growth and private sector capital accumulation activity.
5	Sahr (1998) <i>The impact of external debt on private investment in a low-income economy: the case of Sierra Leone</i> (Doctoral dissertation, UNITED NATIONS).	VEC	The coefficient of debt service ratio was negatively significant at 1 percent confidence level. Public investment in private investment with regard to External debt models for developing countries and most have found evidence in support in crowding in effect. They found a major positive coefficient on the previous and a significant negative coefficient on the latter suggesting that the non-infrastructure component of public investment has crowding out effect
6	Cohen, D. (1993). Low Investment and Large LDC Debt in the 1980's. <i>The American Economic Review</i> , 437-449.	OLS	He found that the particular service of debt crowded out private investment.
7	UNECA (1998), External debt and economic growth in sub-Saharan African countries: An econometric study.	Hansen's Threshold Autoregressive (TAR) model	The debt overhang affects private investment starts at a computed threshold of 33.5% of debt accumulation to GDP. The study further points out that "in addition to the debt accumulated, the debt-service burden which crowds out domestic expenditure needed for supporting productive capacity further compounds the matter, making it difficult to stimulate investment and subsequently reducing growth".
8	Were, M. (2001). The impact of external debt on economic growth and private investments in Kenya: An empirical assessment. <i>Kenya</i>	Hansen's Threshold Autoregressive (TAR) model	He also suggested that current debt service ratio crowds out private investment at a statistical significance of 12%. However variation in past debt service ratio was found to positively affect private investment at 3

	<i>Institute for Public Policy Research and Analysis.</i>		percentage points.
9	Argaw, H. (2013). <i>THE IMPACT OF EXTERNAL DEBT ON ECONOMIC GROWTH OF ETHIOPIA</i> (Doctoral dissertation, St. Mary's University).	VEC	The empirical findings reveal that external debt does not affect economic growth. The results indicated that debt service payment has positive relation with gross domestic product as well the foreign exchange reserve has positive relation with GDP indicating that external debt in Ethiopian has positive impact on economic growth rather than depress it. Furthermore, the result also confirms that there is no sign of debt overhang which negatively affects economic growth.
10	Oshikoya, T. W. (1994). Macroeconomic determinants of domestic private investment in Africa: An empirical analysis. <i>Economic development and cultural change</i> , 42(3), 573-596	Hansen's Threshold Autoregressive (TAR) model	Found that public investment is positively associated with private investment in both groups but with a stronger complementary impact within the middle-income countries. At the identical time, the study revealed that debt service ratio negatively affects private investment moreover because the macroeconomic uncertainty and instability during the 1980s.
11	Serven, L. (1997). Irreversibility, uncertainty and private investment: Analytical issues and some lessons for Africa. <i>Journal of African Economies</i> , 6(3), 229-268.	Structural model	Empirical evidence on the negative association between investment performance and instability measures using a large cross-country time-series data set. The comparative evidence suggests that uncertainty and instability are important factors behind Africa's poor investment record over the last two decades.
12	Hadjimichael, M., & Ghura, D. (1995). Public policies and private savings and investment in Sub-Saharan	Structural model	The main findings of the analysis are as follows: (i) policies effective in stimulating private savings and investment include those that keep the rate of inflation low, reduce

	investigation.		deepening, and lower the external debt burden; (ii) measures that promote structural reforms and reduce the budget deficit (without lowering government investment) help to raise private investment; and (iii) declines in government savings are only partially offset by increases in private savings.
13	FITZ GERALD, J. D. (1994). Life after debt. <i>Administration (Dublin)</i> , 42(2), 123-140.	simple neo-classical model	His model suggested that actual surplus available for debt service could also be much smaller and will cause debt overhang.
14	Amin, A. A., & Audu, I. (2006). External debt, investment and economic growth: Evidence from Nigeria.	VAR	The result revealed that the external debt service features a negative impact on economic growth and there's a negative correlation between external debt overhang and public investment.
15	Weeks, J., Alemayehu, G., Daniel, Z., Dawit, W., & Jonse, D. (2004). Source of growth in Ethiopia. <i>Centre for Development Policy and Research Report</i> , (10).	OLS	The extent of Ethiopia debt is beyond the capacity of the country to its servicing requirements (existence of debt overhang problem). Although, the new debt initiative may have anotify lessen the debt problem, it by no means alleviated the crisis.
16	Degefe, B. (2018). <i>Ethiopia's External Debt: the impact and the way forward</i> (pp. 89-128). Routledge.	VEC	He argued that the debt-overhang hypothesis didn't seem to carry in Ethiopian case.
17	Claessens, S. (1990). The debt laffer curve: Some estimates. <i>World Development</i> , 18(12), 1671-1677.	Structural model	The empirical evidence suggests that only a few indebted countries are on the wrong side of their Debt Laffer curve.
18	Geda, A. (2001).	ECM	Conclude that public investment, import and

	performance in post-Derg Ethiopia. <i>Northeast African Studies</i> , 159-204.		significant factors in explaining private investment in Ethiopia. Hence, they rejected the debt overhang hypothesis within the short-run with the possibility of its impact within the long- run.
19	LETA, J. G. (2002). <i>SCHOOL OF GRADUATE STUDIES FACULTY OF BUSINESS AND ECONOMICS</i> (Doctoral dissertation, ADDIS ABABA UNIVERSITY).	Chowdhury Model	He discovered that the expansion of total external debt of Ethiopia has positive effect on growth of output, and debt overhang effect isn't hold in Ethiopian situation. Growth rate of total debt service ratio is statistically insignificant, which suggested that there's also no evidence of the crowding out effect of debt service payment on investment within the Ethiopian economy.
20	Mbanga, G. N., & Sikod, F. (2001). Macroeconomic effects of internal debt servicing in Cameroon. <i>African Journal of Economic Policy</i> , 8(2), 13-24.	ARDL	The study revealed that debt service ratio negatively affects private investment moreover because the macroeconomic uncertainty and instability during the 1980s.

2.3 Evaluation of the theoretical literature

Theoretical and empirical literature evaluated that the effect of external debt on private investment of a country, mainly in two basic terms: Debts overhang effect and crowding out effect. The debt is said to be over hanged when the country's external debt exceeds its capacity of repayment and it's measured by ratio of debt to GDP. Higher debt burden enforces the govt to impose higher tax for repayment of the loan. This higher tax, in turn, discourages investment, since both the existing and potential investors daunted by the taxing away of their return. So, debt overhang causes squeezing of investment, instability of macroeconomic performance, impairing of economic growth and makes difficult for the country to escape from poverty.

The debt overhang effect is not limited only to constraining effect on investment, but also diminishes factor productivity growth. Due to the later effect, the government will be less willing to undertake difficult and costly investment. As a result investment may be misallocated from a long term and high risk irreversible investments, which are more conducive to long run productivity, to investment with quick return. Besides, investment on human capital and technology, which have long term effect on economic development, will also be weakened. In nut shell, debt overhang worsen economic performance by changing both the quality and level of investments and in turn adversely affects economic growth of the country.

The relationship between the investment and debt accumulation is represented by "debt Laffer curve". It is a backward bending growth curve, which symbolizes the external debt up to certain threshold level stimulates growth, however, when the debt level surpasses the debt servicing capacity of the country, it will negatively affects the economic growth. The threshold represents a debt overhang that delineates the positive and negative effect of external debt.

Literature on crowding out effect of external debt on private investment are also reviewed in this unit; the crowding out effect is captured by the ratio of debt service to exports of goods and non-factor service. As external debt of a country increases, it will reduce fund (export earning) available for the expansion of investment, since the fund will be utilized for the repayment of loans. This effect discourages capital formation and encourages capital flight. It has also determinant effect on government expenditure. The government will be forced to shift resource from social and economic infrastructure development to servicing of debt, which diminishes productivity as well deteriorate the quality of investment mix. Since, the government spending has complimentary with private investment; lesser investment on infrastructure negatively affects private investment. The country's

foreign reserve will also frequently divert for loan repayment, even the foreign aid sometimes used for the repayment of the loan.

Empirical studies on the effect of external debt on private investment have also reviewed in this unit, Elbadawi and his collaborators (1996: 69-82) concluded that high debt burden deters economic growth based on a survey made on 99 developing countries. Fosu (1996), on their independent surveys of external debt effect on economic growth on Sub-Saharan African countries found out that massive growth of external debt have given rise to deleterious effect on investment and growth of sub-Saharan African countries, both through the debt overhang and crowding out effect.

However, their findings differ from country to country as they use different models and different sample of data. Several empirical studies have been developed to assess the external debt overhang disincentive and crowding out effects on private investment in developing countries, mainly by using OLS estimation methods. Most studies find one or more debt variables to be significantly and negatively correlated with private investment. This study using panel data employed the generalized moment method, fixed effect and Random Effect model over the period of 2000-2019. The variables included in the studies are private investment as dependent variables; stock of external debt, GDP growth rate, Debt service ratio, credit to private sector and public investment are included as explanatory variables. This study builds on the existing literature and empirically investigates the potential effect of external debt on private investment in Sub Saharan Africa countries. It is expected that the current study will make a substantial contribution to the debate on this important issue by shedding some light on the phenomenon in Sub Saharan Africa countries.

3 DATA SOURCES, METHODOLOGY & MODEL SPECIFICATION

3.1 Data sources

This study employed data sourced from the world Development Indicators (WDI) as issued by the world Bank and also the World Economic Outlook database, as provided by the International monetary fund (IMF). The study employed balanced panel data from 20 sub-Saharan African countries for the period 2000-2019 with 400 annual time series observations.

3.2 Methodology & Model Specification

3.2.1 Theoretical framework of private investment

The sharp fall in investment rate in many developing countries following the debt crisis of the early 1980s led to the inclusion of debt burden as a key deterrent of private investment. The Assumption of accelerator model is the theory that investment is determined follows as:

1. Investment is determined from the difference between the desired level of capital and the capital that survives from the past.
2. The capital that survives from the past is a constant proportion of past capital.
3. The desired level of capital is proportional to the expected level of output.
4. The level of capital, actual or expected, is proportional to the level of output, actual or expected.
5. If the economy is operating at full utilization of capital then investment is proportion to the expected change in output for the period ahead.
6. The expected change in output in the future will be the same as the latest known change in output.

The debt overhang is expected to discourage domestic private and foreign investors as they anticipate confiscatory taxes to finance the debt service in the future, hence making the expected returns on projects uncertain. Most of the above highlighted empirical studies have shown negative association between private investment and External debt. To examine the relationship between private investment and the external debt, a macroeconomic model is developed. The model follows closely Fitz Gerald et al (1992), and

Alemayehu (1997). According to the simple accelerator model; private investment (I_{pt}) is defined as the difference between the desired capital stock (k_{pt}^*) and the inherited from the previous period (k_{pt-1}).

That is:

$$I_{pt} = \lambda_t(k_{pt}^* - k_{pt-1}) \quad 1$$

Where, λ_t represents an adjustment coefficient reflecting implementation lags, functional constraints or uncertainty about future conditions.

The desired private capital stock for the current year (k_{pt}) depends up on the output(Y_t); the shock of public capital already installed (k_{gt-1}), credit to private sector(CPS_t); Debt service ratio (DSR_t), Stock of external debt(E_xD_t) and then previous level of external debt(E_xD_{t-1}) . Thus the desired level of capital stock is expressed as:

$$k_{pt}^* = \alpha_1 Y_t + \alpha_2 k_{gt-1} + \alpha_3 CPS_t + \alpha_4 DSR_t + \alpha_5 E_xD_t + \alpha_5 E_xD_{t-1} \quad 2$$

Substituting equation (2) in equation (1), gives:

$$I_{pt} = \lambda_t[(\alpha_1 Y_t + \alpha_2 k_{gt-1} + \alpha_3 CPS_t + \alpha_4 DSR_t + \alpha_5 E_xD_t + \alpha_5 E_xD_{t-1}) - k_{pt-1}] \quad 3$$

Take the first difference of equation (3). This gives the following result:

$$I_{pt} - I_{pt-1} = \lambda_t \alpha_1 Y_t + \lambda_t \alpha_2 k_{gt-1} + \lambda_t \alpha_3 CPS_t + \lambda_t \alpha_4 DSR_t + \lambda_t \alpha_5 E_xD_t + \lambda_t \alpha_5 E_xD_{t-1} - \lambda_t k_{pt-1} \quad 4$$

Let, $\beta_i = \alpha_i \lambda_t$ and from the definition $\Delta k_{gt-1} = I_{gt-1}$ and $k_{pt-1} - I_{pt-1}$. Hence equation (4) can be written as:

$$I_{pt} - I_{pt-1} = \beta_1 \Delta Y_t + \beta_2 \Delta I_{gt-1} + \beta_3 \Delta PSC_t + \beta_4 \Delta DSR_t + \beta_5 \Delta E_xD_t + \beta_6 \Delta E_xD_{t-1} - \lambda_t \Delta I_{pt-1} + I_{pt-1} \quad 5$$

Replacing ΔE_xD_t by $(\Delta E_xD_t - \Delta E_xD_{t-1})$ and ΔE_xD_{t-1} by $(\Delta E_xD_{t-1} - \Delta E_xD_{t-2})$ in equation (5) and collecting like terms. Thus it possible to write equation (5) as:

$$I_{pt} - I_{pt-1} = \beta_1 \Delta Y_t + \beta_2 \Delta I_{gt-1} + \beta_3 \Delta PSC_t + \beta_4 \Delta DSR_t + \beta_5 \Delta E_xD_t + (\beta_6 - \beta_5) E_xD_{t-1} + \beta_7 E_xD_{t-2} + (1 - \lambda) I_{pt-1} + \mu \quad 6$$

We impose the linear restriction that $(\beta_6 - \beta_5)$ is not equal to zero, so that the variable representing debt overhang E_xD_{t-1} is non-zero. This analysis will be tasted in the analysis section. The variables are defined as follows: I_{pt} and I_{pt-1} are private investments at time t and t-1 respectively, whilst I_{gt-1} is public investment at time t-1. E_xD_t , E_xD_{t-1} and E_xD_{t-2} are stocks of external debt at time t, t-1 and t-2 respectively. Y_t , PSC_t , DSR_t and E_xD_t are as defined earlier. Finally, μ is assumed a white noise disturbance term.

Then it possible to write the theoretical functional form of private investment as:

$$PRI_t = f(ED_t, DSR_t, GDP_r_t, PUI_t, PSC_t)$$

Where,

PRI_t = Private investment as a ratio of GDP

ED_t = Stock of external debt as a ratio of GNI

DSR_t = Debt service as a ratio of export earnings

$GDPPr_t$ = Gross Domestic Product rate

PUI_t = Public Investment as a ratio of GDP

PSC_t = Credit to private sector (% of GDP) provided by the banking sector

3.2.2 Description of variables and expected signs

External debt stock from 1980's onwards the disincentive effect of external debt on investment and growth, which is debt overhang, is taken into account as one of the main cause for the poor performance of the many developing countries. To countries this effect is included the standard debt overhang measure, total debt to income ratio within the econometrics model. Normally a higher ratio shows a higher debt burden; during this study we expect a negative impact from total debt GNI ratio on private investment. The variable for analysis is calculated using total external debt and Gross value (GNI), both are extracted from the world Bank Data base.

Debt service as ratio of export along with the debt overhang effect, the debt crowding out effect is additionally studied by different researchers like Krugman (1988) and Sachs (1989). This is often the case when indebted poor countries transfer resources, including economic aid and interchange resources to service their accumulated debt. The equivalent ratio which may trap the crowding out effect is that the total debt service export ratio. The study expects a negative impact of the ratio on private investment. The data are taken from the world Bank data base.

Gross Domestic Product this can be the value of all goods and services produced domestically. The sign is expected to be positive.

Public investment one needs to take care on the link between public and private investment. In developing countries, private investment and public investment could also be related although there's uncertainty about whether public sector investment raises or lowers private investment (Chhiber A. and M. Dailami, 1993; Amin, 1998, Blejer and Khan, 1984).

Public investment can cause crowding-out effects when it utilizes scarce financial resources that may preferably be available to the private sector. Additionally, crowding out can occur if public sector investment produces marketable goods that compete with private output. Furthermore, the financing of public sector investment by issuance of debt or through taxes will lower the resources available to the private sector and thus depress private investment activity. Yet, public investment associated with the event of

infrastructure (roads, telecommunications, etc.) and provision of public goods is complementary to private investment. Such public investment enhances the possibilities for private investment and increases the demand for private sector output. Consequently, it is argued that the marginal productivity of private investment is enhanced by public investment. Hence, the sign is expected to be positive.

Private sector credit is expected to minimize the financial constraints of investors and also the complaints from the private sector about credit unavailability, all at once gives a hint to expect a positive relationship with private investment. This might be seen within the study of Chibber and Monsoor (2001) where domestic private sector credit is found to own a positive effect on private sectors investment.

As the availability of finance increases, people have access to finance for the specified project and raises private investment rates. Financial development creates favorable environment by creating link with decision to invest and increase technological specialization and selection of projects to be launched and more risk diversification and creates more efficient and further investment.

The econometric model private investment equation is specified as follows.

$$PRI_t = \beta_0 + \beta_1 ED_t + \beta_2 DSR_t + \beta_3 GDP_r_t + \beta_4 PUI_t + \beta_5 PSC_t + \epsilon_t \quad 8$$

Equation (8) is our main equation of focus in this study. We estimate equation (8) by the model using system Generalized Moments of Methods (GMM), Fixed and Random effect. The advantage of a fixed effects model is that it provides consistent estimates in the presence of country-specific effects that are correlated with the explanatory variables in the model. In a traditional fixed effects formulation, However, the estimate of the lagged variable may be biased downward. To overcome this problem, we follow Pattillo and others (2002) and also provide estimates based on the system GMM methodology of Blundell and Bond (1998). A further advantage of this method is that it addresses the potential endogeneity of the variables.

3.2.3 Dynamic panel methodology

The nature of data used for the study allows for panel data methodology. Panel data methodology allows researchers to undertake cross-sectional observations over several time periods and also control for individual heterogeneity due to hidden factors which, if neglected in time-series or cross-section estimations, leads to biased results (Baltagi, 1995). The general form of the panel data model can be specified as:

$$Y_{it} = \alpha + \beta X_{it} + \epsilon_{it} \quad 9$$

Where the subscript i denotes the cross-sectional dimension and t represents the time-series dimension. Y_{it} represents the dependent variable in the model. α is the constant

and β represents the coefficients. X_{it} contains the set of explanatory variables in the estimation model. ϵ_{it} is the error term. According to Baltagi (2005), most panel data applications have been limited to a single regression with error components disturbances which is explained as:

$$Y_{it} = \alpha + \beta X_{it} + \mu_i + \lambda_i + \nu_{it} \quad 10$$

Where the μ_i is an unobserved individual specific effect. λ_i is an unobserved time specific effect. ν_{it} is a zero mean random disturbance with variance δ^2 and the other variables, are as explained in Equation (9).

The nature of the test to be carried out requires that a dynamic panel methodology is applied. In addition to other benefits associated with panel data methodology, dynamic panel allows for measuring the speed of adjustment (through the lagged dependent variable) using the partial adjustment based approach. The dynamic panel approach accounts for individual effects, which mostly is the cross-sectional (Baltagi, 2005) even though the time-specific effects can also be included.

The dynamic error components regression is characterized by the presence of a lagged dependent variable among the regressors i.e.

$$Y_{it} = Y_{it-1} + \beta X_{it} + \mu_i + \lambda_i + \nu_{it} \quad 11$$

Where Y_{it} is the dependent variable in country i for time t , Y_{it-1} is the dependent variable in the previous period, βX_{it} is a vector of explanatory variables, $i = 1 \dots 20$, $t = 1 \dots 20$.

3.2.4 Generalized Moments of Methods (GMM)

The system GMM could be a superior technique among all the dynamic model estimators since it's an inbuilt mechanism to resolve problems with endogeneity arising from omitted variables, endogeneity of explanatory variables, and also the presence of measurement error, amongst others (Caselli et al., 1996; Roodman, 2006 and Hesse, 2008).

In this particular study, the Arellano Bond General Moments Method (AB-GMM (1991)) approach, first proposed by Holtz-Eakin, Newey, and Rosen (1988), was used because of its popularity in dynamic panel modelling. The Arellano-Bond GMM approach is designed with the flexibility to handle the econometric problems which will arise in estimating Equation (8). It also uses the differencing (first differencing) approach to wipe out the time invariant country-specific effects (which is also correlated with the explanatory variables) and also the problem of autocorrelation which can be caused by the inclusion of the lagged variable. Lastly, the AB approach has been designed for small-T (20 years) and large-N (20 countries) panels (Mileva, 2007).

Therefore, during this paper is used panel data methodology for empirical system General

Moments Method is employed. Several estimation techniques are used while using the panel data approach. particularly, the fixed effect and random effect models are the most prominent ones and that they are going to be employed in this paper as well.

3.2.5 The Fixed Effect (FE)

In the formulation of the fixed effect the intercept in the regression is allowed to differ among individual units in recognition of the fact that each cross-sectional unit might have some special characteristics of its own. That is, the model assumes that differences across units can be captured in differences in the constant term. They α_i are random variables that capture unobserved heterogeneity. The model allows each cross-sectional unit to have a different intercept term though all slopes are the same, so that

$$Y_{it} = \beta X_{it}' + \alpha_i + \mu_{it} \quad 12$$

Where μ_{it} is iid over i and t.

The subscript i to the intercept term suggest that the intercepts across the individuals are different, but that each individual intercept does not vary over time. The FE is appropriate in situations where the individual specific effect might be correlated with one or more regressors (Green, 2003, Gujrati,2003).

3.2.6 Random Effect (RE)

In contrast to the FE, the RE assumes that the unobserved individual effect is a randomly draw from a much larger population with a constant mean (Gujrati, 2003). The individual intercept is then expressed as a deviation from this constant mean value. The RE has an advantage over the FE in that it is economical in terms of degrees of freedom, since we do not have to estimate N cross-sectional intercepts. The RE is appropriate in situations where the random intercept of each cross-sectional unit is uncorrelated with the regressors. The basic idea is to start with Equation (12). However, instead of treating β_{1i} as fixed, it is assumed to be a random variable with a mean value of β_1 . Then the value of the intercept for individual entity can be expressed as:

$$\alpha_i = \alpha + \epsilon_i \text{ Where } i = 1, 2, 3 \dots n. \quad 13$$

The random error term is assumed to be distributed with a zero mean and constant variance: Substituting (13) into (12), the model can be written as:

$$Y_{it} = X_{it}'\beta + \alpha + \epsilon_i + \mu_{it}$$

$$Y_{it} = X_{it}'\beta + \alpha_i + \omega_i \quad 14$$

The composite error term ω_i consists of two components: ϵ_i is the cross-sectional or individual-specific error component and μ_{it} is the combined time series and cross-sectional

error component, given that $\epsilon_i \sim (0 \ \delta^2)$ $\mu_{it} \sim (0 \ \delta_v^2)$ ϵ_i is independent of the X_{it} (Gujirati, 2003).

3.3 Diagnostic tests

3.3.1 Sargan test

The Sargan test and autocorrelation test are the two main diagnostic tests relevant to this study. The Sargan test for over-identifying restrictions is used to determine if the instruments are suitable. The null hypothesis states that "the instruments as a group are exogenous". Consequently, a higher p-value is preferred. Thus, if the p-value is less than 0.05, we reject the null hypothesis in favour of the alternate. The null hypothesis of no autocorrelation is applied to the differenced residuals (Mileva, 2007).

3.3.2 Hausman test Specification

Test Following Hausman (1978) test specification either Fixed effect or random effect model is appropriate based on the given data and helps to find out the parameters to be estimated in the model. It can be employed based on the following tests.

Null hypothesis H0: $\text{Cov} [X_{it}, \nu_{it}] = 0$ which states explanatory variables are uncorrelated with variation across the region. When Ho is true RE is more efficient than FE model, because both β_{RE} and β_{FE} ; are consistence but looking at the standard error of both estimator, $\text{SE} [\beta_{RE}]$ less than $\text{SE} [\beta_{FE}]$, so using RE is more efficient.

Alternative Hypothesis H1: $\text{Cov} [X_{it}, \nu_{it}] \neq 0$ when explanatory variables are correlated with variation across the region, then β_{RE} is solely consistent and only FE model is appropriate. Hence, when Ho is rejecting the difference is systematically justified and FE model uses to interpret the estimated coefficients.

In other hypothesis if result:

H0: Select RE (P-value greater than 0.05)

H1: Select FE (P-value less than 0.05)

4 Empirical Results

4.1 Descriptive Statistics

Table 1: Summary of descriptive statistics

Variable		Mean	Std.Dev.	Min	Max	Obs.
PRI	Overall	15.48878	7.681832	2.439552	72.16368	N=400
	between		5.623584	7.066845	30.53092	n=20
	within		5.375108	-1.207752	57.12149	T=20
ED	Overall	57.36107	72.64872	3.895006	610.4519	N=400
	between		43.32679	10.83556	209.8877	n=20
	within		59.07636	-133.3338	457.9252	T=20
DSr	Overall	8.146006	9.801192	0.5415884	112.7534	N=400
	between		5.015748	1.610178	23.92305	n=20
	within		8.491385	-14.2862	106.3955	T=20
GDPg	Overall	4.380398	4.393327	-30.14513	26.41732	N=400
	between		1.69858	1.600003	9.123658	n=20
	within		4.068533	-28.66347	24.86038	T=20
PUI	Overall	17.49724	10.34355	-16.9400	47.847	N=400
	between		9.2569	1.6779	39.0462	n=20
	within		5.037789	-1.120658	35.94449	T=20
PSC	Overall	11.93878	7.763486	-3.794031	41.06567	N=400
	between		6.313051	3.701281	25.96434	n=20
	within		4.723869	-1.641043	27.95157	T=20

Source: Computed by authors using stata 15

A summary of the descriptive statistics of the variables employed in all the models is reported in Table 1. The average private investment for the sample is 15.48 percent. The maximum private investment per GDP of 72.16% was recorded by Congo, Rep. as far back as 2016, while Malawi recorded the minimum figure of 2.43% in 2000. The mean of external debt stock and debt service ratio is 57.36% and 8.14 percent, respectively. The external debt variables peaked at 610.45% and 112.75% for external debt stock/GDP and external debt service/export and that they were recorded by Liberia in 2003 and Republic of Sierra Leone in 2001, respectively. The mean GDP growth for the sample is 4.38 percent. The highest GDP growth of 26.41% was recorded by Sierra Leone as far back as 2002, while Liberia recorded the lowest figure of -30.14 in 2003. The average values of public investment/GDP and private sector credit/GDP are 17.49 and 11.93 percent respectively. The standard deviation measures the degree to which variables disperse from their mean. Figures from the Table 1 show that the majority of the variables are

very stable, as reflected in their standard deviation figures.

4.2 Correlation Matrix

Table 2: Correlation matrix of the variables in the sample

	PRI	ED	DSr	GDP _r	PUI	PSC
PRI	1.0000					
ED	-0.1248*	1.0000				
DSr	-0.0746	0.2343*	1.0000			
GDP _r	-0.0432	-0.2201*	-0.0276	1.0000		
PUI	0.3468*	-0.3004	-0.0200	0.0850	1.0000	
PSC	0.2182	-0.3839	-0.1604*	-0.0797	0.4513*	1.0000

Source: Computed by authors using stata 15

The results of the correlation matrix of the variables within the study presented in Table 2, reveals a significant negative correlation between external debt stock and economic growth with a correlation of -0.2201. The result indicates that a rise within the level of external debt will cause a decrease in economic growth. This result's partly due to the mismanagement of external debt within the region. It also suggests that the weak economic growth is also because the available earnings from investment and taxes meant for development are now being employed for servicing interest and other obligations arising from the debt. As a contrast, it also implies that when debt is appropriately applied and also the economy is performing well, the funds generated would be enough to service the external debt to a degree where there'll be no negative impact on the economy. The result shows that external debt includes a significant negative correlation with private investment, public investment and private sector credit with a correction coefficients of -0.1248, -0.3004 and -0.3839, respectively while private investment and public investment contains a significant positive correlation coefficient of 0.3468. The correlation between private investment and private sector credit is additionally positive, which implies that Africa has a wonderful chance to use investment.

4.3 Estimation and Discussion

As is shown in table (3) which presents a cross country investigation of the results of the required outcomes of System GMM and Fixed effect models and also the result favors FE model estimation and also the interpretation based on output with the given sign of coefficients and significant levels.

Table 3: Estimates system generalized method of moment (GMM) and Fixed effect (FE)

Variables	GMM	FE
L.PRI	0.746*** (0.10069)	
ED	-0.111* (0.04848)	-0.077* (0.031009)
DSr	-0.077*** (0.02095)	-0.216*** (0.05726)
GDP _r	0.0012 (0.00262)	0.0035 (0.01244)
PUI	0.1304*** (0.04421)	0.147** (0.054367)
PSC	0.225** (0.07019)	0.329*** (0.09947)
Constant	11.729*** (0.2.1694)	10.070*** (0.631664)
Observation	380	380

Source: Computed by authors using stata 15

Note: *, ** and *** denotes significance at 5,1 and 0.1 percent level respectively

As shown from table 3 presents determinant factors of private investment in Sub Saharan Africa countries using GMM and FE model specification where it allows for heterogeneity or individuality in the analysis and accounts country specific parameters across countries and time invariant factors get rid from the model. External debt stock, debt service ratio, public investment and private sector credit significant variables that are substantially affects private investments whereas gross domestic product rate insignificant at level. In the contrary external debt stock and debt service ratio affects private investment negatively associated while growth domestic product rate, public investment and private sector credit is positively associated. Thus, detailed investigations of parameters are as follows.

The system GMM and FE results show that, the estimated coefficient of external debt stock is negative and statistically significant at 5 percent level. The result suggests the debt overhang effect of the debt stock on private investment. That's a 1 percentage in-

crease in external debt stock in relative to 0.111 percentage decrease in private investment. This result's consistent with the fixed effects model results. The result's in agreement with the findings of green and Villanueva (1997), serven and solimano (1993), elbadawi et al (1996), Fosu (1999), deshpande(1997), and chowdhury(2001). Therefore, the results of both system GMM and fixed Effect models support the debt overhang problem of the external debt stock on private investment.

As it seen from table 3 the estimated coefficient debt service ratio significant and has negatively effect on private investment and also the system GMM and FE results a percentage increase in debt service ratio causes private investment to decline by 0.077 and 0.216 percentage points, respectively. This confirms the 'crowding-out' effect of debt service on private investment. Schmidt-Hebbel and Muller (1991), Oshikoya (1994), Elbadawi et al (1997), Desphande (1997) found similar results. This helps to support the existence of crowding-out effects of the debt service ratio obligation on private investment in sub-saharan africa.

The findings also show both private and public investments are highly related and public investment significantly enhances private investment. This is often obvious, because in developing countries private investment actors put much emphasis on the contribution by public sector in terms of infrastructural support. This means that, to attain high growth and employment creation, emphasis should be placed on improving private sector investment development through facilitating their growth by using appropriate macroeconomic policies. This confirms the existence of debt overhang hypothesis in sub Saharan African private investment. This finding is similar with the findings of badawi (2003 & 2005) for Sudan, Ouattara (2005) for Senegal and Green and Villanueva (1991) for developing countries.

In the similar way, The System GMM and Fixed effect results also show that credit to the private sector, which captures as indication for financial development exhibits positive and significant effect on private investment activity in Sub Saharan Africa. Within the region when credit to the private sector increase across time by one percent, private investment increases by 0.225 and 0.329 percent respectively the GMM and FE model estimates. There's a desire to produce more loans so as to boost private sector activities. Financial requirement that's required to commence investment projects has encouraging effect on the development of private sector investments. Hence, it creates a good environment by creating linkage in facilitating decision to speculate and increases technological specialization and selection of projects to be launched and attached with further risk diversification. This is often consistent with empirical investigation of (Harvey 1985; Oshikoya 1994; Kumar and Mlambo 1995; Workie 1997; Harupara 1998; Getachew1997).

4.4 Deagonastic tests

Table 4: Deagonastic test for system GMM &FE

	GMM	FE
AR(1):P-value	0.002	
AR(2):P-value	0.060	
Sargan test:P-value	0.8060	
Wald $\chi^2(5)$ and P-value	11264.60 and 0.0000	
F(5,355) and P-value		5.91 and 0.0000
Hausman test	P-value= 0.0001 chi2(5)=27.18	

Source: Computed by authors using stata 15

From table 4, the Wald chi square statistic for the system GMM and the fixed effect F-statistics is indicate significant effect of the explanatory variables. The Arellano-Bond test AR (2) in first differences fails to reject the null hypothesis of no two-period serial correlation in the residuals. Besides, the Sargan test for over-identifying restrictions shows that the over identifying restrictions are valid in the model implying that the model does not suffer the weakness of too many instruments. From table 4 the Hausman tests: The null hypothesis H_0 : RE model is appropriate and the alternative hypothesis H_a : FE model is appropriate. The probability value indicates that its value is less than 5%, it leads to use, the FE model to investigate the estimated value of the parameters. Generally the diagnostic test, In all cases the F-tests reject the null hypothesis of a common intercept term across countries, and Hausman tests consistently reject random effects in favor of fixed effects. The system GMM estimates all pass the Sargan test for validity of the instrument set.

5 Conclusion and Recommendations

5.1 Conclusion

The central focus of our study was to investigate the impact of external debt on private investment in Sub Saharan Africa. Most of the literature reviewed supports negative relationships between external debt and private investment, particularly in low-income countries. Krugman (1989) argues that, beyond a certain threshold, the outstanding external debt starts to become a disincentive for the government to carry out economic reforms and invest in productive activities. This because the returns of such activities are used to repay outstanding debt instead of directly improving the economic welfare of residents. Thus, high external debt reduces incentives for private sector to invest.

Using the system GMM and FE estimation, the econometric analysis shows a negative and significant effect of the debt service ratio, as hypothesized. But public investment has expected sign and is shown to be significant in both system GMM and FE terms. Since investment is one of the channels through which external debt can affect a private investment equation is developed to examine its interaction with external debt and other variables. The main outcome of the empirical assessment confirms that both in the system GMM and FE, public investment and private sector credit have a positive contribution to private capital formation activity in sub Saharan Africa. The positive relationship between private and public investment assures the complementarity hypothesis of public investment to private sector development. However, the estimated system GMM and FE, private investment equation points that the external debt stock, debt service ratio and gross domestic rate has a negative effect on private sector accumulation.

5.2 Policy implications

Based on the findings of this research paper the researcher forwards the following recommendations to the policy makers and the concern body

1. The debt overhang problem external debt stock and the crowding out effect of debt service debt management authorities should periodically undertake a comprehensive debt sustainability analysis in support of the debt relief policy in view of reducing the level of debt stock and easing the debt overhang problem. Moreover, strengthening the strategies targeting on export diversification and boosting remittances, while optimizing domestic resource mobilization in more productive ventures, could reduce the need for foreign loan.
2. The debt overhang hypothesis asserts that if there is a probability that a country's future debt will be more than its repayment ability, then the anticipated cost of debt servicing can depress domestic and foreign investments which consequently slow down the rate of economic growth as investors lower their expectation of future returns in anticipation of an increasingly higher discretionary taxes in order to repay the debt accumulation. The crowding out effect hypothesis argues if a greater share of external debt or foreign capital of a country is used for external debt servicing, limited amount of fund would be available for investment financing and ultimately retards economic growth.
3. The servicing of external debt erodes the meager foreign exchange available for imports. This has to lead import compression problem that adversely affects both public and private investment. Since many of the imports of the sub Saharan Africa countries are essential intermediate inputs for its capital formation activity, cutting these imports has a larger loss on present and future output of the countries. Hence, external borrowing decisions must be linked to a general policy frame work that will guarantee profitability of invested funds and generation of sufficient foreign exchange earnings for external debt servicing. This can be done by investing on selective and productive investment areas including basic infrastructural developments that facilitate the productivity of other sectors of the economy.
4. While the Government recognizes the private sector to be the key engine of economic growth and poverty reduction, Policy makers should raise productivity of capital and increase the demand for the private sector output, more resources should be allocated to the areas of agriculture and infrastructure and to enhance conditions meant to attract more private investment in the countries.

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Appendix

Table A1: System Generalized method of Moment

Dynamic panel-data estimation, one-step							system	GMM
Group variable: ID		Number of obs		=	380			
Time variable : year		Number of groups		=	20			
Number of instruments = 195		Obs per group: min		=	19			
Wald chi2(6) = 6492.03		avg		=	19.00			
Prob > chi2 = 0.000		max		=	19			
PRI	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]			
PRI								
L1.	.7465935	.1006966	7.41	0.000	.5492318	.9439551		
ED	-.1118364	.0484892	-2.31	0.021	-.2068736	-.0167993		
DSr	-.077235	.0209556	-3.69	0.000	-.1183073	-.0361627		
GDPr	.0012834	.0026243	0.49	0.625	-.00386	.0064269		
PUI	.1304324	.0442155	2.95	0.003	.0437717	.2170931		
PSC	.2257777	.0701945	3.22	0.001	.0881989	.3633565		
_cons	11.72982	2.169424	5.41	0.000	7.477831	15.98181		

Table A2: Fixed Effect

FE (within) regression with AR(1) disturbances		Number of obs = 380				
Group variable: ID		Number of groups = 20				
R-sq:		Obs per group:				
within = 0.0768		min = 19				
between = 0.0663		avg = 19.0				
overall = 0.0905		max = 19				
		F(5, 355) = 5.90				
corr(u_i, Xb) = -0.2339		Prob > F = 0.0000				
PRI	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
ED	-.0778877	.0310098	2.51	0.013	.0168601	.1389154
DSr	-.216467	.0572607	3.78	0.040	.1037773	.3291567
GDPr	.0035521	.012441	-0.29	0.775	-.0280361	.020932
PUI	.14732	.0543678	2.71	0.007	.0403965	.2542435
PSC	.3294501	.0994713	3.31	0.001	.1338229	.5250772
_cons	10.0704	.631664	15.94	0.000	8.828123	11.31267
rho_ar	.64616063					
sigma_u	5.7925102					
sigma_e	3.8691614					
rho_fov	.69148178 (fraction of variance because of u_i)					
F test that all u_i=0:		F(19, 355) = 5.16		Prob > F = 0.0000		

Table A3: Random Effect

RE GLS regression with AR(1) disturbances				Number of obs =400		
Group variable: ID				Number of groups =20		
R-sq:				Obs per group:		
within = 0.1539				min = 20		
between = 0.0864				avg = 20.0		
overall = 0.1073				max = 20		
corr(u_i, Xb) = 0 (assumed)				Wald chi2(6) = 39.72		
				Prob > chi2 = 0.0000		
PRI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ED	-.0030672	.0072811	-0.42	0.674	-.0173379	.0112035
DSr	-.0217104	.029801	-0.73	0.466	-.0801194	.0366986
GDPPr	-.1440773	.046339	-3.11	0.002	-.2349001	-.0532545
PUI	.1619748	.0493466	3.28	0.001	.0652572	.2586924
PSC	.2664502	.0798553	3.34	0.001	.1099366	.4229638
_cons	10.29458	1.833312	5.62	0.000	6.701357	13.88781
rho_ar	.64616063	(estimated autocorrelation coefficient)				
sigma_u	4.2999208					
sigma_e	.3.879073					
rho_fov	.55131884	(fraction of variance due to u_i)				
theta	.53569833					

Table A4: Hausman test for Fixed Effect (FE) and Random Effect (RE)

-Coefficients-				
	(b) fe	(B) re	(b-B) Difference	sqrt(diag((V _b - V - B)) S.E
ED	-.0778877	-0.0030672	-0.0000485	0.0085376
DSr	-.216467	-0.0217104	-0.0112531	0.0340219
GDPPr	.0035521	-0.1440773	-0.1361985	0.0480504
PUI	.14732	0.1619748	0.1345414	0.0544897
PSC	.3294501	0.02664502	0.3189911	0.0973108
$\chi^2(5) = (b-B)'[(V_b - V_B)^{-1}](b - B)$ $= 27.18$				
Prob greater than $\chi^2(5) = 0.0001$				