THE IMPACT OF EXTERNAL DEBT ON ECONOMIC GROWTH IN KENYA

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.

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DECLARATION

This is my original work and has not been presented for any degree or diploma in any other university.

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Student: Jacob Kelly Onyango

This work has been carried out under my supervision and approval as a university supervisor.

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Supervisor: Mr. Jasper A. Okelo

DEDICATION

I dedicate this study to the University of Nairobi and all economic students in the country. In addition, dedicate it to the Kenyan government as I believe there are important policy recommendations.

ACKNOWLEDGEMENT

First I thank the everlasting father for his goodness to me during the 2 years I have done the project to its completion. Secondly, my candid appreciation goes to my direct supervisors Dr. Samuel Nyandemo and Jasper Okelo for dedicating most of their time to supervise and guide me all through the project from the proposal level to the project completion. In addition, I appreciate Dr. Perter Muriu and Dr. Anthony Wambugu for the additional guidance obtained. Through there guidance and criticism, I have been able to complete this paper successfully.

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ABBREVIATIONS AND ACRONYMS

ADB	**:**	African Development Bank
ADF	**:**	African Development Fund
ADF	**:**	Augmented Dickey Fuller
BOP	**:**	Balance of payments
DMO	**:**	Debt Management Office
DOD	**:**	Disbursed and Outstanding Debt
EIB	**:**	European Investment Bank
ESAF	**:**	Enhanced Structural Adjustment Facility
FDI	**:**	Foreign Direct Investment
GDP	**:**	Gross Domestic Product.
GDP	**:**	Gross National Income.
GNP	**:**	Gross National Product
HIPC	**:**	Highly Indebted Poor Countries
IBRD	**:**	International Bank for Reconstruction and Development
IDA	**:**	International Development Association
IMF	**:**	International Monetary Fund
JPY	**:**	Japanese Yen
LDC	**:**	Least Developed Countries
LYOHA	**:**	This is a person's name.
MDGs	**:**	Millennium Development Goals
MTDS	**:**	Medium Term Debt Strategy
NTR	**:**	Net Transfers.
OLS	**:**	Ordinary Least Squares
OPE	**:**	Organization of the Petroleum Exporting Countries
PEFA	**:**	Public Expenditure and Financial Accountability
PFM	**:**	Public Finance Management
PPG	**:**	Private and Publicly Guaranteed
SAF	**:**	Structural Adjustment Facility
SAS	**:**	Statistical Analysis Software
SECALs	**:**	Sectoral Adjustment Loans
SSA	**:**	Sub Saharan Africa
TDS	**:**	Total Debt Service
UK	**:**	United Kingdom
USA	**:**	United States of America.
USD	**:**	United States Dollars
WDI	**:**	World Development Indicators.

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ABSTRACT

This study investigates empirically the effect of the external debt burden on Kenya's economic growth. Using regression analysis on secondary data obtained from WDI and relevant publications from Kenya on the same topic, the findings suggest that there is a positive correlation between GDP and External debt on time series data (1971-2012). The study used the Granger Engle 2 step procedure to obtain stationarity, Vector Error Correction Model to estimate short run impacts and ADF for Unit Roots.

Using SAS and Stata, the study found that external debt had a negative impact on GDP growth and that debt overhung was present

CHAPTER ONE

INTRODUCTION

1.1: Background of the Study

To finance economic activities a country can make use of taxes and fees or it can borrow if the internal sources are not enough to finance the budget deficit. According to Adegbite et al (2008), the Dual Gap theory is a better explanation of the reason for opting for external finance as opposed to domestic in financing the sustainable development. According to this theory in developing countries, the level of domestic savings is not sufficient to finance the needed investment to ensure economic development. Since investment is a function of savings, it is logical to require the use of complementary external sources. Since most of the Developing Countries are far from their steady state growth, any investment injection could lead them to have accelerated economic growth. Therefore, debt theoretically can bring about growth. External debt does not transform automatically into debt burden when a country optimally makes use of the fund. In an optimal condition, the marginal return on investment should be greater than or equal to the cost of borrowing. In this case, debt will show a positive impact on growth. According to the neoclassical growth theory, debt has a positive direct effect on economic growth. This is because the amount borrowed if used optimally will increase investment.

On the other hand the indirect effect of debts is its effect on investment. The transmission mechanism through which the debt affects growth is its reduction on the resources available for investment by debt servicing. According to debt overhang hypothesis, a certain level of external debt has a direct positive effect to economic growth until a certain point where an additional debt will have a negative effect to growth. For developing countries and specifically SSA Countries, theory suggests that the causes of higher external indebtedness were:

The government that engages in foreign borrowing while the private sector shifts its funds abroad. This view has

validity, since the bulk of financing to Africa has been contracted by governments and comes from donor countries and multilateral agencies with capital flight being a private sector activity. The drain of foreign exchange resources through capital flight creates a greater need for governments to borrow abroad.

A second hypothesis, proposed originally by Khan and UlHaque (1985), argues that the perceived risk of investment in developing countries is higher than that elsewhere.

As countries experienced problems in repaying loans, their credit rating was reduced. This made it more difficult and expensive for countries to service their debt.

The oil crisis of 1973 hit developing countries. Firstly, they were reliant on oil imports. Secondly, the attempts at industrialization meant their demand for oil was greater. However, with oil prices increasing, they could not afford the oil imports and so many countries borrowed to be able to continue importing.

The expected boom in economic growth did not materialize especially in SSA. The investment in industrialization gave poor returns, partly due to lack of sufficient labor skills and lack of previous expertise. Import substitution proved a poor policy for economic development. With rising oil prices, poor harvests and fall in agricultural prices, developing countries had a fall in economic growth leading to lower tax revenues between 1970s and 1980s.

The oil price shock also caused inflation and therefore higher interest rates. This meant that SSA countries were faced with both higher debt and higher percentage of debt interest payments.

In the 1970s, banks were eager to lend to developing countries believing that governments don't default. As they gave money to SSA, external debt continued to swell.

In the post war period, many developing countries adopted a policy of import substitution and industrialization which meant that they sought to diversify their economy from being based on agriculture to investing in manufacturing industries. This required investment which was funded mostly by external borrowing. The loans were seen as helping to develop SSA. However, not all loans were used for investment according to the intended purpose. Corruption also reduced the overall gain that could have been accrued.

1.2: GDP Growth over Time

Since independence, the Kenyan economy has had many ups and downs. The first decade of Kenyan independence showed great economic growth and a steadily increasing GDP. Overall, the entire country saw high levels of development, investment and production.

Whereas this study does not trace back to this period, it focuses on the impact of foreign debt on Kenya's economic growth.

The oil crisis of 1973/74 changed the picture as it created BOP problems. To meet the BOP crisis, the government resorted to external borrowing.

Table 1: Debt Statistics from 1971 to 2012

Period (Years)	GDP Growth (US$'M)	GDP Growth (%)	Debt Growth (US$'M)	Debt Growth (%)	Debt To GDP (%)	Debt Growth To GDP Growth (%)	GDP Range (US$'M)	Debt Range (US$'M)	Max of GDP (US$'M)
[1971-1980]	5,462.87	16.29%	3,386.81	24.22%	39.14%	83.65%	1,753-7,043	497-3,386	7,043.42
[1981-1990]	1,163.19	1.80%	3,668.79	8.06%	66.76%	80.55%	7,043-8,206	3,386-7,055	8,206.60
[1991-2000]	4,368.97	6.17%	(866.57)	(1.18%)	76.13%	-57.48%	8,206-12,575	7,055-6,189	13,964.09
[2001-2012]	21,052.11	9.58%	4,068.86	5.04%	34.98%	95.44%	12,575-33,627	6,189-10,257	33,627.68
Total	**32,047.13**	**8.46%**	**9,759.99**	**9.04%**	**54.25%**	**50.54%**	**1,753-33,627**	**497-10,257**	**33,627.68**

Period (Years)	Max of Debt (US$'M)	Debt Service (US$'M)	Debt To Exports (%)	Average Debt Interest (%)	Debt Arrears (US$'M)	Debt Pardon (US$'M)	Average Debt Maturity (Years)	Max Concessional Debt (US$'M)	Exports (US$'M)
[1971-1980]	3,386.81	1,858.38	139.08%	5.23	9.09	0.00	29.98	683.98	11,711.78
[1981-1990]	7,055.60	6,302.82	259.75%	5.44	185.42	(516.55)	29.54	2,378.09	18,111.18
[1991-2000]	7,453.51	7,251.90	207.72%	2.19	1,340.28	(131.50)	34.85	4,140.10	26,476.89
[2001-2012]	10,257.88	5,008.95	132.43%	1.71	2,175.83	(61.22)	33.57	7,014.80	67,406.59
Total	**10,257.88**	**20,422.06**	**184.75%**	**3.64**	**3,710.63**	**(709.27)**	**31.99**	**7,014.80**	**30,926.61**

Source: World Bank's World Development Indicators (WDI) 2013

The external debt stock grew by US$ 3,386.81M (from US$497.89M to US$3,386.81M) between 1971 and 1980 (24.22%) while GDP Grew by US$ 5,462.87M (from US$1,753.79M to US$7,043.42M) between the same periods constituting 16.29% growth. The economic growth was much slower than Debt in terms of percentages given that there were so many other things that happened in that decade. Firstly, there was the first and second oil crises in 1973 and 1978 respectively. The crisis increased the cost of oil importation as a factor of production through borrowed funds. Secondly, there was the coffee boom in 1976/1977 due to Frost in Brazil which was a major coffee exporter. This increased government revenue through taxing the private sector who were the recipients of the boom. As a result, government expenditure increased more than the revenues received. Thirdly, there were controls on foreign exchange and imports (such as Restrictions on the amount of currency that may be imported or exported, fixed exchange rates, banning locals from possessing foreign currency, restricting currency exchange to government-approved exchange agents, etc.). This made the country less appealing to international investors. Agricultural and manufacturing sectors became uncompetitive in the world market. During the same decade, Debt as a percentage of Exports hit 139% which demonstrated that it is here that exports started losing value as to not being able to pay the sought debts. Out of the total external debt, 36% was on concessional basis in 1971 and started reducing from 1973 (first oil crisis) and further in 1978 (second crisis).

Between 1981 and 1990, external debt further grew by US$ 3,668.79M (from US$ 3,386.81M to US$ 7,055.60M) while GDP grew by US$ 1,163.19M (from US$7,043.42M to US$ 8,206.60M). The Oil Prices of prior decade were still high and continued to pressurize the economy. In addition, drought conditions in the 1980s led to food imports (of US$1,461M for the decade), made possible by availability of external loan finance. Increased interest rates on international loans raised the debt service charges. This led to a decrease in net transfers on debt, being negative in 1981, 1984, and 1986. Debt service as a percentage of exports also continued to increase to 30.7% in 1988.

From 1991 to 2000, Kenya's debt was reduced by US$ 866.57M (from US$ 7,055M to US$ 6,189M) with Economic

growth of US$ 4,368.97M (From US$ 8,206M to US$ 12,575M).This period coincided with the funding of structural adjustment programs. Between 1986 and 1991, the World Bank approved 6 Sectoral Adjustment Loans (SECALs) amounting to US$ 792M (1980: SAC [$55 million], 1983: SAC II [$130.9 million], 1986: SECAL Agriculture [$60 million], 1988: SECAL Industry [$165.7 million], 1989: SECAL Finance [$231.3 million], 1991: SECAL Export Dev. [$149.1 million]) while IMF disbursed US $ 360 million of Structural Adjustment Facility(SAF) and Enhanced Structural Adjustment Facility (ESAF) (O'Brien and Ryan, 1999). Large publicly-owned companies were privatized and several new monetary policies were introduced, thanks to assistance from the World Bank and the International Monetary Fund. There were many major changes in the 1990s, including the removal of price controls, foreign exchange controls and import licensing.

The reduction of growth of debt in years following 1991 were as a result of debt forgiveness which started in 1992. During this period, Kenya's external debt forgiveness amounted to US$ 648.04M (US$ 432.53M in 1989, US$ 84.02M in 1990, US$ 65.58M in 1991, US$ 29.58M in 1992, US$ 0.02M in 1993, US$ 25.54M in 1997, US$ 0.18M in 1998, US$ 0.18M in 1999 & US$ 10.42M in 2000). The decline in the 1990s can be attributed partly to the negative net-repayments and aid embargos resulting in no new external debt contracts. Many reforms were not successful, leading to the suspension of monetary assistance from both the World Bank and the IMF. The freeze in 1991 and 1992 resulted in Kenya having increased principle loan arrears summing to US$ 1,340.28M in the period. It is also worth noting that Kenya had negligible level of arrears as a percentage of GDP and only rose from 1989 with a peak in 1993 which was also when the debt freeze was lifted by World Bank and IMF. Despite the increasing magnitude of external debt in the 1980s, Kenya was able to service its debts without rescheduling which is evident from the fact that there was zero or negligible accumulation of arrears in 1970s. However, by early 1990s, the debt burden became visible that Kenya had to reschedule its debt in 1994 for the first time. There was a significant accumulation of arrears in the early and late 1990s with Debt burden ratio standing at 131.8%. This was an indication that the GDP generated was partially (or fully) being used to pay debts.

From 2001 to 2011, the Kenyan economy grew by US$ 21,052.11M (from US$ 12,575.57M to US$ 33,627.68M) while external debt grew by US$ 4,068.86M (from US$ 6,189.02M to US$ 10,257.88M). Debt to GNP ratio reduced to 34.98% on average as compared to the other periods. Debt to Export ratio also reduced to an average of 132.43%.This was as a result of programs of reforms and changes that were introduced in the government structure. The programs were including and not limited to Police Reforms, re-introduction of anti-corruption body, Infrastructure development, Introduction of Constituency development fund and Vision 2010 among others. Following these programs, the IMF once worked closely with the government providing funds for anti-corruption and poverty reduction programs. This period saw a continuous economic growth of 2.8% in 2003, 4.3% in 2004, 5.8% in 2005, 6.1% in 2006, and 7.0% in 2007. The unrest that followed the 2007 elections threatened the economic progress in Kenya. The after-election effects compounded by drought and the global financial crisis, brought economic growth down to 1.6% in 2008. In 2009, there was modest improvement with 2.6% growth, while 2010 and 2011 registered economic growth of 5.8% & 4.4% respectively. The IMF raised concern about Kenya's public debt which was 48% of the GNP (2013) and nearly two times her annual budget, raising issue about its viability. The IMF recommended that Kenya must reduce its debt to GDP ratio by eliminating waste, spending prudently and mobilizing more taxes to stimulate growth. With the renewal of the debate, the question remains as to whether external assistance complements or substitutes available domestic resources in bringing about economic growth.

All loans extended to Kenya have a moratorium (grace) period with an average of 6.85 years in the last 4 decades up to 2011. This shows that the country pays interest on loans for 6 years without a change on the principle amount and could be one of the reasons why the Kenyan economic gains were not felt. The Loans have an average maturity period of 32.02 years. From 1981, Kenya improved its bargaining power and has continuously bargained for concessional terms with such debt standing at 68% of the total external debt in 2012 with an all-time average of 47%. The overall trend of GDP and External Debt is captured by the graph below.

Figure 1: Trend of External Debt, GDP and Related Variables

Source: Based on Data from WDI 2012
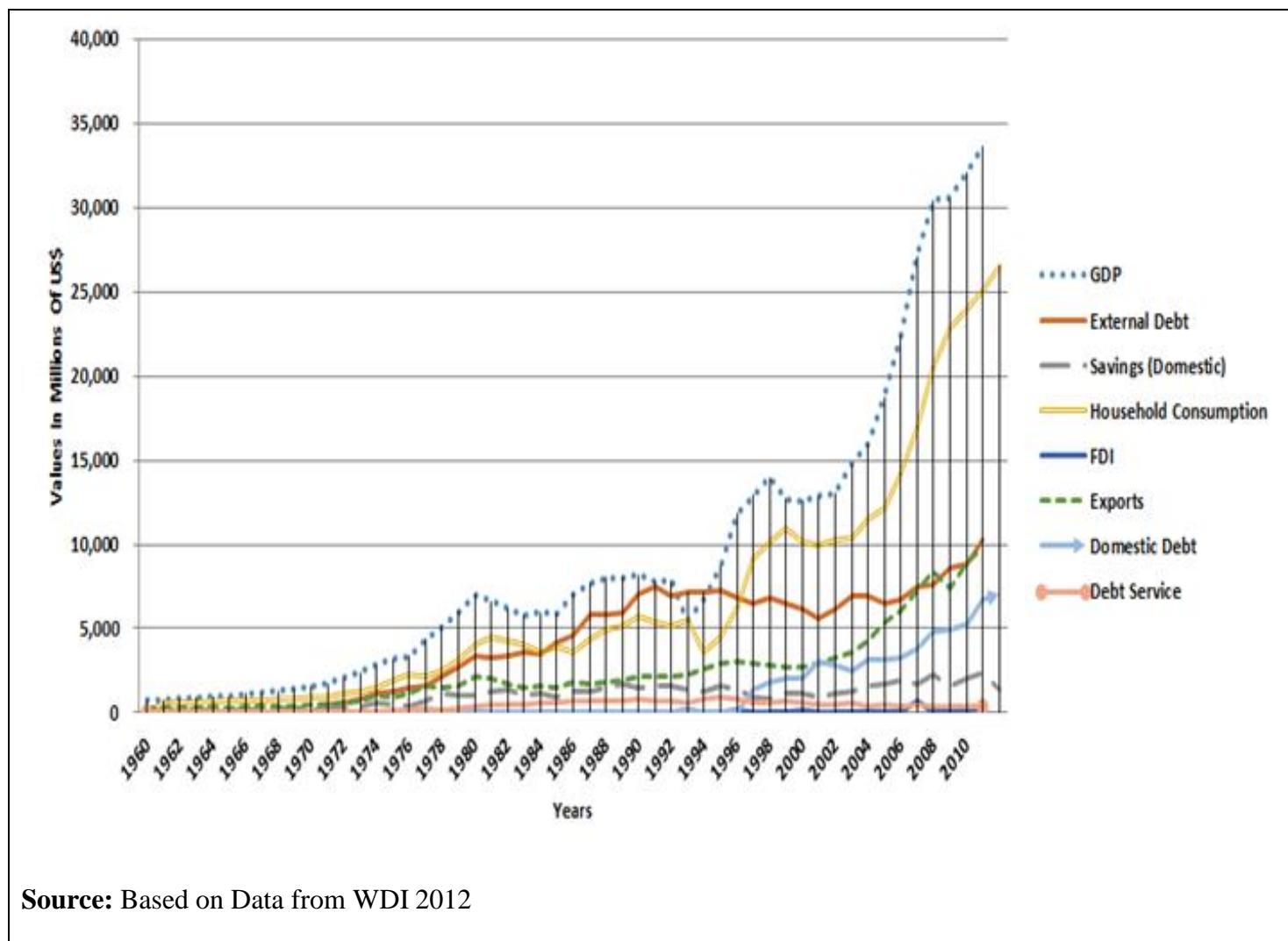
From the graph, the saving rate and FDI have been low with Household consumption strictly following the GDP trend. External Debt grew rapidly between 1970 and 1990 and at some point was more than the GDP.

1.3: Statement of the Problem

Economic theory suggests that reasonable levels of borrowing by a developing country are likely to enhance its economic growth. Countries at early stages of development have small stocks of capital and are likely to have investment opportunities with rates of return higher than those in advanced economies. As long as they use the

borrowed funds for productive investment and do not suffer from macroeconomic instability, policies that distort economic incentives, or sizable adverse shocks, economic growth should increase and allow for timely debt repayments. These predictions hold up even in theories based on the more realistic assumption that countries may not be able to borrow freely because of the risk of debt repudiation.

The theoretical literature on the relationship between external debt and economic growth has focused largely on the harmful effects of a country's debt overhang which is the accumulation of debt stock so large as to threaten a country's ability to repay its past loans, which in turn scares investors and potential lenders. That is to say, if there is some likelihood that, in the future, debt will be larger than the country's repayment ability, expected debt-service costs will discourage further domestic and foreign investment and thus harm growth. Potential investors will fear that the more a country produces, the more it will be "taxed" by creditors to service the external debt, and thus they will be less willing to incur costs today for the sake of increased output in the future.

Although the debt overhang models do not analyze the effects on growth explicitly, the implication is that large debt stocks lower growth partly by reducing investment. But in addition, the incentive effects associated with debt stocks tend to reduce the benefits to be expected from policy reforms that would enhance efficiency and growth, such as trade liberalization and fiscal adjustment: the government will be less willing to incur current costs if it perceives that the future benefit in terms of higher output will accrue partly to foreign lenders.

There is limited evidence in regard to the subject of study with most previous studies not controlling for other macro variables. The previous known studies done by Maureen Were, Kamau Beatrice, Kuria Kiriga and Ndungu Peter used data from 1970 to 2003.

This study will use more recent data in an attempt to identify the relationship between External Debt and Economic Growth in Kenya in addition to using other variables that are likely to have non-linear effects to economic growth. Such variables not used by recent studies are Domestic savings, Household consumption, FDI, Exports, Grants and Debt service. In addition, previous studies have used external debt values in nominal terms. This study will use the net value after netting-out concessions just to capture the actual money Kenya will have to pay.

The study seeks answers to the following research questions:

1)   What is the quantitative effect of external debt on economic growth of Kenya?

2)   What is the relationship between growth and other variables that are thought to affect GDP growth?

1.4: Objectives of the Study

The general objective of this study is to determine the impact of external debt stock on economic growth in Kenya. the specific objectives are:
1) Examine the effect of external debt stock on economic growth in Kenya
2) Determine the relationship between growth and other variables that potentially affect economic growth.

1.5: Significance of the Study

The study shall make the following contributions to existing literature and policy:
To help the Policy makers identify sources of growth in the presence of debt and to what level the government should stop accruing external debt. The government may pick from the study the other variables related to growth including savings/investments and their trend and as a result eliminate the debate of high indebtedness.

The study shall add additional variables using latest dataset to the studies, thereby giving additional empirical view in so far as external debt and economic growth is concerned.

CHAPTER TWO
LITERATURE REVIEW

2.1: Introduction

This chapter will have three sections:- (a.) The Theoretical literature review (b.) The Empirical literature review and (c.) The overview of literature. The first section will be looking at the theoretical development as far as external debt is concerned. The second will be looking at the studies that have been done on external debt and its relationship to economic growth in addition to findings of the studies.

2.2: Theoretical Literature

According to debt overhang hypothesis, a certain level of external debt has a direct positive effect to economic growth until a certain point whereby an additional debt will have a negative effect to growth.

This argument is represented in the debt "Laffer curve" (Figure 2 below), which posits that larger debt stocks tend to be associated with lower probabilities of debt repayment. On the upward-sloping or "good" section of the curve, increases in the face value of debt are associated with increases in expected debt repayment, while increases in debt reduce expected debt repayment on the downward-sloping or "bad" section of the curve.

Figure 2: Debt Laffer Curve
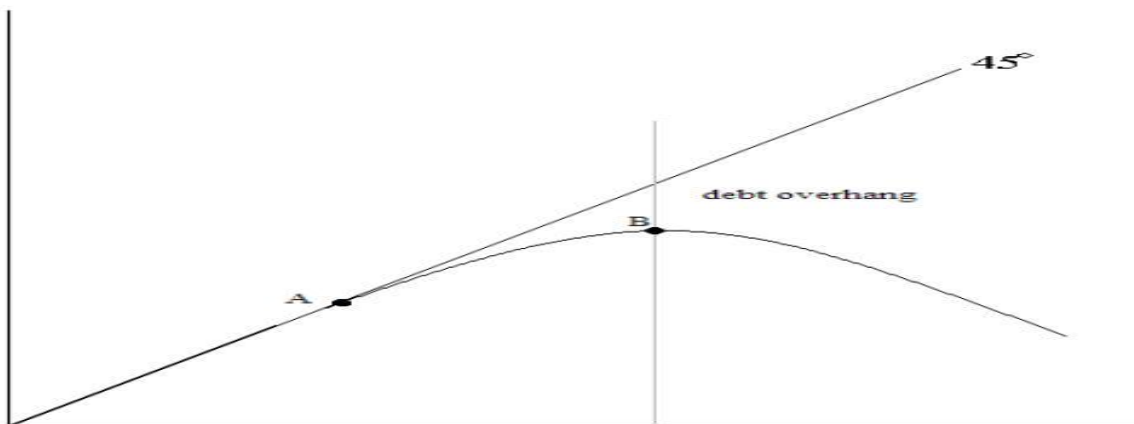
Source: IMF Quarterly Magazine – Finance & Development (2013)

According to Krugman (1988), the debt overhang theory shows that if there is some likelihood that in the future debt will be larger than the country's repayment ability, expected debt-service costs will discourage further domestic and foreign investment because the expected rate of return from the productive investment projects will be very low to support the economy as the significant portion of any subsequent economic progress will accrue to the creditor country. This eventually will further reduce both domestic and foreign investments and hence downsize economic growth.

Claessens and Diwan (1990) argue that "debt overhang is a situation in which the illiquidity effect, the disincentive effect, or both effects are strong enough to discourage growth in the absence of concessions by creditors". This is a "narrow" definition of the debt overhang where the impact of a high external debt that is linked to the tax disincentives argument, where any success in indebted country's economic performance is taxed away by creditors and ultimately little is left over for domestic investment and subsequent growth (Hjertholm, 2001).

Agenor and Montiel (1996) argue that the approach to external debt is motivated by several observations. The main argument being the policy-oriented discussion that the debt problem is centered on the question of whether the debt crisis is one of solvency or of liquidity problem

Liquidity problem is the inability of a country to service its debts as they fall due. This means that lack of liquidity occurs when a country does not have enough cash on hand to pay current obligations. Solvency on the other hand relates to whether the value of a country's liabilities exceeds the ability to pay at any time. A country is insolvent when it is incapable of servicing its debt in the long run (Ajayi, 1991).

Jonse G. Leta (2002) in his research on external debt and economic growth in Ethiopia pointed out that although the indebted poor countries have been able to pay i.e. solvent, the willingness to pay decline for a variety of reasons. The domestic factors often cited include wrong macroeconomic policies such as fiscal irresponsibility and exchange rate

misalignment, policies that deter savings such as negative real interest rates, which in turn reduce investment and encourage capital flight and financing long-run projects with short-term credits. External factors include oil shocks, deterioration in the terms of trade and rising foreign interest rate.

Essentially the higher the stock of debt to the country, the higher is the current sacrifice for the sake of the future growth. The theory of debt overhang is well explained by the hypothesis of Debt Laffer curve which relates the magnitude of country's debt and the value of repayment. According to Freytag, A et al (2008) the NPV of the debt repayments increases with stock of debt up to a certain threshold point beyond which a higher face value of the debt will be associated with lower efforts and investments, lower economic growth and lower NPV of expected debt service.

2.3: Empirical Literature

According to Chinedu Okonkwo (2013) who used data from 1970 to 2007 on selected west African states and using the Granger Causality Error Correction Model, external debt and debt burden has country specific effects due to structural differences and appears to have significant immediate impacts. Though few studies have tried to investigate the external debt-growth relationship using a non-linear model, some have found the relationship to be insignificant (like Adegbite et al (2008), for Nigeria and Schclarek (2004) for both developing and industrial countries).

According to Ezeabasili (2011) who used Granger causality tests on Nigerian External debt data, there exists a negative relationship between economic growth and the present level of external debt in Nigeria. In addition, the Parwise Granger Causality test reveals that uni-directional causality exists between external debt service payment and economic growth at the 10 percent level of significance. Also, external debt was found to Granger cause external debt service payment at the 1 percent level of significance.

According to Adepoju et al. (2007), Nigeria's high debt burden has daring consequences for the economy and the general welfare of the citizenry. The servicing of external debt has gravely encroached upon resources availability for socioeconomic development and poverty alleviation. Since 1986, Nigeria had taken a decision to limit debt

service to no more than 30 percent of total oil receipts, though this has not brought much relief. Between 1985 and 2001, Nigeria expended over USD32 billion on external debt servicing. Cohen (1993), Clements et al. (2003) corroborate the aforementioned impact of debt as they observe that the negative effect of debt on growth works not only through its impact on the stock of debt, but also through the flows of service payments on debt which are likely to "crowd out" public investment. This is so because service payments and repayments on external debt soak up resources and reduce public investments.

According to *Kamau B. (2006),* using a simultaneous equation models, finds a negative relationship between debt-servicing and economic growth rate.

Ndungu P. (2002) in his study finds that there exists a "crowding out" effects (effects of huge external debt stock) although the study failed to confirm the presence of debt "overhang "effects (effects of external debt service payments) on Private investment in Kenya;

Kuria K.B. (2001), using linear and quadratic models, finds that external debt has negative impact on economic growth.

Edo (2002) analyzes the African external debt problem with reference to Nigeria and Morocco. He concludes that external debt severely affects investment severely. Other findings include the fact that fiscal expenditure, balance of payments (BOP) and global interest rate are the major factors explaining debt accumulation in the studied countries. He therefore suggests measures that could alleviate the above problems (privatization, sustained export promotion programme, and restructuring and development of capital markets among others).

According to Were M. (2001) who used a regression and granger causality models to identify the relationship between Kenya's External debt, debt service, economic growth and investment, external debt accumulation has a negative impact on economic growth and private investment which confirmed the existence of Debt overhang in Kenya at that time. In addition, the study posits that Debt servicing does not appear to affect growth adversely but has some crowding-out effects on private investment.

2.4: Overview of Literature

Theoretically, it is difficult to determine whether External debt really affects the actual economic performance as economic performance may have several linkages (including and not restricted to external debt policy and management) that affect the overall position.

Most of research done in this area used a broader data set defined over a longer time period than others, with only a few studies focusing on country specific analysis. Overall, majority of the studies came up with a conclusion that higher level of external debt is associated with a relatively lower level of economic growth, mainly due to debt overhung problem; with only few studies finding no conclusive evidence supporting these hypotheses.

To sum up, the prime objective of this study is to explore the empirical evidence regarding the dynamic relationship between external debt and economic growth through usage of current data and additional macroeconomic variables.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1: Introduction

Despite the discoveries on the relationship between external debt and economic growth, most findings support a negative impact of external debt accumulation on economic growth especially in developing countries. Many of these studies have used different empirical approaches to expose the relationship for different time frames as stated under Literature Review. However, most studies use neoclassical growth models augmented with other factors such as debt and export which are not captured in the traditional neoclassical growth model. Additional variables used to augment the model are dependent on the motivation of each study.

3.2: Theoretical Framework

There is limited published theoretical framework that talks about the relationship between Solow growth model (a discussed by Barro, R and Sala-i-martin (2003)) and external debt. But some empirical works on external debt used Solow growth model as a base to investigate its impact on economic growth.

As it is known, the Solow growth model is built on a closed economy which uses labor (L) and capital (K) as means of production. Under this situation the implication of external debt on growth can be seen using its effect on the public saving which in turn used as investment in a closed model. Below are important Solow Models:

$$Y = F(K, AL) = K^{(\alpha)}(AL)^{(1-\alpha)} \quad \text{................................……………………………………………………..(1)}$$

[where Y=Output, K=Capital, L=Labor, α = Output elasticity, A=Technical Progress]

As per debt overhang theory, a government with debt overhang problem will always raise taxes on the private sector as a means of transferring resources to the public sector. This, in turn, discourages private sector investments and as

such, more government public spending on infrastructure decreases (For example the government cannot be able to do the likes of Thika Super Highway, Migori Level 1 Hospital, Kisumu International Airport, etc) as the available resources are used to pay debt obligation.

As a result, overall investment (both private and public investment) will decrease in the country. This will shift both the investment and production function curves in Solow growth model downward. On the other hand when countries are paying their external debt, they use their income from export and foreign exchange to service their debt. This is the case for debt crowding out effect. Those countries which transfer income from export (which can be used to invest) towards debt repayment will discourage public investment and in turn decrease economic growth. This will shift both the investment and production function curves in Solow –swan growth model (a discussed by Barro, R and Sala-i-martin (2003)) downward.

Figure 3: Solow Swan Growth Model
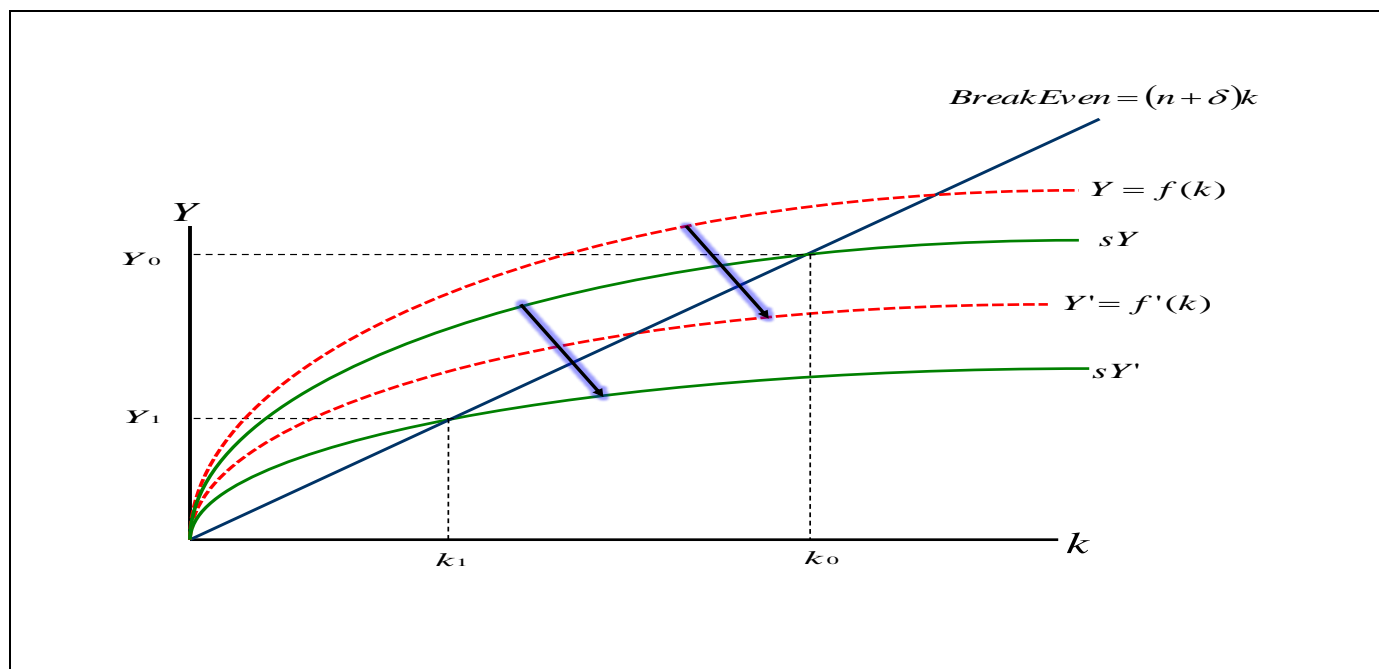
Source: Barro, and Sala-i-Martin (2003)

Based on the above discussion, we then modify our model in Equation 1 to read as follows:

$$\mathbf{GDP} = \mathbf{A}\left[K^{\beta_1}\right]\left[L^{\beta_2}\right]\left[(ExD)^{\beta_3}\right]\left[(EDS)^{\beta_4}\right]\left[(DStE)^{\beta_5}\right] \quad \text{------------------------------} \quad (2)$$

Where: .

GDP	=	Gross Domestic Product (US$ Millions)
ExD	=	External Debt Stock (US$ Millions)
EDS	=	External Debt Service (US$ Millions)
DStE	=	External Debt Service to Exports (%age)
K	=	Gross Capital Formation (US$ Millions),
L	=	Population (Millions)

Taking natural logarithms to the equation 2 above we obtain a linear equation as below:

$$\mathbf{Ln\_GDP} = \mathbf{Ln\_A} + \beta_1 \mathbf{Ln\_K} + \beta_2 \mathbf{Ln\_L} + \beta_3\ \mathbf{Ln\_ExD} + \beta_4 \mathbf{Ln\_EDS} + \beta_5 \mathbf{Ln\_DStE} \text{--------------------------} (3)$$

Where:	Ln_A	=	Log$_e$ A which is constant
	Ln_ExD	=	Log$_e$ EXD
	EDS	=	Log$_e$ EDS
	DStE	=	Log$_e$ DStE
	K	=	Log$_e$ K
	L	=	Log$_e$ L

Following this theoretical framework and the Literature review in Chapter 2, we expect a negative impact of external debt on Solow Swan's investment and production function as this can be shown using the inward movement of both investment and production curves.

3.3: Model Specification

The main aim of this empirical enquiry is to determine whether external debt affects growth in Kenya. According to Sala-i-martin (1997), economic theories are not sufficiently able to underpin the exact determinants of growth.

In line with past studies and to better analyze the impact of external debt on economic growth, the multivariate statistical model specification in this study will use variables like external debt stock, GDP, Gross Capital Formation, Labour represented by Population and Debt Service.

Based on equation 3 above and adding the error term, we can specify the following empirical model.

$$Ln\_GDP = Ln\_A + \beta_1 Ln\_K + \beta_2 Ln\_L + \beta_3 Ln\_ExD + \beta_4 Ln\_EDS + \beta_5 Ln\_DStE + \mu _____ (4)$$

3.4: Description and Measurement of Variables

The table discusses about the variables used with their expected signs on the regression model.

Table 2: Description and Measurement of Variables

Variable	Description	Measurement	Expectation
Y	Gross Domestic Product (Is a primary indicator used to gauge the health of a country's economy. It represents the total dollar value of all goods and services produced over a fiscal year)	Continuous and measured in Millions of US$.	To have a relationship with all the other variables.
ExD	External Debt (This is the portion of a country's debt that was borrowed from foreign lenders including commercial banks, governments or international financial institutions)	Continuous and measured in Millions of US$.	To have a negative coefficient based on the theory as spelled by Solow model and data provided.

Variable	Description	Measurement	Expectation
EDS	External Debt Service (Is the sum of principal repayments and interest actually paid in currency, goods, or services on external debt and repayments (repurchases and charges) to the financiers)	Continuous and measured in Millions of US$. Proxy Variable for Debt crowding out	To have a negative coefficient based on the theory as spelled by Solow model and data provided.
DStE	Debt Service as a ratio of Exports. (To measure Debt overhung)	Continuous and measured in Percentages	To have a negative coefficient based on previous studies in Kenya.
E2G	Export as a Ratio of growth (To measure crowding out effect)	Continuous and measured in Millions of US$.	To have a negative coefficient based on previous studies in Kenya.
K	Capital Formation	Continuous and measured in Millions of US$.	To have a positive coefficient in line with Solow Model.
P	Population (Representing Labour Force)	Continuous and measured in Millions.	To have a positive coefficient in line with Solow Model.

3.5: Source of Data

The main source of data used in this study is secondary data. The use of secondary data is valid for this study for the purpose of gathering background information and of comparing the past experience with the current. The analysis uses time series data for Kenya from 1970 to 2011:

GDP, External Debt, External debt Service, Debt Service as a ratio of Exports, External debt Stock as a ratio of GDP, Gross capital Formation and Population have been obtained from World Bank's World Development Indicators.

3.6: Econometric Approach

3.6.1: Pre-Estimation Tests:

Unit Root test

To avoid making spurious regression and inferring a misleading conclusion from a non-stationary data, it is usually essential to check stationarity of the data which will be done through Unit root tests using the Augmented Dickey fuller Test (ADF). If a series has a unit root, it is non-stationary and the use of estimation methods like OLS yield spurious estimates. In this case, the series may require differencing by order (k) to make it stationery (k is the number of times the series is differenced to make it stationery). If a series has no unit root then it is integrated of order zero [I (0)] and do not have estimation issues. The ADF test will be based on the following equation for each of the time series (Gujarati D. (2004)).

$$\Delta Y_t = \alpha + \beta T + \gamma \Delta Y_{t-1} + \sum_{j-1}^{p}(\delta_j \Delta Y_{t-j}) + \mu_t --------------------------(5)$$

Where: Δ =   First Difference operator

Y_i =   Observed time series

t =   Time Index

α	=	Intercept constant called drift
β	=	Coefficient on a time trend
T	=	Time Trend
γ	=	Coefficient presenting process root, that is, the focus of testing
μ_t	=	Independent identically distributed residual term

The null hypothesis is:

H$_0$: $\gamma=0$ (Unit root exists hence not stationery)

H$_A$: $\gamma \neq 0$ (Stationery)

Decision rule: If t statistic > ADF critical value then accept null hypothesis and as such unit roosts exists

Cointegration test

Once variable have been classified as integrated of order *I(0), I(1), I(2), …, I(n)*. It is possible to set up models that lead to stationary relations among the variables. Using the Engle Granger Cointegration procedure as detailed by Gujarati (1995), we obtain the residuals in the equation 4 above as follows:

$$\mu_t = \mathbf{Ln\_GDP} - Ln\_K - Ln\_L - Ln\_ExD - Ln\_EDS - Ln\_DStE \ _____(6)$$

We then test the residual μ for stationarity using the ADF Test against the following Hypothesis:

H$_0$: μ_t = Not Stationary (that is I(d) where d>0)

H$_A$: μ_t = Stationary (that is I(d) where d=0)

If null hypothesis is accepted then we conclude that the variables have same trend (Cointegrated) and as such can stay in a fixed long-run relationship with each other. Otherwise, we cannot model a long-run position

3.6.2: Post-Estimation Tests:

Normality test

After Estimation, the initial step is to investigate whether the residuals follow the normal distribution. This will use Jargue-Bera test with hypothesis as below:

H_0: JB = 0 (normally distributed)

H_1: JB $\neq$ 0 (not normally distributed)

For normal distribution the JB statistic is expected to be statistically not different from zero. Rejection of the **H₀** for the residuals would imply that the residuals are not normally distributed. Normality rules out the possibility of getting nonstandard estimators.

Heteroskedasticity Test

One of the key assumptions of regression is that the variance of the errors is constant across observations. If the errors have constant variance, the errors are called *homoskedastic*. Typically, residuals are plotted to assess this assumption. Standard estimation methods are inefficient when the errors are *heteroskedastic* or have non-constant variance.

To test for *heteroskedastic situations,* White's test is used and the following hypothesis is tested:

H_0: $\varepsilon_i^2 = \Omega^2$ for all t.
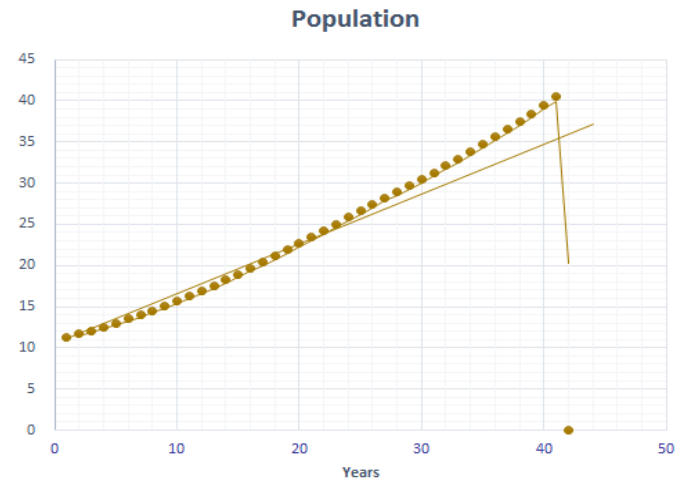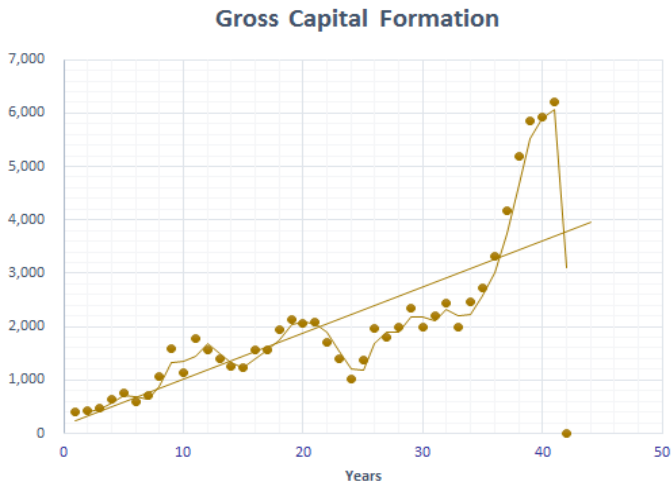
H_A: $\varepsilon_i^2 \neq \Omega^2$ for all t.

If heteroskedasticity is present, it can be corrected using robust standard errors.

CHAPTER 4

DATA ANALYSIS

4.1: Graphical Analysis of Variables

Figure 4: Graphical Trends
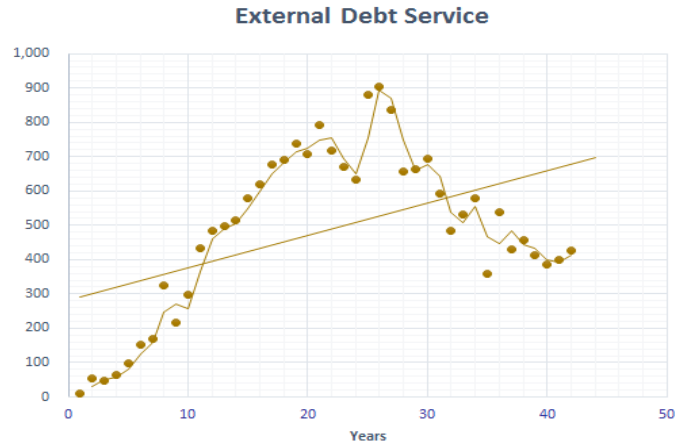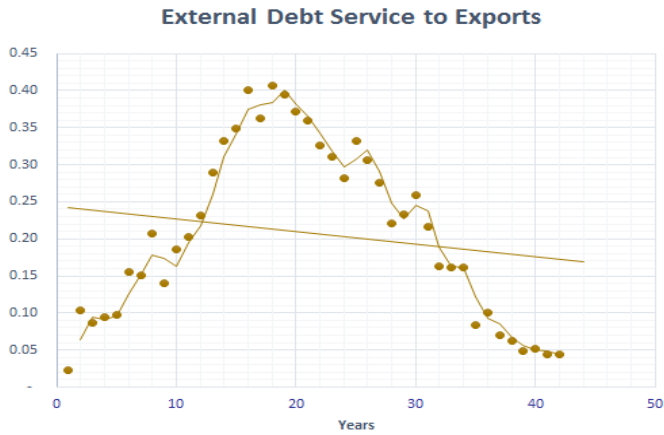
From graphical presentation, all the variables have an upward trend save for DStE whose trends are downwards and flat respectively. The decreasing value for the ratio $(^{EDS}/_{EXp})$ is an indication of either a denominator swelling faster that the numerator or vice visor. The former is more acceptable as we can see on the graphs that Exports have continued to grow and hence a reduction of debt overhung probability

4.2:Descriptive Statistics

Table 3: Descriptive Statistics

Variable	N	Mean	Std Deviation	Kurtosis
GDP	42	10980.41	8707.723	1.115422
ExD	42	5075.21	2639.07	-0.87969
EDS	42	486.5072	238.6154	-0.57408
DStE	42	0.20723	0.117206	-1.27846
K	42	2010.067	1481.475	2.315706
P	42	23.56396	9.533747	-0.60442

From the above table, it's evident that apart from the variables in ratio form, all the others have been growing given that the standard deviations are large and positive. This also agrees with the graphical representation above as regarding trend.

4.3: Pearson Correlation Coefficients

We look at the Correlation matrix to identify any form of correlation before regardless of whether the datasets are non-stationary. From the below data, GDP has a very strong correlation with Exports, Capital and Population which is an indication that there is similar information between those variables and GDP. Also Capital has a very high correlation with Population and Exports.

Table 4: Pearson Correlation Coefficients

	Ln_GDP	Ln_ExD	Ln_EDS	Ln_EXp	Ln_DStE	Ln_E2G	Ln_K	Ln_P
Ln_GDP	1.0000	0.8516	0.6068	0.9770	-0.3121	-0.1889	0.9719	0.9462
Ln_ExD	0.8516	1.0000	0.8977	0.8422	0.1677	0.3540	0.8273	0.8879
Ln_EDS	0.6068	0.8977	1.0000	0.5951	0.5448	0.5990	0.5938	0.6418
Ln_EXp	0.9770	0.8422	0.5951	1.0000	-0.3497	-0.1654	0.9547	0.9308
Ln_DStE	-0.3121	0.1677	0.5448	-0.3497	1.0000	0.8708	-0.3040	-0.2231
Ln_E2G	-0.1889	0.3540	0.5990	-0.1654	0.8708	1.0000	-0.1843	-0.0249
Ln_K	0.9719	0.8273	0.5938	0.9547	-0.3040	-0.1843	1.0000	0.8855
Ln_P	0.9462	0.8879	0.6418	0.9308	-0.2231	-0.0249	0.8855	1.0000

4.4: Unit Root Tests

Table 5:Augmented Dickey Fuller Results

				Interpolated Dickey-Fuller			
				1%	**5%**	**10%**	
	Dif. Order	**Lag**	**t**	**Critical**	**Critical**	**Critical**	**Comment**
Variable	**[I(d)]**	**[L(d)]**	**Statistic**	**Value**	**Value**	**Value**	**(5%CL)**
Ln_GDP	0	0	(2.164)	(4.233)	(3.536)	(3.202)	Unit Root
D_Ln_GDP	**1**	**0**	**(4.526)**	**(3.648)**	**(2.958)**	**(2.612)**	**No Unit Root**
Ln_ExD	0	0	(3.484)	(4.242)	(3.540)	(3.204)	Unit Root
D_Ln_ExD	**1**	**0**	**(3.856)**	**(3.655)**	**(2.961)**	**(2.613)**	**No Unit Root**
Ln_EDS	0	0	(4.527)	(4.233)	(3.536)	(3.202)	No Unit Root
D_Ln_EDS	**1**	**0**	**(10.010)**	**(3.648)**	**(2.958)**	**(2.612)**	**No Unit Root**
Ln_DStE	0	0	(3.403)	(4.233)	(3.536)	(3.202)	Unit Root
D_Ln_DStE	**1**	**0**	**(10.994)**	**(3.648)**	**(2.958)**	**(2.612)**	**No Unit Root**
Ln_K	0	0	(2.375)	(4.242)	(3.540)	(3.204)	Unit Root
D_Ln_K	**1**	**0**	**(6.388)**	**(3.655)**	**(2.961)**	**(2.613)**	**No Unit Root**
Ln_P	0	0	1.556	(4.242)	(3.540)	(3.204)	Unit Root
D_Ln_P	1	0	0.117	(3.655)	(2.961)	(2.613)	Unit Root
DL_Ln_P	**1**	**1**	**(3.064)**	**(3.662)**	**(2.964)**	**(2.614)**	**No Unit Root**

Since we are dealing with time series data in addition to the fact that the data has some extreme values (outliers) as

depicted by the graphs, there is need to check for Stationarity. To do so, we are going to use the ADF test in Stata software to test all the variables and determine at what orders of differencing and lags will the variables be stationary. The results were obtained as below from Stata.

Using the Hypothesis defined earlier, we reject the Null Hypothesis and first difference orders (I[1]) except for the variable Ln_P which becomes stationery after second order differencing. Since they must have same order, we have lagged it once after first differencing after which stationarity has been obtained.

4.5: Cointegration Test

Co-integration is the statistical implication of long run relationship between economic variables. The basic idea behind co-integration is that if in the long run two or more series move closely together, even though the series are trended, the difference between them is constant. Using SAS again, we run PROC REG on the de-trended variables to obtain the error term which we call **e.**

For there to exist Cointegration, the error term should be integrated to order zero (I[0]). In our case, we obtain the results using the AIC criterion on SAS which is demonstrated as below:

Table 6: Dickey Fuller Results for Residuals

Variable	Label	Minimum AIC	Integration Order [I(d)]
e	Residual variable	-135.648	I(0)

From the two tables and using the AIC criterion on the Innovation Variance table, we see that Minimum AIC is negative 135.648. This minimum AIC is achieved at Order 0 as per table 7 and as such we conclude that there exists an underlying long-run equilibrium relationship between the dependent variable and all the explanatory variables

Table 7: Order Innovation Variance

```
ORDER  INNOVATION VARIANCE
  M        V(M)           AIC(M)
  0     0.00868220   -135.64791278
  1     0.00862300   -133.84634065
  2     0.00861989   -131.85680424
  3     0.00734979   -134.47944129
  4     0.00720610   -133.05200226
  5     0.00714702   -131.29074560
  6     0.00631005   -132.90274008
  7     0.00594485   -132.63166302
  8     0.00593150   -130.69687422
  9     0.00557531   -130.49283458
 10     0.00556222   -128.56098326
```

```
                    AIC(M)-AICMIN (truncated at 40.0)
                         0    10    20    30    40
  M   AIC(M)-AICMIN    +--------+--------+--------+--------+
  0        0       *                                    |
  1     1.801572    | *                                 |
  2     3.791109    |   *                               |
  3     1.168471    |*                                  |
  4     2.595911    |  *                                |
  5     4.357167    |    *                              |
  6     2.745173    |  *                                |
  7     3.016250    |   *                               |
  8     4.951039    |    *                              |
  9     5.155078    |     *                             |
 10     7.086930    |       *                           |
                    +--------+--------+--------+--------+

***** MINIMUM AIC = -135.647913  ATTAINED AT M =  0 *****
```

4.6: Regression Results

The main objective of this study was to estimate the relationship between external debt and Kenya's economic growth. Having gone through the above procedures, we now fit the model as follows: Using the SAS Procedure "PROC REG", the following estimation results were obtained. We therefore present our results for long-run and short-run relationships.

4.6.1: Regression Results – The Long Run Growth Equation:

Table 8: Long Run Relationship Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1.435	0.263	5.46	<.0001
Ln_ExD	1	-0.197	0.129	-1.53	0.1349
Ln_EDS	1	0.387	0.129	2.99	0.0051
Ln_DStE	1	-0.296	0.100	-2.96	0.0056
Ln_K	1	0.545	0.085	6.44	<.0001
Ln_P	1	0.745	0.162	4.60	<.0001
R-Square		0.984			
Adj. R-Square		0.982			
Coeff. Var		1.089			
F-Value		421.09			
Pr>F		<0.0001			

The above table is represented by the equation 7 below.

$$Ln\_GDP = 1.435 + 0.545Ln\_K + 0.745Ln\_L - 0.197Ln\_ExD + 0.387Ln\_EDS - 0.296Ln\_DStE ----(7)$$

R Squared of 98.4% shows that the dependent variable is sufficiently explained by the independent variables. The model almost explains all the variability of the response data around its mean.

The F-Statistic of 421.09 is significant with p-value >0.0001. This confirms that the coefficients are different from zero and that the it did not happen by chance. As such, this is an additional confirmation that the relationship between explanatory variables and dependent variable exists in the long run.

The model shows correct signs for all the explanatory variables as per expectation. All the variables are significant at 10% confidence level except for the External debt stock whose p-value is 0.135. Even though not significant at the defined level, it doesn't move far away (3.5%) and hence acceptable. The signs on the external debt variable does not agree with the theoretical expectation that debt is positively correlated to GDP. This is an indication that the Kenyan debt may not have been put into good use.

The debt overhung represented by variable DStE is significant with p-vales of 0.0056 and a negative sign which is an evidence that Kenya has had a debt overhung problem in the long run as postulated by Were (2001). This shows that in the long run, the Exports have grown much slower than External debt service thereby having negative net exports and as a result leading to economic slowdown. As already explained in literature, Debt overhung acts like a high marginal tax on investments thereby lowering returns and presenting a disincentive to domestic capital formation and encouraging capital flight.

External Debt Service had a positive relationship with GDP in the long run which was not the expectation and the

relationship is significant (p-value=0.0051). 1% increase in Debt service leads to GDP growth of 0.38%. Normally, as a country pays debt, there is expected to be less and less surplus which is then injected into the economy for growth to be realized. A number of reasons for this relationship can be pointed as:

As a country's debt remain more and more on moratorium (grace period) during which only interest is paid, the period of non-payment is expected to achieve economic growth through the same loan injections. This is the case for Kenya which may be misleading.

A country whose debt is on concessional terms will definitely have lesser debt repayments against true loan values which then shall be recorded as growth. This is not good for Kenya especially after rebasing and being announced as a middle income country given that the concessions will be taken away.

There is also the possibility of having more than sufficient exports which in turn takes care of debt repayments with a surplus that then spurs economic growth. This seems to have weight given that from the data used for this study, exports have grown past Debt Service.

Capital Formation variable has a positive sign in the long run as expected. The relationship is significant with a p-value of <0.0001. This is evidence that in the long run, 1% growth in capital leads to 0.55% growth in GDP.

Labour Force variable has a positive sign in the long run as expected. The relationship is significant with a p-value of <0.0001. This is evidence that in the long run, 1% growth in capital leads to 0.74% growth in GDP. This is an indication that in the long run, the effectiveness of labour force leads to more growth than capital accumulation, a phenomenon which may have been caused by the debt overhung problem.

4.6.2: Regression Results – The Short Run Growth Equation:

Having established the existence of a cointegrating relationship among the variables, a vector error correction model (VECM) is estimated to determine the dynamic behavior of the growth equation in the short run. We estimate the short run based on the following specifications.

$$\Delta Y_t = \boldsymbol{\alpha} + \boldsymbol{\beta}\Delta X_{t-1} - \boldsymbol{\beta}ECT_{t-1} + \varepsilon_t \ \text{---------------------------------(8)}$$

Where all the variables are as previously defined except the Δ which represents change and ECT_{t-1} which is the one period lagged error correction term estimated from equation 3. The coefficient measure the speed of adjustment to attain equilibrium in the event of shocks to the system.

Table 9: Short Run Error Correction Relationship Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	0.127	0.098	1.29	0.2047
Δ_Ln_ExD	1	-0.016	0.140	-.011	0.9122
Δ_Ln_EDS	1	0.242	0.115	2.10	0.0434
Δ_Ln_DStE	1	-0.122	0.131	-0.93	0.3601
Δ_Ln_K	1	0.339	0.075	4.49	<.0001
Δ_Ln_P	1	-2.802	3.139	-0.89	0.3788
ECT_{t-1}	1	-0.655	0.138	-4.73	<.0001
R-Square		0.668			
Adj. R-Square		0.606			
Coeff. Var		104.618			
F-Value		10.74			
Pr>F		<0.0001			

The above table is represented by the equation 7 below.

$$\Delta\_Ln\_GDP = 0.127 + 0.339\Delta\_Ln\_K - 2.802\Delta\_Ln\_L - 0.016\,\Delta\_Ln\_ExD + 0.242\Delta\_Ln\_EDS - 0.1227\Delta\_Ln\_DStE - 0.655 \;---\; (9)$$

R Squared of 66.8% shows that the dependent variable is sufficiently explained by the independent variables. The model explains 66.8% the variability of the response data around its mean.

The F-Statistic of 10.74 is significant with p-value >0.0001. This confirms that the coefficients of the short run model are significantly different from zero. As such, this is an additional confirmation that the relationship between explanatory variables and dependent variable exists in the short run.

The model shows same signs as the long run except for the Labour force which is negative and against expectation. External debt stock has a negative relationship with GDP in the short run. However, with p-value of 0.9122, the relationship is not significant hence in the short run, economic growth weakly depends on external debt and as such any increase or decrease of external debt may not have implications on growth. A percentage increase in external debt causes a decrease in GDP by 0.016%

The debt overhung represented by variable DStE is insignificant with p-vales of 0.3601 even though maintains same sign as predicted in the long run equations. As such, in the short run, there exist and insignificant debt overhung evidence.

External Debt Service retains the sign in line with long run model and the relationship is still significant with a p-value of 0.0434.

Capital Formation retains its positive sign in agreement with long run model as expected. The relationship still remains significant with a p-value of <0.0001. This is evidence that in the short run, 1% growth in capital leads to 0.33% growth in GDP which is lower than the 0.55% growth in the long run.

Labour Force variable has a negative sign in the short run contrary to expectations and not in agreement with long run model. The relationship is however not significant in the short run (p-value = 0.3788) with a percentage increase in labour resulting to 2.8% economic slowdown. Ordinarily, as population increases, expectation is that there will be an increase in productive labour force and hence economic growth. This doesn't seem to be the case for Kenya which points to the following possibilities:

   The Kenyan labour force lack technological progress and any incremental force appears to be lacking that

technological progress. This is contrary to what is known because Kenya as a country invests in education and that education should lead to growth. What is coming out is that the education does not help the country and as such this could form subject of study for future studies. There is need to have a full blown inquiry as to why educated population does not spur growth.

The population may be concentrated on the young who are not productive with a possibility of dwindling workforce.

The estimated coefficient of error correction term is statistically significant with a p value of <0.0001 and with an appropriate negative sign reflecting the joint significance of the long run coefficients. This suggest the validity of the long run equilibrium relationship among the variables in equation 3 above. The estimated coefficient value of -0.655 suggests that the system corrects 65.5% of its previous period disequilibrium to its equilibrium level following a shock.

CHAPTER 5:

5.0: SUMMARY AND CONCLUSIONS

The purpose of this study was to estimate the impact of external debt on Kenya's economic growth using time series analysis. Our model follows the Cob Douglas growth model augmented to capture the additional variables of external debt, external debt service and debt overhung.

The empirical results support a long run relationship between the variables in equation 3. Incremental external debt has negative effects on GDP both on the long and short runs. This is in agreement with Were (2001). An increment in debt service increases GDP contrary to previous studies. Debt overhung exists in Kenya both in the long and short runs. Labour force has a positive impact on GDP in the long run but a negative impact in the short run.

In term of literature, past researches concluded negative relationship between external debt and economic growth. Developing nations face the phenomenon stated by the debt overhang hypothesis. Developing nations face other economic issues which the developed nations do not face. Therefore the debt management becomes more difficult for the developing nations like Kenya.

According to this study:

Kenya's debt is positively influencing economic growth. This is contrary to results by previous studies in line with the previous studies. The only concern is that debt has to grow by a higher percentage to achieve unit growth of GDP. There should be additional future inquiry to ascertain exactly what external debt is used for in Kenya and reasons why those activities cannot lead to proportional economic growth

Kenyan debt service grows faster than exports and hence an indication that there exists Debt overhung problems in Kenya.

Population which represents the labour force has a negative relationship with GDP. Conclusion may be that the education does not help the country and as such this could form subject of study for future studies. There is need to have a full blown inquiry as to why educated population does not spur growth.

In terms of policy implications, the results suggest that reducing debt levels would contribute to growth more proportionately by boosting both capital accumulation and productive growth. But reducing debt may not have the desired effect on productive growth, if other macroeconomic and structural distortions or political constraints are held constant (e.g. Political will, civil strife, corruption, exchange rates, drought).

Owing to the relationship stated in section 4.5, this study recommends use of external debt by government to spur growth but the usage needs to be controlled for near proportional growth of debt and GDP.

The results have important policy implications for Kenya. First it nullifies the rebasing of GDP which makes Kenya a middle class economy thus not fit for debt and concessions. There is already debt overhung problem in Kenya and removal of these privileges are likely to increase debt servicing amounts which is likely to affect the economy further. If the problem of debt persists, the government will increase taxes to manage expenditure and as such the resultant effect is slowdown on investment through capital flight. In addition, policies that will improve debt management, reduce corruption and encourage sound government expenditure will be effective in sustainable growth of GDP.

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