

**POTENTIAL AND CONSTRAINTS OF PUBLIC DEBT AS A
TOOL FOR ECONOMIC GROWTH**

By

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DECLARATION

This project is my original work and has not been presented for a degree in any other University or for any other award.

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DEDICATION

This work is dedicated to my son Christoher Kilonzo. You inspired me to see this work to completion.

And to my dear mum Hellen for encouraging me to pursue higher education.

In memory of my father, Eng. Joseph K. Mong'are.

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First, my gratitude goes to the Almighty God for His mercy and grace which has seen me through this course. It is His abundant grace that has brought this research project to a success.

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Lastly, I accept complete responsibility for any errors and omissions that may be in this paper.

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LIST OF ABBREVIATIONS

EU	European Union
FDI	Foreign Direct Investments
GDP	Gross Domestic Product
GoK	Government of Kenya
HIPCs	Highly Indebted Poor Countries
IMF	International Monetary Fund
OECD	Organisation for Economic Co-operation and Development
SSA	Sub-Saharan Africa

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ABSTRACT

This study set out to establish the potential and constraints of public debt as a tool for economic growth. The study used secondary data for a time series of 1980 to 2010 using an error correction model. The study findings indicated that there was cointegration among the variables in the long run. Results also indicated that in the long run, public domestic debt has a negative but insignificant effect with GDP growth rate. The results also showed that in the long run, external debt (ED) has a negative and also insignificant relationship with GDP growth rate. In the long run, the square of domestic debt and the square of external debt reveal that Kenya has not yet reached a point of debt unsustainability as currently, the relationship is positive but insignificant for external debt and negative but also insignificant for domestic debt. Results also showed that in the long run workforce population ages 15-64 (L) has a negative but insignificant relationship with GDP growth rate.

CHAPTER ONE

INTRODUCTION

1.1 Background

Does a high level of public debt have a positive or negative effect on economic growth? The answer to this question is important to policy and key for understanding whether expansionary fiscal policies that increase the level of debt will reduce future standards of living. If positive, it would imply that, while it could be effective in the short-run, expansionary fiscal policies that increase the debt level may reduce long-run growth, and therefore partly or fully negate the positive effects of the fiscal stimulus. Reinhart and Rogoff (2010 and 2012) showed that high levels of public debt are negatively correlated with economic growth, but that there is no link between debt and growth when public debt is below 90% of GDP. Reinhart and Rogoff were careful in stating that their results did not prove the existence of a causal relationship going from debt to growth.

Economic theory suggests that reasonable levels of borrowing by a developing country are likely to enhance its economic growth. When economic growth is enhanced, the economy's poverty situation is likely to be affected positively. In order to encourage growth, countries at early stages of development need to augment what they have because of dominance of small stocks of capital hence they are likely to have investment opportunities with rates of return higher than that of their counterparts in developed economies. This becomes effective as long as borrowed funds and some internally ploughed back funds are properly utilized for productive investment (Checherita and Rother, 2012).

Growth therefore is likely to increase and allow for timely debt repayments. When this cycle is maintained for a period of time, growth will affect per capita income positively which is a prerequisite for poverty reduction. These predictions are known to hold even in theories based on the more realistic assumption that countries may

not be able to borrow freely because of the risk of debt denial. Most policymakers do seem to think that debt reduces long-run economic growth. This view is in line with the results of a growing empirical literature which shows that there is a negative correlation between public debt and economic growth in advanced and emerging economies, and that this correlation becomes particularly strong when public debt approaches 100 percent of GDP (Reinhart and Rogoff, 2010b; Kumar and Woo, 2010; Cecchetti, Mohanty and Zampolli, 2011).

According to Ferreira (2009), the relevance of the public debt to economic growth has become crucial, particularly to the policy-makers who have to deal with increasing fiscal imbalances. In terms of economic theory, it is widely accepted that at moderate levels of public debt, fiscal policy may induce economic growth, with a typical Keynesian behavior. But at high public debt levels, the expected tax increases will reduce the positive results of public spending, decreasing the investment and consumption expenses, with less employment and lower GDP growth rates. On the other hand, there is a broad consensus view that lower GDP growth may also be synonymous with less public revenue and sometimes more public expenditure in social security transfers and other subsidies paid by the Government, which can contribute to the increase of public debt (Ferreira, 2009). However, empirical findings on the link between public debt and economic growth are still inconclusive.

Recently, several theoretical and empirical works analyzed the relationship between the external (and not specifically public) debt and economic growth in developing countries. Patillo et al. (2002 and 2004) conclude that at low levels, total external debt affects economic growth positively, while at high levels, this relationship becomes negative. Presbitero (2005) uses dynamic panel estimations and finds a clear negative relationship between external debt and economic growth.

Schclarek (2004) used a panel including 59 developing and 24 industrialized countries. For the developing countries, he concluded that there is always a negative and significant relationship between total external debt and economic growth, which

is in clear contrast with the results obtained by Patillo et al. (2002 and 2004). Schclarek (2004) found that there is no evidence of a positive relationship between total external debt and growth at low debt levels. In the case of industrial countries, Schclarek did not find any robust relationship between gross government debt and economic growth, suggesting that for these more developed countries, higher public debt levels are not necessarily associated with lower GDP growth rates.

Perroti (2002) had already concluded that fiscal consolidations are more likely to have non- Keynesian effects in countries with high debt levels. Furthermore, the European Commission (2003) verifies that during the past three decades, only half of the fiscal consolidation episodes in EU countries were followed by an immediate acceleration in economic growth. For some specific countries in the EU (namely the cohesion countries), Mehrotra and Peltonen (2005) found that an improvement in the net lending position of the government, as well as a fall in the level of public debt, would be beneficial for socio-economic development in the medium term.

1.1.1 Public Debt theory

Public debt is a public finance concern and according to Alesina and Tabellini(1992) it has progressed along two avenues. The first being, which policy should be chosen and the second, how governments choose policies. The latter's normative prescriptions concern the procedures for reaching public policy decisions rather than the policy decision itself.

Barro (1979) as cited in Alesina and Tabellini (1992),addressed taxation by applying the Ramsey model which yielded results that optimal tax rates are approximately constant over time. Thus any temporary shocks to expenditure or income should be met by issuing debt, while tax rates should be adjusted only in the face of permanent shocks. This conclusion is consistent with historical behaviour of tax rates and public debt in industrial countries (UK,US) where the largest public debt issues occur

during wars (temporary) and tax rates vary when shocks to government spending or transfers during peaceful times are permanent.

Debt can be used without changing tax rates through devaluations or revaluations of the outstanding debt to absorb permanent shocks. With complete markets, public debt enables governments to achieve tax smoothing across time over states of nature.

Citing incentive constraints as reason for dynamic optimal taxation, a government cannot commit in advance to an optimal contingent monetary policy which leaves the equilibrium policy entails too much inflation. Obstfeld (1990,) shows that the bias toward high inflation is greater when the stock of public debt outstanding is larger. As a result, it is optimal for the government to bring down the stock of debt over time. Calvo and Guidotti (1990), show in their study that if a government cannot commit to an optimal state contingent inflation rate, it is also reluctant to do tax smoothing by issuing debt, thus making labour tax rate and inflation rate more variable.

1.1.2 Public Debt Trends in Kenya

Debt increases the array of things which people or organizations would otherwise not be able to do with their existing resources, mostly in purchasing things too expensive to buy with cash at hand. Debt becomes a burden when the cost of servicing the debt grows beyond the ability to pay due to either external events like loss of income or internal difficulties like poor management of resources. In the case of countries that are highly indebted which are otherwise known as highly indebted poor countries (HIPC), they try to bring their escalating fiscal deficits down and in order to do so, these countries are confronted with challenges of increasing revenues by cutting unessential public expenditure and expanding avenues for new investments that can lead these economies to higher growth trajectory path while limiting the current account deficit to sustainable levels (GoK, 2009).

Nevertheless, HIPC's continue to experience difficulties in managing and servicing their huge stocks of debt. While this is happening, there has been a large net outflow of resources more so in the 1990s to meet the debt burden, thus it is widely accepted that the heavily indebted countries particularly in the sub-Saharan Africa require debt relief initiatives to have a turnaround in their economic performance and fight against poverty (World Bank, 2010).

Figure 1.1 shows the trend of public debt in Kenya which has been rising. As at April 2010, Kenya's debt burden had reached Kshs. 1.19 trillion translating to each of the 40 million Kenyans owing foreign and domestic creditor's Kshs. 29,750 which is more than the take home salary of many workers. The growth in the debt burden is mainly through multi-lateral sources with foreign financial institutions like the African Development Bank, International Monetary Fund and the International Development Association as some of the major creditors.

Figure 1.1: Kenya Public Debt Trends.

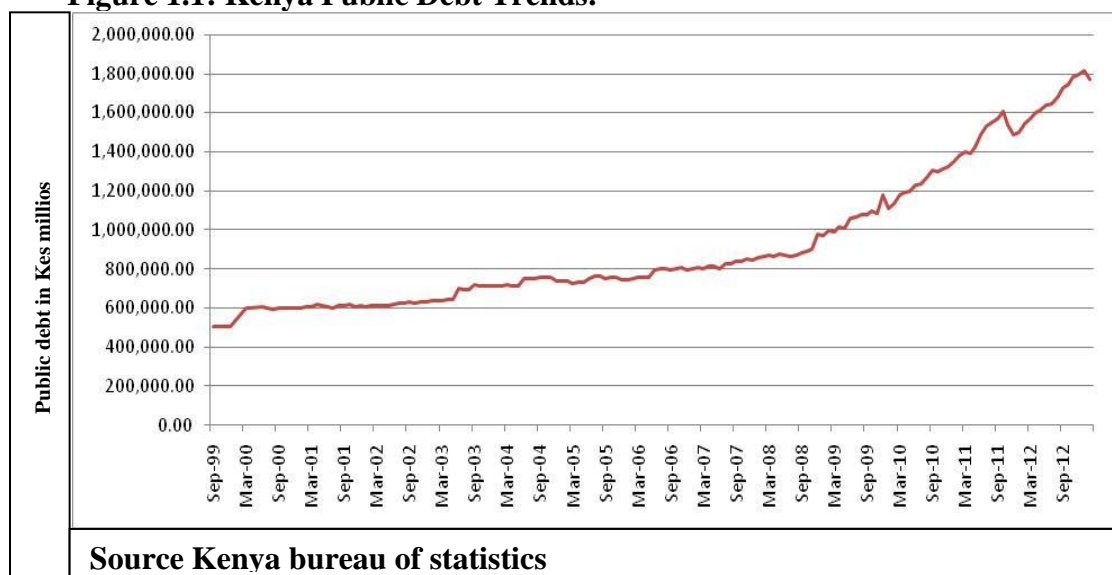
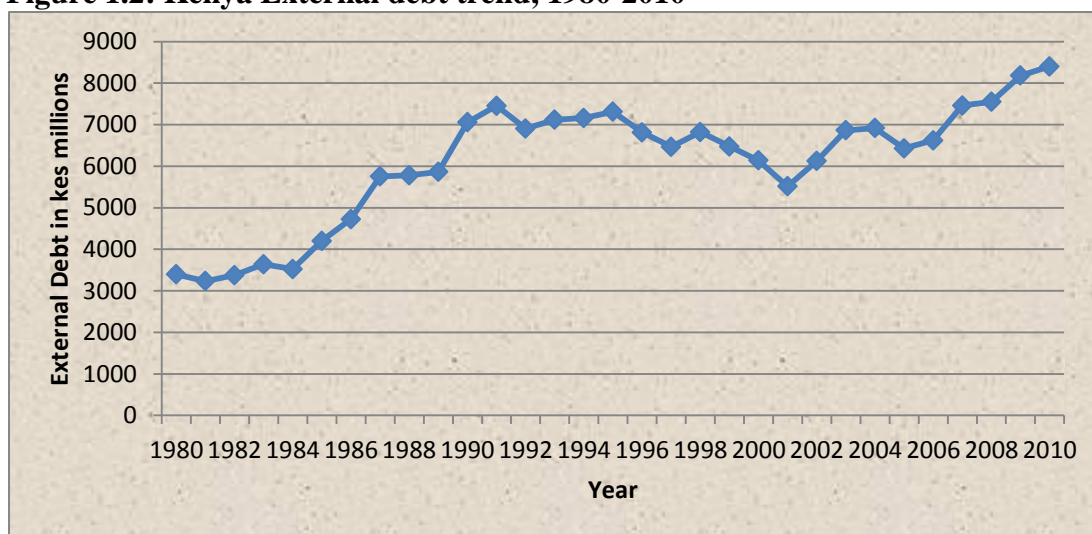


Figure 1.2 shows the external debt stocks which although has been rising has been occasioned with some dips at times. The 1983 Economic Survey had observed that as the government was responding to the increased pressure on government finances

and need to finance large balance of payment deficits, public debt had been increasing. Most of this increase was due to the rapid escalation in the size of external debt. External public debt increased at 33.5 per cent in 1982 alone. Internal public debt increase was much more moderate at 3.8 per cent that same year.

Figure 1.2: Kenya External debt trend, 1980-2010



Source world bank data

Development and investment expenditures were reduced which brought down the overall deficit. There was a significant increase in receipts from external grants and loans, so that the remaining deficit to be financed was smaller than in 1981/82. Much of the internal borrowing was met by long term rather than short term borrowing.

According to 1991 Economic Survey expenditure growth was greater than growth in receipts in 1990/91. This increase meant that the current account deficit worsened. Although internal resources were marshalled through floatation of treasury bonds and bearer bonds, the high cost of internal debt offset the net resources to finance the overall deficit thus explaining the sharp rise during this period. Net external debt remained the major source of funds financing the overall deficit.

In 1994, domestic debt grew modestly as compared to external debt. The rise in external debt is attributed to the rapid depreciation of the shilling against the

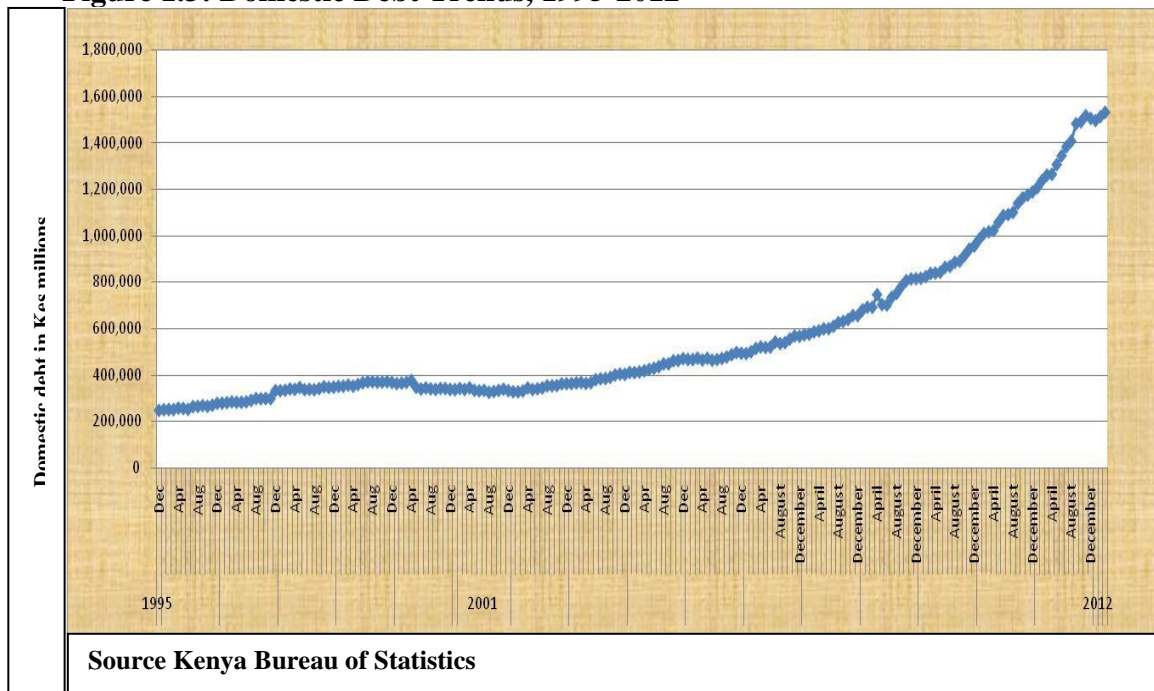
currencies in which the liabilities are denominated. The 1993/94 budget contained strong fiscal measures aimed at sound and prudent government finance management. Firm monetary policies to mop up excess liquidity were put in place to ease inflationary pressure, rising interest rates and stabilise exchange rates. During this period, the already overstretched budgetary resources were diverted to famine relief measures.

In 2004, the government effort shifted from domestic borrowing to external borrowing which increased stock of external debt and slowed growth of domestic debt. The outstanding debt had 45 per cent as sourced domestically and 55 per cent sourced externally. This is in line with the government's objective to minimise domestic borrowing and rely on external concessional borrowing to finance the budget deficit.

The economic survey of 2012 indicated that internal debt decelerated from 32.9 percent in 2010 to 17.0 percent in 2011 largely as a result of under subscription of treasury bills in the auction market and turbulent financial markets locally and internationally.

Figure 1.3 shows the domestic debt trend and while it has been rising, the trend is different from the external debt as it does not experience pronounced dips.

Figure 1.3: Domestic Debt Trends, 1995-2012



Deficits in the current account were considered normal from early 1950s. Countries were encouraged to borrow abroad to encourage economic growth (World Bank, 2010). Little attention was paid to the liabilities side which increased the external indebtedness of these countries. A significant growth of multi-lateral debt began with the Latin American debt crisis of the early 1980s. Mexico, Argentina and Brazil all came to the brink of defaulting on loans that large private banks had freely offered during the 1970s to developing country governments in Latin America and elsewhere.

In the case of Kenya, it resorted to heavy external borrowing during the oil crisis of 1973/74 which created severe balance of payments (BOP) problems that changed the economy outlook in the country. The external debt stock grew by 45.3% in 1973 from the previous year. The growth rate decelerated to less than 4%, being only 2.9% in 1975 (World Bank, 2010).

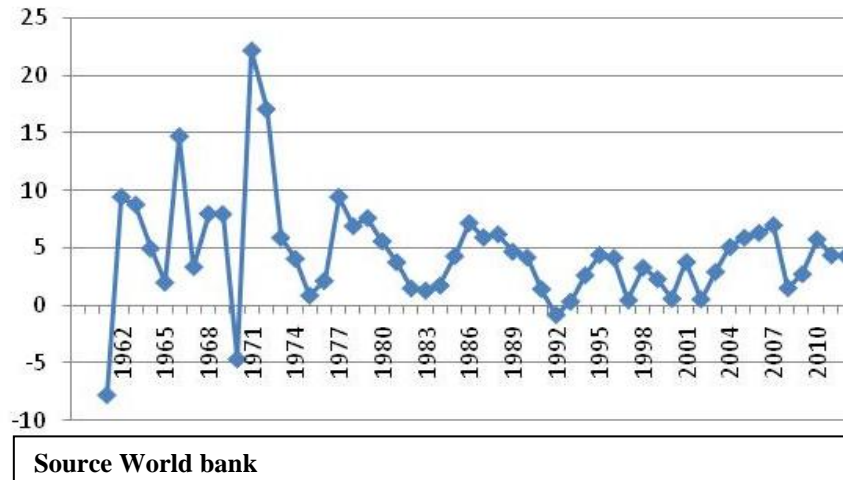
A drop in debt-servicing ratio was experienced in 1978 owing to the coffee boom of 1977 which led to an abrupt increase in export volume earnings. However, the drop was short lived due to second oil crisis immediately after the coffee boom that saw a

sharp deterioration in world commodity markets. The debt- servicing ratio for that matter began to blow out of proportion which in turn led to a rising debt to GDP ratio. Increased real foreign interest rates on international loans raised the debt service charges substantially. This led to a decrease in net transfer on debt, being negative in 1981, 1984 and 1986 despite the IMF and World Bank introducing Structural Adjustment Programmes (SAPs) which were packages of economic reforms designed to restore economic health to indebted countries. SAPs failed on most HIPC countries as they caused increased poverty, unemployment and environmental destruction and usually led to an increase in the overall size of a country's multi-lateral debt and Kenya is no exception (ICJ Kenya, 2010).

1.1.3 Trends of Economic Growth in Kenya

In the first decade of independence between 1964 and 1973 there was remarkable performance with the economy growing at an average of 6.7 percent. This was as a result of emphasis on small holder agricultural farming and growing demand both domestically and within East Africa. The period that followed between 1973 and 1985 was characterized by oil shocks of 1973/74 and 1979/80 which affected the economy negatively. The mismanagement of proceeds from coffee boom of 1976/77 together with the effects of the oil shocks resulted to balance of payment problems (Mwega and Ndungu, 2002). During this period the government was the major investor leading to a 37 percent increase in government spending.

Figure 1.4: Kenyan Economic Growth Trend (annual %), 1962-2010



Following the effects of the second oil price shock, attempted military coup of 1982 and severe drought in 1983-84, the average growth in GDP declined to 3.2 percent. This was followed by mini-coffee boom of 1986 which saw the economic growth increase to an average of 5 percent. The favourable weather condition after the drought and decreased oil prices also favoured economic growth (Mwega and Ndungu, 2002). As a result of ethnic clashes experienced during multi-party elections in 1992 followed by major drought in the same year the average economic growth rate declined further to 2.5 percent. During this period, the interest rates were high, there were large exchange rate depreciations as a result of foreign exchange market liberalization and growing budget deficit and hence balance of payment problems. Most donors withdrew foreign aid, leading to a remarkable decline in foreign investments.

All major sectors of the economy like tourism, agriculture and manufacturing recorded poor performance leading to further decline in average economic growth to 1.9 percent in the late 1990s. After ethnic clashes in 1997, the effect of El Nino rains experienced in 1997/98 which had a great impact on infrastructure and major draught in year 2000 (Economic Report on Africa, 2002), Kenya's economic growth was at 0.6 percent in year 2000.

A modest recovery was experienced between 2001 and 2007 when real GDP growth rate rose to 7.0 percent. This was as a result of increased investor confidence after

2002 general elections, increasing economic integration and increased donor support. However, various challenges experienced in 2008 namely post-election violence, high fuel and food prices, global economic turmoil and unfavourable weather condition saw economic growth take a downturn recording a real GDP growth of 1.7 percent (Kenya Economic Survey, 2009).

In 2010, the real GDP expanded by 5.6 percent after suppressed growth of 1.5 percent and 2.6 percent in 2008 and 2009 respectively. During this period there was macroeconomic stability, low inflationary pressure, favourable weather conditions and private investor confidence remained high therefore boosting economic growth. However, instability of the foreign exchange market in the second half of 2011 and inflation due to high oil and food prices restrained growth further to 4.4 percent in the year 2011.

1.2 Problem Statement

Public debt has been researched widely with different studies yielding conflicting results about the relationship between economic growth and public debt (Panizza and Presbitero, 2012; Pattillo et al., 2002; Schclarek, 2004; Abbas and Christensen, 2007; Freeman and Webber, 2009).

These studies reported conflicting results about the relationship between public debt and economic growth. Pattillo et al. (2002) found that the impact of external debt on per-capita GDP growth is negative for net present value of debt levels above 35-40% of GDP. Clements et al. (2003) found that the turning point in the net present value of external debt is at around 20-25% of GDP. Schclarek (2004) investigating the relationship between gross government debt and per capita GDP growth in developed countries, did not find any robust evidence of significant relationship. Abbas and Christensen (2007) explored the role of domestic debt markets in economic growth and revealed that government debt markets play an increasingly important role in supporting economic development in developing countries. According to macroeconomic theory government expenditures should have positive

relationship with the level of economic growth. This view is supported by the paper of Freeman and Webber (2009) who find that expenditures such as education, health and nutrition (productive type of expenditure) can lead to economic growth and returns.

The recent surge in public debt across industrial countries during and after the recent global crisis has made it a prominent policy issue of whether high debt levels have a negative impact on growth. Panizza and Presbitero (2012) tested for causality and did not find evidence in support of the hypothesis that debt causes economic growth.

The studies that have been conducted were done on developed and emerging economies. This is a study conducted on a developing country like Kenya. It will seek to establish what effect the external and internal debt levels in the Kenyan economy have on economic growth. Public debt trends in Kenya have been seen to be rising with a different rate from economic growth.

1.3 Research Objectives

The general objective of the study is to establish the impact of public debt on economic growth. The main objective is pursued in line with the following specific objectives

- i) To examine the effect of the constituents of public debt levels on economic growth in Kenya.
- ii) Make policy recommendations based on the research findings.

1.4 Relevance of the Study

This study is of practical relevance to all institutions both private and public who uphold the economic growth of Kenya. It will provide institutions with useful insights of how best to effectively manage debts. It will seek to add growing literature of debt and economic growth by disaggregate the components of debt and

assess the respective effect on growth. Issues on public debt are also important in addressing the economic significance on future generations.

The study will also seek to come up with findings that will assist policy makers' gain vital understanding on the effects of public debt on economic growth hence put in place effective measures to enhance nation's economic growth and stability. The findings will be vital in informing policy makers on the appropriate and optimal debt mix for the purpose of achieving better economic outcomes.

In theory, the study will seek to contribute to the body of knowledge, while at the same time, deepening research gaps on effects of public debt on economic growth that other scholars may need to undertake in future.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses a number of theories relevant to the study of economic growth and public debt while also reviewing literature related to the study.

2.2 Theoretical Review

Solow (2002) contended that all theory depended on assumptions that were not quite true. However, successful theorizing was to make inevitable simplifying assumptions in such a way that the results derived from these theories were not very sensitive. He further contends that crucial assumptions that conclusions from these theories depend on sensitively, should be reasonably realistic. In this section I discuss theories that are relevant to this study which are encompassed in Harrod-Domar, the Neo-classical and the dependency growth theories.

2.2.1 Harrod-Domar Growth Model

The Harrod-Domar model tries to explain economic growth in terms of savings and productivity of capital and it has been attributed to be one that postulates an exogenous growth model. It was a contention by Solow (2002) however, that a characteristic of the Harrod-Domar model of growth was that it studied the long-run with short term tools. The model handled the long run in terms of the multiplier, the accelerator and the capital co-efficient.

The assumption that this model makes is that there is only one commodity whose rate of production is Y_t . Where part is consumed and the rest saved at a constant rate s and invested. The rate of saving is thus sY_t . The capital stock K_t is an

accumulation. Net investment is the rate of increase of the capital stock dK/dt or \dot{K} and the identity at every instant of time is as:

$$\dot{K} = sY. \dots\dots\dots(1)$$

Production of output is done using two factors of production, capital and labour at the rate of input as $L(t)$. The technological possibilities represented by a production function as:

$$Y = F(K, L) \dots\dots\dots(2)$$

Here, output is net output as capital is depreciated accordingly.

This model assumes that; there are constant returns to scale; the production function is homogenous of first degree. Another assumption is that non-augmentable resources like land are non-existent as this would mean that there would be decreasing returns to scale in capital and labour negating the theory.

Substituting equation (2) in equation(1):

$$\dot{K} = sF(K, L) \dots\dots\dots(3)$$

Population growth of the labour force is assumed to be exogenous and increases at a constant relative rate n , and in the absence of technological change n is the natural rate of growth. Thus:

$$L(t) = L_0 e^{nt} \dots\dots\dots(4)$$

The difference in equation 3 and equation 4 is that L is for total employment in equation 3 while it denotes supply of labour in equation 4, which means the assumption that full employment is maintained when it is substituted as shown below:

$$\dot{K} = sF(K, L_0 e^{nt}) \dots\dots\dots(5)$$

The above equation 5 determines the time path of capital accumulation that must be followed if all labour is at full employment. If equation 4 is assumed to be a supply curve of labour, then the exponentially growing labour force is offered employed inelastically.

This model also assumes that there is full employment of capital stock. And at any point in time the pre-existing stock of capital is inelastically supplied. At any point in time, the available labour supply is given by equation 4 and so is capital by substitution. This is because the real return to factors of production will adjust to

bring full employment of both and equation 2, the production function can be used to find the current rate of output.

The assumptions of this model as discussed above are: there are constant returns to scale, the production function is homogenous of degree one, there are no scarce resources e.g. land, there is no technological change, full employment of the factors of production is maintained.

2.2.2 Neoclassical Growth Model

The neoclassical growth theory is what the dynamic models of macroeconomics build on from Solow's (1956) and Swan (1956) work which brings out the Solow-Swan model. The model was developed as a criticism of the Harrod-Domar model of analysing long run problems with short run classical analysis. Solow also adopted the assumptions as given in the Harrod-Domar model except that of fixed proportions of input and extended the model by requiring diminishing returns to labour and capital separately and constant returns to scale for both factors combined, adding time varying technology variable, distinct from capital and labour.

The growth model is based on three key assumptions. First, that the active labour (L) and labour saving technical progress (t) grow at a constant exogenous rate. Second, all savings are invested and that investment is not an independent function. The third is that output is a function of capital and labour, where the production function exhibits constant returns to scale and diminishing returns to the individual components of the factors of production.

In equation form the Solow growth model begins with a production function;

$$Y_t = f(K_t, A_t L_t) \dots \dots \dots (6)$$

Where Y_t represents output; K_t represents capital; A_t represents technology; L_t represents labour

The neoclassical assumptions are satisfied as:

- Positive and diminishing marginal returns of factor inputs.
- Constant returns to scale with respect to capital and labour.

$$F(\lambda K_t, A_t (\lambda L_t)) = \lambda F(K_t, A_t L_t) \quad \lambda > 0$$

- Inada conditions hold.

After several manipulations, the final Solow-Swan model is;

$$\frac{d}{dt}k(t) = sf(k) - (g + n + \delta)k(t) \dots\dots\dots (7)$$

This is the equation of motion of capital in the Solow growth model. It stipulates that capital will increase (decrease) when the amount of savings $sf(k)$ is larger (smaller) than the combined cost of technology growth $gk(t)$, labour growth $nk(t)$ and capital depreciation $\delta k(t)$.

2.2.3 Dependency Theory of Growth

Dependency theory is a theory of the interaction between the developing and developed nations. It can be seen as an opposition theory to the free market theory of interaction. Dependency theory had first been formulated in the 1950s, drawing on a Marxian analysis of the global economy, and as a direct challenge of the market economic policies that were adopted in the post-war era which advocated a free market.

The free market ideology holds that open markets and free trade benefit developing nations, helping them to eventually join the global economy as equal players. Although painful for a time, some of the methods of market liberalization will in the long run help these nations to establish their economies making them competitive at the global level.

The dependency theory of growth also argues that the underdeveloped countries have features and structures that are unique and are integrated into the world market economy as weaker members. This was a reaction to earlier theories of development that purported that societal progress would only be achieved through similar stages of development which today's developed world experienced in the past. As such, the

task of helping the underdeveloped areas out of poverty is to aide in accelerating them along that development trail. This would take place by means such as investment, technology transfers and greater interaction in the world market.

The theory was explained as first, that poor countries exported natural resources, cheap labour and markets for developed nations who manufactured products out of those commodities and sold them back to them. This would always cost more and as a result, leave the poorer countries spending more on imports than what they earned from their exports. It has been purported that poor nations also provided markets for the developed world's obsolete technology.

Second, is where the developed world perpetuated dependence through various means which did not end when independence was attained. It has been posited that this involves media control, politics, banking and finance, education (which translates to all aspects of human resource development) and sport. Domination by the developed world has continued through the great influence of transnational companies. Supporters of the dependency theory propose that only through the delinking by the developing countries from the developed world would we have development seen in these countries.

Third is that wealthy nations counter attempts by dependent nations to resist influence and actively keep developing nations in a subservient position often through economic sanctions or by proscribing free trade policies attached to loans granted by the World Bank or International Monetary Fund.

The dependency theory also suggests that dependency increases as the developed and developing world continue to interact in the world market system because of how they are integrated into the system. Wealthy countries use their wealth to influence the adoption of policies that increase wealth of the developed nations at the expense of the developing nations. This causes a situation where capital moves to the developed nations but not developing nations. This causes a situation where capital

moves to the developed nations, which forces the latter to seek larger loans which further indebts them further.

2.3 Empirical Review

The basic reason of external debt in developing countries is to fill the “saving-investment” gap (Chenery, 1996). The developing countries faced with current account deficit are encouraged to borrow from developed countries as well as the international community to boost their economic growth.

Were (2001) investigations revealed that nations borrow for macroeconomic reasons to either finance capital investment and to circumvent hard budget constraints. Economies borrow to boost economic growth, improve standard of living and eradicate poverty.

Domestic savings play a dominant role in economic growth and stability of any country. Economic growth requires investment which can be financed through domestic savings or from abroad through foreign capital inflows. However, in the long run a nation has to rely on domestic savings. Economic growth stimulation primarily depends on investment through both domestic savings and capital accumulation. Theoretical and empirical economic literature emphasize the role of domestic savings in influencing the pace of fixed investment in an economy. Theoretical frameworks emphasizes the role of domestic savings in the growth of GDP through investment channels which is supported by evidence from the contrast between the high growth rates of East Asia Tigers and the slow growth in Latin America despite the two regions starting off with comparable levels of per capita GDP in the 1960s. Aghion et al. (2009) noted that a major difference between the two regions was that the average private saving rate from 1960 to 2000 was 25% for East Asia, while Latin American countries rate was only 14%.

Aghion et al. (2009) on the other hand posits that a country with international capital markets cannot grow faster by saving more as investment can be financed by foreign

saving. The existence of a secondary market in Kenya would mean that savings from international capital flows into the stock exchange may fill the shortfalls in domestic savings, therefore weakening the proposition that domestic savings might be a precondition for increased investment as proposed in the Vision 2030. For instance Mwega et al. (2009) did not find a positive or significant relationship between real deposit interest rates and financial savings for Kenya suggesting that safety rather than returns has been the major reason for keeping savings with financial institutions.

According to Di Giovanni et. al. (2009), of interest in economics is the extent to which monetary policy interventions affect the real economy. An increase in interest rates makes the cost of money more expensive and may crowd out private demand, particularly when investments show a significant sensitivity to changes in interest rates. This could lead to a decrease in aggregate demand, both directly through investment and indirectly through a lower wealth effect in the private sector and subsequent lower consumption. However, higher interest rates could also lead to an increase in savings and could attract foreign inflows that could lead to a currency appreciation. This is holds true in a fairly small open economy, with a flexible exchange rate regime and relatively mobile capital (Briotti, 2005).

Di Giovanni et al. (2009) found that interest rates lower quarterly real growth only moderately. Their results, using an ordinary least squares (OLS) methodology, show that a 1 percentage point increase in the interest rate in the Netherlands resulted in a 0.094 percentage point decrease in the real growth rate. A similar increase in the interest rate in France gave rise to only a 0.015 percentage point decrease in the real growth rate. Their research shows an average interest rate effect of -0.043 on real growth across 12 European countries.

Gokal and Hanif (2004) reviewed several different economic theories to the inflation and growth relationship for the economy of Fiji. Their results showed that a weak negative correlation exists between inflation and growth, while the change in output gap bears significant bearing. Sweidan (2004) examined the relationship between

inflation and economic growth for economy of Jordan and finds a structural break point at 2 percent level of inflation. They also find from their result the implication that the effects of inflation on growth are stronger as compared to the effects of inflation on uncertainty and variability.

Khan and Schimmelpfenning (2006) constructed a simple inflation model taking data of economy of Pakistan for the period January 1998 to June 2005 and found that monetary factors determine inflation in Pakistan. They examined long run relationship between the CPI and private sector credit and their results show that there may be no trade-off between inflation and growth in the short run but it certainly exists in the medium and long run. Their estimated results suggest 5 percent inflation target for sustained economic growth and macroeconomic stability for the economy. Kemal (2006) finds that an increase in money supply over the long-run becomes the source of inflation and thus verifies the quantity theory of money .The results drawn by Khan and Schimmelpfenning (2006) study showed that the long-run excess money supply is the main responsible for inflation in Pakistan. The study by Hussain (2005) had results that implied inflation in Pakistan is a monetary phenomenon.

Munir et al. (2009) analyzed the nonlinear relationship between inflation level and economic growth rate for the period 1970-2005 in the economy of Malaysia. Using annual data and applying new endogenous threshold autoregressive (TAR) models proposed by Hansen (2000), they find an inflation threshold value existing for Malaysia and verify the view that the relationship between inflation rate and economic growth is nonlinear. The estimated threshold regression model suggests 3.89 percent as the structural break point of inflation above which inflation significantly hurts growth rate of real GDP. In addition, below the threshold level, there is statistical significant positive relationship between inflation rate and growth.

Ogunmuyiwa (2011) examines whether external debts promotes economic growth in Nigeria using time series data from 1970-2007. The regression equation was estimated using Vector Error Correction Method. The results revealed that causality

did not exist between external debt and economic growth. The Nigerian Government debt rose considerably but this trend was generally accompanied by an expansion in the size of governments.

According to European Commission's Sustainability Report (2009), many euro area and EU countries (8 in the euro area and 13 EU countries) are now at high risk with regard to fiscal sustainability. This reflects large current fiscal deficits, high debt levels, an outlook of possibly subdued GDP growth, as well as the projected fiscal implications of population ageing which are considerable in some countries. The sustainability risks in the EU-27 is so significant that "debt sustainability should get a very prominent and explicit role in the surveillance procedures" under the EU Stability and Growth Pact. Financial markets have reacted to the deterioration in the fiscal situation and outlook of individual countries with significant increases in sovereign yield spreads.

Discussing the relationship between public debt and economic growth in advanced economies are Reinhart and Rogoff (2010a) finding that high levels of debt are negatively correlated with economic growth. They find that there is no link between debt and growth when public debt is below 90 percent of GDP. Reinhart and Rogoff (2010b) illustrate this threshold effect by using annual data on debt and output growth for 20 advanced economies over 1946-2009 and splitting their sample into four groups: (i) country-years for which public debt is below 30 percent of GDP (443 observations); (ii) country-years for which public debt is between 30 and 60 percent of GDP (442 observations); (iii) country-years for which public debt is between 60 and 90 percent of GDP (199 observations); and (iv) country years for which public debt is above 90 percent of GDP (96 observations).

Minea and Parent (2012) conducted a study on the relationship between debt and growth and found that public debt is negatively associated with growth when the debt-to-GDP ratio is above 90 percent and below 115 percent. However, they also find that the correlation between debt and growth becomes positive when debt

surpasses 115 percent of GDP. They suggested the existence of complex non-linearities that may not be captured by models using sets of exogenous thresholds.

Panizza and Presbitero (2012) did a study on whether public debt has a causal effect on economic growth in a sample of OECD countries. The results were consistent with the existing literature that found a negative correlation between debt and growth. However, the link between debt and growth disappeared once the author's instrument debt with a variable that captures valuation effects brought about by the interaction between foreign currency debt and exchange rate volatility.

Pattillo et al. (2002) used a large panel dataset of 93 developing countries for the period 1969-1998. They found that the impact of external debt on per-capita GDP growth is negative for net present value of debt levels above 35-40% of GDP. Also Clements et al. (2003) used a panel of 55 low-income countries for the period 1970-1999. They found that the turning point in the net present value of external debt is at around 20-25% of GDP.

In a recent paper Reinhart and Rogoff (2010b), analyze the developments of public debt and the long-term real GDP growth rate in 20 developed countries for a period that cover about two centuries (1790 - 2009). They found that the relationship between government debt and long-term growth is weak for debt/GDP ratios below 90% of GDP.

Abbas and Christensen (2007) explore the role of domestic debt markets in economic growth. Their study covered 93 countries over the 1975 to 2004 period and revealed that government debt markets have an important role in supporting economic development in developing countries. According to macroeconomic theory the government expenditures should have positive relationship with the level of economic growth. This theory is supported by Freeman and Webber (2009) where they found that expenditures on education, health and nutrition can lead to economic growth and returns.

Maana *et al.* (2008) studying the impact of domestic debt in the Kenyan economy used the Barro growth regression model. The results indicated that although the composition of Kenya's public debt had shifted in favour of domestic debt, the expansion had a positive but not a significant effect on economic growth during that period.

Mukui (2013) studied the effect external debt had on economic growth and also if there was any significant contribution of the debt in economic growth for the period between 1980 -2011 in Kenya. The results showed that external debt had a negative effect on economic growth.

The connection between growth and debt is positive and is obtained through the strong and worldwide extended financial markets channel (Alfaro, 2010; Durham, 2004; Hermes and Lensink, 2003; Chee 2010), as an insufficient level of development of the markets and financial institutions prevent the achievement of a high level of economic growth (Abzari *et. al.*, 2011). The relation between rate of accumulation and national income growth rate has a positive implication on the balance of payments by financing the deficit.

Studies that identified a negative correlation as a result include Durham (2004), Lyroutdi (2004), Carkovic and Levine (2005) and Lipsey (2006). The unfavorable approach of the relation between FDI and the economic growth is supported by Durham (2004) after researching a panel formed by 80 countries, in the period 1970 – 1980, but sustained the important role played by financial and institutional absorptive capacity.

Salman and Feng (2009) and Misztal (2011) stipulated the role of the foreign capital in gaining an increased GDP rate through contribution to: human resources development, capital formation, raising the competitiveness on the local market. Technological progress stimulated by capital transfers has a favorable impact on national productivity, increasing the industries role in achieving an increased GDP growth rate. Lipsey (2006) based an analysis of the information taken from the

balance of payments of 25 countries from Central and Eastern Europe argues that the relation between foreign capital flows and GDP is a “positive, significant and robust” one.

Johnson (2006) analyzes 90 selected countries foreign capitals impact on increasing physical capital, obtaining a positive result in developing countries and a negative one in the developed economies. He concludes that a superior rate of economic expansion can be obtained through actions which promoted national interest and opening the extension perspectives. The economic and financial implications on development are produced both directly through the essential channels which permit externalities transmission and indirectly by increasing competitiveness, innovative techniques and the modernization of productive equipment.

Jayasuriya (2011) showed that the positive connection between variables considering investment ratio, political instability, conditions for implementing commercial operation to gain national welfare. The advanced technology is favorable to business, but capital accumulation ensure the adequate space for enhancing national productivity through a bigger number of jobs and persons involved in activities where their incomes guarantee the functionality of productive cycles.

Reviewing Meade’s article (1958) with the postulation that “apart from a redistribution of wealth and income, a domestic national debt can have little effect on the economy”, Hansen (2002) refuted this argument. He continued to point out that a large national debt would have: 1) pigou-effect on saving; (2) a “kaldor –effect” on incentives to work, invest and accumulate; (3) an adverse incentive effect of the additional taxes needed to finance interest payments and more so the widened gap between the value of marginal product and the net reward for labour (or investment) caused by high marginal rates; (4) the adverse effect of the higher interest rates needed to counter the inflationary impact of the “pigou-effect”.

Hansen contended that a large national debt has the effect on the stability of the economy over the cycle. He agrees with Meade that the wealth – effect of public debt is of importance but arrives at a different conclusion from Meade.

2.4 Overview of Literature

The effect of public debt on economic growth has been widely researched leading to diverse results. This can be attributed to the choice of specifications that are used. Reinhart and Rogoff (2010b) showed that there is no link between debt and growth when the percentage of debt is below 90%. Other studies have shown that debt and growth have a negative correlation (Panizza and Presbitero, 2012). Some studies have shown that there lacks any robust evidence of a significant relationship (Schclarek, 2004).

The existing literature has shown that some studies showed a positive link between debt and growth, others showed a negative relationship (Mukui, 2013) while others show that the relationship is insignificant even if there exists a positive correlation.

This study seeks to add to the existing literature by examining the potential and constraints of public debt as a tool for economic growth in Kenya while seeking to establish if Kenya's current debt levels has affected the economic growth rate. To this end determine how public debt, domestic and external, has affected economic growth.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter covers the methodological approach of how the data is analysed, specification of the empirical model, data sources and measurement of variables.

3.2 Theoretical Framework

Various economic growth models have used different variables to attempt to explain what causes growth. This paper has discussed three; Harrod-Domar theory, neoclassical and the dependency theory.

The model that is adopted to capture the constraints and potential of public debt as a tool for economic growth is the neoclassical growth model. It has adopted the Solow growth model and modification done on it to capture the effects of debt on growth so as to inform the inference that is meant to aide in making policy recommendation. The Solow model adds labour as a factor of production and relaxed the assumption of having capital-labour ratios fixed which the Harrod-Domar model assumes. The model captures the effects of long-run economic growth having productivity, capital accumulation, population growth and technological progress as its main variables.

This study seeks to determine the effect of public debt on economic growth and as a consequence includes the determinants of growth from the neoclassical framework together with the debt variables and control for them. This study builds on the Solow growth model as modified by Barro(1991).

The relationship that determines growth according to the neoclassical growth model as expressed by Solow can be expressed in the following:

$$Y=f(K,L,T) \dots\dots\dots(8)$$

Add to this and as described by Barro in the form below;

$$Y=\beta_0+\beta_1.Y+\beta_2.X+\varepsilon_{it}\dots\dots\dots (9)$$

Where;

Υ -Represents the growth rate; Y - Represents the level of per capita GDP; X – Represents vector of explanatory variables. In Barro’s model, X represented the determinants of long run economic growth.

The empirical model that is estimated in this study on the basis above is specified as follows:

$$\Phi_t = \beta_0 + \sum_{i=1}^2 \beta_i Y_i + \sum_{j=1}^4 \beta_j X_j + \beta_1 D + \varepsilon_t \dots\dots\dots (10)$$

Where Φ represents GDP growth rate; Y represents public debt (external and internal); X –Represents vector of explanatory variables that are controlled for. D represents a dummy variable that will capture the effects for, if any of outliers in the variables that may have been caused by policy. The controlled variables are Capital (K), Savings(S), Labour (L), Inflation (I).

The debt variables are then squared to investigate the nonlinear nature of debt in the determination of economic growth as shown below:

$$\Phi_t = \beta_0 + \sum_{i=1}^2 \beta_i Y_i + \sum_{i=1}^2 \beta_i Y_i^2 + \sum_{j=1}^4 \beta_j X_j + \beta_1 D + \varepsilon_t \dots\dots\dots(11)$$

The estimated model is specified as:

$$Y = \beta_0 + \beta_1 K + \beta_2 S + \beta_3 L + \beta_4 I + \beta_5 DD + \beta_6 ED + \beta_7 D + \varepsilon_t \dots\dots\dots (12)$$

Where; β_0 = constant; β_{1-7} = estimated coefficients; ε_t = error term

K represents capital, S represents savings, L represents labour, I represents inflation, DD represents domestic debt and ED represents external debt. The inclusion of domestic debt and external debt as specified in equation (11) is done to find out which of the debt variables, external and domestic tips first in the model. This is specified as below:

$$Y = \beta_0 + \beta_1 K + \beta_2 S + \beta_3 L + \beta_4 I + \beta_5 DD + \beta_6 ED + \beta_7 DD^2 + \beta_8 ED^2 + \beta_9 D + \varepsilon_t \dots\dots\dots (13)$$

Where β_0 = constant; β_{1-9} = estimated co-efficient; ε_t = error term

Table 3.1: Variable definition, Measurement and Expected sign.

Variable Name	Definition	Measurement	Expected Sign
Y	GDP Growth rate	Change in value of GDP as a percentage of GDP of previous year	-
K	Capital	Gross fixed capital formation as a percentage of GDP	Positive
L	Population	Growth rate of productive workforce (ages 18 to 64 years)	Positive
S	Domestic Savings	Gross Domestic savings as a percentage of GDP	Positive
I	Inflation Rate	Annual inflation rate	Negative
DD	Domestic Debt	Domestic debt as percentage of GDP	Positive
ED	External Debt	External debt as a percentage of GDP	Positive
D	Dummy variable	'1' for the period after 1992 '0' otherwise	Indeterminate

3.3 Econometric Methodology

The first step would be to test for unit roots in all the variables involved. In the case of stationary variables, the model would be estimated in levels. If all the variables are non-stationary, $I(1)$, in levels and are stationary in first differences, $I(0)$, then a co-integration test is carried out to determine if a long-term relationship exists.

3.4 Testing for Unit Roots

Unit root testing is done to determine whether a series is stationary or non-stationary and establish their order of integration. The need for this is because the non-stationary series is seen to be time dependent in its mean and variance which makes it move away from the mean. Differencing rectifies the non-stationarity. However, it has been seen as leading to a loss of long run information. A stationary series is independent of time, has a constant mean, with finite variance and moves close to its mean.

The first step is to test the variables for unit roots to establish their order of integration. To test the level of integration of the variables that is employed in this study, Augmented Dickey-Fuller test (ADF) is applied. The aim is to determine whether the variables follow a non-stationary trend and are of the order 1 denoted as $I(1)$ or whether the series are stationary, that is, of the order of 0 denoted as $I(0)$. ADF test is based on the estimate of the following regression:

$$\Delta x_t = a_0 + a_1 t + \beta x_{t-1} + \sum_{j=1}^p \delta_j \Delta x_{t-j} + \varepsilon_t \dots\dots\dots(14)$$

Where a_0 is a drift term; t represents a time trend; and p is a large enough lag length to ensure that ε_t is a white noise process. The null hypothesis that the variable x is non-stationary ($H_0 : \beta = 0$) is rejected if β is significantly negative, when compared with the Augmented Dickey-Fuller (1979), critical values.

If the series are non-stationary, the use of classical methods of estimation such as OLS could lead to a spurious relationship thus rendering the results meaningless. The traditional suggestion to deal with series that are non-stationary around their means is to difference the series.

3.5 Co-integration and Error Correction Model

Most economic variables are non-stationary in their levels (integrated of order 1, $I(1)$ but stationary, $I(0)$, in their first difference. If all variables are $I(1)$ the second step is to test for co-integration. Engle and Granger (1987) introduced the concept of co-integration in which economic variables may reach a long-run equilibrium that indicates a stable relationship.

Two variables, x and y are said to be co-integrated of order one if both are integrated of order 1 and there exists a linear combination of the two variables that is stationary, $I(0)$. The linear combination is given by either equation (15) or (16):

$$y_t = \alpha_0 + \beta_0 x_t + \mu_{0t} \dots\dots\dots(15)$$

$$x_t = \alpha_1 + \beta_1 y_t + \mu_{1t} \dots\dots\dots(16)$$

For cointegration testing, the study uses the Engle and Granger (1987) two step method. Engle and Granger (1987) established a number of new results concerning cointegration and the ECM. First, an OLS regression is run on the levels of each variable, and the null hypothesis of non-cointegration is tested. If rejected, the parameter estimates of the variables provide an estimate of the long-run relationship. In the second step, the dynamic specification is considered, with lagged value of the residuals from the cointegrating regression appearing among the regressors.

3.6 Data Sources

All the data used is annual and is secondary for the period 1980 – 2010 and is extracted from the Government of Kenya Economic Surveys, Statistical Abstracts, World Development Indicators (WDI) of the World Bank, Kenya Bureau of Statistics and data from the public debt annual report of Kenya.

CHAPTER FOUR

DATA ANALYSIS

4.1 Introduction

This chapter presents the results of the analysis in the study. Tests discussed in the previous chapter are carried out on the data before the ECM is done. It concludes by discussing the results.

4.2 Descriptive statistics

The table 4.1 below shows the compiled summary for all the variables used in this study.

Table 4.1: Descriptive Statistics

VARIABLES	Mean	Std.Dev.	Min.	Max	Skewness	Kurtosis
GD Growth rate(Y)	0.035	0.022	-0.008	0.072	-0.057	-1.066
Gross fixed capital formation(K)	0.182	0.017	0.154	0.214	-0.134	-1.030
Growth rate of productive work force-ages 15-64(L)	0.508	0.031	0.469	0.548	0.015	-1.704
Gross domestic savings(S)	0.136	0.056	0.051	0.226	0.049	-1.637
Inflation rate(I)	0.131	0.092	0.016	0.460	1.792	4.427
Domestic debt(DD)	0.164	0.036	0.044	0.217	-1.025	2.651
External debt(ED)	0.333	0.122	0.186	0.814	2.175	7.208

As shown in table 4.1, the mean for GDP growth rate (Y) is 3.5% with a standard deviation of 0.022. The minimum growth for the period 1980-2010 is -0.8% (1992) and a maximum of 7.2 % (1986). Gross fixed capital formation (K) has a mean of 18.2% with a standard deviation of 0.017. the minimum for this period is 15.4%(1994) and a maximum of 21.4%(1995).

Population ages 15-64 measured as a percentage of total population (L) has a mean of 50.8% with a standard deviation of 0.031. The minimum is 46.9 % (1981) with a

maximum of 54.8% (2010). Gross domestic savings measured as a percentage of GDP(S) has a mean of 13.6% and a standard deviation of 0.056. the minimum is 5.1%(2008) and a maximum of 22.6%(1993). Inflation (I) has a mean of 13.1% with a standard deviation of 0.092. The minimum inflation rate for the period was 1.6% in 1995 and a maximum of 46.0% (1993).

Domestic debt has a mean of 16.4% and a standard deviation of 0.036. the minimum was at 4.4% (1995) and a maximum of 21.7%(2003). External debt has a mean of 33.3% with a standard deviation of 0.122. The minimum for that period was 18.6% (1980) and a maximum of 81.4%(1993). The normality tests showed normal distribution.

4.2.1 Correlation

Table 4.2 shows the correlation matrix of the variables. A variable will be considered as being highly correlated with another when the value is close to -1 or +1. All the values are less than $|0.8|$ with the exception of S and L at -0.844 showing that they have a strong inverse correlation where they move in opposite directions. High levels of unemployment feature in developing economies and the working population may be forced to use up savings for the provision of basic needs even for the unproductive labour force. When the percentage of the population aged 15-64 years of the total population, who contribute to this savings is high, gross domestic savings levels drop.

The correlation co-efficient showed a positive sign for Gross fixed capital formation (K) with GDP growth rate (Y) which is expected (Salman et.al, 2009 and Misztal, 2011). Population shows a weak correlation with GDP growth rate though positive. Domestic savings, Inflation, Domestic Debt and External Debt have a weak correlation that is negative with GDP growth at -0.004, -0.440, -0.152 and -0.282 respectively. The weak negative correlation of inflation and growth rate is consistent with the findings of Gokal and Hanif (2004) of a negative correlation between growth and inflation.

Though positive, the correlation between Savings and Capital formation is weak at 0.292. Domestic Debt has a negative correlation with capital formation at -0.54 which can be attributed to the contention that government borrows to finance a larger part of its recurrent expenditure and not developmental expenditure. Yet this funds are pooled from the private sector to the public sector with little replacement alternatives. Domestic Debt and population have a correlation coefficient of 0.583. The sign is positive meaning they move to the same direction.

Domestic debt, DD, has a negative sign meaning it is negatively correlated with Savings at -0.526. The negative correlation between debt and growth is consistent with other study findings like Panizza and Presbitero(2012).

Table 4.2: Correlation of the Variables

Variable	Y	K	L	S	I	DD	ED
Y	1.000						
K	0.499	1.000					
L	0.072	-0.177	1.000				
S	-0.004	0.292	-0.844	1.000			
I	-0.440	-0.053	-0.197	0.430	1.000		
DD	-0.152	-0.540	0.583	-0.526	-0.076	1.000	
ED	-0.282	-0.123	-0.238	0.526	0.570	-0.260	1.000

Where Y represents GDP growth rate; K- Gross fixed capital formation; L-population; S-Domestic savings; I- Inflation rate; DD- Domestic Debt; ED- External Debt.

4.3 Unit Root tests

Before estimation is done the first step is to check the stationarity of the series used in the model. This is to check if the series have a stationary trend, and, if non-stationary, to establish orders of integration. The study used the Augmented Dickey-Fuller (ADF) test to test for stationarity. The test is done against a null hypothesis of no unit root (stationary series).

Results in table 4.3 indicated with the exception of population, all variables are non-stationary (i.e. presence of unit roots) at 1%, 5% and 10% levels of significance. Differencing is then done on the non-stationary variables.

Table 4.3: Unit root tests-Level

Variable name	ADF test At levels	Comment	At 1 st Difference	Comment
GDP growth rate	-3.104	Non Stationary	-4.335**	Stationary
Capital format	-2.803	Non Stationary	-5.173*	Stationary
population	-8.204*	Stationary	-4.839*	Stationary
savings	-2.398	Non Stationary	-3.745**	Stationary
inflation	-3.041	Non Stationary	-5.225*	Stationary
Domestic debt	-2.873	Non Stationary	-5.120*	Stationary
External debt	-2.151	Non Stationary	-3.797**	Stationary

MacKinnon critical values for rejection of hypothesis of a unit root at * 1% = -4.343, **
5% = -3.584, *** 10% = -3.230

The non-stationary variables were differenced and unit roots tested. All the variables differenced become stationary at first differencing.

4.3 Estimation Results

The long run results of the equation 10, are presented in table 4.4 and is generated from the non-stationary variables. The model R squared is 0.488%. This implied that the goodness of fit of the model was 48.8% of the variation in GDP growth rate was explained by the independent variables in the model.

The results indicate that in the long run, public domestic debt (DD) has a negative but insignificant relationship with GDP growth rate. ($\beta = -0.082$). The findings agree with Reinhart and Rogoff (2010b) which showed that there is no link between debt and growth when the percentage of debt is below 90%.

Table 4.4: Results without debt variables squared

Variable	Co-efficient	T statistic
K	0.279	0.86
L	0.651	1.57
S	0.298	1.59
I	-0.109	-2.38
DD	-0.082	-0.52
ED	-0.039	-0.71
D	-0.013	-0.57
CONSTANT	-0.340	-1.93
F(7,23)= 3.13 Prob. > F=0.018 R squared = 0.488 Adj. R squared= 0.332 Root MSE=0.018		

Durbin-Watson=1.544

Where Y represents GDP growth rate; K- Gross fixed capital formation; L-population; S-Domestic savings; I- Inflation rate; DD- Domestic Debt; ED- External Debt, D- dummy.

The results indicate that external debt and domestic debt have a negative but insignificant effect on GDP growth rate. Inflation is the only variable that had a negative and significant effect at -0.109.

Equation 11 was run which included the squares of the debt variables and table 4.5 shows the results.

Table 4.5: Results with the debt variables squared.

Variable	Co-efficient	T statistic
K	0.353	1.12
L	0.593	1.46
S	0.380	2.03
I	-0.196	-2.99
DD	1.083	1.58
ED	-0.109	-0.84
D	-0.007	0.28
DD2	-0.041	-1.71
ED2	0.001	0.64
CONSTANT	-0.400	-2.16
F(9,21)= 2.98 Prob. > F=0.019 R squared = 0.561 Adj. R squared= 0.372 Root MSE=0.018 Durbin-Watson=1.847		

Where Y represents GDP growth rate; K- Gross fixed capital formation; L-population; S-Domestic savings; I- Inflation rate; DD- Domestic Debt; ED- External Debt, DD2- Domestic debt squared, ED2- External Debt squared, D- dummy.

The results indicate that in the long run, external debt (ED) has a negative but insignificant relationship with GDP growth rate. ($\beta = -0.109$). The findings agree with Ogunmuyiwa (2011) study which examined whether external debts promotes economic growth in Nigeria using time series data from 1970-2007.

The findings disagree with Minea and Parent (2012) who found that public debt is negatively associated with growth when the debt-to-GDP ratio is above 90 percent and below 115 percent. However, they also find that the correlation between debt and growth becomes positive when debt surpasses 115 percent of GDP.

Results further indicate that in the long run, capital (K) has a positive but insignificant relationship with GDP growth rate. And that labour (L) also has a positive but insignificant effect on GDP growth rate.

Domestic debt results showed that though the effect was positive, it was insignificant at 1.083. The only variables in this regression that had significant effect were domestic savings levels and inflation rate. Savings effect coefficient was 0.380 while inflation was -0.196. The sign on DD2 showed that it had a downward curvature while for ED2 had a convex curvature.

Durbin Watson Test Result

This test was carried out to test for autocorrelation in the regression whose results are in 4.4 and 4.5. The results that were arrived at are as shown in the table below.

Table 4.6: Results of Durbin- Watson Test

Description	Without domestic debt squared and external debt squared variables	With domestic debt squared and external debt squared variables
Durbin Watson d statistic	(8,31) = 1.571734	(10,31) = 1.873
Observations	31	31
F statistic	(7,24) = 3.70	(9,22) = 3.49
Prob>F	0.0096	0.0095
R squared	0.4805	0.5589
Root MSE	0.01781	0.01714

Granger and Newbold (1974) suggested that as a rule of thumb, to assume that two series suffer from spurious regression when the R squared > Durbin Watson value. In this case the values are both less than the Durbin Watson value and conclude that the regression is not spurious.

Cointegration Test Results

The two step angle granger test was conducted and results presented in table 4.7. First a long run equation was run after which the residuals were generated. The residuals were then lagged. The second step was to test for stationarity of the residuals using the ADF test. Results indicated that the lagged residuals were stationary at 1%, 5% and 10% levels implying that the lagged residuals were

stationary. This shows that cointegration among the variables in the long run exists and that the variables converge to long run equilibrium.

Table 4.7: Engle Granger Cointegration Test

Description	ADF test statistic	P value
Ecm 1 Debt variables Not squared	-4.441*	0.000
Ecm 3 Debt variables squared	-5.169*	0.000

*MacKinnon critical values for rejection of hypothesis of a unit root at *1% critical value= -3.716,

**5% critical value = -2.986, 10%= critical value=-2.624.

The above shows the result derived when Unit root test was done on the residuals, when the variables of interest which are squared are included and one where they are not included.

The results -4.441 and -5.169 are the test statistic value, whose absolute value, is greater than the critical value at 1%, 5% and 10% confirming that there is cointegration at levels. As such, estimation will be done using an error correction model.

4.4 Error Correction Model

Error correction models apply to a model that directly estimates the rate at which changes in the dependent variable GDP growth rate(Y) return to equilibrium after a change in the exogenous or independent variables population, domestic savings, inflation, domestic debt, external debt and gross fixed capital formation. This implies that changes in the short run in GDP growth rate respond to deviations from that long run equilibrium. The ECM in this study takes the following form:

$$\Delta Y_t = \beta_0 \Delta K_t + \beta_1 \Delta L_t + \beta_2 \Delta S_t + \beta_3 I_t + \beta_4 DD_t + \beta_5 ED_t + \eta[Y_{t-1} - \mu_1(K_{t-1} + L_{t-1} + S_{t-1} + I_{t-1} + DD_{t-1} + ED_{t-1})] + e_t$$

.....(17)

Y - GDP growth rate; F-Inflation; DD-Domestic debt; ED-External debt; K-Gross Fixed Capital Formation; L-Population; S-Domestic savings.

Where Δ refers to a first difference i.e. $\Delta Y_t = Y_t - Y_{t-1}$. This model uses differences in all the variables (dependent and exogenous variables). The term $Y_{t-1} - \mu_1 X_{t-1}$ (where X represents variables K, L, S, I, DD, ED, DD^2 and ED^2) captures the assumption that X and Y have a long-term equilibrium relationship. But Y_t is a sum of two effects: (i) The short-run impact of the change in X_t on Y_t and (ii) The long-run impact of the deviation from the equilibrium value in period t adjusted at each period at the rate η .

Having tested for cointegration and the null hypothesis rejected, an error-correction model has been specified to link the short-run and the long-run relationships. Residuals from the cointegrating regression are used to generate an error correction term (lagged residuals) which is then substituted into the short-run model. The specific lagged residual term is LAGecm1 when the debt squared is not included and LAGecm3 where the squared domestic debt and external debt is included when deriving the residuals. The results are given in table 4.8a and 4.8b.

Table 4. 8a: Results of Error Correction Model (WITHOUT DEBT VARIABLES SQUARED)

Variable	Coefficient (std errors)	Robust Std Errors	T statistic	p>t
K	0.690(0.303)	0.216	2.28	0.129
L	0.234(1.885)	0.421	0.12	0.158
S	0.184(0.133)	0.151	1.38	0.151
I	-0.068(0.043)	0.499	-1.60	0.024
DD	0.082(0.119)	0.120	0.69	0.982
ED	-0.030(0.049)	0.471	-0.62	0.913
Lagecm 1	-0.799(0.232)	0.166	-3.44	0.358
Dummy	0.002(0.007)	0.019	0.26	0.126
Constant	-0.002(0.006)	0.182	-0.33	0.069
R squared = 0.597 Adjusted R squared= 0.443 Root MSE = 0.017 Prob > F = 0.006 F(8, 21) = 5.73				

Where Y represents GDP growth rate; K- Gross fixed capital formation; L-population; S-Domestic savings; I- Inflation rate; DD- Domestic Debt; ED- External Debt, D- dummy.

The error correction term $Lagecm\ 1$ measures the speed of adjustment to the long run equilibrium in the model. It has the expected sign and is significantly negative (-0.799). It implies that there is a negative gradual adjustment (convergence) to the long run equilibrium. The coefficient of (-0.799) indicates that 79.9% of the disequilibria in short run GDP achieved in one period are corrected in the following period.

Results in table 4.8a indicated that the overall model fitness was satisfactory. This was demonstrated by an R squared of 0.597. This implied that 59.7% of the variations in the short run GDP growth rate were explained by the independent variables.

Results from this model show that the short run domestic debt has a positive relationship with short run GDP growth rate. This agrees with Maana et al(2008) study. The findings also agree with Reinhart and Rogoff (2010b) which showed that there is no link between debt and growth when the percentage of debt is below 90% since the regression coefficient of 0.082 of domestic debt is insignificant.

The results also show that external debt has a negative effect on GDP growth rate with a regression coefficient of -0.030 but that this effect is insignificant. The findings agree with Ogunmuyiwa (2011) which examines whether external debts promotes economic growth in Nigeria using time series data from 1970-2007, but disagree with Minea and Parent (2012) who found that public debt is negatively associated with growth when the debt-to-GDP ratio is above 90 percent and below 115 percent. Their results suggested the existence of complex non-linearities, which may not be captured by models that use a set of exogenous thresholds.

Gross fixed capital formation (K) showed to have a significant effect in the model with, a coefficient of 0.690. One unit change in K saw a 0.69 unit change in GDP growth rate. This agrees with Jayasuriya (2011), Salman and Feng (2009), Misztal (2011) and Lipsey (2006) findings.

Table 4.8b shows the results when the debt variables are squared and included in the regression.

Table 4. 8b: Error Correction Model (WITH DEBT VARIABLES SQUARED)

Variable	Coefficient (std errors)	Robust Std Errors	T statistic	p>t
K	0.482(0.368)	0.251	1.31	0.105
L	-1.262(3.140)	0.441	-0.40	0.185
S	0.178(0.169)	0.131	1.05	0.026
I	-0.097(0.046)	0.089	-2.09	0.047
DD	0.095(0.159)	0.942	0.60	0.263
ED	-0.032(0.059)	0.130	-0.53	0.783
Lagecm 3	-0.668(0.301)	0.202	-2.22	0.728
Dummy	0.004(0.013)	0.021	0.32	0.950
ED²	0.000(0.001)	0.001	0.69	0.736
DD²	-0.001(0.008)	0.034	-0.08	0.268
Constant	-0.003(0.019)	0.227	-0.17	0.072
Rsquared = 0.556 Adjusted R squared= 0.332 Root MSE = 0.019 Prob > F = 0.000 F(10, 19) = 12.20				

Where Y represents GDP growth rate; K- Gross fixed capital formation; L-population; S-Domestic savings; I- Inflation rate; DD- Domestic Debt; ED- External Debt, DD²- Domestic debt squared, ED²- External Debt squared, D- dummy.

The error correction term (lagecm 3) is negatively significant which suggests that deviations from equilibrium are corrected at 66.8% per year. There also appears that the variables have no significant short term effects on GDP growth rate except the inflation rate level.

The results also show that Gross fixed Capital formation, domestic savings and domestic debt have a positive effect on GDP growth rate although not significant. Population, inflation and external debt all have a negative effect on growth. A one unit change in gross fixed capital formation increases the growth rate by 0.482 units while for domestic savings a unit increase causes a 0.178 change in the growth rate of GDP and a unit change domestic debt causes a 0.095 change in GDP growth rate. This changes with the other variables as they cause a decrease in the growth rate. A

unit change in population causes a -1.262 change, a unit change in inflation causes a -0.097 change and a unit change in external debt causes a 0.032 decrease. Inflation is the only variable whose effect is significant. This result is inconsistent with Khan and Schimmelpfenning (2009) result. The result however is consistent with the findings of Gokal and Hanif(2004) of a negative correlation between growth and inflation.

The inclusion of the dummy variable (D) was to capture the effect of the changes that took place in 1992 which is evidenced as a shock to the economy and the trends of the variables used in this study (see trend in appendix 1). The constant in this model is -0.003 and its effect is not significant.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary, conclusions and recommendations based on the findings of this study.

5.2 Summary

Since there was cointegration among the variables in the long run as the results indicated, gross fixed capital formation (K) was found to be positively correlated with GDP growth rate(Y). It was further found that it has a positive significant relationship with GDP growth rate. Therefore an increase in gross fixed capital formation will lead to an increase in GDP growth rate.

Population between the ages of 15-64(L), was found to be positively correlated with GDP growth rate(Y) but negatively correlated with gross fixed capital formation (K). Though its contribution was positive in the first regression, its effect to GDP growth rate was negative in the second regression but was insignificant.

From the results within this framework, gross domestic savings(S) was found to be negatively correlated to GDP growth rate(Y) but positively correlated with Population between the ages of 15-64(L). However its positive contribution to GDP growth rate(Y) was insignificant in the first regression and also in the nonlinear model.

Inflation was found to have a negative correlation with GDP growth rate(Y), gross fixed capital formation(K) and Population between the ages of 15-64(L) but positively correlated with gross domestic savings (S). The results also showed that

inflation had a negative but insignificant effect on GDP growth rate(Y). In the nonlinear model the effect was negative but significant.

The debt variables, domestic debt and external debt both had a negative correlation with GDP growth rate(Y) and gross fixed capital formation (K). Domestic Debt had a negative correlation with gross domestic savings(S) and inflation rate (I) while external debt(ED) had a positive correlation with gross domestic savings and Inflation rate. Domestic debt was found to have a positive but insignificant contribution to changes in GDP growth rate while external debt had a negative and also insignificant effect.

The dummy variable was added to capture the change that occurred that caused the pronounced change in the trend of some of the variables as captured in appendix 1. It was found that the coefficients were insignificant in determining changes in GDP growth rate(Y).

The error terms in both models were both found to be significant implying that there was gradual adjustment (convergence) to the long run equilibrium.

5.3 Conclusion

This study used an error correction model to examine the effect of the constituents of public debt levels on economic growth in Kenya during the period 1980-2010. Domestic debt was found to have a positive effect on economic growth indicating that higher domestic debt levels will encourage economic growth. External debt was found to have a negative effect. This shows that higher external debt will not lead to higher economic growth rate. This effects were however insignificant.

Gross fixed capital formation was found to have a positive effect which was significant on economic growth and the sign was the expected. This reveals that higher levels of capital formation will lead to higher economic growth rates. Inflation was also found to have significant effect which was negative. This indicates

that inflation rates that keep rising will be detrimental to efforts of stimulating economic growth. The growth rate of the productive workforce (ages 15-64) was seen to have an insignificant effect on economic growth rates. In the second regression the effect was negative which means that as this rate rises, economic growth rates will be affected negatively since Kenya being a developing country faces high levels of unemployment. As this groups growth rate increases, resources are sent but its unproductive. Gross domestic savings was seen to have a positive effect on economic growth which suggests that higher levels of domestic savings will increase economic growth rates.

The investigation into the nonlinear nature of external debt showed that higher external debt levels will continue to spur growth after which at a given level, more will not be contributing positively to economic growth. The sign was positive which meant that its curvature was convex and upward. Domestic debt had the opposite results. Implying that more domestic debt levels will add to growth after a certain level is reached.

5.4 Recommendations

This study results show that gross fixed capital formation and inflation have significant effect on economic growth rate. Implying that increasing the level of capital will increase the growth rate. Based on the results, domestic debt funds also increase economic growth rates. Stringent measures to ensure that funds derived from this source are strictly budgeted for and art used for accumulation of capital will be a great step towards achieving this. Increasing the savings level which is used for the accumulation of capital will affect economic growth positively. Measures to control inflation rates at levels that encourage savings will also add to economic growth. This recommendation is based on the significance of the variables in affecting growth derived in this study.

Government needs to seek out more domestic debt when funds are required more that external debt as results show that external debt has a negative effect while

domestic debt has a positive effect. This will mean that even when repayments fall due, circulation will be within the economy as opposed to external funding where funds are transferred abroad.

5.5 Areas of Further Research

Further research should be done on the savings level and its effect on growth. Another area of research would be on the effect of the workforce on all factors that affect growth and in effect how growth rate of the workforce population age is affected by GDP growth rate. The study would also need to investigate how productive and unproductive population ratio affects growth.

Further research can also be done on how domestic debt affects the commercial bank lending rates in the country. This should be done with the aim of establishing the effect on inflation.

Another area of research is on a country to country analysis and checking whether effects of domestic and external borrowing on GDP growth rate are consistent across the East African Countries.

REFERENCES

- Abbas, A. and Christensen, J. (2010) 'The role of domestic debt markets in economic growth: An empirical investigation for low-income countries and emerging markets', *IMF Staff Papers*, 57(1), pp. 209-255.
- Abbas, A. and Christensen, J. (2007) 'The role of domestic debt markets in economic growth: An empirical investigation for low income countries and emerging markets', *IMF Working Papers* no.127
- Abzari, M., Zarei, F. and Esfahani, S. (2011) 'Analyzing the link between financial development and foreign direct investment among D-8 group of countries', *International Journal of Economics and Finance*, Vol. 3, No.6.
- Adofu, I. and Abula, M. (2010) *Domestic debt and the Nigerian Economy*: Curr. Res. J. Economic Theory, 2(1): pp. 22-26.
- Aghion, P., Comin, D. and Tecu, I. (2009) when does domestic saving matter for economic growth?
- Alesina, A. and Tabellini, G. (1992) 'Positive and Normative Theories of Public Debt and Inflation in Historical Perspective', *European Economic Review* 36, pp. 337-344, North Holland.
- Alfaro, L. (2003) 'Foreign Direct Investment and Growth: Does the Sector Matter?' U.S.A: Harvard Business School.
- Barro, R., (1979) 'On the determination of public debt', *Journal of Political Economy* 87, October, pp. 940-971.
- Barro, R., (1991) 'Economic Growth in a cross section of Countries', *Quarterly Journal of Economics*, vol. 106, no. 2, pp. 407-433.
- Bengoa, M. and Sanchez, R. (2003) 'FDI, Economic Freedom and Growth: New Evidence from Latin America', *European Journal of Political Economy*, Vol.19.
- Briotti, G. (2005) 'Economic Reactions to Public Finance Consolidation: A Survey of Literature', *European Central Bank*, Occasional Paper Series No. 38. [Online], Available: http://ssrn.com/abstract_id=807411.
- Calvo, G. and Guidotti, P. (1990) 'Level and Variability of the Optimal Inflation Tax', Mimeo: International Monetary Fund, Washington, DC.
- Carkovic, M. and Levine, R. (2005) 'Does Foreign Direct Investment Accelerate Economic Growth?', In: Moran, T.H., Graham, E.M., Blomstrom, M. (eds.) 'Does

Foreign Direct Investment Promote Development?, Institute of International Economics Press, Washington DC, 2005

Checherita, C., and Rother, P. (2012) 'The impact of high government debt on economic growth and its channels: An empirical investigation for the euro area', *European Economic Review*, vol. 56, no. 7, pp. 1392–1405.

Checherita, C., Hughes, A. and Rother, P. (2012) 'Fiscal Sustainability using Growth-Maximising Debt Targets', *Working Paper Series* 1472, European Central Bank.

Chenery, H.B and Strout, A.M (1966) 'Foreign Assistance and Economic Development', *American Economic Review* vol. 56, no. 4, pp. 679-733.

Chee, L.Y. (2010) 'The Impact of FDI and Financial Sector Development on Economic Growth: Empirical Evidence from Asia and Oceania', *International Journal of Economics and Finance*, Vol.2, no.2.

Clements, B., Bhattacharya R. and Nguyen, T. Q. (2003) 'External debt, public investment, and growth in low-income countries', *IMF Working paper* 03/249.

Di Giovanni, J., McCrary, J. and Wachter, T. (2009) 'Following Germany's lead: Using international monetary linkages to estimate the effect of monetary policy on the economy', *Review of Economics and Statistics*, Vol. 9, No. 2, pp. 315–331.

Durham, J., (2004) 'Absorptive capacity and the effects of foreign direct investment and equity foreign portfolio investment on economic growth', *European Economic Review*, Vol.48

Economic Report on Africa (2002). *Economic Surveys*.

Engle, R. and Granger, J. (1987) 'Co-integration and error correction. representation, estimation and testing', *Econometrica*, pp. 251-276.

European Commission (2003) Public finances in EMU – 2003. *European Economy*, No. 3.

Ferreira, C. (2009) 'Public Debt and Economic Growth: A ganger causality panel data approach'. *Working paper* ; ISSN no. 0874-4548

Gokal, V. and Hanif S.(2004) 'Relationship between inflation and economic Growth', Economics Department, *Working Paper* 2004/04, Reserve Bank of Fiji, Suva, Fiji.

Government of Kenya. *Various Economic surveys*. Government press.

Granger, C. (1969) 'Investigating causal relations by econometric methods and cross-spectral methods', *Econometrica*, vol. 34, pp. 424-438.

Granger, C. (1986) 'Developments in the study of cointegrated economic variables', *Oxford Bulletin of Economics and Statistics*, vol. 48, pp. 213-228.

Granger, C. (1988) 'Some recent developments in a concept of causality', *Journal of Econometrics*, vol. 39, pp. 199-211.

Granger, C. and Newbold, P. (1974) 'Spurious regressions in econometrics'. *Journal of Econometrics* 2, pp. 111—120.

Hansen, A. H. (1959) Is the National Debt a Burden? By J.E.Meade: 'Public Principles of Public Debt by James M. Buchanan' *The Review of Economics and statistics*, Vol. 41, No. 4, pp. 370-378. MIT Press.

Hermes, N. and Lensink, R. (2003) 'Foreign Direct Investment, Financial Development and Economic Growth', *The Journal of Development Studies*, Vol.40

Hussain, M. (2005) 'Inflation and Growth: Estimation of Threshold Point for Pakistan', *Pakistan Business Review*, vol. 17, no. 3, pp. 1-15.

Jayasuriya, D. (2011) 'Improvements in the World Bank's Ease of Doing Business Rankings: Do they translate into greater foreign direct investment inflows?' *Policy Research Working Paper*, no. 5787, The World Bank

Johnson, A. (2006) 'The Effects of FDI Inflows on Host Country Economic Growth', *CESIS Electronic Working Paper Series*.

Kemal, M. (2006) 'Is Inflation in Pakistan a Monetary Phenomenon?', *The Pakistan Development Review*, vol. 45, no. 2, pp. 213-220.

Khan, M. S. and Schimmelpfenning, A. (2006). Inflation in Pakistan. *The Pakistan Development Review*, 45(2), 185-202.

Krugman, P. (1989) 'Financing Vs Forgiving A Debt Overhang: Some Analytical Issues.' *NBER Working Paper*, No. 2486, National Bureau of Economic Research, Cambridge, Massachusetts.

Krugman, P. (1988) 'Financing versus forgiving debt overhang', *National Bureau of Economic Research*, Massachusetts.

Kumar, M., and Woo, J. (2010) 'Public Debt and Growth', *IMF Working Papers* vol. 10, no. 174, International Monetary Fund.

Lipsey, R.E. (2006) 'Measuring the Impacts of FDI in Central and Eastern Europe', *NBER Working Paper Series*, No.12808, Cambridge.

Lyrroudi, K., Papanastasiou, J. and Vamvakidis, A. (2004) 'Foreign Direct Investment and Economic Growth in Transition Economies', *South Eastern Journal of Economics*, Vol.1.

Maana, J., Owino and N. Mutai, (2008) 'Domestic Debt and Its Impact on the Economy-the Case of Kenya'. Proceeding of 13th Annual African Econometric Society Conference. Pretoria, South Africa.

Mehrotra, A. and Peltonen, T. (2005) 'Socio-Economic Development and Fiscal Policy – Lessons from the Cohesion Countries for the New Member States', *ECB Working Paper Series*, No. 467.

Minea, A. and Parent, A. (2012) 'Is High Public Debt Always Harmful to Economic Growth? Reinhart and Rogoff and Some Complex Nonlinearities', *Working Papers* 8, Association Francaise de Cliometrie.

Mistzal, P. (2011) 'Foreign Direct Investments as a Factor for Economic Growth in Romania', *Review of Economic and Business Studies*, Vol. 3, Issue 1.

Mukui G. (2013) ' Effects of external debt on Economic Growth.' M.A thesis, University of Nairobi.

Munir, Q. et al. (2009) 'Inflation and Economic Growth in Malaysia: A Threshold Regression Approach', *ASEAN Economic Bulletin*, vol. 26, no. 2, pp.180-193.

Mwega F. and Ndungu N. (2002) 'Explaining African Economic Growth Performance; the Case for Kenya', *AERC Research Paper*.

Mwega, F. (2009) 'Financial Sector Reforms in Eastern and Southern Africa', *AERC Research Paper*.

Obstfeld, M. (1990) 'Dynamic seigniorage theory: An exploration', mimeo, University of California at Berkeley, CA.

Ogunmuyiwa, M.S. (2011) 'Does External Debt Promote Economic Growth?', *Current Research Journal of Economic Theory*, vol. 3, No.1, pp. 29 – 35.

Panizza, U., and Presbitero, A. F (2012) 'Public Debt and Economic Growth: Is There a Causal Effect?', *Working Papers* no. 65.

Patillo, C., Romer, D. and Weil, D. N. (2002) 'External debt and growth', *IMF Working Paper*, No. 02/69.

Patillo, C., Romer, D. and Weil, D. N. (2004) 'What are the channels through which external debt affects growth?', *IMF Working Paper*, No. 04/15.

Perotti, R. (2012) 'The Austerity Myth Gain Without Pain?: In Fiscal Policy after the Financial Crisis,' NBER Chapters. *National Bureau of Economic Research, Inc.*

Perroti, R. (2002) 'Estimating the Effects of Fiscal Policy in OECD Countries', *European Network of Economic Policy Research Institutes, Economics Working Papers*, No. 15.

Presbitero, A. (2005) 'The Debt-Growth Nexus: A Dynamic Panel Data Estimation', *Quaderno di Ricerca*, Dipartimento di Economia, Università Politecnica de Marche, No. 243, Ancona, Italy.

Presbitero, A. F. (2012) 'Total Public Debt and Growth in Developing Countries.' *European Journal of Development Research*, vol. 24, No. 4, pp. 606–626.

Reinhart, C. M., And Rogoff, K. S. (2010a) 'Debt and Growth Revisited', VoxEU.org.

Reinhart, C. M., and Rogoff, K. S. (2010b) 'Growth in a Time of Debt', *American Economic Review*, vol. 100, no. 2, pp. 573–78.

Reinhart, C. M., and Rogoff, K. S. (2011) 'From Financial Crash to Debt Crisis', *American Economic Review*, vol. 101, no. 5, pp. 1676–1706.

Salman, A. and Feng, X. H. (2009) 'GDP Growth with Economic Stability: An FDI perspective', Harbin Institute of Technology.

Schclarek, A. (2004) 'Debt and Economic Growth in Developing Industrial Countries', mimeo, available on-line in http://www.nek.lu.se/publications/workpap/Papers/WP05_34.pdf

Solow, R. M. (2002) 'A contribution to the theory of Economic Growth', *Quarterly Journal Of Economics*, pp.65-94, Massachusetts Institute of Technology. EBSCO Publishing.

International 3(2) Available at SSRN: <http://ssrn.com/abstract=2180323>.

Sweidan, O. D. (2004) 'Does Inflation Harm Economic Growth in Jordan? An Econometric Analysis for the Period 1970-2000', *International Journal of Applied Econometrics and Quantitative Studies*, vol. 1, no. 2, pp. 41-66.

Were, M. (2001) 'The impact of External Debt on Economic Growth and Private Investment in Kenya: An Empirical Assessment', A Paper Presented at the Wider Development Conference on Debt Relief, Helsinki.

World Bank (2010), World Development Indicators, Washington DC, World Bank.

APPENDIX

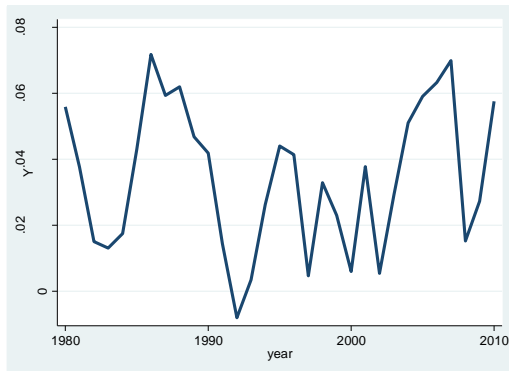


Figure A1- GDP growth rate (Y)

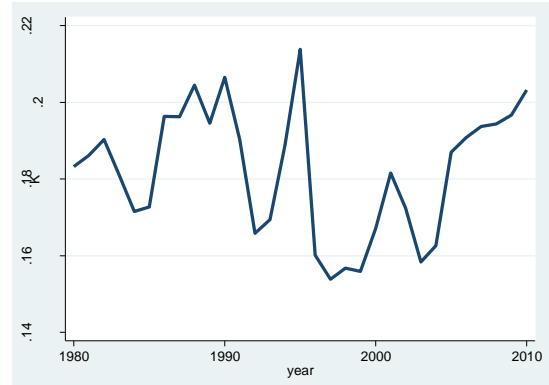


Figure A2- Gross Fixed Capital (K) formation

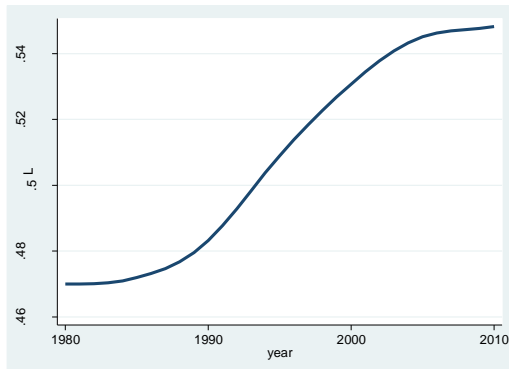


Figure A3- Productive workforce (ages 18 to 64 years) (L)

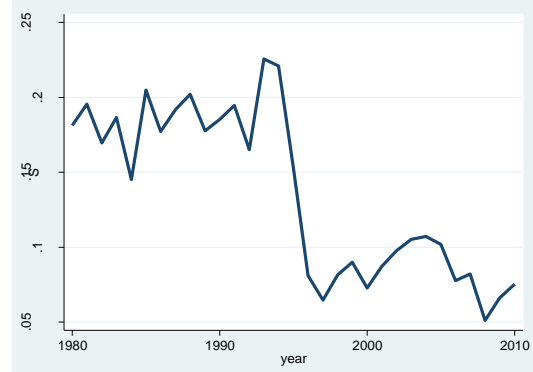


Figure A4- Gross Domestic savings (S)

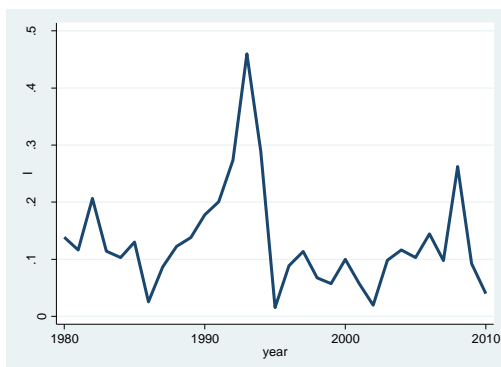


Figure A5- Annual inflation rate (I)

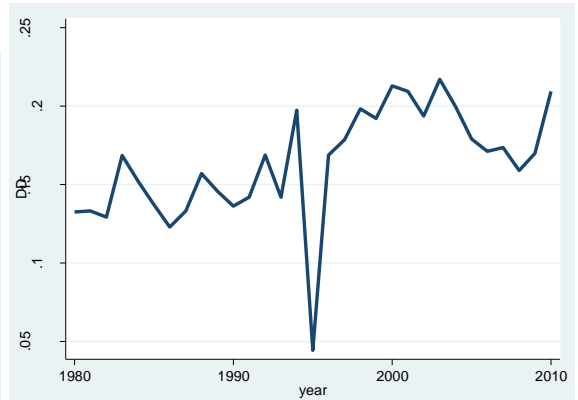


Figure A6- Domestic Debt (DD)

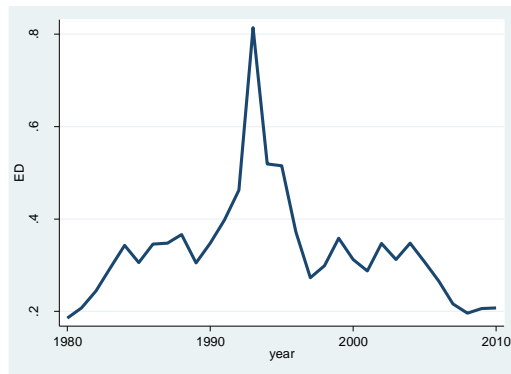


Figure A7- External Debt (ED)

DATA USED IN STUDY

Year	GDP growth (annual %)	Gross fixed capital formation (% of GDP)	Population ages 15-64 (% of total)	Gross domestic savings (% of GDP)	Inflation, consumer prices (annual %)	Inflation, consumer prices (annual %)	Domestic debt as % of GDP	External debt as % of GDP
1980	5.591	18.322	46.999	18.115	13.858	13.858	13.251	18.564
1981	3.773	18.611	46.998	19.553	11.603	11.603	13.328	20.778
1982	1.506	19.027	47.009	16.959	20.666	20.666	12.934	24.464
1983	1.309	18.114	47.040	18.662	11.397	11.397	16.858	29.342
1984	1.755	17.153	47.099	14.506	10.284	10.284	15.205	34.331
1985	4.300	17.271	47.194	20.477	13.006	13.006	13.708	30.603
1986	7.177	19.635	47.318	17.723	2.534	2.534	12.309	34.547
1987	5.937	19.626	47.473	19.197	8.637	8.637	13.315	34.777
1988	6.203	20.446	47.679	20.216	12.264	12.264	15.704	36.651
1989	4.690	19.458	47.960	17.771	13.789	13.789	14.565	30.475
1990	4.192	20.648	48.324	18.528	17.781	17.781	13.634	34.810
1991	1.438	19.030	48.772	19.456	20.084	20.084	14.198	39.771
1992	-0.799	16.581	49.286	16.510	27.332	27.332	16.891	46.227
1993	0.353	16.937	49.833	22.559	45.978	45.978	14.209	81.402
1994	2.632	18.873	50.379	22.107	28.814	28.814	19.751	51.932
1995	4.406	21.385	50.900	15.257	1.554	1.554	4.438	51.503
1996	4.146	16.009	51.387	8.092	8.864	8.864	16.886	37.272
1997	0.474	15.387	51.846	6.456	11.361	11.361	17.857	27.273
1998	3.290	15.675	52.278	8.133	6.722	6.722	19.833	29.899
1999	2.305	15.591	52.688	8.994	5.742	5.742	19.219	35.864
2000	0.599	16.708	53.075	7.280	9.980	9.980	21.297	31.266
2001	3.779	18.151	53.442	8.706	5.738	5.738	20.954	28.745
2002	0.546	17.236	53.783	9.761	1.961	1.961	19.375	34.709
2003	2.932	15.838	54.084	10.523	9.815	9.815	21.702	31.213
2004	5.104	16.259	54.328	10.706	11.624	11.624	19.982	34.775
2005	5.906	18.699	54.509	10.188	10.312	10.312	17.906	30.687
2006	6.330	19.080	54.626	7.767	14.453	14.453	17.114	26.577
2007	6.993	19.366	54.692	8.198	9.758	9.758	17.365	21.659
2008	1.526	19.435	54.729	5.099	26.239	26.239	15.895	19.618
2009	2.735	19.662	54.765	6.607	9.234	9.234	16.983	20.638
2010	5.764	20.324	54.819	7.519	3.961	3.961	20.952	20.732

Source: World Bank, Various Economic surveys.