PUBLIC DEBT AND ECONOMIC GROWTH IN KENYA

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF APPLIED ECONOMICS IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTERS IN ECONOMICS (FINANCE) OF KENYATTA UNIVERSITY.

May, 2015
DECLARATION

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

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I confirm that this research project has been developed by the student under my supervision.

Signature............................................... Date.................................

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DEDICATION

To my wife Violet and my daughter Marbel— you are my inspiration.
ACKNOWLEDGEMENTS

I am beholden to my supervisor Dr. James Maingi for the immense support, guidance and contribution in making this research project what it is. I would want to acknowledge Mr. Paul Ngure and my other classmates who have encouraged and gave a lot of support throughout my study. I also thank the lecturers in School of Economics, Kenyatta University for their invaluable contribution they gave and continue to give in realization of this project.
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<tr>
<td>ADF</td>
<td>Augmented dickey-fuller</td>
</tr>
<tr>
<td>ECM</td>
<td>Error Correction model</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GNP</td>
<td>Gross National Product</td>
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<td>GOK</td>
<td>Government of Kenya</td>
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<tr>
<td>HIPC</td>
<td>Heavily indebted poor countries</td>
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<td>IMF</td>
<td>International monetary fund</td>
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<td>KNBS</td>
<td>Kenya National Bureau of Statistics</td>
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<tr>
<td>MTD'S</td>
<td>Medium term debt strategy</td>
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<tr>
<td>OLS</td>
<td>Ordinary Least Squares</td>
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<tr>
<td>OECD</td>
<td>Organization for economic co-operation and development</td>
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<td>RET</td>
<td>Ricardian equivalence theorem</td>
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<td>SSA</td>
<td>Sub Saharan Africa</td>
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DEFINITION OF OPERATIONAL TERMS

**Domestic debt** This is the amount of money that is raised through borrowing by the government in local currency from its citizens and local financial institutions during a given period of time.

**External debt** The portion of a country's debt that is borrowed from foreign lenders including commercial banks, governments or international financial institutions in a given period of time.

**Gross domestic Product** This is an aggregate measure of production equal to the sum of the gross values added of all resident, institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs.

**Gross national Product** This is the market value of all the products and services produced in one year by labour and property supplied by the citizens of a country.
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ABSTRACT

Public debt remains one of the most critical elements of economic development especially in developing countries. This study focuses on the public debt in Kenya and its effect on economic growth. Most developing countries will expect that public debt will affect the economic growth positively. Thus the resources from public debt should be used to finance government expenditures which will spur economic growth of the country. There is a considerable increase in domestic debt as compared to external debt raising concerns on its effects on investments in Kenya. However, the empirical study indicates the contrary. The study is also aimed at determining whether increase in domestic debt affects economic growth in Kenya. The study was based on Barro growth regression that applies a vector of inputs in production of economic growth status. Longitudinal research design was adopted whereby published quarterly secondary data from the year 2000 to 2003 was analyzed. The findings of the study indicated that the public debt has led to increased economic growth and increased investment. The results obtained from the study indicate that the coefficient associated to public debt is positive and is equal to 2.05. The implication of this is that increase of public debt by one per cent improves Gross domestic product by 2.05 per cent in short-run. On the other hand, domestic debt is statistically significant at 5 per cent level of significance. The coefficient associated to domestic debt is negative and is equal to -1.60. The implication of this is that increase of domestic debt by one per cent decreases Gross domestic product by 1.61 per cent in short-run. Thus domestic borrowing should be discouraged in favour of external debt.
CHAPTER ONE

INTRODUCTION

1.1 Background

For a government to run well, it needs resources for its expenditure. The main source of these funds comes from taxes, if not enough, borrowings are made to bridge the gap between receipt and expenditure. The borrowing may be from domestic or external markets. Even though debt avails resources for the economy, with time debt accumulates and attracts a lot of interest liability. If these borrowings are not properly utilized, they will affect the economy negatively because more resources will be diverted to repaying these debts than for routine government expenditures. Gurley and Shaw (1956) observed that increasing volume of public debt is an essential factor for strong and good financial structure of an economy and the increase of the public debt should be well planned. Thus, public spending should be properly utilized to make it easy to service the debt. Many developing countries including Kenya have not been able to curb the growth of their domestic debt to avail revenue after debt service payments to service important government recurrent and development expenditures.

Most developing countries have greatly focused on the external debt this is because domestic borrowing just transfers resources internally within the country whereas external borrowing increases access to resources thus external debt generates transfer problem (Keynes, 1929). External borrowing creates a dependency syndrome according to Levy (1978). Debt can cause vulnerabilities that can lead to debt crisis because
central banks in the developing countries cannot print money necessary to repay external debt (Keynes, 1929). Even though there is a colossal foreign aid to the developing countries, they are faced with high degree of indebtedness, unemployment, poverty and slow economic growth, this has caused donor agencies to revisit earlier discussions on the effectiveness of foreign aid to developing countries (Lancaster, 1999). Initiatives have been put in place to reduce the debt burden for most low income countries which include Debt initiative for heavily indebted poor countries (HIPC), Multilateral debt relies initiative by the World Bank and the international monetary fund (IMF). All this initiatives are aimed at helping low income countries to walk out from repeated debt rescheduling, the initiatives however focus more on the external debt than the domestic debt. In most developing countries external debt has received a lot of attention from the international development agencies as compared to the domestic debt. Most countries including Kenya have been paying external debt for more than a decade while increasing the domestic rates very fast (Patillo 2002).

1.2 How debt affects economic growth
Debt is brought up by government borrowings from local financial sectors and individuals to meet its expenditure. Increasing government borrowings from local financial institutions leads to a reduction in the funds available for investment in the private sector (Mankiw 1995)

To the economy, government borrowing leads to a reduction in domestic savings making the interest rates to go high. This leads to a decrease in money supply which in turn leads to low investment in the private sector because of the increased interest rates.
When the government issues treasury bills and bonds, money supply in the economy reduces makes the interest rates to rise. Interest rates have negative effect on private investment, increasing interest rates makes borrowing more expensive in the private sector which in turn leads to the crowding out effect of the private investors (Mankiw 1995)

1.3 Overview of Kenya’s deb
In the Early 1990’s Kenya fell into a debt crisis which made it one of the highly indebted countries in Africa. This was caused by sharp decline of the assistance provided to Kenya due to mismanagement of the development assistance resources provided to Kenya like the case of Goldenberg scandal which fleeced the government billions of Shillings thus leading to the reduction of donor funding and also partly because of the collapse of the soviet union. This made the government to opt for debt rescheduling and short term borrowing to finance its expenditures.

There has been an emerging trend of high and growing domestic debt in most African countries. Domestic debt accounted for 23 percent of total debt in sub-Saharan Africa between the years 1995 to 2000 up from 20 percent between the years 1990 to 1994 according to IMF (2003). This has made many countries to come up with domestic debt strategies to counter the high and ever rising debt levels.

In Kenya, Domestic debt rose from Ksh.236.0 billion in June 2000 to Ksh.858 billion in June 2012(Table 1.1). This represents a 264 percent increase in a span of 10 years. At the same time, the ratio of domestic debt as compared to total public debt increased from 38.5 percent to 52.9 percent during the period.
TABLE 1.1. EVOLUTION OF PUBLIC DEBT 2002-2012 (KSH BILLION)

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<tbody>
<tr>
<td>External Debt</td>
<td>377.7</td>
<td>407.1</td>
<td>443.2</td>
<td>345.5</td>
<td>431.2</td>
<td>396.6</td>
<td>440.0</td>
<td>504.4</td>
<td>528.7</td>
<td>676.9</td>
<td>716.6</td>
</tr>
<tr>
<td>(As a % of GDP)</td>
<td>36.8</td>
<td>39.2</td>
<td>36.6</td>
<td>32.2</td>
<td>27.9</td>
<td>21.7</td>
<td>21.2</td>
<td>23.4</td>
<td>23.2</td>
<td>25.9</td>
<td>23.3</td>
</tr>
<tr>
<td>(As a % of total debt)</td>
<td>61.5</td>
<td>58.4</td>
<td>59.1</td>
<td>57.1</td>
<td>54.7</td>
<td>49.5</td>
<td>50.5</td>
<td>51.1</td>
<td>46.3</td>
<td>48.6</td>
<td>47.1</td>
</tr>
<tr>
<td>Domestic debt</td>
<td>236.0</td>
<td>289.4</td>
<td>306.2</td>
<td>315.6</td>
<td>357.6</td>
<td>404.7</td>
<td>430.6</td>
<td>518.5</td>
<td>660.2</td>
<td>764.2</td>
<td>858.8</td>
</tr>
<tr>
<td>(as a % of GDP)</td>
<td>23.0</td>
<td>27.9</td>
<td>25.3</td>
<td>23.4</td>
<td>23.2</td>
<td>22.1</td>
<td>20.8</td>
<td>22.5</td>
<td>26.9</td>
<td>27.4</td>
<td>26.2</td>
</tr>
<tr>
<td>(As a % of total debt)</td>
<td>38.5</td>
<td>41.6</td>
<td>40.9</td>
<td>42.1</td>
<td>45.3</td>
<td>50.5</td>
<td>49.5</td>
<td>48.9</td>
<td>53.7</td>
<td>51.4</td>
<td>52.9</td>
</tr>
<tr>
<td>Total debt</td>
<td>613.7</td>
<td>696.4</td>
<td>749.4</td>
<td>750.0</td>
<td>789.1</td>
<td>801.3</td>
<td>870.6</td>
<td>1,059.3</td>
<td>1,229.4</td>
<td>1,487.1</td>
<td>1,622.8</td>
</tr>
<tr>
<td>(As a % of GDP)</td>
<td>59.8</td>
<td>67.1</td>
<td>62.0</td>
<td>55.6</td>
<td>51.1</td>
<td>43.8</td>
<td>41.9</td>
<td>46.4</td>
<td>50.0</td>
<td>53.4</td>
<td>49.5</td>
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Source: Ministry of Finance

The share of domestic debt as a percentage of GDP also increased from 23.0 percent to 26 percent during the period under review, this was attributed to the change in the composition of debt especially because of decrease accessibility to external funding and consequently increased need for domestic borrowing to meet the budget requirements. This led fast growth of the domestic debt during this time under review.

1.4 Trend in the public debt in Kenya

The domestic debt has been on the rise in the period under review. However, it was less than the external debt up to the year 2006. Since then domestic debt has been higher than the external debt representing 52.9 percent of the total debt by the year 2012. Figure 1.1 show the trend of public debt in Kenya, the trend is ever increasing contrary to the government expectations.
Figure 1 shows that public domestic debt has ever since showed an upward trend but not more than public external debt up to 2007 where domestic debt was Ksh.404.7 down from Ksh.357.6 billion and external debt was Ksh. 396.6 billion. This shift in debt composition was mainly due to reduced access to external funding (Republic of Kenya, 2012). Since then, public domestic debt has been more than external debt to date.

1.4 Statement of problem
The Government borrows mainly for its financial requirements. The strategy has been to borrow as much as possible from external lenders on concessional terms while domestic borrowing is only used to cover the remaining resource gap (Republic of
Kenya, 2012). Domestic borrowing and monetary policies should be coordinated closely to ensure that government raises required resources from the financial market without crowding out private investor and destabilizing interest rates, (Republic of Kenya, 2012). Economic growth in developing countries has been increasing in a very slow pace due to increased debt burden, This is because most funds are used for debt servicing than it’s for development thus having negative effect on countries GNP (Elmendorf and Mankiw 1999). But reasonable borrowing by developing country can enhance its economic growth (Patillo, 2002). Previous studies on domestic debt and economic growth has indicated positive relation and some negative relation as indicated in the literature review. This brings about a need to investigate the impact of domestic debt on economic growth in Kenya.

Trends have shown that domestic debt has been higher than external debt since 2009 in Kenya with domestic recording Ksh.404.7 down from Ksh.357.6 billion in 2008 and external debt was Ksh. 396.6 billion and also, domestic debt seems to be expensive in terms of interest rates as compared to external debt, more especially if external debt is taken on concessional conditions from multilateral creditors. Despite being Cheaper compared to domestic debt, external debt exposes the country to exchange rate risk. (Montiel 2005). At the same time with changes in political spotlight by donor community due to change of political systems and fiscal problems, the foreign tabs seem to be running dry Feyzioglu (1998). This has shifted the center of focus to domestic debt and made it a major economic policy issue that faces most developing countries. This has made several developing countries to come up with policies targeting reducing external debt by substituting it with domestic debt, which is not
efficient due to high interest rates attached to it thus prompting a study on the effect of
domestic debt on private investors in Kenya.

1.6 Research Questions
The research questions for this study were:

i. What is the relationship between public debt and economic growth in Kenya?

ii. What is the effect of external debt on economic growth in Kenya?

iii. What is the effect of domestic debt on economic growth in Kenya?

1.7 Objectives of the study
The overall objective of this study is to determine the effect of public debt on the
economic growth in Kenya. On the other hand, the specific objectives were;

i. Investigate the relationship between public debt and economic growth in Kenya

ii. Determine the effect of external debt on economic growth in Kenya

iii. Establish the effect of domestic debt on economic growth in Kenya

1.8 Significance of the study
The Government’s Medium Term Debt Strategy (MTDS) is to raise resources through
borrowing to meet its expenditure at minimum cost and low risk, with the ever
increasing domestic debt, this study was premised on the fact that Kenya, like all other
developing countries is suffering from a debt burden. This study aimed determining the
effect of public debt on the economic growth in Kenya. This will inform the policy
makers and practitioners on the most effective and efficient way of obtaining public
debt and how domestic debt can be utilized to make it easy to service the debt. However
most developing countries, studies on domestic debt are scarce and insufficient, and more specifically in Kenya there is inadequate studies towards the same. Information from this study would help policy makers in assessing the best debt that the government should borrow. Therefore this will add knowledge to policy makers and stimulate interest for further research in this area.

1.9 Scope and organization of the study

This study used quarterly data on public debt for the period 2000 to 2013, based on the availability of data, time, financial resources and the magnitude of the problem within the projected time period. The research was organized in five chapters. Chapter outlines the introduction and objectives of the study whereas chapter two gives give literature review. Chapter three highlights the research design and methodology adopted in the research. Chapter four discusses analysis and findings and chapter five gives summary conclusion and policy implications.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction
The effect of public debt and in specific has been a debatable issue in macroeconomic literature. Different schools of economic thoughts view the condition differently as some are for and other against public debt and there has been no agreement so far more especially in developing countries. Some schools of thought argue that overreliance on public debt can create fiscal and monetary instability and also lead to economic burden to the society and may lead to the crowding out of the private investors. At the same time others argue that if the public debt is well utilized it can lead to economic growth. Thus there has been wide literature in the world on the effect of debt on economic growth. This chapter will cover theoretical literature review, empirical literature review, how domestic debt affects economic growth and lastly overview of literature review.

2.2 Theoretical literature Review

2.2.1 Keynesian View
Public debt to some extent can be injurious because it burdens the future generations which may lead to bankruptcy of an economy. Keynesians advocated for debt-financed government expenditure arguing that there exists employment creating effect of public outlays during unemployment period. On a similar case, (Hansen and Perloff 1963) argued that productive government expenditures acquired through borrowing would increase national income by the same amount of government expenditure, even if previously financed through consumption taxes (Joshi, 1995) same thing echoed by
Keynesian. Classical economist (Buchanan 1958) said that future tax payers bear the real burden of arguing those generations in time of debt conception do not bear any tax burden. Smith argued that public debt may lead to the crowding out of the private investors. While Keynesian advocated for unbalanced budget, a cure for depression, Smith came up with unbalanced budget to meet emergency arising out of war. According to Keynes public debt would be of importance when the economy is at recession as a good fiscal measure in the short run, because at this time there was low investment, increased unemployment and low economic growth, due inadequate aggregate demand.

This theory also relies on certain advantages of public borrowing. Through debt creation, the government can tap savings streams, put the resources thus raised to productive use and bring about an increase in national income. The increased flow of income facilitates the payment of taxes to service the debt. At the time of unemployment, increase in public debt contributes to current capital formation. It promotes the development of more and more institutionalised sources of savings like banks, stock markets and insurance companies. It helps curb consumption, encourages savings and promotes capital formation and makes it possible for the people of a country to improve their standard of living.

Thus public debt acts as an anti-cyclical fiscal policy measure thus saving the economy from recession, (Sijben, 1979). Keynes however indicated that debt financing should have a limit since much of it may crowd out private investors. Thus most economic theories do not encourage much budget deficits which may create demand for
public debt, apart from (Lerner 1948) who allowed public borrowing as a fiscal policy instrument in his finance theory. This theory is very relevant to this study since it advocates for public debt to increase economic growth.

2.2.2 Classical views on Public Debt
In contrary to the above arguments, the new classical (Barrow, 1974) basing his case on Ricardian equivalence theorem (RET) hypothesis of neutrality of public debt of public debt, argues that increase in public expenditure which is debt financed would not have effect on the economy as future taxes are personified in the present debt. He supposes that individuals don’t die thus inherit among generations, presence of perfect capital mobility and that individuals can freely borrow and lend in the economy, this theory’s strife is that domestic public debt have no wealth effect because its counter balanced by present value of future taxes thus individuals markdown the lump sum drawn in and save on government bonds to pay taxes in future without affecting their current consumption conduit, thus debt and taxes counter balance. In that regard increased domestic debt by government makes the permanent income of the consumers to reduce since they expect taxes to increase in future. This accumulated domestic debt cascade on private consumption which in turn lead to reduction in current private consumption in favor of future private consumption as individuals will earn interest on holding government bonds and at the same time their principal thus not affecting private consumption savings.

The views of classical economists on public debt depended on their faith in the role of the government in the economic life of a country. There is a grand distinction between
an individual borrower and a borrowing government that in general, the former borrows capital for the purpose of beneficial employment, the latter for the purpose of barren consumption and expenditure. And that the burden of the debt could be shifted over a great number of successive years J.B. Say (1968)

Adam Smith (1987) was of the view that the State was wasteful; it took borrowed funds for unproductive purposes from private capitalists and deprived them of capital which was badly needed for promoting production and trade. Ricardo too was convinced of the wastefulness of public expenditure. Smith (1987) admitted that debt service involves transfer payments within the community, but did not know whether the recipients of such income would employ it productively or squander it unproductively. Smith (1987) held that a loan calls for no immediate payment from the people- the lenders are satisfied, since they have secured a good investment. He refuted the argument that the burden of the expenditure cannot be shifted forward in time.

According to Malthus (1980), the existence of the national debt by maintaining a body of unproductive consumers contributed powerfully to distribution and demand. Malthus (1980) argued that public debt contributed among other things to the evils resulting from changes in the value of money and expressed the desirability of containing the growth of public debt. J.S. Mill (1978) argued that government borrowing was harmful because it destroys capital which could otherwise be used for productive employment. According to Mill (1978), it is expedient to pay off a debt as early as possible either through immediate payment by a general contribution or by gradual payment from the surplus revenue.
Classical disapproved views of public debt because they thought it interfered with the natural order which was conducive to the creation of wealth and increase in the material welfare of the nation and that Government borrowing makes future financing more difficult by increasing the proportion of the budget which must go for fixed charges and by increasing the amount of taxes which must be paid to finance the interest on the debt.

2.2.3 Buchanan Theory of debt

This theory was developed by J.M. Buchanan (1958) the theory is referred to as calls the currently dominant theory of public debt the 'New Orthodoxy' which according to him is based on three basic propositions:

(a) The creation of public debt does not involve any transfer of the primary real burden to future generation.

(b) The analogy between individual or private debt and public debt is fallacious.

(c) There is a sharp and important distinction between an internal debt and an external debt.

Buchanan (1958) has tried to prove that in the most general case, the primary real burden of a public debt is shifted to future generations and also the analogy between public debt and private debt is fundamentally correct and at the same time the external debt and the internal debt are fundamentally equivalent. Buchanan asserted that payment of taxes is per se a burden. Since debt finance postpones the levy of taxes, it obviously shifts burden to future generations which supports this study. Justification for this is that taxes are compulsory and involuntary. In contrast, market transactions,
including the purchase of public debt are voluntary agreements. Buchanan's view implies that democratic societies burden themselves, whenever they agree to a social compact binding on their members. On the other hand, agreements which do not involve governmental coercion evidently burden none of the participants.

2.3 Empirical literature review
There has been comparatively little literature on the impact of domestic debt on the economic growth in developing countries with quite a number researching on external debt. Gurley and Shaw (1956) found out in their study that increased volume of public debt is an important characteristic of a strong and growing economy. Thus according to them increase in public debt should be planned by each government which is geared towards growing. They argued that the cost of debt servicing is the important thing as it leads to the payment of interest on the loan and the principal. Thus they advocated for borrowing for government development programs which do not have adequate finance. But in the real sense there is no government which wants to increase its debt in the long term, because indebtedness amounts to problem more especially if a country can't afford to repay its debt (Queientin 1984).

Barro (1978) investigated the effect of domestic debt on economic growth using unanticipated component of domestic debt, or the stock growth. Barro (1978) concludes that the unanticipated component of domestic debt affects growth.

Using cross-sectional study of 34 countries, Komendi (1983), sought to study on the relationship between domestic debt and economic growth. Komendi (1983) used sample countries extending from the highly developed countries to the underdeveloped
countries. Before estimating consumption equation using nested approach, Komendi (1983) used OLS approach. The study concluded that growth and debt do not have any relationship. But the critics argued that the assorted groups with different levels of development may not give out consequential results. However it should be noted that International comparisons should be interpreted cautiously because of definitional and methodological differences in the data across countries (Anderson et al., 2000).

Using the Granger causality tests, Cunningham (1993) examined the relationship between domestic debt and economic growth of India for the period 1959-1995. Cunningham (1993) found out that co integration and Granger causality tests conger with the Ricardian equivalence hypothesis of domestic debt and economic growth which suggests that regardless of whether the government finances its expenditure with debt or increase in tax, the net effect of demand in the economy was the same and that public debt has positive effect on economic growth. Most of the research to date has focuses on middle and high-income countries thus creating a need for more research this issue in the context of low- and middle-income countries.

Kulkarni and Alfirmans (1999) scrutinized the crowding out effect for Indonesia during the period 1969-1995. They used OLS technique. Their findings indicated that the interest rates are neither affected by budget deficit nor by domestic investment. They also found out that budget deficits have a positive influence on domestic investment, going against the crowding out hypothesis proposed by various researchers. In their conclusion, expansionary fiscal policies through increased budget deficit do not crowd out private investment for the country. Contrary to that, Haliassos (1991), indicates that
most Organization for economic corporation and development (OECD) countries budget deficits cause interest rates to rise

Muhdi and Sasaki (2009) looked at the role of domestic debt in the Indonesia's macroeconomic situation. They used OLS for estimation data from the year 1991 to 2006. Findings of the study indicated that the public debt has led to increased economic growth and increased investment. Apart from these positive effects, their findings found out that domestic debt led to the crowding out of the private investors which in turn reduces the total output.

Patillo (2002), in their analysis reviewed the non-linear impact of public debt on growth basing it on panel data of 93 countries over 29 years from 1969-1989 using econometric methodologies. Findings of the study were that debt impact becomes negative at about 160-170 percent of exports or 35-40 percent of GDP. The also study noted that the debt burden of countries has been increasing and Central loans formed about 77 percent of total indebtedness of the countries reviewed. It also revealed that the relative importance of Central loans decreased over the plan period.

Christensen (2005) looked at the role of domestic debt markets in 20 sub Saharan countries including Kenya for the period (1980-2000) and found out that on average, domestic market in the countries under study are small and have a slim investor base. Christensen also observed out that domestic interest payments have a major weight to the budget with crowding out effects of private investors.

Abbas and Christensen (2007), analyses the optimal domestic debt levels in low income countries between 1975 and 2004. They found out that domestic debt have positive
effects on economic growth. This study provided evidence that debt even exceeding 35 percent of total bank deposits have negative effect on economic growth. Nevertheless, this study may not apply in Kenya since many developments have been carried out in the management of domestic debt since that time and at the same time there has been accelerated economic growth which is not captured in this study.

In more recent study, Maana et al. (2008), sought to find out on the impact of domestic debt in the Kenyan economy. They used OLS technique applying data from 1996-2007. Their study finds out that domestic debt does not crowd out domestic investors in Kenya because of the significant financial development in the Kenya's economy. The study at the same time examines the impact of domestic debt on economic growth of Kenya using the Barrow growth regression. They found out from the study that even if the mix of Kenya's public debt has moved in favor of domestic debt, according to them, domestic debt increase have positive even if not significant effect on the economic growth of Kenya in the time under review.

Applying OLS technique, Adoufu and Abula (2009) explored on the impact of rising domestic debt on the Nigerian economy. Using time series data from 1986-2005, they found out from the study that there are several factors which lead to increase of domestic debt which include; budget deficit, low output level, increased government expenditures, high inflation rate and narrow revenue base. The analysis shows that domestic borrowing has negatively affected the economic growth of the Nigerian economy and recommends that efforts should be put in place to curb the ever increasing and outstanding domestic debt. They also suggested for the broadening of the tax stand.
Godfrey and Cyrus (2012) sought to find out the relationship between domestic debt and economic growth in Kenya for the period 2000-2010 using advanced econometric technique they used the Jacque Bera (JB) and Augmented Dickey-Fuller (ADF) tests to test for normality and unit roots respectively. The study indicated that domestic debt has positive and significant effect on economic growth in Kenya.

2.4. Overview of the literature review.

The effects of public debt on economic growth have attracted a considerable disparity in theoretical and empirical literature. With the theoretical literature revealing contradicting views about the effect of public debt on the growth. For example (Buchanan 1958) argues that public debt may be of great importance to the economy and the private sector. While (Malthus 1980) indicates the contrary and argues that projects which the government uses its borrowings for take very long time to reap benefits from the same but the projects may be benefiting the private sector such as infrastructure construction. This may not have a direct positive effect, but in the long run the private sector would benefit from the same through reduced cost of doing business brought up by good transport and communication and thus profitability. At the same time if the government borrows to finance human capita and in health will in the long run improve skills and improve health standards in the private sector thus increasing effectiveness.

A close examination of the empirical literature revealed contradictory views on the effect of public debt on economic growth with most of the researches focusing on external debt and the and on the developed nations. At the same time, findings from
previous studies are not clear concerning the relationship between public debt and economic growth. That notwithstanding, there was limited literature on the effect of public debt on the Kenyan context. There is a need to more systematically study this issue in the context of low- and middle-income countries. Therefore, this study was designed to fill these gaps for developing countries and more so specifically to Kenya.

The methodologies adopted in the empirical studies included ECM, time series modeling, Jacque Bera (JB), Augmented Dickey-Fuller (ADF) and OLS. The main variables considered in empirical studies included interest rates, real GDP, Domestic Debt and Public debt and Total labour force. This study had an advantage as it used time series modeling and longitudinal research design to empirically analyze whether public debt has effect on economic growth in Kenya. The data that was used was from 2000 to 2013 on quarter basis.
CHAPTER THREE

METHODOLOGY

3.1 Introduction
This chapter presents the methodology that was used in the analysis, it also defined and measure the variables to be used in the study, explain data type and source, Research Design, Theoretical framework, Empirical model, and Data analysis.

3.2 Research Design
The study analyses the effect of public debt on economic growth in Kenya. Longitudinal research design and quantitative techniques was adopted to obtain information about the study. Quarterly data covering the period 2000 to 2013 was used in the study.

3.3 Theoretical framework
This study employed the extended model of production function originally applied by Solow (1956) growth model of economic growth, which includes, among other variables, the accumulation of physical capital and human capital to examine the influence of public debt and the study also extended the model by assuming that the technological progress can be disaggregated into exogenous technical progress, the direct effect of public debt on economic growth, and the effect of public debt on GDP.

The study assumed a Cobb-Douglas production function for the entire economy and so that the production at time \( t \) is given by:
\[ Y_t = V_t K_t^\alpha H_t^\beta L_t^{1-\alpha-\beta} \] ............................................................... 3.0

Where, \( \alpha, \beta > 0 \) and \( \alpha + \beta = 1 \). \( Y_t \) is output, \( V_t \) the technological progress and other institutional factors, \( L_t \) is the labor, and \( K_t \) and \( H_t \) are the stocks of physical and human capital at time \( t \), respectively.

\[ V_t = A_t D_t L_t \] ............................................................... 3.1

Where \( A_t \) is the level of technology (exogenous), \( D_t \) is the level of public debt, and \( L_t \) measures investment or the level of capital formation. Note that \( D_t \) is synonymous with the direct effect of public debt on output. If public debt indirectly influences output through its impact on capital formation, citrus paribus, then it will indirectly influence economic output through \( L_t \). While the primary focuses is the indirect influence of public debt on economic growth through its impact on investment.

The study further assumed that \( L_t \) is function of \( D_t \) and \( Z_t \)

\[ L_t = f(D_t, Z_t) \] ............................................................... 3.2

Where, \( Z_t \) is a set of control variables including economical, institutional and social variables. At this time, for theoretical simplicity, the study assumes that \( D_t \) is uncorrelated with \( Z_t \).

If \( S_k \) is the fraction of income invested in physical capital, then the evolution of the economy can be determined by;

\[ K_t = S_k Y_t - (n + \rho + \delta)K_t \] ............................................................... 3.3

\[ H_t = S_k Y_t - (n + \rho + \delta)H_t \] ............................................................... 3.4
Where $Y = Y/L$, $k = K/L$ and $h = H/L$ are quantities per effective unit of labor. The study assumed that the same production function and same rate of depreciation ($\delta$) applies to physical and human capital. In addition, each are subject to decreasing returns to scale that no combination of capital inputs exhibits constant returns. This implies that the economy, over the long-run, will tend to constant physical capital-labor and human capital-labor ratios. Thus once steady state output is achieved, additional increases in output can only be achieved through increases in capital productivity or increases in the level of public debt (assuming that the overall effect of public debt on economic growth is positive). From this perspective that interests us here; public debt may affect output through two channels, a potential direct effect on output channel, and a series of potential indirect effects, one of which is investment channel.

To determine the influence of public debt on economic growth, this study determined the steady state levels of the physical inputs specified in the production function

$$Y_t = f(V_t K_t^\alpha H_t^\beta L_t^{1-\alpha-\beta})$$

Therefore modifying equations 3.5 to accommodate domestic debt, and Public debt, the study developed equation 3.6 in a linear form.

$$Y = f(HK, K, L, DD, ED)$$

Thus, this equation shows how steady state per capita output depends on the accumulation of reproducible capital, the technology, the direct effect of public debt.
and domestic debt, and the indirect effect of public debt on economic growth through the investment channel.

3.4 Empirical Model
This study employed the extended model of production function originally applied by Cunningham (1993), to investigate the effect of public debt on economic growth in Kenya. This study used debt as a percentage of GDP to capture the effect of debt because debt as a percentage of GDP signifies the indebtedness relative to economic strength of the country.

The model used is as follows:

\[ Y = f(HK, K, L, DD, ED) \]  

The production function used the following specification:

\[ Y_t = \beta_0 + \beta_1 HK + \beta_2 K + \beta_3 LF + \beta_4 DD + \beta_5 ED + \varepsilon_0 \] 

\( Y_t \) = Gross Domestic Product (GDP)
HK = Human capital, It consists of the skills and knowledge of particular workers (Annual education expenditures of Kenya used as a proxy of human capital)
K = Capital stock (Capital formation)
L = Total labour force
DD = Domestic debt as a percentage of GDP
ED = External Debt as a percentage of GDP
\( \varepsilon_0 \) = White noise error term

By applying natural logs, the model was

\[ \ln Y_t = \beta_0 + \beta_1 LHK + \beta_2LK + \beta_3 LLF + \beta_4 LDD + \beta_4 LED + \varepsilon_0 \]
The study used the third specification to test the null hypothesis that the series used does contain a unit root (i.e., it is non stationary) against the alternative hypothesis of stationarity.

$$\Delta Y_t= \beta_1 + \beta_2 t + \delta Y_{t-1} + \alpha \sum_{i=1}^{1} \Delta Y_{t-i} + \epsilon_t$$ \hspace{1cm} 3.11

Where $Y_t$ is relevant time series, $t$ is time trend and $\epsilon_t$ is white noise error term.

**Table 3.5 Definition and measurement of Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definition</th>
<th>Measurement</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>Total GDP divided by the total population which indicates standard of living.</td>
<td>Kenya Shilling (Ksh).</td>
<td>Various issues of Statistical abstracts</td>
</tr>
<tr>
<td>Domestic Debt</td>
<td>The amount of money that is raised by the government through borrowing in local currency from its citizens.</td>
<td>Kenya Shilling (Ksh).</td>
<td>Ministry of finance annual debt report</td>
</tr>
<tr>
<td>ED</td>
<td>The portion of a country's debt that was borrowed from foreign lenders including</td>
<td>Kenya Shilling (Ksh).</td>
<td>Ministry of finance annual debt report</td>
</tr>
</tbody>
</table>
### Capital Stock
- The total amount of stock authorized for issue by a country which includes common and preferred stock
- Kenya Shilling (Ksh)
- Ministry of finance

<table>
<thead>
<tr>
<th>Human capital</th>
<th>Total labour force in the public sector</th>
<th>Kenya Shilling (Ksh)</th>
<th>Ministry of finance</th>
</tr>
</thead>
</table>

Source (Resercher2014)

### 3.6 Types and sources of data.
Secondary data for the period 2000 to 2013 was collected and used for analysis in this study. The data consisted of, level of GDP from annual economic surveys published by The Kenya National Bureau of Statistics (KNBS), Annual public debt management reports from Ministry of finance, annual interest rates from The Central Bank of Kenya, and other sources such as Government of Kenya publications was consulted and for any additional information that was of importance.

### 3.7 Data Analysis
Stationarity and cointegration tests was tested, ADF was used to check stationarity, and, Johansen test for cointegration was used to check for cointegration. Error correction models (ECM) was used to cater for long run relationships.
To address the first objective, a regression specification error (RESET) test was conducted to identify model with best fit. Correlation tests was carried out to eliminate the presence of collinearity. OLS technique was used to regress private sector lending on domestic debt.
CHAPTER FOUR

ANALYSIS AND FINDINGS

4.1 Introduction
This chapter presents descriptive statistics, the estimation results and the interpretation of the empirical results.

4.2 Descriptive Statistics
This section highlights descriptive statistics for average capital stock, domestic debt, GDP, human capital labour force and public debt. Table 4.1 provides statistics on the mean, maximum, minimum and the standard deviation for each variable.

Table 4.1: Descriptive Statistics of the Variables

<table>
<thead>
<tr>
<th></th>
<th>CAPITAL STOCK</th>
<th>DOMESTIC DEBT</th>
<th>GDP</th>
<th>HUMAN CAPITAL</th>
<th>LABOR</th>
<th>PUBLIC DEBT</th>
<th>TOTAL DEBT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>8.525</td>
<td>1420361</td>
<td>29.05214</td>
<td>2.052314</td>
<td>14225755</td>
<td>2768826</td>
<td>4189187</td>
</tr>
<tr>
<td>Maximum</td>
<td>15.1</td>
<td>3534018</td>
<td>55.2</td>
<td>4.416</td>
<td>17245867</td>
<td>6015499</td>
<td>9549517</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.05</td>
<td>201463.2</td>
<td>12.7</td>
<td>0.635</td>
<td>11913757</td>
<td>0</td>
<td>705017.2</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>5.169236</td>
<td>825242.9</td>
<td>14.2849</td>
<td>1.19838</td>
<td>1685591</td>
<td>1347456</td>
<td>2152177</td>
</tr>
<tr>
<td>Observations</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>56</td>
</tr>
</tbody>
</table>

Source of the data: Author’s calculations from raw data (2015).

Table 4.1 shows descriptive statistics of the variables over the period of 13 years. Capital stock and domestic debt averaged 8.525 and 1420361 respectively. On the other hand, GDP recorded an average 29.05 and human capital averaged 2.05. Public debt had a mean of 2768826 with a maximum of 6015499.
4.3 Empirical Results

The regression results of GDP model are presented in table 4.2 that follows.

Table 4.2 Regression Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>-1.778649</td>
<td>1.637213</td>
<td>-1.086388</td>
<td>0.2831</td>
</tr>
<tr>
<td>human capital</td>
<td>-0.035824</td>
<td>0.238657</td>
<td>-0.150107</td>
<td>0.8814</td>
</tr>
<tr>
<td>capital stock</td>
<td>-0.146086</td>
<td>0.089771</td>
<td>-1.627325</td>
<td>0.1107</td>
</tr>
<tr>
<td>labour force</td>
<td>3.06829</td>
<td>1.494342</td>
<td>2.053271</td>
<td>0.0459</td>
</tr>
<tr>
<td>external debt</td>
<td>2.051349</td>
<td>0.21874</td>
<td>9.378014</td>
<td>0</td>
</tr>
<tr>
<td>domestic debt</td>
<td>-1.606852</td>
<td>0.309881</td>
<td>-5.185389</td>
<td>0</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.942836</td>
<td></td>
<td></td>
<td>3.304192</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.936485</td>
<td></td>
<td>0.505379</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>0.127367</td>
<td></td>
<td>-1.173356</td>
<td></td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>0.730007</td>
<td></td>
<td>-0.946082</td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>35.92057</td>
<td></td>
<td>-1.086508</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>148.4421</td>
<td></td>
<td>0.403845</td>
<td></td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source of the data: Author’s calculations from raw data (2015).

The estimated results in table 4.2 have an adjusted R-squared of 93.64 per cent. This implies that 93.64 per cent of the variation in GDP are explained by the explanatory variables used in the model. The F-statistic is 148.44 and the probability of not rejecting the null hypothesis that there is no statistically significant relationship between the dependent variable and independent variables is 0.0000(prob<0.05). This implies that GDP and debt model is statistically significant at 5 per cent level of significance.
Before the interpretation of the results, it was necessary to examine the statistical properties of the estimated model. The model was tested for multicollinearity, normality, serial correlation, heteroscedasticity, and specification. The tests are discussed here under.

The model was tested for multicollinearity because the multicollinearity affects calculations regarding individual predictors. Another feature of multicollinearity is that the standard errors of the affected coefficient tend to be large. In that case, the test of the hypothesis that the coefficients is equal to zero leads to a failure to reject the null hypothesis. Analyst may falsely conclude that there is no linear relationship between an independent and dependent variable. The multicollinearity test showed the tolerable levels of multicollinearity between explanatory variables. The multicollinearity problem is tolerable if the correlation coefficient between explanatory variables is close or less than 0.5. The pair wise correlations are low as it can be noticed from the following correlation matrix.

### Table 4.3 Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>human capital</th>
<th>capital stock</th>
<th>labour</th>
<th>domestic</th>
<th>public</th>
</tr>
</thead>
<tbody>
<tr>
<td>human capital</td>
<td>1</td>
<td>-0.10091</td>
<td>-0.2388</td>
<td>0.051542</td>
<td>0.0361</td>
</tr>
<tr>
<td>capital stock</td>
<td>-0.10091</td>
<td>1</td>
<td>-0.1257</td>
<td>-0.11254</td>
<td>-0.1459</td>
</tr>
<tr>
<td>labour force</td>
<td>-0.2388</td>
<td>-0.1257</td>
<td>1</td>
<td>0.041166</td>
<td>0.04222</td>
</tr>
<tr>
<td>domestic debt</td>
<td>0.051541</td>
<td>-0.11254</td>
<td>0.041166</td>
<td>1</td>
<td>0.09862</td>
</tr>
<tr>
<td>public debt</td>
<td>0.0361</td>
<td>-0.14592</td>
<td>0.042228</td>
<td>0.098621</td>
<td>---------</td>
</tr>
</tbody>
</table>

Source: own calculations (2015)

Table 4.3 displays pair wise correlations between explanatory variables included in GDP debt model. None of the coefficients is greater than 0.5. Hence, the
multicollinearity problem between GDP and other variables is tolerated. The multicollinearity is therefore tolerated for all variables.

Another test that was performed is a serial correlation test. In regression analysis using time series data, autocorrelation of errors is a problem. Autocorrelation violates the OLS assumption that the error terms are uncorrelated. The standard errors tend to be underestimated and the t-scores overestimated when then autocorrelations of errors at low lags are positive. In this paper Breusch-Pagan-Godfrey serial correlation LM test was applied at 5 per cent level of significance. The results of the serial correlation test indicated that the test-statistic is equal to 0.457760 and that its probability is equal to 0.7954. The probability of the t-statistic is greater than 0.05. This led to the acceptance of the null hypothesis of no-autocorrelations. Hence, the model has no problem of autocorrelation of errors.

Another test performed was the specification test. The mis-specification of the model means the poor predictive power of that model. In this study Ramsey's RESET test was performed at 5 per cent. The results of Ramsey's RESET test showed that the test-statistic is equal to 10.05532 and that its probability is equal to 0.0737. This probability is greater than 0.05 and this led to conclusion that the model is not mis-specified.

The normality test was also performed. According to Greene (2005), if the residuals from a linear regression are not normally distributed, they should not be used in Z tests or any other tests derived from the normal distribution such as t-test, F test and chi-squared test. If the residual are not normally distributed, then the dependent variable or at least one explanatory variable may have the wrong functional form or important
variables may be missing. In this study Jarque-Berra test was applied. The results showed that the test-statistic is equal to 0.674810 and that its probability is equal to 0.713620. The probability of the test-statistic is greater than 0.05. This led to the acceptance of the null hypothesis of normal distribution of the residuals. Thus, the residuals of GDP model are normally distributed.

4.3.1 Relationship between public debt and economic growth

The first objective of the study sought to establish the relationship between public debt and economic growth. To achieve this objective, the model 3.10 was estimated and the statistical significance of public debt coefficient was tested using student t-test.

Findings of the study indicated that the public debt has led to increased economic growth and increased investment. Apart from these positive effects, the findings show that domestic debt led to the crowding out of the private investors which in turn reduces the total output.

4.3.2 Effect of external debt on economic growth

The coefficient associated to external debt is positive and is equal to 2.05. This coefficient has a t-statistic which is equal to 9.37 and its probability is equal to 0.0000. Using 5 per cent level of significance, this probability is less than 0.05. This implies that external debt is statistically significant at 5 per cent level of significance.

Empirically, the sign of external debt can either be positive or negative. In this case the coefficient is positive which is in line with research done by (Queientin 1984) which indicates that external debt increases economic growth. The implication of this is that increase of external debt by one per cent improves GDP by 2.05 per cent in short-run.
4.3.3 Effect of domestic debt on economic growth

The third objective of the study sought to establish the effect of domestic debt and economic growth. The results were in line with the study done by Christensen (2005) which indicated that domestic debt is very significant to economic growth. To achieve this objective, the model 3.10 was estimated and the statistical significance of domestic debt coefficient was tested using student t-test. The coefficient associated to domestic debt is negative and is equal to -1.60. This coefficient has a t-statistic which is equal to -5.18 and its probability is equal to 0.0000. Using 5 per cent level of significance, this probability is less than 0.05. This implies that domestic debt is statistically significant at 5 per cent level of significance.

Empirically, the sign of public debt can either be positive or negative. In this case the coefficient is negative. The implication of this is that increase of domestic debt by one per cent decreases GDP by 1.61 per cent in short-run.
CHAPTER FIVE

SUMMARY CONCLUSION AND POLICY IMPLICATIONS

5.0 Introduction
In this chapter, a concise summary of the results is given briefly and recommendations cited. The chapter further suggests policy implications anchored on the findings of this study. Areas for further research are also proposed.

5.1 Summary
Public debt has been a major issue for every developing country that has to be addressed. Kenya has in the recent past put measures to enhance the borrowing mechanisms in the country to ensure that public debt is well managed to ensure full benefits from the same.

Debt is brought up by government borrowings from local financial sectors and individuals to meet its expenditure. Domestic borrowing and economic growth are statistically significant. Domestic debt led to the crowding out of the private investors which in turn reduces the total output. Increased government borrowings from local financial institutions leads to a reduction in the funds available for investment in the private sector. Thus, there was a negative relationship between domestic debt.

To the economy, government borrowing leads to a reduction in domestic savings making the interest rates to go high. This leads to a decrease in money supply which in turn leads to low investment in the private sector because of the increased interest rates. When the government issues treasury bills and bonds, money supply in the economy
reduces makes the interest rates to rise. Interest rates have negative effect on private investment, increasing interest rates makes borrowing more expensive in the private sector which in turn leads to the crowding out effect of the private investors.

The results of the study showed a positive relationship between economic growth and public debt. Public debt can lead to increased economic growth and increased investment. Empirically, the sign of public debt can either be positive or negative. In this case the coefficient is positive, the implication of this is that increase of public debt by one per cent improves GDP by 2.05 per cent in short-run.

5.2 Conclusion
The government could play a very important role in stimulating economic growth if the resources borrowed are targeted at productive activities. In the recent past, funds from public debt has been mismanaged thus leading to low or insignificant contribution to economic growth. But the country has a chance of overcoming the debt burden by cultivating the right policies and procedures through debt relief support.

5.3 Policy Recommendations
The central focus of this study was to establish the effect of public debt on economic growth of Kenya more especially the external debt that has caused concern among donor governments given as concessional loans.

The alarming increase in public debt in Kenya can be attributed to both internal and external factors. Internal factors are mainly overly expansionary fiscal policies and external factors include deterioration of trade leading to BOP deficits.
Change of political conditions in the country reduced foreign grants making domestic debt to be preferred by the government thus rising significantly, even though having negative effects to economic growth thus domestic borrowing should be discouraged in favour of external debt.

In as much as debt burden is a reality in Kenya, it is also a reality that the country cannot achieve its long term goals without borrowing from both internal and external sources. This should be done with measures in place to avoid the problem of indebtedness by putting a ceiling up to which the country can borrow. External debt if very well utilized will stimulate economic growth of a country. With the current debt levels, Kenya should consider to have comprehensive debt relieve measures. Attainment of desired economic growth with the current domestic debt levels remains elusive if aggressive measures are not undertaken.

5.4 Areas of Further Research
This study proposes a comprehensive study for each of the debts incurred by the government. This will give an insight of the utilization of the studied debts. Further researchers should verify the effects of other variables as used in the study with external debt and domestic debt respectively. Finally cost benefit analysis of projects that are funded by both external and domestic debt should be carried out in order to ascertain their viability.
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## APPENDICES

### Appendix 1: STATIONARITY TEST

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type of the Test and test statistic</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>ADF Test</strong></td>
<td><strong>PP Test</strong></td>
</tr>
<tr>
<td></td>
<td>Test statistic</td>
<td>Critical value</td>
</tr>
<tr>
<td>CAPITAL STOCK</td>
<td>Level</td>
<td>-1.0614</td>
</tr>
<tr>
<td></td>
<td>1st Difference</td>
<td>-7.4713</td>
</tr>
<tr>
<td>DOMESTIC DEBT</td>
<td>Level</td>
<td>3.5972</td>
</tr>
<tr>
<td></td>
<td>1st Difference</td>
<td>-3.7251</td>
</tr>
<tr>
<td>GDP</td>
<td>Level</td>
<td>0.4668</td>
</tr>
<tr>
<td></td>
<td>1st Difference</td>
<td>-2.1359</td>
</tr>
<tr>
<td>HUMAN CAPITAL</td>
<td>Level</td>
<td>0.7301</td>
</tr>
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**Appendix 2: heteroscedasticity**

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