

KSh-3,000

**RESPONSE OF ECONOMIC GROWTH TO DOMESTIC
BORROWING, GOVERNANCE AND MARKET REFORMS 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 MASTER
OF ECONOMICS (FINANCE) OF KENYATTA UNIVERSITY.**

JULY, 2015

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DECLARATION

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

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DEDICATION

To my beloved parents, Mr Isaac Kimolo and Mrs Benes Kimolo.

ACKNOWLEDGEMENTS

First of all, I thank the Almighty God for granting me the gift of life and strength that enabled me complete this research project. Secondly, I thank all the people who, until now, have supported me materially, socially and spiritually during my studies.

I thank my highly dedicated supervisors, Dr. Perez Onono and Dr. James Maingi who added value to my work through their constructive guidelines. I also thank my classmates for their input during the process of undertaking this research project. I acknowledge the scholarship awarded by Kenyatta University and access to facilities that enabled me reach this far. Finally, I thank my dear parents Mr Isaac and Mrs Benes Kimolo for supporting me all the way in school.

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ABBREVIATIONS AND ACRONYMS

ADF	Augmented Dickey Fuller
CBK	Central Bank of Kenya
EAC	East African Community
ECT	Error Correction Term
GDP	Gross Domestic Product
HIPCS	Heavily Indebted Poor Countries
IMF	International Monetary Fund
KANU	Kenya African National Union
KENDREN	Kenya Debt Relief Network
KES/KShs	Kenya Shillings
KNBS	Kenya National Bureau of Statistics
MTDS	Medium-term Debt management Strategy
OLS	Ordinary Least Squares
SAPs	Structural Adjustment Programmes
UNCTAD	United Nations Conference on Trade and Development
USD	United States Dollar
GDI	Gross Domestic Investment

OPERATIONAL DEFINITION OF TERMS

Crowding out: A situation where increased government borrowing reduces private investment spending in the economy.

Debt Sustainability: The ability of a country to meet its debt obligations without requiring debt relief or accumulating arrears.

Domestic debt: Central government debt incurred internally through borrowing in the local currency from residents.

Government budget deficits: A status of financial health in which government expenditures exceed revenue.

Lump sum taxes: Taxes that are fixed, no matter the change in circumstance of the taxed entity.

National Debt: The total amount of money that a country's government has borrowed from both internal and external sources. It comprises both external and domestic debt.

Ricardian equivalence theorem: An economic theory that suggests that when a government tries to stimulate demand by increasing debt-financed government spending, demand remains unchanged.

Treasury bonds: Medium (maturity of 1-10 years) to long-term (maturity of 10 years and above) debt instruments while **treasury bills** are short-term debt instruments (maturity of 1 year or less).

ABSTRACT

The *Kenya vision 2030* aims at achieving a sustained 10 per cent per annum growth rate in the economy by 2012 as well as reducing domestic debt levels to below 25 per cent of GDP but these targets have not been achieved. Post independent Kenya has also experienced changes in governance as well as market liberalisation. The study therefore aimed at analysing the response of economic growth to domestic borrowing, governance and market reforms. The study used time series data for 1971-2013. A multivariate linear regression model was used to analyse the response of economic growth to domestic debt in Kenya while dummies and interaction terms were used to capture the moderating effects of changes in governance and market reforms on the response of economic growth to domestic borrowing in Kenya. After the regression, diagnostic tests were performed on the models to check their statistical soundness. The models passed all the tests so the results were considered reliable. The study found that economic growth responded negatively to domestic borrowing. Economic growth responded negatively to Private Consumption and Inflation while it responded positively to growth in Private Investments and Net exports. Market reforms were found to have no significant effects on economic growth. Economic growth in the third governance under President Mwai Kibaki was higher than in the governance regime under President Jomo Kenyatta. Domestic debt and the governance under President Mwai Kibaki had own significant effects on economic growth but did not have any joint effects on economic growth in Kenya. From the results the study recommends that the government should pursue policies aimed at reducing growth in domestic debt in Kenya to minimize the negative effects on economic growth. The government should also work on measures to curb inflation while ensuring private investments and net exports are on the rise.

CHAPTER ONE

INTRODUCTION

1.1 Background

According to United Nations Conference on Trade and Development (UNCTAD), (2001) many African countries are not well developed and are thus categorised as Developing Countries (DC's). Most of the African countries attained independence in the 1960s and 1970s which meant that their governments needed funds to conduct various economic activities so as to stabilise their economies (International Monetary Fund (IMF) and World Bank, 2001). These countries therefore became indebted to international lenders as they accepted loans for political and economic stabilization in the post-independence era (IMF and World Bank, 2001). The oil crisis in the 1970s led to massive revenue surpluses of oil money in Western banks and in turn huge loans were made to African countries with little thought to their purpose or to their recipients' capacity to repay the debt (Signoriello and Vincent, 1991).

The African debt crisis began to unfold in the 1980s when the shocks of the 1970s oil crisis caused a rise in the interest rates and a fall in global prices for primary commodities (IMF and World Bank, 2001). The size of these debts thus grew very fast and several countries fell behind in their repayments (Signoriello and Vincent, 1991). Further, the higher interest rates due to global

recession of the 1980's drastically increased the cost of new loans (IMF and World Bank, 2001). As a result, demand for the DCs' exports declined creating the need for increased new borrowing at higher rates (Signoriello and Vincent, 1991). LDCs spent as much as 50% of their exports earnings on debt service which meant that little resources were left for economic growth (Krugman, 1988).

Things worsened in 1982 when Mexico announced it could not pay its foreign debt, sending shock waves throughout the international financial community as creditors feared that other countries would do the same (IMF and World Bank, 2001). As a result, all creditors demanded that the indebted countries pay off their loans and withheld any more lending to DCs (Signoriello and Vincent, 1991). Unfortunately, the DCs were not able to pay off their loans due to lack of sufficient resources which led to the emergence of the Heavily Indebted Poor Countries (HIPC) (IMF and World Bank, 2001). The IMF set strict rules to these nations requiring that new loans be conditioned on adopting Structural Adjustment Programs (SAPs). The SAPs were aimed at making the debtor government efficient by undertaking programs designed to control inflation, root out government graft and corruption, and scale back public services (IMF and World Bank, 2001). These programs worsened economic situations that were already quite bad, and engendered great resentment and protest in the LDCs (Krugman, 1988).

The HIPC's, desperate for the foreign exchange they needed to keep their economies functioning had to export whatever they could even if much of their export revenue had to be paid right back out in debt service (Signoriello and Vincent, 1991). As a result, the IMF pushed for debt relief recognizing that countries would not be able to pay back in full the large sums they owed (Krugman, 1988). However, not all the HIPC's benefited from the debt relief program, for instance, Kenya. According to IMF and World Bank (2001) exclusion of Kenya from debt relief was due to poor record of reforms and economic performance. This led to increased debt burden for Kenya and other HIPC's and as a result they resorted to measures like debt rescheduling, debt conversion, debt equity, debt forgiveness or cancellation (IMF, 2010). Despite these efforts, total debt burden for most developing countries, for instance Kenya, still remain above 40 per cent of their GDP which poses a threat on debt sustainability (Republic of Kenya, 2013).

1.2 Trends of Domestic Public Debt in Kenya

Over the years, the Kenyan government has experienced budget deficits due to revenues falling short of expenditure (Republic of Kenya, 2008). Domestic debt in Kenya comprises central government debt incurred internally through borrowing in the local currency from residents (Republic of Kenya, 2008). The government borrows from the domestic market using securities, overdrafts at the Central Bank of Kenya and advances from commercial banks (Republic of Kenya, 2010). Domestic debt in Kenya is contracted for two major reasons.

First, it is used to finance the budget deficit when the government is not able to meet its expenditure commitments using domestically raised revenue and externally sourced grants and borrowing (Republic of Kenya, 2010). Second, domestic debt is contracted during implementation of monetary policy through open market operations (Republic of Kenya, 2010). Figure 1.1 shows the trends of Kenyan domestic debt between 1971 and 2013

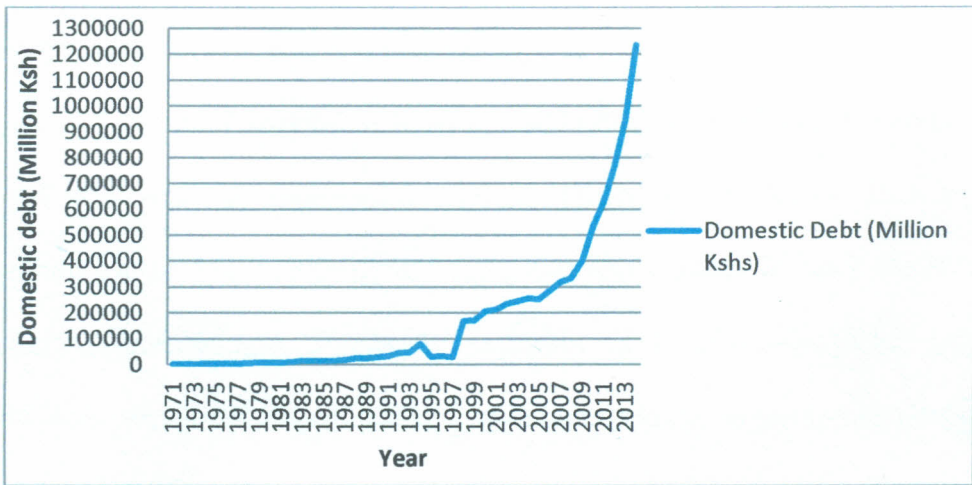


Figure 1.1: Trends of Kenyan domestic debt: 1971-2013

Source: Republic of Kenya (Economic Surveys, various issues).

In the 1970's domestic debt in Kenya was on the rise with the 1974 oil crisis being one of the major causes (Krugman, 1988). Kenya borrowed heavily domestically so as to generate revenue needed to import oil (Republic of Kenya, 1978). As shown in Figure 1.1, Kenya's domestic debt steadily increased between the period 1971 and 1994. This was attributed to the fact that Kenya experienced moderate increase in budget deficits and government

government borrowing (Republic of Kenya, 1999). This led to a sustained level of domestic debt in Kenya between 1995 and 1997.

In 1997, Kenya experienced a widened budget deficit as well as reduced donor funding which resulted to increased domestic borrowing between 1997 and 1998 as shown in figure 1.1 (Republic of Kenya, 1999). Effects of El Nino rains and general elections also called for more government borrowing. Between 2000 and 2007 the government set policies to reduce domestic debt levels and increase the level of donor funding (Republic of Kenya, 2008). This led to a drastic increase in domestic debt levels between 2000 and 2007. This was not satisfactory because the ratio of domestic debt to Gross Domestic Product (GDP) levels was above 20 per cent and was persistently increasing.

This raised concern to the government which led to the formulation of Kenya's Medium Term Debt Management Strategy (MTDS) in 2009. The strategy sought to address the terms of new borrowing, including the appropriate mix between domestic and external debt and incorporated initiatives to develop a vibrant domestic debt market (Republic of Kenya, 2010). The 2009 MTDS sought to slow down the uptake of domestic borrowing not to 'crowd-out' the private sector, the engine of growth for Vision 2030 but this was not the case. Treasury bonds issuance was to be biased towards medium to long tenors to

create liquidity around benchmark bonds, lowering the cost of borrowing (Republic of Kenya, 2010).

However, despite the efforts by the government, domestic debt levels increased persistently between 2007 and 2013 as depicted in figure 1.1. As a percentage of GDP, domestic debt was set at below 20 per cent but it has been over 25 per cent. Domestic debt as at 2013 is also above 50 per cent of the total debt contrary to the set target of less than 50 per cent (Republic of Kenya, 2014). At the current levels, Kenya is reeling from the high cost of servicing growing debt, a situation that raises borrowing costs, which in turn increases interest rates (Republic of Kenya, 2014). A high interest rate environment would eventually crowd out the private sector from the debt market (Diamond, 1965). This could dampen investment and increase the cost of doing business (Barro and Martin, 1979). Although borrowing is not bad, what makes Kenya's situation unstable is that about 70 per cent of the budget goes to recurrent expenditure (Republic of Kenya, 2013). This means that little money is left for financing development projects which leads to the question on how this could relate to economic growth.

1.3 Trends of Economic Growth in Kenya

Kenya's economic growth has been unstable since independence. Between 1963-1970 Kenya's GDP growth was high due to high levels of both private

and public investment and agricultural production (Republic of Kenya, 1972). However, between 1970 and 2004 Kenya experienced high volatility in GDP growth rate due to a number of factors among them erratic weather conditions and escalating oil prices which led to widening of the current account deficit and high inflation (Republic of Kenya, 2005). Figure 1.2 shows Kenya's real GDP growth rates for the year 1971-2013.



Figure 1.2: Real GDP Growth Rates for Kenya: 1971-2013

Source: Republic of Kenya (Economic Surveys, Various issues)

The year 1971 was characterized by; the upheaval of the international monetary system, a fall in the rate of growth of world trade and sharp inflation in

industrial countries which affected flow of trade (Republic of Kenya, 1978). This led to a decline in real GDP growth rate in 1972 as shown in figure 1.2. The principal reason for a slower rate of growth in 1972 was the negative growth of product in the agricultural sector due to drought (Republic of Kenya, 1978). A sharp decline in GDP growth rate was witnessed in 1974 due to oil crisis (Republic of Kenya, 1978). There had been a poor agricultural season in 1973/74, and also there were numerous indications of the impact of the rise in petroleum prices on various sectors of the economy (Republic of Kenya, 1978). This was attributed to higher import prices partly affected by the rising oil prices (Republic of Kenya, 1978).

The Government took various measures in 1975 to improve the unfavourable trade balance of 1974. These included imposition or raising of tariffs on raw materials; raising import duties and sales taxes on certain luxury consumer goods; and raising duties and taxes on petroleum products to reduce consumption (Republic of Kenya, 1978). Subsidies were encouraged to increase Exports of manufactured goods and government borrowing increased (Republic of Kenya, 1978). This led to a sustained increase in GDP growth rate between 1974 and 1977.

In 1978, the terms of trade deteriorated and the balance of payments exhibited substantial difficulties leading in the later part of the year to the tightening of

credit restrictions in the domestic economy and the introduction of an import prepayment scheme (Republic of Kenya, 1984). Kenya GDP growth rate fell even further all though 1980 due to: relatively low prices for coffee and tea on world markets, drought and increased crude petroleum prices (Republic of Kenya, 1984). There was a welcome recovery in Kenya's economy in 1982 especially due to the adjustment of the exchange rate which made Kenya's exports more valuable (Republic of Kenya, 1984).

However, in 1984, Kenya experienced famine which led to a decline in GDP growth rate (Republic of Kenya, 1990). The government pursued trade liberalization policies which led to economic recovery in 1985. The economy again improved in the following years but in 1993 it went down to 0.2 per cent. This was as a result of prolonged drought, domestic macro-economic problems such as high inflation and further decline in real investment. The government introduced significant economic reforms in 1993 in an attempt to rectify some of the prevailing macro-economic imbalances. These included: liberalization of exchange control regulations, abolition of import licensing, introduction of export retention schemes and removal of price controls (Republic of Kenya, 1994). This led to economic recovery all though 1996 after which GDP growth rates were quite volatile.

In the early 2000's the growth rate was average. However, a major turnaround was witnessed between the periods 2003- 2007 when the real GDP growth rate witnessed a sustained increase from 3.0 per cent in 2003 to 7.1 per cent in 2007. This was due to the implementation of the Economic Recovery Strategy for Wealth and Employment 2003-2007 (Republic of Kenya, 2008). Unfortunately this major turnaround was short lived due to the 2008 post-election violence which saw the real GDP growth rate decline from 7.1 per cent in 2007 to 1.7 per cent in 2008. In response, the government put up measures to stimulate growth among them: Restoring investor confidence, Expansionary fiscal policy and monetary policy focusing on achieving and maintaining price stability within a single digit inflation rate of 5.0 per cent (Republic of Kenya, 2012). The economy responded accordingly with an improved growth rate in the next years.

In 2011, there was reduced economic growth attributed to sluggish growth in the agricultural sector caused by erratic weather conditions and increased prices of agricultural inputs (Republic of Kenya, 2012). Other causes of this decline in growth were: Escalating oil prices, high inflation and weakening of the Kenya shilling which led to widening of the current account deficit. The years 2012 and 2013 witnessed improved growth rates as shown in figure 1.2.

Kenya has not always met the set targets in terms of GDP growth rates as stipulated by the first medium term development plan (2008-2012). The Kenyan economy was supposed to grow at 10 per cent by the year 2012 which was to be sustained henceforth. However, this was not achieved and the actual growth rate by 2012 was 4.6 per cent. Figure 1.3 presents the targeted and real growth rates for Kenya between 2003 and 2013.

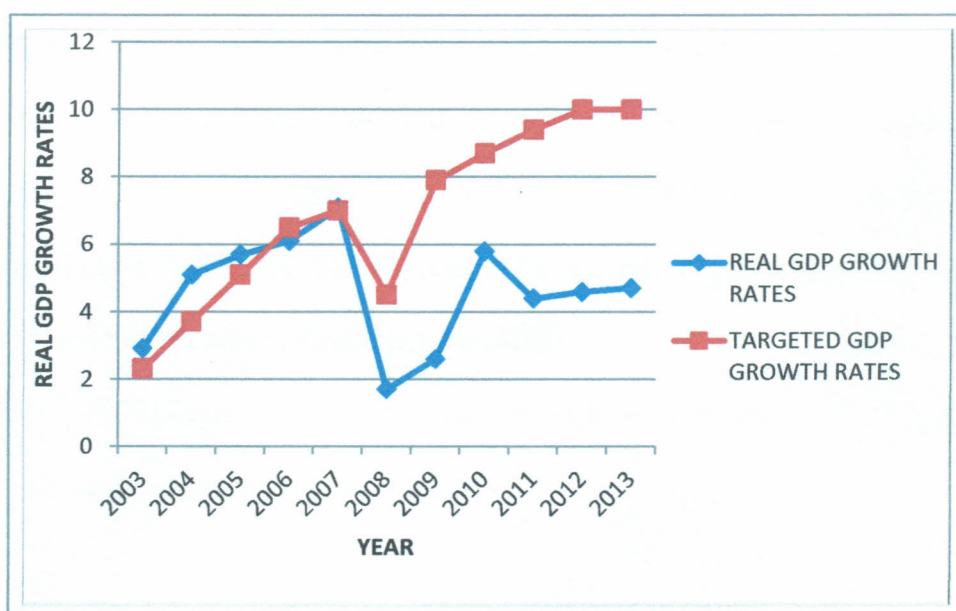


Figure 1.3: Real and targeted GDP growth rates for Kenya between 2003 and 2013.

Source: Republic of Kenya (Economic Surveys, various issues).

According to Republic of Kenya (2010) the targets set in terms of real GDP growth rates between 2003 and 2007 were met as shown in figure 1.3. However all the targets for the years 2008-2012 were not attained. This means

that the government has to implement more measures to ensure the economic growth in Kenya is sustained above 10 per cent.

The relationship between domestic debt and economic growth in Kenya is an issue of great debate among scholars. On the bright side, debt increases economic growth by bridging the gap between receipts and expenditure (Matiti, 2013). It is also beneficial in financing investment projects thus the adjustment in a country's industrial structure while enhancing the compliance among different industries in order to achieve a healthy, nationwide development (Matiti, 2013). However, excessive public debt may be harmful to the economy because it may limit productivity and weaken investment growth (Barro, 1979). Both internal debt and economic growth are key public issues which need to be addressed cautiously.

1.4 Institutional reforms in post-independent Kenya

Major institutional reforms have focused on improving market conditions and governance in Kenya.

1.4.1 Market Condition Reforms

Market condition in post independent Kenya can be classified into three phases namely: heavy government control (1963-1985), SAPs (1986-1992) and finally liberalization in 1993-2014 (Republic of Kenya, 1980; 1996; 2014). Markets play a critical role in growth and adjustment process and in order to improve

competitiveness and efficiency, there is need for market liberalization with minimal government interference (Swamy, 1994). Kenya gained independence in 1963 and this period was marked by heavy government control: Effective rates of protection for new firms were very high, and many established firms enjoyed near monopolies (Republic of Kenya, 1978).

The government implemented SAPS in 1980 which came to effect in 1986 and this was meant to deal with challenges faced in the 1970's (Republic of Kenya, 1999). SAPs were initiated and supported by the IMF and the World Bank and new loans and grants were conditional on adoption of these programs (IMF and World Bank, 2001). The aim of SAPs was to set up and implement policies aimed at attaining macroeconomic stability by eliminating fiscal and external imbalances (Republic of Kenya, 1999). The implementation of SAPs involved: liberalization of prices and marketing systems, financial sector policy reforms such as interest rate liberalization, international trade regulation reforms, government budget rationalization, divestiture and privatization of parastatals as well as civil service reforms (Republic of Kenya, 1999).

By 1991, the interest rates were fully liberalized and the government was less involved in market activities (Republic of Kenya, 1994). This promoted genuine competition, with savers and borrowers getting the best return (Swamy, 1994). Interest rate liberalization was accompanied by other reforms

including the floating of the exchange rate and trade liberalization. Despite liberalization, the period 1991-1996 witnessed unsustainable burden on the budget due to rising domestic debt servicing which led to increased interest rates and reduced investments (Republic of Kenya, 1999). All these transformations might have had an impact on domestic debt levels and economic growth thus the study sought to find out how.

1.4.2 Governance Reforms

The political climate is determined by the government policies in place and their implementation and this may affect the response of economic growth to domestic debt in a country. Post independent Kenya has experienced four government regimes namely: the Jomo Kenyatta's regime, the Daniel Moi's regime, Mwai Kibaki's regime and Uhuru Kenyatta's regime. The Jomo Kenyatta's regime was between 1963 and 1978. Kenya was ruled by a single party known as the Kenya African National Union (KANU). The aim of the independent government was to improve standards of living, improve the education and health facilities, promote economic growth, decrease poverty levels and increase employment opportunities (Republic of Kenya, 1999). The government put policies to increase the levels of both private and public investment and boost agricultural production and exports.

After the 1974 oil crisis, the government set policies for economic recovery among them: imposition or rising of tariffs on raw materials; raising import duties and sales taxes on certain luxury consumer goods; and raising duties and taxes on petroleum products to reduce consumption (Republic of Kenya, 1978). Subsidies were encouraged to increase Exports of manufactured goods and government borrowing increased and this improved the status of the economy (Republic of Kenya, 1978). The first president of Kenya passed on in 1978 and was succeeded by President Daniel Moi.

President Daniel Moi's regime ran from 1978-2002. In the late 70's tight restrictions were placed on domestic borrowing which led to reduced domestic borrowing aimed at reducing government budget deficits (Republic of Kenya, 1978). In the 1980s problems in the country such as the Goldenberg scandal and political wrangles as some leaders pushed for pluralism led to withdrawal of donor funding thus the government had to increase the level of domestic borrowing to finance its' expenditures (KENDREN, 2009). In the late 1990's bilateral donor funding increased and the government further implemented structural adjustment efforts such as establishment of recurrent expenditure ceilings for ministries, improved tax collection and reduced government borrowing (Republic of Kenya, 1994). This led to a sustained level of domestic debt in Kenya in the late 90's. However, in 1997, due to general elections the government contracted more government debt to finance its expenditures.

In 2002, Mwai Kibaki's regime, which fell under the period of full liberalization, began and his term was devoted towards economic recovery owing to the fact that real GDP growth rate in 2002 was 0.2 per cent (Republic of Kenya, 2010). Moreover the poor growth performance was accompanied by huge domestic debt, worsening fiscal deficit and rising inflation and this led to the launch of Economic Recovery Strategy (ERS) for the period 2003-2007 (Republic of Kenya, 2010). The major aim of this strategy was to create opportunities for productive employment by rebuilding sound governance structures and addressing main macroeconomic vulnerabilities through: strengthening the budgetary position, reducing domestic debt, developing the financial system, reforming the parastatals sector, labour market and trade system to foster a more competitive private sector (Republic of Kenya, 2010). The major policy set in terms of domestic debt was the formulation of Kenya's Medium Term Debt Management Strategy (MTDS) in 2009 as discussed in section 1.2.

Under the economic pillar of the Kenya vision 2030, several macroeconomic targets were set among them: annual growth of 4.7 per cent, increase domestic investment rate by 17.7 per cent increase annual savings rate to 15.8 per cent, increase export growth to 5.8 per cent and reduce government consumption to 14 per cent of GDP (Republic of Kenya, 2010). The study sought to find out if these policies have moderated the response of economic growth to domestic borrowing in Kenya.

1.5 Statement of the Problem

To curb challenges facing Kenyans such as poverty, social inequality, poor living conditions, unemployment and inflation, there is need to achieve a sustained 10 per cent economic growth rate as stipulated by the Kenya vision 2030. The Kenyan government uses domestic debt to offset its budget deficits as well as settle its debts (Republic of Kenya, 2010). Both domestic debt and economic growth are key policy issues in Kenya because most of the set targets for domestic debt and economic growth have not been achieved.

Several studies have investigated the relationship between domestic debt and economic growth in Kenya. However, these studies report mixed findings. Owino, Maana and Mutai (2008) found no relationship between domestic debt and economic growth in Kenya. Koka (2010) reported a positive relationship while Matiti (2013) found that the relationship was negative. The response of economic growth to domestic borrowing in Kenya remains inconclusive and therefore further empirical investigations are needed. Further, the studies do not provide a scope for understanding the moderating effect of institutional reforms on the response of economic growth to domestic debt in Kenya over the post-independent period. Post-independent Kenya has witnessed major institutional reforms such as changes in market conditions and governance. It is of great importance to determine whether these reforms have affected how economic growth responds to domestic debt in Kenya. The purpose of this study was to analyse the response of economic growth to domestic borrowing

and further determine whether changes in governance and market reforms moderate this response.

1.6 Research questions

The study addressed the following questions:

- (i) How does economic growth respond to domestic borrowing in Kenya?
- (ii) What is the moderating effect of changes in governance and market reforms on the response of economic growth to domestic borrowing in Kenya?

1.7 Research objectives

The general objective of the study was to evaluate the response of economic growth to domestic debt, changes in governance and market reforms in Kenya.

The specific objectives were:

- (i) To determine the response of economic growth to domestic borrowing in Kenya.
- (ii) To analyse the moderating effect of changes in governance and market reforms on the response of economic growth to domestic borrowing in Kenya.

1.8 Significance of the study

The study findings are of great use to policy makers. The findings bring additional knowledge to policy makers on how domestic debt and economic growth relate. This guides future enactment of policies affecting public debt and economic growth in Kenya.

Scholars and researchers benefit from the findings of the study. The study enables them isolate knowledge gaps and identify areas of further study. The study does not only help in making informed decisions to enhance economic growth in Kenya but also in Africa and other developing countries as well.

1.9 Scope of the study

The study was limited to determining the response of economic growth to domestic borrowing, changes in governance and market reforms in Kenya. Data used in the analysis was generally on the Kenyan economy as a whole from the year 1971-2013. The span was considered long enough for the analysis so the results were considered reliable.

1.10. Organization of the study

This research project is presented in five chapters. The study background has been provided in chapter one. In the next chapter, a review of relevant

literature, both theoretical and empirical is presented. In chapter three, the methodology that the study adopted, the variables and their measurements, the type of data used and how analysis was done are presented. Chapter four presents the findings of the study. A summary of the study, findings, conclusions and policy implications of the findings are provided in chapter five.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of relevant theoretical and empirical literature on economic growth and domestic public debt in Kenya. At the end of the chapter, an overview is presented.

2.2 Theoretical Literature

The response of economic growth to domestic borrowing in Kenya can be described by two major theories namely: the Ricardian Equivalence Hypothesis and the neoclassical model usually referred to as the Crowding out Hypothesis.

2.2.1 Ricardian Equivalence Hypothesis

Ricardian Equivalence is a macroeconomic theory by Barro and Ricardo (1974) which was developed to explain how government financing through taxation or borrowing affects key real variables in the economy. It is based on the assumptions that government consumption stays unaltered at its initial level, the service of the debt must be financed by taxes levied in later periods, parents leave bequests to their children, consumers have the same planning horizon as the government, taxes are lump sum, the population is infinitely lived, capital markets are perfect and future income is certain.

The theory proposes that if the government imposes lump sum taxes, then the mix of tax and debt financing of government purchases is irrelevant in the sense that there is no impact on the equilibrium sequence of key real variables. It suggests that when a government tries to stimulate demand by increasing debt-financed government spending, demand remains unchanged. This is because the public will save its excess money in order to pay for future tax increases that will be initiated to pay off the debt. Parents realize that their children will bear the tax burden and thus increase their bequests by an amount sufficient to pay the extra taxes as a result each generation consumes exactly the same amount as before the government borrowed. The proposition is easily understood in the context of the Ramsey, (1965) model in which infinitely-lived representative agents solve dynamic optimization problems and have rational expectations about the future course of the economy.

Consider the problem of a family wishing to maximise its utility in the infinite horizon case. The utility function and the budget constraint are, respectively:

$$\int_{t=0}^{\infty} u(c_t)e^{-\theta t} dt \dots\dots\dots (2.1)$$

$$c_t + \dot{a}_t + na_t = w_t + ra_t - \tau_t \dots\dots\dots (2.2)$$

Where c_t is real consumption, w_t is the real wage, and a_t are the holding and the variation of financial assets, τ_t are taxes, n is the rate of growth of the

number of member of the family, r is the real interest rate and θ is the rate of time preference. Integrating the instantaneous budget constraint, the intertemporal budget constraint is:

$$\int_{t=0}^{\infty} c_t R_t dt = a_0 + \int_{t=0}^{\infty} w_t R_t dt - \int_{t=0}^{\infty} \tau_t R_t dt \dots\dots\dots (2.3)$$

Where a_0 is the initial holding of financial assets and $R_t = e^{-(r-\theta)t}$

This budget constraint illustrates that real consumption at any period positively depends on the initial holding of financial assets as well as the wealth of the household and negatively related to government taxation. This means that when the government issues a debt today, the households will reduce their present consumption by the amount they expect to be taxed in future and save the excess money for future taxes.

Ricardian equivalence can be understood under two cases: in the first there is no government debt and the budget is balanced in each period of time, in the second there is government borrowing due to budget deficits. In case of no government borrowing, government expenditures equal taxes and all financial assets consist of capital. The intertemporal budget constraint is given by:

$$\int_{t=0}^{\infty} c_t R_t dt = k_0 + \int_{t=0}^{\infty} w_t R_t dt - \int_{t=0}^{\infty} g_t R_t dt \dots\dots\dots (2.4)$$

Where g represents government expenditure such that a steady state increase in government expenditure will have no effect on capital or output per head, and must be reflected in an equal fall in consumption. In the case of borrowing, we

assume that the government remains solvent, which implies that it obeys to the No-Ponzi game rule:

$$b_0 + \int_{t=0}^{\infty} g_t R_t dt = \int_{t=0}^{\infty} \tau_t R_t dt \dots\dots\dots (2.5)$$

Where b and g are government debt and expenditure respectively. This rule tells us that extra government spending will always be financed by higher taxes at some point in time: deficits are just deferred taxes. Thus consumption is totally unaffected by government deficits.

Ricardian equivalence, to some extent can be used to explain the Kenyan situation. This is because in Kenya tax cuts due to increased government expenditure through domestic borrowing are followed by tax increases in future to raise funds needed for debt servicing (Republic of Kenya, 2009). However, the theory has received some critics due to its foundations. The assumptions of perfect capital markets, lump sum taxes, certainty about future income, infinitely lived population and parents always leaving bequests for their children do not always hold. This takes us to the neoclassical model of internal debt.

2.2.2 Neoclassical Model of Internal Debt (Crowding out Hypothesis)

This model was developed by Fischer (1933) to explain the effects of government borrowing on the private sector which later received modifications

by other economists. It is based on the assumptions that capital markets are perfect, debts must be repaid, prices are fixed and money supply is fixed. According to the model, if an increase in Government expenditure, financed by either taxes or debt issuance to the public, fails to stimulate total economic activity, the private sector is said to have been crowded out by the Government action.

The extent to which crowding out occurs depends on the economic situation. If the economy is at capacity or full employment, then the government suddenly increasing its budget deficit could create competition with the private sector for scarce funds available for investment, resulting in an increase in interest rates and reduced private investment or consumption. Thus the effect of the stimulus is offset by the effect of crowding out.

In this model, debt finance leaves the future generation with a smaller capital stock, holding other factors constant. Its members therefore are less productive and have smaller real incomes than otherwise would have been the case. Thus, the debt imposes a burden on future generations through its impact on capital formation. But if the public sector undertakes productive investment with the resources it extracts from the private sector, the total capital stock increases.

There are two extreme cases of crowding out: Liquidity trap and the classical case. If the economy is in a Liquidity trap the LM curve is horizontal, an increase in government spending has its full multiplier effect on the equilibrium income. There is no change in the interest associated with the change in government spending, thus no investment spending cut off. The Classical Case involves a vertical LM curve thus an increase in government spending has no effect on the equilibrium income and only increases the interest rates. In this case, the increase in interest rates crowds out an amount of private spending equal to increase in government spending. Thus, there is full crowding out if LM is vertical.

This hypothesis can be used to explain how increased domestic borrowing leads to higher interest rates by creating a greater demand for money in Kenya. The private sector, which is sensitive to interest rates, will likely reduce investment due to a lower rate of return. This is the investment that is crowded out. This in turn hurts long-term economic growth of the supply side. Depending on how the funds are used, for instance, if used productively, crowding in could also occur thus spurring economic growth.

The weaknesses of this hypothesis are that it ignores inflation, assumes no default on loans which is not always the case, ignores capital market imperfections and assumes a fixed money supply which unrealistic. The theory

links with the study through the effect of domestic public debt on interest rate which, through the transmission mechanism, affects investments and economic growth. The study therefore adopted this theory in explaining the response of economic growth to growth in domestic debt in Kenya.

2.3 Empirical Literature

Singh (1999) explored the relationship between domestic debt and economic growth in India by applying co integration technique and Granger causality test for the period of 1959-95. The author considered two theoretical views of domestic debt and economic growth (traditional view and Ricardian Equivalence) that showed neutrality of domestic debt to growth. The results of the Engle-Granger cointegration test indicated that the domestic debt and economic growth are not co-integrated. The study supported the Ricardian equivalence hypothesis between domestic debt and growth in India. Their findings can be used to explain how rising trend of domestic debt discourages private investment due to crowding-out effect in Kenya though the data needs to be updated. However, the study did not incorporate governance as a key variable and thus this was incorporated in the current study.

Maana, Owino, and Mutai (2008) used generalised method of moment's regression model to examine the effect that domestic debt has on economic growth in Kenya between 1996 and 2007. According to the study, the lagged

values of GDP, the ratio of government expenditure to GDP, broad money supply, secondary school enrolment, private sector credit, the ratio of debt to GDP and trade are the variables which influence the level of economic growth. They found that debt and secondary school enrolment have a positive but insignificant effect on economic growth. Despite the inclusion of key variables in the study, the time horizon was quite short which is a challenge on the reliability of the results.

Koka (2009) investigated on the relationship between government bond issues and economic growth in Kenya for the period 2003-2011. The study regressed market capitalization, value of bonds traded and total new issues on economic growth and found out that the relationship was positive. However, the study did not incorporate institutional factors in the analysis thus this study added these factors to find out if they moderated the relationship.

Rother and Checherita (2010) determined the average impact of government debt on per capita GDP growth for twelve euro area countries over a period of about 40 years from 1970-2009. The channels through which government debt impact the economic growth are private savings, public investment, total factor productivity and real interest rates. The study showed non-linear negative impact of government debt on economic growth. This can be used to explain the Kenyan case because the channels seem similar.

Rabia and Kamran (2012) examined the impact of domestic and external debt on the economic growth of Pakistan. They examined the determinants of economic growth for Pakistan, the impact of domestic debt and external debt on the economic growth of Pakistan separately over period of 1980 to 2010, using Ordinary Least Square (OLS) approach to Cointegration, Unit Root Testing, Serial Correlation Testing, test for checking Heteroskedasticity and CUSUM test of stability. The findings suggested an inverse relationship between domestic debt and economic growth and also the relationship between external debt and economic growth was found to be inverse. This study was also considered suitable in explaining the situation in Kenya due to the issue of crowding out.

Maji, Okon, and Denies (2013) used the error correction model to investigate the relative potency of external and domestic debt on the economic performance in Nigeria. Both domestic and external debt were found to have a positive effect on economic performance but while external debt had a significant impact, domestic debt had an insignificant impact. The impact of external debt on GDI was negative and insignificant while the impact of domestic debt on GDI was positive and significant. This has the implication that external debt and not domestic debt has a crowding out effect on the level of investments in Nigeria. This study seems to contradict the existing findings for the Kenyan case but can however be used for cross-country comparisons.

Matiti (2013) investigated the relationship between public debt and economic growth in Kenya for the period 1992-2012. The study adopted a descriptive research design and time series data for both external and internal debt was used. A multiple regression analysis was conducted where total debt was regressed on economic growth and the relationship was found to be negative. The study did not incorporate other intervening variables which the current study sought to include for more reliable estimates.

2.4 Overview of literature

From theoretical literature, Ricardian equivalence argues that public debt is deferred taxation so it has no impact on real economic variables. The neoclassical model argues that domestic debt affects economic growth through the rise in interest rates which crowds out private investments. From empirical literature, there exist inconclusive results. Singh (1999) reported that economic growth was neutral to domestic debt level; Maana, Owino and Mutai (2008); Maji, Okon and Denies (2013) and Koka (2009) reported that domestic debt did not crowd out private investments thus positively affected economic growth while Checherita and Rother (2010); Rabia and Kamran (2012) and Matiti (2013) found out that domestic debt crowded out private investments thus negatively affecting economic growth.

Further, some of the studies are not country specific and none has focussed on whether or not institutional factors affect the response of economic growth to growth of domestic debt in Kenya. This study therefore aimed at incorporating changes in governance and market reforms in order to find out if they moderated the response of economic growth to domestic borrowing in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research design, the theoretical framework of the study, the empirical model used, definition and measurement of variables and the study area. Data type and sources, preparation of data for analysis, time series properties and diagnostic tests as well as how the data was analysed are also presented.

3.2. Research Design

The study adopted a descriptive, non-experimental research design. Non-experimental research design was used since the researcher had no control over the variables. The study examined the response of economic growth to domestic debt in Kenya without any direct manipulation of the variables. Data on all variables was be collected and analysed as it was.

3.3 Theoretical Framework

The response of economic growth to domestic debt in Kenya can be explained using the neoclassical model of internal debt developed by Fischer (1933) to explain the effects of government borrowing on the private sector and the economy at large. It is based on the assumptions that capital markets are

perfect, no defaults on debt, prices are fixed and money supply is fixed. The neoclassical economists suggest keeping public undertakings such as borrowing as minimum as possible since by borrowing public authority accumulates resources for its own use leaving private sector with less thereby crowding-out private investments. When the government increases its demand for credit, interest rates increase which makes private investments more expensive thus their decline. Crowding out can be partial or complete.

Partial crowding out occurs when both investments and savings are sensitive to interest rates such that a decrease in private investments due to government debt is offset by an increase in savings. As a result the private investments crowded out are less than the government debt. On the other side, complete crowding out occurs when savings are insensitive to interest rates but investments are sensitive to interest rates such that the private investments crowded out equals the government debt since savings remain constant. If private investments are insensitive to interest rates, crowding out does not occur. However, the theory argues that crowding in could occur when private investments are sensitive to interest rates and positively depend on income in which case the increase in income due to more government spending leads to more savings and investments.

Figure 3.1 represents the partial crowding out effects of government borrowing.

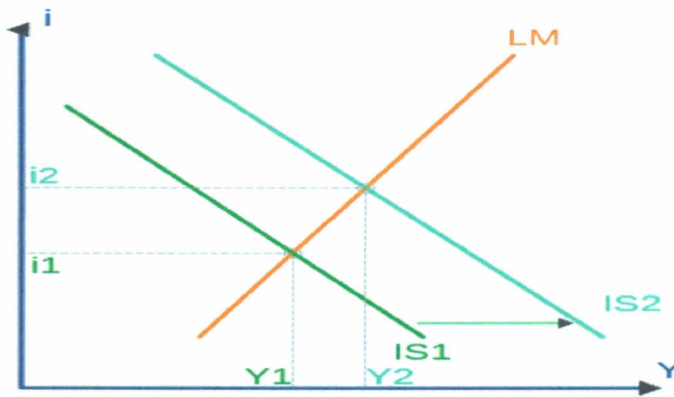


Fig 3.1: Partial crowding out effects of government borrowing

Source: Blanchard (2007)

When the government borrows, it reduces supply of loanable funds from the private sector which raises interest rates leading to a shift in the IS curve to the right. This increases real GDP from Y_1 to Y_2 but the increase in income is less than the increase in interest rates which causes reduced demand for loanable funds thus a decline in private investments. In Kenya, increased borrowing leads to higher interest rates by creating a greater demand for money. The private sector, which is sensitive to interest rates, will likely reduce investment due to a lower rate of return resulting to crowding out. This in turn hurts long-term economic growth of the supply side.

According to Keynes (1936) aggregate demand in an open economy is determined by: Private consumption (C), private investments (I), government expenditure (G) and net exports (X-M) as shown in equation 3.1.

$$Y = C + I + G + X - M \dots\dots\dots (3.1)$$

Incorporating debt in 3.1 we have:

$$Y = DD + C + I + G + X - M \dots\dots\dots (3.2)$$

Where DD is domestic debt and the rest of the variables are as defined before. The study therefore adopted model 3.2 and modified it by adding dummies and interaction terms to capture the moderating effect of changes in governance and market reforms on the response of economic growth to growth of domestic debt in Kenya. Inflation was also incorporated to capture macroeconomic stability and interest rates to capture the channel of crowding out of private investments.

3.4 Empirical Model

Following the theoretical argument in section 3.3, the study used a multivariate linear regression model of the general form:

$$GRATE_t = f(DD_t, PI_t, RIR_t, PC_t, GOVT_t, XM_t, INFL_t, M_1, M_2, G_1, G_2, G_3) \dots\dots\dots (3.3)$$

Where: $GRATE_t$ represents growth rate of Real GDP at period t; DD_t is the total value of domestic public debt as a percentage of GDP for period t; PI_t is the level of Private Investments as a percentage of GDP at period t; RIR_t

represents real interest rates at period t ; PC_t is the level of private consumption as a percentage of GDP at period t ; $GOVT_t$ is government expenditure as a percentage of GDP at period t ; XM_t represents net exports as a percentage of GDP at period t ; $INFL_t$ is the inflation rate at period t ; M_1 captures the pre-liberalisation period and M_2 represents the liberalisation period in Kenya. Changes in governance is captured by G_1 , G_2 and G_3 for presidential regime 1, 2 and 3, respectively.

3.5 Definition and measurement of variables

Domestic public debt is the total amount of money borrowed by the government within the country to raise revenue needed for government spending. This was measured by the Reported values for domestic debt levels on Economic surveys for each year. The share of domestic debt on GDP was obtained by dividing these values by the corresponding GDP values for each year.

Economic growth is the growth rate of the real GDP of a country from one period to the next. This was measured through the reported values on real GDP growth rates on Economic surveys for each year.

Private investments represent the sum of domestic investments in the private sector and this was measured by the reported values for private investments on Economic surveys for each year.

Real interest Rates show the rate of interest an investor expects to receive after allowing for inflation. The study measured this through the reported values for real interest rates on Economic surveys for each year.

Net Exports show the external balance on goods and services and equals exports of goods and services minus imports of goods and services. This was measured by the reported values for net exports on Economic surveys for each year.

Private Consumption represents the total market value of all goods and services by households and the private sector and this was measured through the reported values of private consumption on Economic surveys for each year.

Government expenditure is the government current expenditures for purchases of goods and services and this was measured by the reported values of government expenditure on Economic surveys for each year

Inflation Rate shows the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed changed at specified intervals. This was measured by the reported values of inflation rate on Economic surveys for each year.

Market liberalisation represents the removal of heavy government control on economic activities to allow market forces to control private activities in the economy. This was measured by a dummy which was equated to 1 for the period 1993-2013 and 0 otherwise.

Changes in governance show the change of leadership from one president to another. It was measured using 3 dummies for each governance regime.

3.6 Data type and Sources

The study used time series data for all variables from published and unpublished sources for the year 1971-2013. All the data was collected from various issues of economic surveys and recorded on a data collection sheet as shown in Table A1 in Appendix 1.

3.7 Data cleaning, coding and refinement

Data on debt for the period 1971-1998 was reported in Kenya pounds so this was converted in to Kenya shillings. For the variables reported in their nominal terms, the annual weighted inflation index was used as a deflator to convert the nominal figures in to real figures.

3.8 Time series properties

The study used time series data which has its own weaknesses. For instance, most of time series data is non-stationary but difference stationary. Regression analysis requires that data be stationary to avoid spurious results because non-stationary data exhibit strong trends (Greene, 2008). Test statistics for instance t-test and F-test requires stationary data to avoid errors in hypothesis testing. If the variables are cointegrated, non-stationary data can be used at levels since errors cancel out and return to zero (Greene, 2008).

Multicollinearity is also another weakness of time series data. High correlation among regressors could also yield spurious results. To avoid spurious results, the study conducted stationarity test for the series using ADF (Augmented Dickey Fuller) and Kwiatkowski Phillips Schmidt-Shin (KPSS) tests. Correlation analysis was also conducted using a correlation matrix for the variables.

3.8.1 Stationarity of Data

The ADF test for unit root in a time series y , involved estimating the equation:

$$\Delta y_t = \gamma + \tau t + \rho y_{t-1} + \sum_{i=1}^p \lambda_i \Delta y_{t-i} + v_t \dots \dots \dots (3.4)$$

Where: γ = drift (intercept), t is trend, i = the number of lags in Δy_{t-i} with the maximum being p and v is the random error term. The null hypothesis tested was: $H_0: \rho = 0$ against the alternative, $H_a: \rho < 0$. Failure to reject the null hypothesis implied that the time series variable contained a unit root and was therefore non stationary, otherwise it was stationary. The null hypothesis was rejected if the absolute value of the computed test statistic exceeded Mackinnon's critical tau (τ) values at 5 per cent level of significance. However, if the absolute value of the computed test statistic was less than the critical value, the null hypothesis could not be rejected and it was concluded that the time series was non stationary (Gujarati, 2004; Greene, 2008).

According to Gujarati (2004) the ADF test favours the null hypothesis for a unit root so once the null hypothesis was rejected under the test, there was no need to conduct the KPSS test in which case the series was termed stationary. On the other hand if the null hypothesis was not rejected under the ADF test, the KPSS was performed to verify the ADF results. The stationarity tests were conducted with intercept and trend first then with intercept only if the trend was found to be insignificant. The trend was deemed insignificant if the p-value was more than 0.05 at 5 per cent level of significance (Gujarati 2004; Greene, 2008). The null hypothesis under the KPSS states that the series is stationary. Failure to reject the null hypothesis implied that the time series variable was stationary otherwise non stationary. The null hypothesis was

rejected if the computed LM statistic was greater than the critical values as shown in table A4 in appendix 3.

3.8.2 Correlation Analysis

In classical normal linear regression, presence of high correlation between regressors makes the standard errors of coefficient estimates to be large. This may lead to insignificant t-ratios, even when the adjusted R-squared for estimated model is very high (Gujarati, 2004). The consequence is that a null hypothesis which should be rejected fails to be rejected (Gujarati, 2004). Multicollinearity leads to inaccurate estimates. To avoid having inaccurate estimates, the study tested for correlation between regressors through checking the correlation coefficients of the correlation matrix.

Correlation can be positive or negative, linear or non-linear as well as strong, moderate or weak. The correlation coefficient measures the strength and direction of a linear relationship between variables. If the correlation coefficient is negative the relationship is considered negative otherwise positive (Pearson, 1895). If the coefficient is 1 regardless of the sign, the relationship is considered perfect otherwise not (Pearson, 1895). A correlation coefficient of less than 0.5 indicates that the relationship between the variables is weak. If it is between 0.5 and 0.7 the relationship is considered moderate and if it is greater than 0.7 the relationship is strong (Pearson, 1895). The results for the multicollinearity test are presented in Table A6 in Appendix 3.

3.9 Diagnostic tests

For consistent coefficient estimates, diagnostic tests were conducted on the models used. Normality test using the Jarque-Berra statistic, Breuch-Godfrey langrange multiplier test for serial autocorrelation, langrage multiplier test for autoregressive conditional heteroskedasticity (ARCH), were performed on the residuals to ascertain the least square method's assumption on the error term. Ramsey RESET test for specification error and recursive estimations were also conducted to test for parameter constancy and the results are reported in chapter four.

3.10 Data Analysis and interpretation

Data analysis process was guided by the research questions. The first research question was on how economic growth responds to domestic borrowing in Kenya. To answer question one, the study used model 1 shown in equation 3.5:

$$\begin{aligned} GRATE_t = & \alpha_0 + \alpha_1 DD_t + \alpha_2 PI_t + \alpha_3 RIR_t + \alpha_4 XM_t + \alpha_5 GOVT_t + \\ & \alpha_6 INFL_t + \alpha_7 PC_t + \alpha_8 G_1 + \alpha_9 G_2 + \alpha_{10} G_3 + \alpha_{11} M_1 + \alpha_{12} M_2 + \\ & \alpha_{13} UNUSUAL1 + \alpha_{14} UNUSUAL2 + \mu_{it} \dots\dots\dots (3.5) \end{aligned}$$

Where variables are as described before and α_{is} , are constants while μ_{it} represents the error term. UNUSUAL 1 and 2 represent unexpected occurrences in Kenya which affected the economy such as the 2008 post-election violence. To answer question one, real GDP growth rate was regressed on Domestic debt as a percentage of GDP with the inclusion of other

exogenous variables shown in equation 3.4. Further, dummies were used to remove outliers from the residual series, and to capture shocks in the system which provided significant influence on the behaviour of the dependent variables. This was realised by examining the residual series graphs and then capturing the years which had large abnormal spikes by dummies.

After the regression analysis, if the coefficient was statistically different from 0 at 5 per cent level of significance, it was concluded that economic growth responds either positively or negatively to the corresponding variable depending on the sign. If the sign before the coefficient was positive the response was considered positive otherwise negative. A positive response meant that as the corresponding variable increases, economic growth increases and if it decreases, economic growth reduces. If the coefficient estimate was statistically insignificant, it was concluded that economic growth does not respond to changes in the respective variable.

Hypothesis test was conducted using the t-statistic of that the coefficient was equal to zero according to the null hypothesis against the alternative that the coefficient was statistically different from zero. Interpretations of the t- tests were based on the absolute values and the probability (p-value) of observing the t-statistic given that the coefficients were equal to zero. If the computed t-statistic was greater than 1.96 in absolute terms, the null hypothesis was rejected at 5 per cent level of significance. The p-value determined the level at

which the estimated coefficient was significantly different from zero. At 5 per cent level of significance, the null hypothesis was rejected if the p-value was less than 0.05, while at 1 per cent level of significance, the null hypothesis was rejected if the p-value was less than 0.01. Rejection of the null hypothesis implied that the estimated coefficient was statistically significant thus the corresponding variable was important in explaining variations in the dependent variable. The findings are presented in section 4.4.

Question two was on the moderating effect of changes in governance and market reforms on the response of economic growth to domestic borrowing in Kenya. To answer question two the following model, also referred to as model 2, was used:

$$GRATE_t = \alpha_0 + \alpha_1 DD_t + \alpha_2 PI_t + \alpha_3 XM_t + \alpha_4 INFL_t + \alpha_5 PC_t + \alpha_6 G_3 + \alpha_7 DD_t * G_3 + \alpha_{13} UNUSUAL1 + \alpha_{14} UNUSUAL2 + \mu_{it} \dots \dots \dots (3.6)$$

Variables are as described before. For objective 2 the model was constructed using only the statistically significant variables in model 1. $DD_t * G_3$ is an interaction term between domestic debt and governance 3. The coefficients for governance 1 and 2 as well as market liberalisation were not statistically significant so only Governance 3 was used. Model 2 was therefore used to find out if changes from governance 2 under President Daniel Moi to governance 3 under President Mwai Kibaki had any moderating effect on the response of economic growth to domestic borrowing in Kenya. This was achieved by

regressing economic growth on the interaction term (DD*G3) and the results are discussed in section 4.4.

3.11 Ethical issues

The researcher obtained a permit from Kenyatta University graduate school to conduct the research. Approval was sought (where necessary) on data collection and use. Plagiarism was avoided and citations were made where applicable. Actual data collection was done from reliable sources to avoid ‘cooking’ of data which yields unreliable results.

CHAPTER FOUR

EMPIRICAL FINDINGS

4.1 Introduction

This chapter presents the findings of the study. The results for descriptive statistics of the data and time series properties tests are presented in section 4.2 while model diagnostic tests are presented in section 4.3. Econometric results on analyses of the effect of domestic debt on economic growth are presented in section 4.4.

4.2 Descriptive Analysis of Data

4.2.1 Results for the measures of central tendency and dispersion

Descriptive statistics were conducted to summarize the series and form the basis for quantitative data analysis. The mean, range and standard deviation of the data gave the researcher a good idea of how good the data was. If there is little variability in the data, then the estimation process becomes a challenge because no variance can be explained and thus the research collapses. Table 4.1 presents a summary of the measures of central tendency and dispersion for the variables used in the study.

Table 4.1: Descriptive Statistics on Data

VARIABLE	MEAN	MAXIMUM	MINIMUM	STANDARD DEVIATION
Real GDP Growth Rate	4.07	8.40	0.20	2.30
Domestic Debt	15.92	26.34	4.55	4.31
Government Expenditure	17.26	19.80	14.48	1.30
Inflation Rate	12.59	45.98	1.55	8.26
Private Consumption	5.32	44.94	-6.57	8.72
Private Investment	18.96	25.08	15.39	2.07
Real Interest Rates	6.29	21.10	-8.13	7.57
Net Exports	-6.17	4.94	-17.19	4.72

Source: Extracted from Table A3 in Appendix 2

From the results presented in Table 4.1, the mean for Gross Domestic Product (GDP) growth rate over the study period was 4.08 per cent with the highest and lowest values of 8.4 per cent for the year 2010 and 0.2 per cent for the year 2001, respectively. The standard deviation was 8.26 per cent. This implied that there was variation in the data set and therefore a regression analysis could be conducted using the values for real GDP growth rate. The mean for domestic debt as a percentage of GDP was 15.92 per cent with the highest and lowest values of 26.35 per cent and 4.56 per cent, respectively. The standard deviation was 4.31 per cent.

Government purchases as a percentage of GDP, inflation rate, private consumption, private investments, real interest rates and net exports averaged 17.26 per cent, 12.59 per cent, 5.32 per cent, 18.96 per cent, 6.29 per cent and -6.18 per cent, respectively. There was variation in all the variables as shown in

Table 4.1 therefore a regression analysis could be conducted using all the variables.

4.2.2 Time Series Property test Results

Estimation of the response of economic growth to domestic debt, changes in governance and market reforms in Kenya was done on the basis of the classical normal linear regression model. In order to get efficient and consistent estimates using the least squares method all the necessary assumptions of the model must be met (Greene, 2008). The data used in the analysis must also meet certain properties such as stationarity and the variables should not be multicollinear.

4.2.2.1 Stationarity Test Results

Before estimating the model, all the time series were subjected to unit root tests using the Augmented Dickey Fuller (ADF) test and the Kwiatkowski Phillips Schmidt-Shin (KPSS) test. According to Gujarati (2008) the ADF test favours the null for a unit root so once the null hypothesis was rejected under the test, there was no need to conduct the KPSS test in which case the series was termed stationary. On the other hand if the null hypothesis was not rejected under the ADF test, the KPSS was performed to verify the ADF results. The stationarity tests were conducted with intercept and trend first then with

intercept only if the trend was found to be insignificant. The trend was deemed insignificant if the p-value was more than 0.05 at 5 per cent level of significance.

Under the ADF stationarity test, the null hypothesis of non stationarity is rejected if the computed values are more than the critical values otherwise not rejected. The critical values are presented in Table A4 in Appendix 3. Rejection of the null hypothesis implies that the series is stationary. From the results in Table A4 in Appendix 3, Real GDP growth rate, Domestic Debt as a percentage of GDP, Private Investments as a Percentage of GDP, Real Interest Rates, Inflation Rate, Net Exports as a percentage of GDP, Private Consumption as a percentage of GDP were all stationary under the ADF test. This is because the computed ADF statistics were more than the Mackinnons' critical values for rejection of the null hypothesis at 5 per cent level of significance (Gujarati, 2004).

Government expenditure as a percentage of GDP was not stationary via the ADF test at 5 per cent level of significance because the ADF statistic was less than the MacKinnon's' critical values so the null hypothesis of non-stationarity could not be rejected therefore the KPSS test was conducted. Under the KPSS test, the null hypothesis states that the series is stationary therefore if the null hypothesis is not rejected, it means that the series is stationary otherwise non

stationary. The null hypothesis is rejected if the LM statistic is more than the critical values presented in Table A5 in Appendix 3 otherwise not rejected. The study could not reject the KPSS null hypothesis of stationarity since the LM statistic was less than the critical values at all levels of significance as shown in Table A5 in Appendix 3.

The results on the stationarity test show that all the variables were stationary. The variables were thus used at levels to estimate the response of economic growth to growth in domestic debt, changes in governance and market reforms in Kenya.

4.2.2.2 Correlation Analysis Results

Multicollinearity between regressors leads to inaccurate estimates (Gujarati, 2004). To avoid having inaccurate estimates, the study tested for correlation between regressors through checking the correlation coefficients of the correlation matrix of the variables. The correlation coefficient measures the strength and direction of a linear relationship between variables. If the correlation coefficient is negative the relationship is considered negative otherwise positive (Pearson, 1895). If the coefficient is 1 regardless of the sign, the relationship is considered perfect otherwise not (Pearson, 1895). A correlation coefficient of less than 0.5 indicates that the relationship between

the variables is weak. If it is between 0.5 and 0.7 the relationship is considered moderate and if it is greater than 0.7 the relationship is strong (Pearson, 1895). From the results presented in Table A6 in Appendix 3 show that the time series variables were not highly correlated since none of the correlation coefficients was greater than 0.6. This implied that the coefficient estimates were expected to be accurate since the series did not have multicollinearity issues.

4.3 Results for Diagnostic tests

The study was aimed at achieving two research objectives. The first objective was to determine the response of economic growth to domestic debt in Kenya. To meet this objective, the study regressed real GDP growth rate on domestic debt as a ratio of GDP with inclusion of other exogenous variables as specified in equation 3.5 on page 43 in Chapter 3. The output of the regression is given in Table A7 in Appendix 4. The second objective was to determine the moderating effect of changes in governance and market reforms on the response of economic growth to domestic debt in Kenya. For this to be achieved the study introduced an interaction term between domestic debt and governance 3 ($DD*G3$) since the market dummy was not statistically significant as specified in equation 3.6 on page 45 in Chapter 3. Real GDP growth rate was regressed on the interaction term and the regression output is presented on Table A10 in Appendix 6.

Before making any conclusions from the study findings, it was necessary to perform diagnostic tests on the models to test their statistical soundness. The study conducted model stability tests on the two models constructed for each objective and Residual based tests.

4.3.1 Residual Property Tests Results

The classical normal linear regression requires that the error term must be normally distributed, with a mean of zero and constant variance (Gujarati, 2004). The study tested for normality of the error term using the Jarque Berra test. Heteroskedasticity and autocorrelation tests were also conducted. Autocorrelation was conducted through Breuch-Godfrey (BG) language multiplier test for serial correlation for both models. Heteroskedasticity test was conducted using the autoregressive conditional heteroskedasticity (ARCH) test for both models. ARCH was used because it is capable of handling higher order of heteroskedasticity as compared to Breusch-Pagan-Godfrey test (Gujarati, 2004).

When testing for normality using the Jarque-Berra test, the residuals are considered normally distributed if probability of the Jarque-Berra statistic of the test is greater than 0.05 at 5 per cent significance level otherwise not. The Jarque-Berra statistic from the test was 0.1721 and 1.9845 with a probability of 0.918 and 0.3708 for model 1 and model 2, respectively. The normality assumption of the regression residuals could not therefore be rejected at 5 per

cent level of significance. It was concluded that the regression residuals, from the estimated equations were normally distributed as shown in Table A8 in Appendix 5 for model 1 and Table A11 in Appendix 7 for model 2. This implied that hypothesis testing using the student t and F tests was possible because they are usually normally distributed (Gujarati, 2004).

The study employed the Breusch-Godfrey (BG) language multiplier test for serial correlation and the results are presented in Table A8 in Appendix 5 and Table A11 in Appendix 7 for model 1 and 2, respectively. The p-value of the test statistic for both models was greater than 0.05 at 5 per cent level of significance thus the null hypothesis of no serial correlation could not be rejected. This implied that the regression residuals did not suffer from serial autocorrelation.

Autoregressive Conditional Heteroskedasticity (ARCH) occurs when the magnitude of the regression residual is related to that of the recent residuals and this leads to inefficient estimates (Greene, 2008). The study tested for heteroskedasticity using ARCH for both models and the results are presented in Table A8 in Appendix 5 for model 1 and Table A11 in Appendix 7 for model 2. It was concluded that the residuals were homoscedastic since the probability values of the obs*R-squared were greater than 0.05 for the two models.

4.3.2 Results for Model misspecification tests

According to Ramsey (1969) RESET test which refers to Regression Specification Error Test is a general test for omitted variables, incorrect functional form, correlation between regressors and the error term, which may be as a result of measurement errors in regressors, simultaneity, or presence of lagged values of the dependent variables on the right hand side of the models. Ramsey (1969) showed that any or all of the specification errors produce non zero mean vector of regression errors. The Ramsey RESET test was conducted for the estimated equations. The probability values for the F-statistic were all greater than 0.05 hence the null hypothesis, that coefficients of powers of fitted values are all zero, could not be rejected at 5 per cent level of significance as shown in Table A9 in Appendix 5 for model 1 and Table A12 in Appendix 7 for model 2 indicating that the models were correctly specified.

4.3.3 Parameter Constancy Test results

Recursive estimations were also performed to determine constancy or stability in parameters of the two models. Recursive residual tests, CUSUM tests, CUSUM of squares tests, One-Step Forecast tests, N-Step Forecast tests and Recursive Coefficient tests were performed. Figures A1 to A6 in Appendix 6 reported the results for model 1 while Figures A7 to A12 in Appendix 8 reported results for model 2. In all the tests, the residuals lie within the two

standard error bands implying stability or constancy in the parameters. The models passed all the tests and therefore the results were considered reliable and are discussed in section 4.4.

4.4 Empirical Results

The study was aimed at achieving two objectives. The first one was to determine the response of economic growth to domestic borrowing in Kenya while the second one focused on the moderating effect of changes in governance and market conditions on the response of economic growth to domestic borrowing in Kenya.

4.4.1: The response of Economic Growth to Domestic Borrowing in Kenya.

The first objective of the study was to determine the response of economic growth to domestic borrowing in Kenya. This was achieved by regressing real GDP growth rate on domestic debt as a percentage of GDP with the inclusion of other variables and the results are reported in Table 4.2.

Table 4.2: Results for the response of Economic Growth to growth in domestic borrowing and other variables in Kenya.

Dependent Variable: Real GDP growth rate			
Independent Variable	Coefficient	t-statistic	Probability
Constant	-4.005033	-1.058828	0.2984
Domestic Debt (DD)	-0.214819***	-5.043985	0.0000
Government Expenditure	0.071361	0.406135	0.6876
Inflation Rate	-0.149854***	-5.098658	0.0000
Private Consumption	-0.087951*	-1.899893	0.0674
Private Investments	0.688949***	5.815693	0.0000
Real Interest Rates	-0.019267	-0.484560	0.6316
Net Exports	0.196995***	3.516310	0.0015
Unusual 1	-3.283524***	-4.606967	0.0001
Unusual 2	0.501105	0.749958	0.4593
Market Liberalization (M2)	-0.287962	-0.430957	0.6697
Governance 2: (1979-2002)	0.619109	1.335820	0.1920
Governance 3: (2003-2012)	3.686169***	6.281307	0.0000
Adjusted R-Squared:	0.795111		
Durbin-Watson statistic:	1.816130		
F-Statistic:	13.53763		
Probability (F-Statistic):	0.000000		

Asterisk (***) and (*) Indicates that the effect is significant at 1% and 10%, respectively

Source: Extracted from Table A7 in Appendix 4.

Table 4.2 shows that the adjusted R-squared was 79.5 per cent in the estimated model. The values implied that at least 79.5 per cent of the variations in economic growth could be attributed to changes in the independent variables included in the model while 20.5 per cent of variations in economic growth are explained by factors outside the model. It was therefore concluded that the model fitted the data well since more than 50 per cent of variations in the dependent variable were explained by factors within the model.

The study used the t-statistic to test the hypothesis that a coefficient was equal to zero and the F-statistic to test that all the coefficients in the estimated response equations were zero. Interpretations of the t- tests were based on the absolute values and the probability (p-value) of observing the t-statistic given that the coefficient was equal to zero. The null hypothesis was rejected if the absolute value of the computed t-statistic was greater than 1.96, at 5 per cent level of significance. The p-value determined the level at which the estimated coefficient was significantly different from zero. At 5 per cent level of significance, the null hypothesis was rejected if the p-value was less than 0.05, while at 1 per cent level of significance, the null hypothesis was rejected if the p-value was less than 0.01. Interpretation of the F-statistic was based only on its p-value. If the p-value of the f-statistic is less than 0.05 it implies that not all coefficients are zero, that is, some coefficients in the estimated model are statistically significant. Since the p-value of the model used in the study was 0.00 which is less than 0.05, it was concluded that some of the coefficients were statistically significant. This implied that economic growth responded to some variables in the model.

The Durbin-Watson Statistic is used to detect presence of serial autocorrelation in a model which could lead to spurious results. According to Phillips (1986) if the Durbin-Watson Statistic converges to zero, the regression is spurious thus the results are not reliable. If the Durbin-Watson Statistic is greater or close to 2, it means that there is no evidence of serial autocorrelation in the residuals thus the regression is not spurious implying that the results are reliable

(Greene, 2008). The Durbin-Watson Statistic for the study was 1.8 which is approximately equal to 2 therefore it was concluded that the regression was not spurious.

From the results, the coefficient of domestic debt is statistically significant meaning that economic growth responds to growth in domestic borrowing in Kenya. The coefficient is negative meaning that economic growth responds negatively to growth in domestic borrowing in Kenya. This means that economic growth increases with decrease in growth of domestic debt. The value of the coefficient, -0.21, shows that if growth in Domestic Debt increases by 1 per cent economic growth decreases by 0.21 per cent. From the results it was concluded that the response of economic growth to growth in domestic debt in Kenya is inelastic because the response is less than a unit (0.21). It means that economic growth responds less proportionately to growth in domestic debt.

The findings in this study are consistent to Matiti (2013) findings that estimated the effect of domestic debt on economic growth in Kenya and found out that the effect was negative and less proportionate to domestic debt growth. However, they contrast to the findings by Maana, Owino and Mutai (2008) who found that there was no relationship between economic growth and domestic debt in Kenya. Koka (2010) found that the effect was positive contrary to the study findings. Studies in other developing countries report mixed findings too. Rabia and Kamran (2012) examined the impact of

domestic and external debt on the economic growth of Pakistan and also found out that the effect was negative. However, Singh (1999) explored the relationship between domestic debt and economic growth in India and found out that there was no effect. Maji, Okon, & Denies (2013) used the error correction model to investigate the relative potency of external and domestic debt on the economic performance in Nigeria and reported a positive relationship.

These contradictions could be explained by the different data used; methodologies used or even the time span of the study. All the above studies were conducted for developing countries therefore the study concluded that there was no consensus on the response of economic growth to domestic debt in Kenya and developing countries in general.

Variables other than debt also affect economic growth in Kenya. The coefficient for inflation rate is statistically significant meaning that economic growth responds to changes in the level of inflation in Kenya. The negative coefficient implies that economic growth responds negatively to inflation rate. This means that periods of high inflation are accompanied by low economic growth. The value of the coefficient, -0.15, shows that if inflation rate increases by 1 per cent economic growth decreases by 0.15 per cent. This means that the response of economic growth to inflation is inelastic since the change in economic growth is less proportionate to the change in inflation rate. These findings are consistent to Matiti (2013) and Maji, Okon, & Denies (2013).

The coefficient for Private Consumption is statistically significant meaning that economic growth responds to growth in private consumption. The coefficient is negative showing that economic growth responds negatively to private consumption. This implies that when private consumption increases, economic growth decreases. The value of the coefficient, -0.09, indicate that when private consumption increases by 1 per cent, economic growth decreases by 0.09 per cent. The response is also inelastic since it is less than a unit. The findings are similar to Maji, Okon, & Denies (2013) who found out that private consumption negatively affects economic growth.

Table 4.2 shows that the coefficient of growth in Private investments is statistically significant. Other than being statistically significant, the coefficient is also positive. This means that economic growth responds positively to growth in private investments. A positive response means that growth in private investments and economic growth move in the same direction, that is, an increase in private investments growth increases economic growth. The value of the coefficient is 0.69 meaning that a 1 per cent increase in private investments growth leads to 0.69 per cent increase in economic growth. Economic growth responds less proportionately to private investments meaning that the response is inelastic. Rabia and Kamran (2012) found similar findings.

The coefficient of net exports as a percentage of GDP is statistically significant and it is positive. This means that economic growth increases with an increase

in growth of net exports. The value of the coefficient, 0.20, indicates that a 1 per cent increase in growth in net exports leads to 0.2 per cent increase in economic growth. This response is also inelastic. Maana, Owino, & Mutai (2008) reported similar findings.

Dummies were used to capture unusual occurrences which might have affected economic activities in the country. The dummies were equated to 1 for the years where the unusual occurrences were experienced and zero otherwise. The coefficient for unusual occurrence 1 was statistically significant meaning that economic growth responded to the unusual occurrences for those particular years. The coefficient was negative which means that economic growth was lower in the years that had unusual occurrences compared to those that did not experience unusual occurrences. The value of the coefficient was -3.28 implying that during the periods of unusual occurrences, economic growth was lower by 3.28 per cent compared to the periods that did not have these unusual occurrences.

These unusual occurrences included the 1975 oil crisis shocks and poor agricultural season which negatively affected economic growth. The 1976/77 coffee boom was also a major shock to the Kenyan economy. In 1982 there was an attempt to overthrow the government, the economy also experienced drought, low export revenues due to low tea and coffee prices, increase crude petroleum prices which also impacted on the GDP negatively. General elections in 1992 and 2002 also had an impact on the GDP due to increased

revenue allocations to finance the elections. In 2008, the results of the post-election crisis were negative shocks in the economy.

The study also used dummies to capture changes in governance from one president to another. Governance 3 (G3) captured the governance under President Mwai Kibaki from the period 2003-2013. The coefficient for G3 was statistically significant and positive. This meant that there was a significant difference in economic growth during the governance by president Mwai Kibaki compared to the first governance by Mzee Jomo Kenyatta. The value of the coefficient, 3.6, implied that Economic growth was higher by 3.6 per cent in the third presidential regime compared to the first presidential regime.

The coefficients for government expenditure, real interest rates, unusual occurrences (unusual2), Market liberalization (M2) and Governance during president Moi's regime (G2) were not statistically significant. This implied that economic growth did not respond to changes in government expenditure as well as interest rates. It also implied that there was no significant difference in economic growth during the pre-liberalisation and liberalisation periods in Kenya. This was captured by M2. Since the coefficient for G2 was not statistically significant it meant that there was no difference in economic growth during the first presidential regime by President Jomo Kenyatta and the second presidential regime by President Moi.

The unusual occurrences included the 1982 there was an attempt to overthrow the government, the economy also experienced drought, low export revenues due to low tea and coffee prices and increase crude petroleum prices. The country also had General elections in 1992 and 2002 as well as post-election crisis in 2008. These unusual occurrences 2 did not have significant effects on economic growth in Kenya probably because there effects were already captured in unusual occurrences 1.

4.4.2: Moderating effect of changes in governance on the response of economic growth to domestic borrowing in Kenya.

The second objective of the study was to determine the moderating effect of changes in governance and market reforms on the response of economic growth to domestic borrowing in Kenya. Since the coefficient for the dummy capturing market reforms was not statistically significant, the objective was modified to determining the moderating effect of changes in governance on the response of economic growth to domestic borrowing in Kenya. The objective was met by first multiplying domestic debt with governance under Mwai Kibaki's regime (G3) to obtain the interaction term $DD*G3$. The interaction term measured how the change to the third governance of Kenya moderated the response of economic growth to domestic borrowing in Kenya. Real GDP growth rate was then regressed on the interaction term with inclusion of only

the exogenous variables that were statistically significant in objective 1. The findings are reported in Table 4.3.

Table 4.3: Results for the moderating effect of changes in governance on the response of economic growth to domestic borrowing in Kenya.

Dependent Variable: Real GDP growth rate			
Independent Variable	Coefficient	t-statistic	Probability
Constant	-2.815612	-1.428356	0.1626
Domestic debt (DD)	-0.199345***	-4.108671	0.0002
Inflation rate	-0.133906***	-5.046591	0.0000
Private consumption	-0.028746	-1.141917	0.2617
Private investments	0.669457***	6.901834	0.0000
Net exports	0.218115***	3.864249	0.0005
Unusual1	-2.686810***	-4.853779	0.0000
Unusual2	0.975884	1.473157	0.1502
Mwai Kibaki's regime (G3)	3.096611	0.905858	0.3716
DD*G3	0.010395	0.058541	0.9537
Adjusted R-squared:	0.757353		
Durbin-Watson statistic:	2.382763		
F-Statistic:	15.5656		
Probability (F-Statistic):	0.000000		

Source: Extracted from Table A8 in Appendix 7

From the results presented in Table 4.3, the adjusted R-Squared for the second model was 75.7 per cent. This implied that 75.7 per cent variations in the real GDP growth rate were explained by the exogenous variables included in the model while 24.3 per cent of variations in real GDP growth rate were explained by variables outside the model. The model had a good fit of the data since more than 50 per cent of variations in the dependent variable were explained by variables within the model. The p-value of the F-statistic was less than 0.05

implying that not all coefficients were zero and the study concluded that some coefficients were statistically significant. The Durbin-Watson statistic was 2.4 which is greater than 2 implying that there was no evidence of serial autocorrelation thus the results were reliable.

The important variable in Table 4.3 was the interaction term between governance 3 and domestic debt (DD*G3) but since the coefficient estimate was statistically insignificant the study found that domestic Debt and governance under President Mwai Kibaki had own independent effects on economic growth but did not have any joint effects on economic growth in Kenya.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Introduction

This chapter presents the summary, conclusions and policy implications of the study findings as well as areas for further research.

5.2 Summary

The aim of this study was to analyze the response of economic growth to domestic borrowing in Kenya and further analyze the moderating effect of changes in governance and market reforms on this response. The study was conducted because the government of Kenya has pursued policies aimed at achieving a sustainable economic growth rate of 10 per cent as well as reducing domestic debt levels below 25 per cent of GDP but the set targets for economic growth and domestic debt have not been achieved. Post independent Kenya has also experienced changes in governance as well as market liberalization. It was therefore necessary to find out if there was any moderating effect of these changes on the response of economic growth to growth in domestic borrowing in Kenya.

Past studies on the effect of domestic debt on economic growth in Kenya report mixed findings. Further, none focused on the moderating effect of the changes in governance as well as market reforms on the response of economic growth to domestic borrowing in Kenya. In order to add value to the existing literature, the study incorporated the objective of determining the moderating effect of changes in governance and market reforms on the response of economic growth to domestic borrowing in Kenya. This was captured by using dummies to show the direct effect of these changes on economic growth then interacting domestic debt with the dummies to capture the moderating effect of these changes on the response of economic growth to domestic borrowing in Kenya.

The study used time series data for all the variables for the period 1971 to 2013. Two models were estimated for each objective using the Ordinary Least Squares estimation technique. Before adopting the results, various tests were conducted on the models to ensure their soundness. These included diagnostic tests on the residuals, model stability tests for specification error among others. The two models used in the study passed all the tests and were therefore considered sound for the analysis.

For the first objective aimed at determining the response of economic growth to domestic borrowing in Kenya. The study found that economic growth in Kenya responds negatively to growth in domestic borrowing since the coefficient for domestic debt was negative and statistically significant. It was also found that economic growth in Kenya responds positively to growth in

Private Investments and net exports and negatively to Inflation Rate and growth in Private Consumption. The study also found out that economic growth in Kenya was higher during the presidential regime under President Mwai Kibaki compared to the presidential regime under Mzee Jomo Kenyatta. This can be explained by the fact that during President Mwai Kibaki's regime there was the formulation of the Economic Recovery Strategy for Wealth and Employment creation 2003-2007 which was followed by brilliant economic performance in Kenya.

The second objective was to determine the moderating effect of changes in governance on the response of economic growth to domestic borrowing in Kenya. The study found that domestic debt and the governance under President Mwai Kibaki had significant individual effects on economic growth but did not have any joint effects on economic growth in Kenya. Economic growth did not respond to market liberalization therefore there was no need to test the moderating effect of market reforms on the response of economic growth to growth in domestic borrowing in Kenya.

5.3 Conclusions

For the first objective, it was concluded that economic growth in Kenya responds negatively to growth in domestic borrowing. The coefficient for domestic debt was negative and statistically significant implying that more intake of domestic debt in Kenya reduces economic growth. The negative

coefficient for inflation rate implies that when the cost of buying goods and services is very high the growth rate declines. This is because during periods of inflation, the domestic currency appreciates making exports expensive to foreigners, who in turn reduce their demand for exports thus reduced export earnings and consequently low growth. On the other hand it was concluded that economic growth in Kenya responds positively to private investments and net exports.

For the second objective, the study concluded that domestic debt and changes in governance have own independent effects on economic growth but do not have joint effects on economic growth in Kenya. This implies that the response of economic growth to domestic borrowing in Kenya is independent of the changing political regimes.

5.4 Policy Implications

The government of Kenya should formulate and implement policies aimed at reducing growth in domestic debt so as to avoid the negative effects on economic growth. This is because the study findings show that economic growth in Kenya responds negatively to growth in domestic borrowing. This can be achieved by uptake of more external debt to substitute the domestic debt. The government of Kenya through the medium term strategy is putting emphasis on having an optimal mix of domestic and external debt to guard

against crowding out effect. This means that the government is heading towards the right direction to boost economic growth in Kenya.

The government should work on measures that curb inflation in the country. This is because the study found that economic growth in Kenya responds negatively to inflation. This can be achieved through policies aimed at reducing aggregate demand such as contractionary fiscal and monetary policy to curb demand pull inflation. The government could also use income policies such as controlling wage increases to curb cost push inflation in the country.

The government should also aim at increasing private investments in the country. The study found that economic growth responds positively to growth in Private Investments. The government can achieve this through maintaining interest rates at reasonable levels so as to ensure that investors can afford credit for investments. This can be achieved through expansionary monetary policy.

Lastly, policies aimed at boosting net exports should be pursued since this boosts economic growth in Kenya. For instance the government should ensure the domestic currency does not appreciate too much to avoid lack of competitiveness in the foreign market. This can be achieved through expansionary monetary policy.

5.5 Areas for Further Research

The relationship between domestic debt and economic growth in Kenya has been an issue of debate for many years and none of the studies done give conclusive results thus calling for further research. This study was limited to analyzing the response of economic growth to growth in domestic debt, governance and market reforms in Kenya for the period 1971-2013. This was analyzed using a multivariate linear regression model. A further study can be done on a similar concept using a Vector Autoregressive (VAR) model so as to capture the linear interdependencies among multiple time series as well as analyze the impulse response functions and variance decomposition.

The study was also limited at analyzing the moderating effect of changes in governance and market reforms on the response of economic growth to growth in domestic debt in Kenya. It was found that there was no moderating effect of changes in governance and market reforms on the response of economic growth to growth in domestic debt in Kenya. A study can be conducted to determine the factors that moderate the response of economic growth to growth in domestic debt in Kenya. This is because the study found that the response was negative so knowing the factors that moderate the response would be useful in minimizing the negative effects.

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APPENDICES

APPENDIX 1: DATA USED FOR THE STUDY

Table A1: Data on Macroeconomic variables (1971-2013)

YEAR	GRATE	DD	PRINV	RIR	INFL	XM	PI	GOVT
1971	7.20	13.20	22.70	20.07	3.78	-6.55	82.63	17.98
1972	6.90	13.23	21.76	7.70	5.83	-2.14	79.82	17.63
1973	7.00	13.58	20.45	-1.09	9.28	-1.28	75.46	16.45
1974	3.60	15.04	19.12	-5.64	17.81	-7.22	81.47	17.04
1975	1.20	14.42	20.21	-1.64	19.12	-4.69	86.55	18.33
1976	5.10	14.02	19.98	-7.49	11.45	0.69	79.06	17.46
1977	7.30	15.11	20.97	-5.90	14.82	3.37	72.91	17.21
1978	5.70	13.17	25.08	6.71	16.93	-9.75	79.96	19.51
1979	4.20	15.86	19.17	4.13	7.98	-5.86	87.73	19.20
1980	3.00	16.15	18.32	0.94	13.86	-6.38	81.88	19.80
1981	4.80	13.57	18.61	1.41	11.60	-3.36	80.45	18.59
1982	7.40	13.60	19.03	2.61	20.67	-4.90	83.04	18.43
1983	3.10	13.28	18.11	3.57	11.40	-2.26	81.34	18.42
1984	0.90	17.46	17.15	3.84	10.28	-5.30	85.49	17.38
1985	4.10	15.80	17.27	5.26	13.01	-4.85	79.52	17.46
1986	5.70	13.84	19.64	4.86	2.53	-4.04	82.28	18.32
1987	4.90	12.37	19.63	8.16	8.64	-5.09	80.80	18.57
1988	5.20	13.31	20.45	8.03	12.26	-5.23	79.78	18.41
1989	4.90	15.40	19.46	6.82	13.79	-7.09	82.23	18.06
1990	4.50	14.36	20.65	7.33	17.78	-5.64	81.47	18.64
1991	2.20	13.47	19.03	5.75	20.08	-1.51	80.54	16.77
1992	0.40	14.07	16.58	1.83	27.33	-0.41	83.49	15.68
1993	0.20	16.89	16.94	3.41	45.98	4.95	77.44	14.48
1994	3.00	14.21	18.87	16.43	28.81	2.81	77.89	15.15
1995	4.80	19.75	21.39	15.80	1.55	-6.56	84.74	14.84
1996	4.60	6.73	16.01	-5.78	8.86	-6.91	91.91	15.18
1997	2.30	6.20	15.39	16.88	11.36	-8.68	93.54	15.54
1998	3.10	4.56	15.68	21.10	6.72	-8.56	91.87	16.25
1999	1.40	26.35	15.59	17.45	5.74	-6.53	91.01	15.75
2000	0.60	20.13	16.71	15.33	9.98	-10.13	92.72	15.05
2001	0.20	21.29	18.15	17.81	5.74	-10.08	91.29	15.97
2002	0.60	21.11	17.24	17.36	1.96	-5.38	90.24	17.08
2003	3.00	21.63	15.84	9.77	9.82	-5.96	89.48	18.13
2004	4.90	21.51	16.26	5.05	11.62	-6.26	89.29	17.86
2005	5.80	19.99	18.70	7.61	10.31	-7.46	89.81	17.38
2006	6.40	17.91	19.42	-8.13	14.45	-9.27	92.23	17.57
2007	6.90	17.65	19.96	4.96	9.76	-10.06	91.80	17.88
2008	0.20	17.44	18.86	-0.98	26.24	-12.23	94.90	16.48
2009	3.30	15.89	18.51	2.84	9.23	-10.80	93.42	16.16
2010	8.40	16.97	20.37	12.03	3.96	-10.80	92.54	17.48
2011	6.10	20.94	20.39	3.85	14.02	-17.20	95.81	17.67
2012	4.50	20.50	21.24	9.51	9.38	-15.61	97.08	17.41
2013	5.70	22.58	20.41	10.94	5.72	-15.44	96.85	17.47

Source: Republic of Kenya, Economic surveys (Various issues)

Table A2: Changes in governance and market liberalisation (1971-2013)

YEAR	G1	G2	G3	Market 1	Market 2
1971	1	0	0	1	0
1972	1	0	0	1	0
1973	1	0	0	1	0
1974	1	0	0	1	0
1975	1	0	0	1	0
1976	1	0	0	1	0
1977	1	0	0	1	0
1978	1	0	0	1	0
1979	0	1	0	1	0
1980	0	1	0	1	0
1981	0	1	0	1	0
1982	0	1	0	1	0
1983	0	1	0	1	0
1984	0	1	0	1	0
1985	0	1	0	1	0
1986	0	1	0	1	0
1987	0	1	0	1	0
1988	0	1	0	1	0
1989	0	1	0	1	0
1990	0	1	0	1	0
1991	0	1	0	1	0
1992	0	1	0	1	0
1993	0	1	0	0	1
1994	0	1	0	0	1
1995	0	1	0	0	1
1996	0	1	0	0	1
1997	0	1	0	0	1
1998	0	1	0	0	1
1999	0	1	0	0	1
2000	0	1	0	0	1
2001	0	1	0	0	1
2002	0	1	0	0	1
2003	0	0	1	0	1
2004	0	0	1	0	1
2005	0	0	1	0	1
2006	0	0	1	0	1
2007	0	0	1	0	1
2008	0	0	1	0	1
2009	0	0	1	0	1
2010	0	0	1	0	1
2011	0	0	1	0	1
2012	0	0	1	0	1
2013	0	0	1	0	1

APPENDIX 2: DESCRIPTIVE STATISTICS TEST RESULTS

Table A3: Results for descriptive statistics

	DD	GOVT	GRATE	INFL	PC	PRINV	RIR	XM
Mean	15.92	17.26	4.08	12.59	5.32	18.96	6.29	-6.17
Median	15.40	17.46	4.50	11.36	4.77	19.03	5.26	-6.25
Maximum	26.34	19.80	8.40	45.98	44.94	25.08	21.10	4.94
Minimum	4.55	14.47	0.20	1.55	-6.57	15.39	-8.13	-17.19
Std. Dev.	4.31	1.29	2.30	8.26	8.72	2.07	7.57	4.72
Skewness	-0.25	-0.35	-0.21	1.80	2.17	0.32	0.09	0.04
Kurtosis	3.70	2.44	2.06	7.68	11.00	3.34	2.43	3.35
Jarque-Berra	1.37	1.43	1.91	62.47	148.3	0.93	0.65	0.24
Probability	0.50	0.49	0.38	0.00	0.00	0.63	0.72	0.88
Sum	684.5	742.22	175.30	541.4	228.9	815.30	270.4	-265.64
Sum Sq. Dev.	781.1	70.74	222.00	2864.1	3192.1	179.61	2406.6	935.94
Observations	43	43	43	43	43	43	43	43

Source: Own computations from study data

APPENDIX 3: TIME SERIES PROPERTY TESTS RESULTS

Table A4: Unit Root Tests Results via the ADF test

VARIABLES	ADF TEST STATISTIC		MACKINNON'S CRITICAL VALUES		CONCLUSION
	With Intercept only	With both intercept and trend	With Intercept only	With both intercept and trend	
Real GDP growth rate	-4.77	-4.67	-2.94	-3.52	Stationary
Domestic Debt	-3.68	-4.38	-2.94	-3.52	Stationary
Private Investments	-3.45	-3.32	-2.94	-3.52	Stationary
Interest Rates	-4.08	-4.64	-2.94	-3.52	Stationary
Inflation Rate	-3.91	-3.92	-2.94	-3.52	Stationary
Net Exports	-2.30	-3.63	-2.94	-3.52	Stationary
Government Expenditure	-2.21	-2.21	-2.94	-3.52	Non-Stationary
Private Consumption	-8.67	-8.38	-2.94	-3.52	Stationary

Source: Own Computations from study data

Table A5: Unit root test results via the KPSS test

VARIABLES	KPSS TEST STATISTIC		LM CRITICAL VALUES		CONCLUSION
	With Intercept only	With both intercept and trend	With Intercept only	With both intercept and trend	
Government Expenditure	0.25	0.12	0.46	0.15	Stationary

Source: Own Computations from study data

TABLE A6: Correlation Matrix

	GRATE	DD	GOVT	INFL	PC	PRINV	RIR	XM
GRATE	1.00	-0.14	0.43	-0.34	0.35	0.59	-0.18	-0.10
DD	-0.14	1.00	-0.02	-0.12	-0.02	-0.00	0.14	-0.30
GOVT	0.43	-0.02	1.00	-0.21	0.16	0.44	-0.24	-0.13
INFL	-0.34	-0.12	-0.21	1.00	-0.33	-0.10	-0.34	0.42
PC	0.35	-0.02	0.16	-0.33	1.00	0.47	0.26	-0.22
PRINV	0.59	-0.00	0.44	-0.10	0.47	1.00	-0.12	-0.11
RIR	-0.18	0.14	-0.24	-0.34	0.26	-0.12	1.00	-0.22
XM	-0.10	-0.30	-0.13	0.42	-0.22	-0.11	-0.22	1.00

Source: Own computations from study data.

APPENDIX 4: ECONOMETRIC RESULTS FOR MODEL 1 (Equation 3.5 on page 43)

Table A7: Results for the response of Economic Growth to growth in Domestic borrowing in Kenya

Dependent Variable: GRATE
 Method: Least Squares
 Date: 05/23/15 Time: 23:16
 Sample: 1971 2013
 Included observations: 43
 Convergence achieved after 18 iterations
 MA Back cast: 1970

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.005033	3.782516	-1.058828	0.2984
DD	-0.214819	0.042589	-5.043985	0.0000
GOVT	0.071361	0.175708	0.406135	0.6876
INFL	-0.149854	0.029391	-5.098658	0.0000
PC	-0.087951	0.046293	-1.899893	0.0674
PRINV	0.688949	0.118464	5.815693	0.0000
RIR	-0.019267	0.039762	-0.484560	0.6316
XM	0.196995	0.056023	3.516310	0.0015
UNUSUAL	-3.283524	0.712730	-4.606967	0.0001
UNUSUAL2	0.501105	0.668177	0.749958	0.4593
M2	-0.287962	0.668192	-0.430957	0.6697
G2	0.619109	0.463467	1.335820	0.1920
G3	3.686169	0.586847	6.281307	0.0000
MA(1)	-0.981769	0.023200	-42.31796	0.0000
R-squared	0.858529	Mean dependent var		4.076744
Adjusted R-squared	0.795111	S.D. dependent var		2.298948
S.E. of regression	1.040611	Akaike info criterion		3.174751
Sum squared resid	31.40324	Schwarz criterion		3.748165
Log likelihood	-54.25715	Hannan-Quinn criter.		3.386208
F-statistic	13.53763	Durbin-Watson stat		1.816130
Prob(F-statistic)	0.000000			

Source: Own computations from study data

APPENDIX 5: DIAGNOSTIC TESTS RESULTS FOR MODEL 1

Table A8: Residual Properties for MODEL 1

Type of test	Test Statistic	Dependent Variable	CONCLUSION
		Real GDP growth rate	
Histogram-Normality Test	Jarque-Berra	0.172114	The residuals are normally distributed
	Probability	0.917542	
Breusch-Godfrey LM test for Serial Correlation	F- statistic	1.788914	No serial correlation
	Probability	0.1864	
ARCH	Obs*R ²	4.490200	No evidence of heteroskedasticity
	Probability	0.1059	

Source: Own computations from study data

Table A9: Ramsey RESET Tests Results for MODEL 1

Dependent variable	No. of terms	Test statistic		Conclusion
		F-statistic	Prob. (F-stat)	
Economic growth rate	1	0.7689	0.3878	No evidence of misspecification error
	2	0.7951	0.4615	

Source: Own computations from study data

APPENDIX 6: PARAMETER CONSTANCY TEST RESULTS FOR MODEL 1



Fig A1: Recursive residuals for MODEL 1



Figure A2: CUSUM test results for MODEL 1

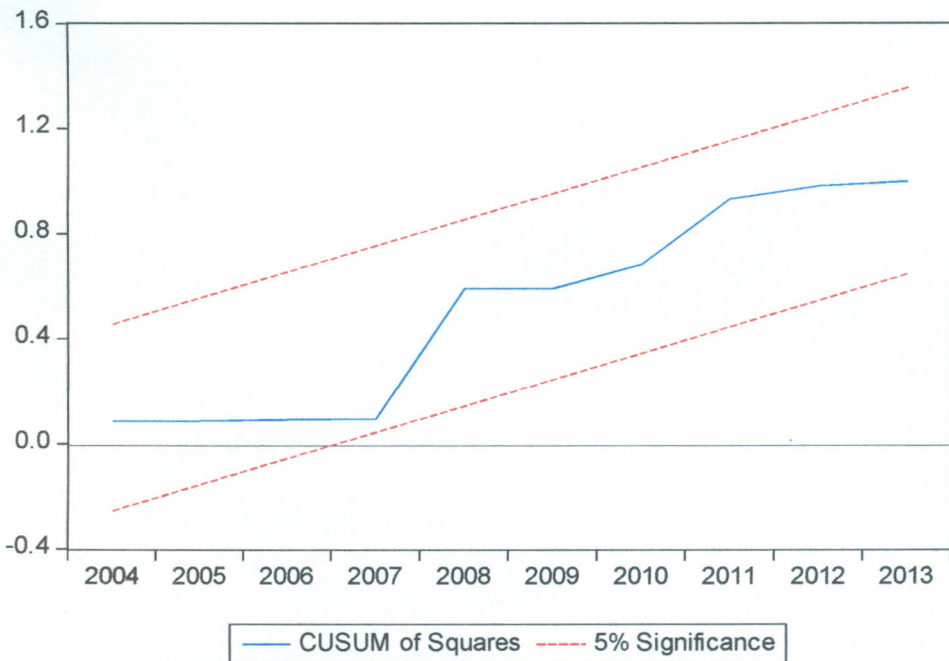


Figure A3: CUSUM of Squares test results for MODEL 1

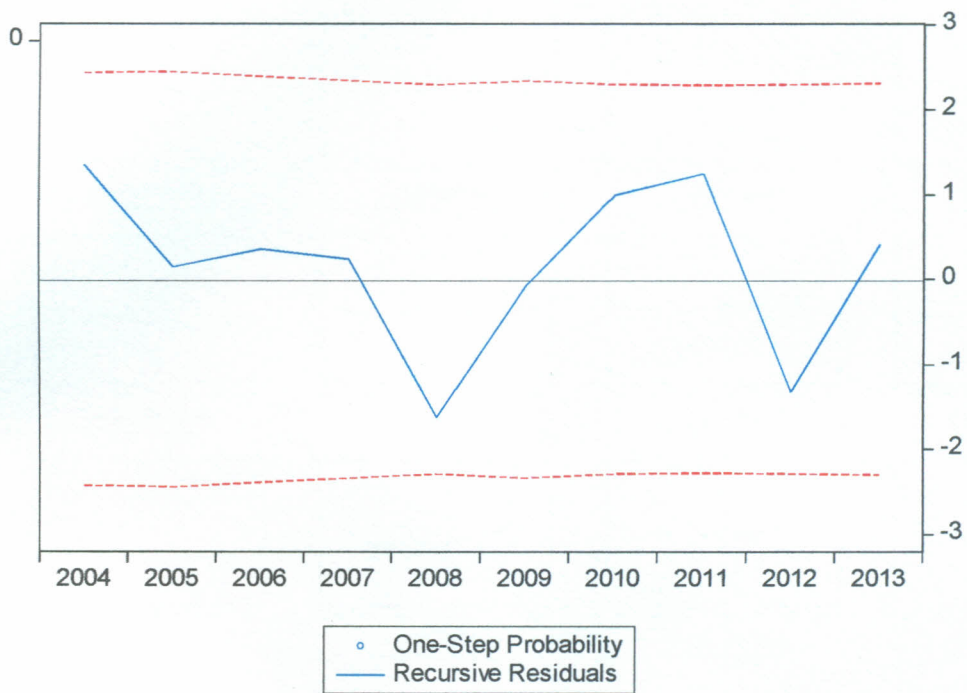


Figure A4: One-Step Forecast test results for MODEL 1

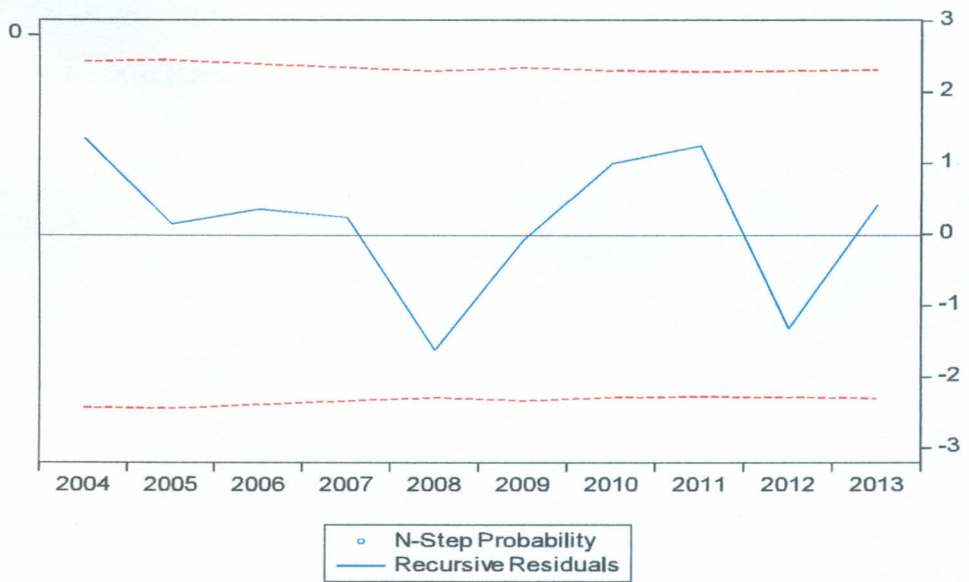


Figure A5: N-Step Forecast test results for MODEL 1

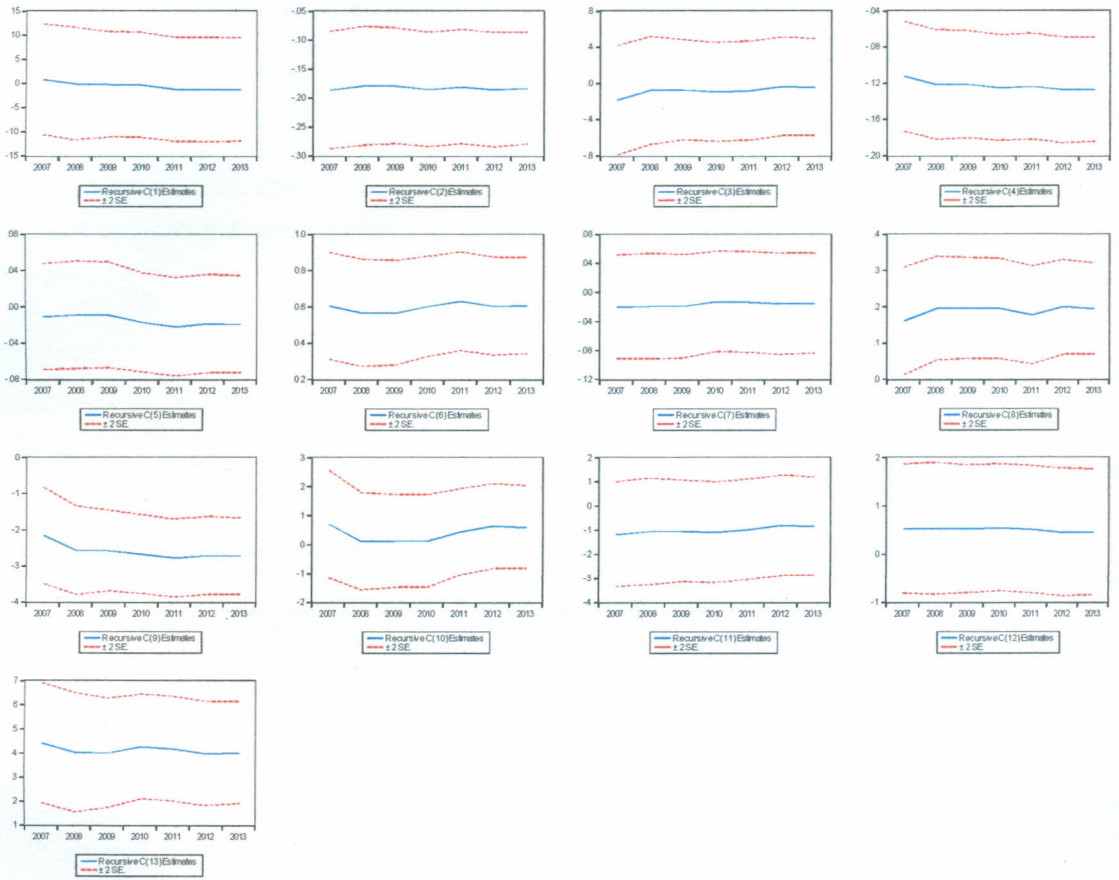


Figure A6: Recursive coefficients test results for MODEL 1

APPENDIX 7: ECONOMETRIC RESULTS FOR MODEL 2 (Equation 3.6 on page 45)

Table A10: Results for the moderating effect of change in governance and market conditions on the effect of domestic debt on economic growth in Kenya

Dependent Variable: GRATE
 Method: Least Squares
 Date: 05/24/15 Time: 21:09
 Sample: 1971 2013
 Included observations: 43

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.815612	1.971226	-1.428356	0.1626
DD	-0.199345	0.048518	-4.108671	0.0002
INFL	-0.133906	0.026534	-5.046591	0.0000
PC	-0.028746	0.025173	-1.141917	0.2617
PRINV	0.669457	0.096997	6.901834	0.0000
XM	0.218115	0.056444	3.864249	0.0005
UNUSUAL	-2.686810	0.553550	-4.853779	0.0000
UNUSUAL2	0.975884	0.662444	1.473157	0.1502
G3	3.096611	3.418427	0.905858	0.3716
DDG3	0.010395	0.177562	0.058541	0.9537
R-squared	0.809349	Mean dependent var		4.076744
Adjusted R-squared	0.757353	S.D. dependent var		2.298948
S.E. of regression	1.132443	Akaike info criterion		3.287056
Sum squared resid	42.32011	Schwarz criterion		3.696637
Log likelihood	-60.67169	Hannan-Quinn criter.		3.438097
F-statistic	15.56567	Durbin-Watson stat		2.382763
Prob(F-statistic)	0.000000			

Source: Own computations from study data

APPENDIX 8: DIAGNOSTIC TESTS RESULTS FOR MODEL 2

Table A11: Residual Properties test results for MODEL 2

Type of test	Test Statistic	Dependent Variable	CONCLUSION
		Real GDP growth rate	
Histogram-Normality Test	Jarque-Berra	1.9845	The residuals are normally distributed
	Probability	0.3707	
ARCH	Obs*R ²	0.2809	No evidence of heteroskedasticity
	Probability	0.5961	
Breusch-Godfrey LM test for Serial Correlation	F- statistic	2.4862	No serial correlation
	Probability	0.0997	

Source: Own computations from study data

Table A12: Ramsey RESET Tests Results for MODEL 2

Dependent variable	No. of terms	Test statistic		CONCLUSION
		F-statistic	Prob. (F-stat)	
Economic growth rate	1	0.0073	0.9323	No evidence of misspecification error
	2	0.2596	0.7730	

Source: Own computations from study data

APPENDIX 9: PARAMETER CONSTANCY TEST RESULTS FOR MODEL 2

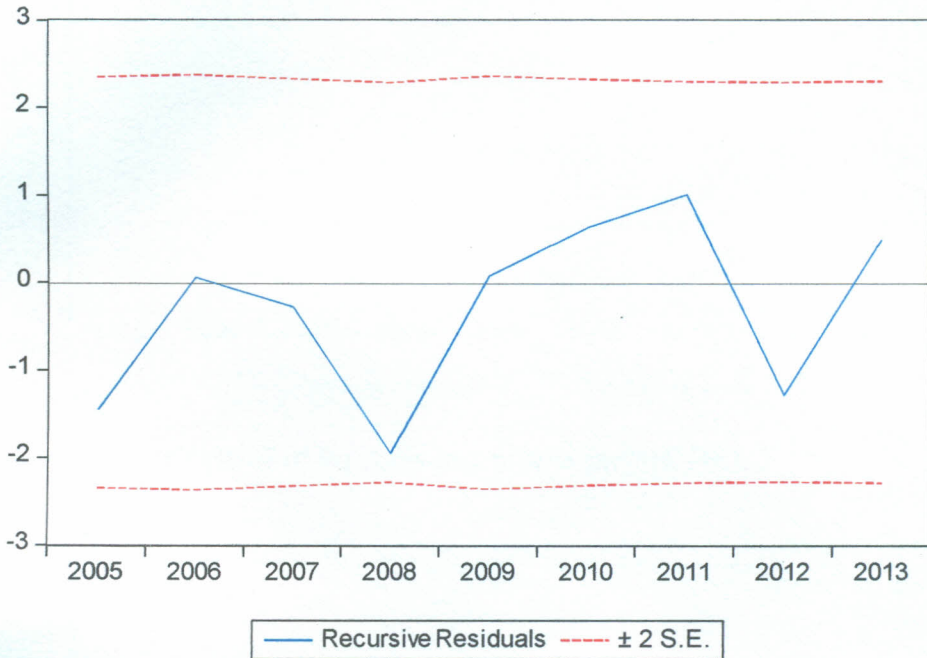


Figure A7: Recursive Residuals for MODEL 2



Figure A8: CUSUM test results for MODEL 2

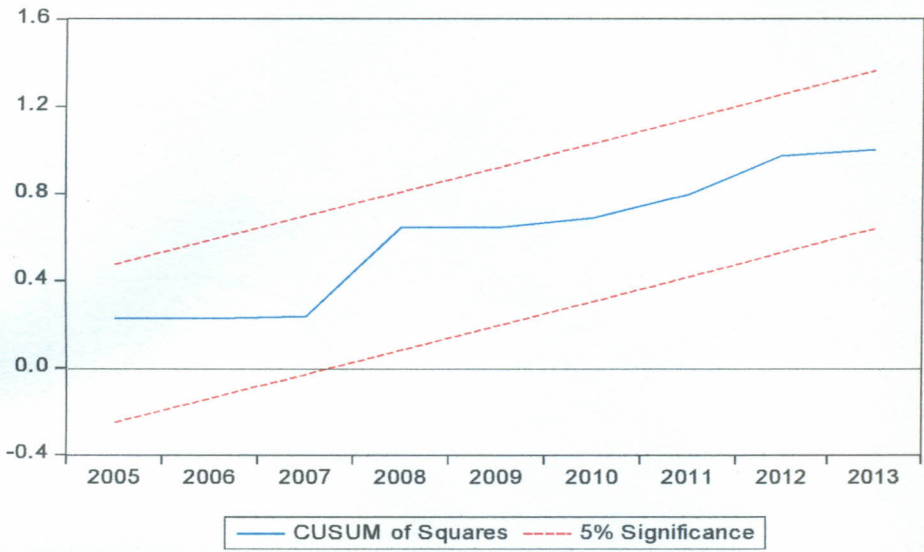


Figure A9: CUSUM of Squares test results for MODEL 2

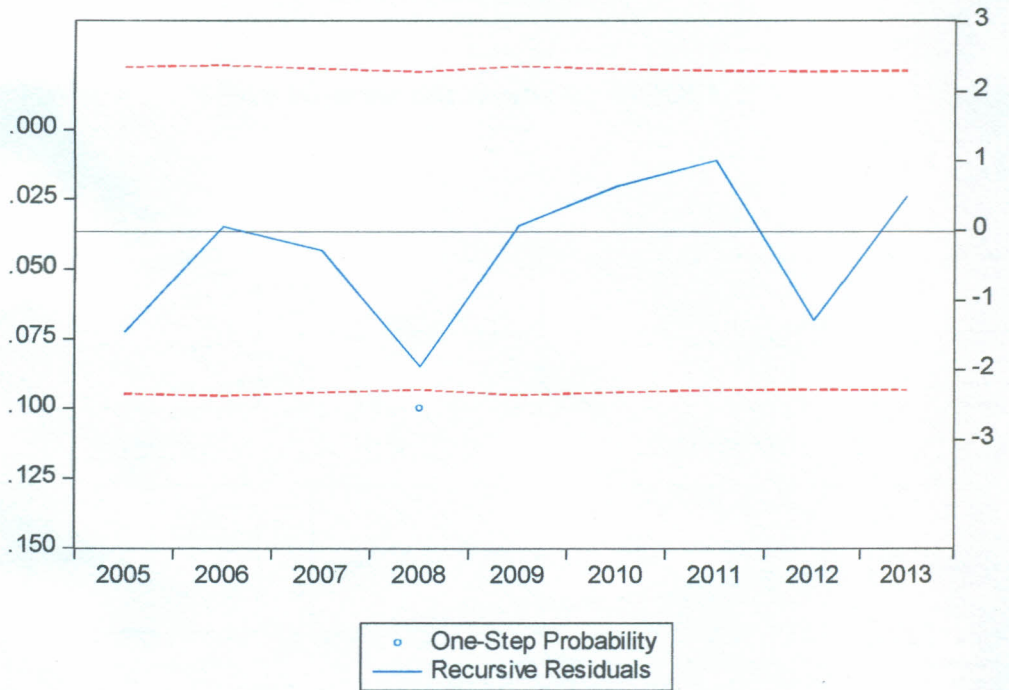


Figure A10: One-Step Forecast test results for MODEL 2

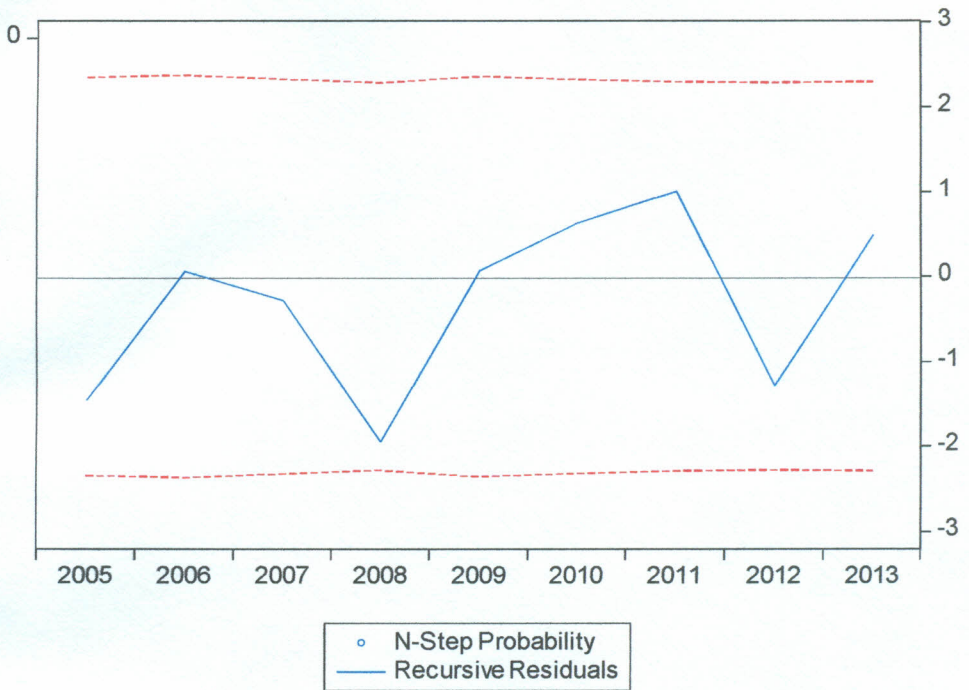


Figure A11: N-Step Forecast test results for MODEL 2

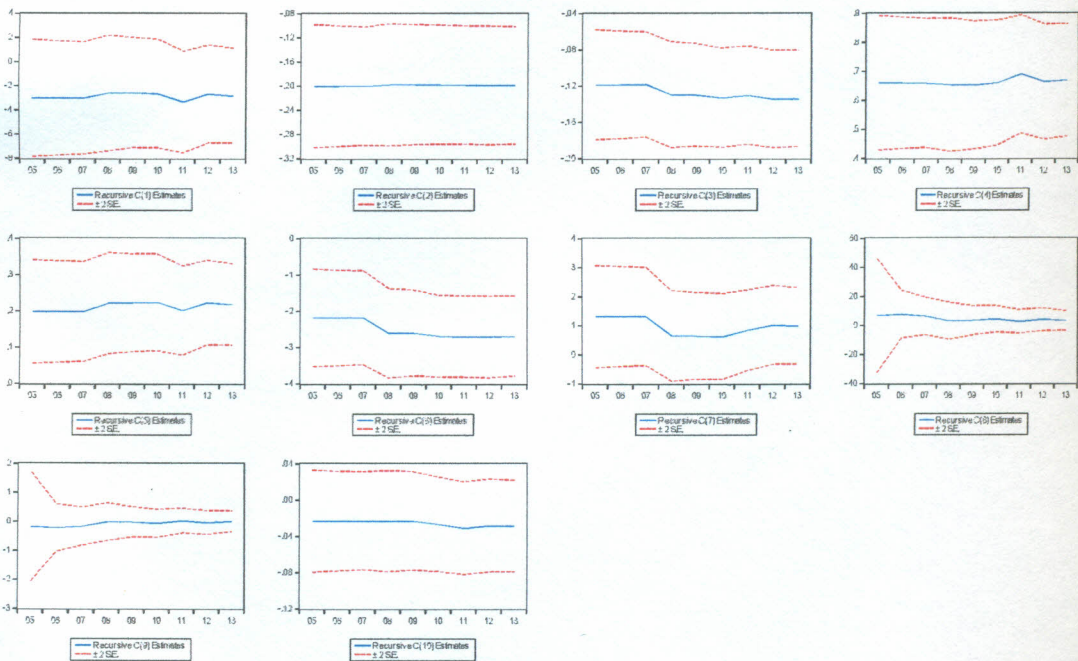


Figure A12: Recursive coefficients test results for MODEL 2