

DETERMINANTS OF GROSS DOMESTIC SAVINGS IN KENYA

BY

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X50/76166/2012

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**Research Paper Submitted in Partial Fulfilment of the Requirements for
the Award of the degree of Master of Arts in Economics of the University
of Nairobi.**

OCTOBER, 2014

DECLARATION

This research paper is my original work and to the best of my knowledge, it has never been presented for the award of a degree in any other university.

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APPROVAL

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DEDICATION

This paper is dedicated to my mother Nyandeng Lueth for her continuous support, prayers and everlasting inspiration as I search for knowledge and success.

ACKNOWLEDGEMENT

First and foremost my gratitude goes to the almighty God for enabling me to pursue a Master of Arts degree in Economics. My sincere thanks go to my supervisors Prof. Francis M. Mwega and Dr. Seth Omondi Gor for their professional guidance, tolerance and cooperation. I am greatly indebted to my colleague, Mr. Hilal Mohamed for his insights and guidance during the research.

Above all, my sincere and humble thanks go to my sponsor Daniel Akech Thiong; a founder of Sudan Scholarship Foundation who generously sponsored my education covering both tuition fees and costs of accommodation. Special thanks go to my family members and friends for their constant encouragement, moral support and love without which it would not have been possible to successfully complete this research paper. My final appreciation goes to my classmates who trusted and made me their leader. To this end, I am grateful to all for their input. Any mistakes remain solely mine.

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LIST OF ACRONYMS

ADF	Augmented Dickey Fuller
CBK	Central Bank of Kenya
ECM	Error Correction Model
ERS	Economic Recovery Strategy
FDI	Foreign Direct Investment
GDS	Gross Domestic Savings
GDP	Gross Domestic Product
GoK	Government of Kenya
ODA	Overseas Development Assistance
OLS	Ordinary Least Squares
SAPs	Structural Adjustment Programmes
SSA	Sub-Saharan Africa

ABSTRACT

This study examined the major determinants of gross domestic savings rate (GDS) in Kenya using secondary annual data for the period 1971-2012. The macroeconomic variables used include economic growth, real per capita income, deposit interest rate, M2, public savings and current account balance. The model was estimated using co-integration and error-correction models to analyze the short and long run equilibrium among the variables.

The ADF test shows that most variables contained unit root at levels except economic growth. However, all variables were stationary after first difference. Results of the study show that current account deficit, public savings and real per capita income play a significant role in determining the gross domestic savings in Kenya in the long-run. The coefficient analysis also shows that real per capita income gives a positive impact while the current account deficit, public savings, rate of interest on deposits and broad money (M2) show negative impact on domestic savings in the long run. The study also concludes that the speed of adjustment is 63% which means that the model will correct short run disequilibrium position at the rate of 63% annually.

The study also finds unidirectional causality which runs from economic growth (GGDP) to gross domestic savings (GDS). The paper concludes that there is a potential for increased domestic savings and this calls for policy changes and political will among policy makers who should put more emphasis on current account balance, public savings, per capita income and economic growth that influence savings.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

The prosperity of any country depends on the levels of savings and investment as conduits for capital formation. The role of domestic savings in a country's development process is a very important process to promote and support self-sustained economic growth and development. It has been argued that higher savings lead to higher investment, which in turn leads to higher economic growth and development. A country's economic progress depends largely on the ability of a nation to mobilize the necessary savings to finance capital formation in order to increase the rate of economic growth and development. Gross domestic savings could reduce the country's dependency on foreign capital (Ahmad and Marwan, 2003). Foreign borrowing and loans lead to unsustainable foreign debts and hence result in balance of payment disequilibria. Savings, capital accumulation and growth are inter-related, thus there is need to understand the determinants of gross domestic savings in a developing country in order to address chronic lack of internally generated resources to propel economic growth.

Mahmoud (2008) argued that persistent low domestic saving rates can lead to low growth rates. When domestic resources are not enough to finance investment requirements, external sources are allowed to augment meagre local resources. While depending on foreign savings has its own benefits, it makes countries completely dependent on unforeseen adverse effects such as political crisis and economic shocks coming from other countries. Thus, mobilizing local resources through domestic savings is an important step in reducing vulnerability to external economic fluctuations and shocks such as the currency crisis of October 2011 in Kenya. In recent times, there has been a great deal of empirical work on determinants of saving in both developed and developing countries. This intense interest has been motivated by the general worry over deteriorating saving rates in most of developing countries and the

growing discrepancy in saving and investment rates among the developing nations (Mahmoud, 2008).

It has been argued that saving in an economy always determines economic growth through accumulation and allocation of financial resources to promote investments. The necessary resources for investment are obtained through cumulative savings of income. To finance investment required, a nation needs to generate sufficient domestic saving or it should borrow abroad and/or source for foreign direct investment. On the other hand, developing countries still show low performance in attracting FDI due to economic and political uncertainty. This is made worse by the fact that foreign direct investment is also highly volatile (Kidane, 2010). It is believed generally that nations that save more are able to accumulate and mobilize enough domestic resources for huge investment projects.

This study examines from an empirical point of view the determinants of gross domestic savings in Kenya for the period 1971-2012 and suggests policy measures to adopt to mobilize domestic savings to support self-sustained economic growth and development in the country. This period is important in the sense that it captures the periods in which gross domestic savings was moderately high in early 1970s and 1980s, and 1990s up to 2000s where gross domestic savings were declining with time. Most studies have not been conclusive on factors influencing savings in developing countries. This study is motivated by the need to fill this gap.

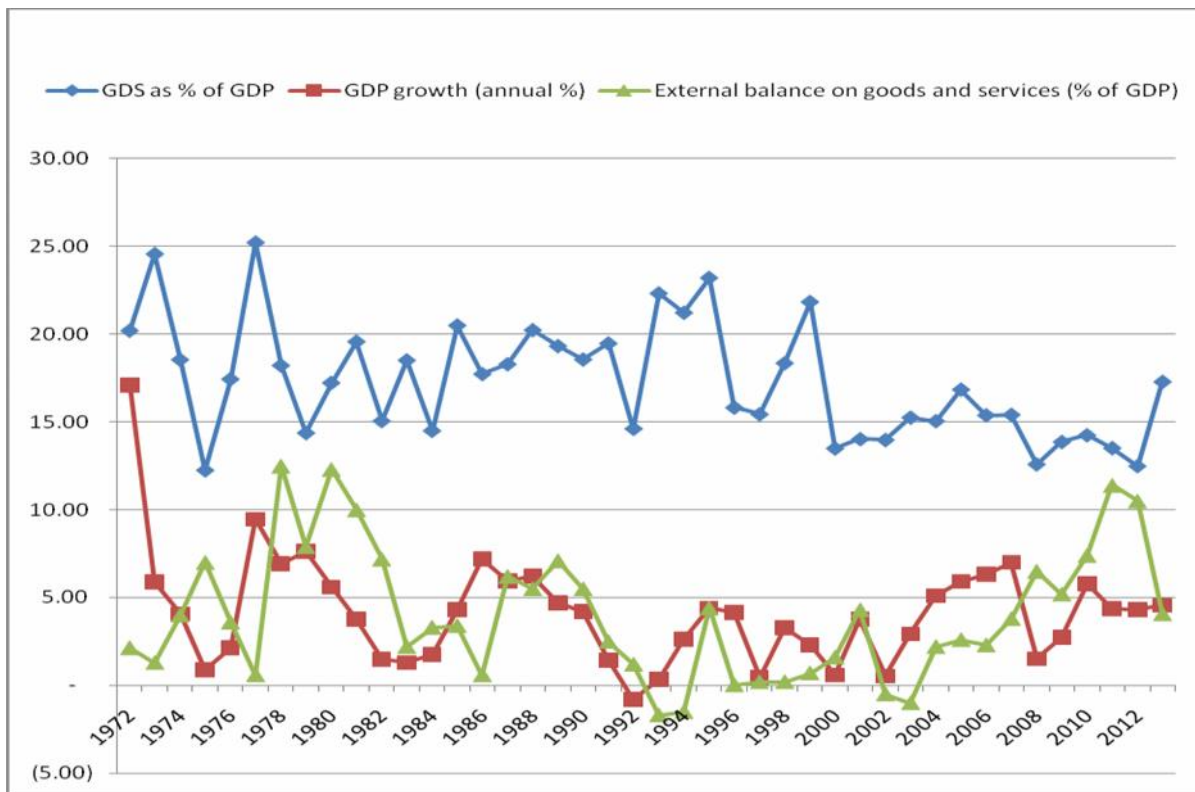
1.2 Background to the Study

The importance of savings cannot be overlooked when it comes to promoting economic growth and development. To realize economic growth of 10% annually, the government of Kenya crafted a long term vision, commonly referred to as Kenya Vision 2030. Its financial objective is to build a vibrant and very competitive capital and financial sector that will promote economic growth and development, besides creating jobs and promote high levels of savings to finance overall investment needs in Kenya.

To achieve macroeconomic goals in Kenya, savings rates should be raised from 17% in 1971 to about 30% of GDP in 10 years. Savings of up to 10% of GDP for investment are expected to be realised from remittances from abroad, foreign direct investments (FDI), overseas development assistance (ODA) and sovereign bonds (Republic of Kenya, 2007). From this analysis, it is clear that savings rate is an important variable that should be carefully stimulated to realize a 10% annual economic growth.

The behaviour of domestic savings as a percentage of GDP presented in Figure 1 shows major fluctuations in its value during the period 1971-2012.

Figure 1: Trends in Kenya’s Gross Domestic Savings, GDP growth and current account balance.



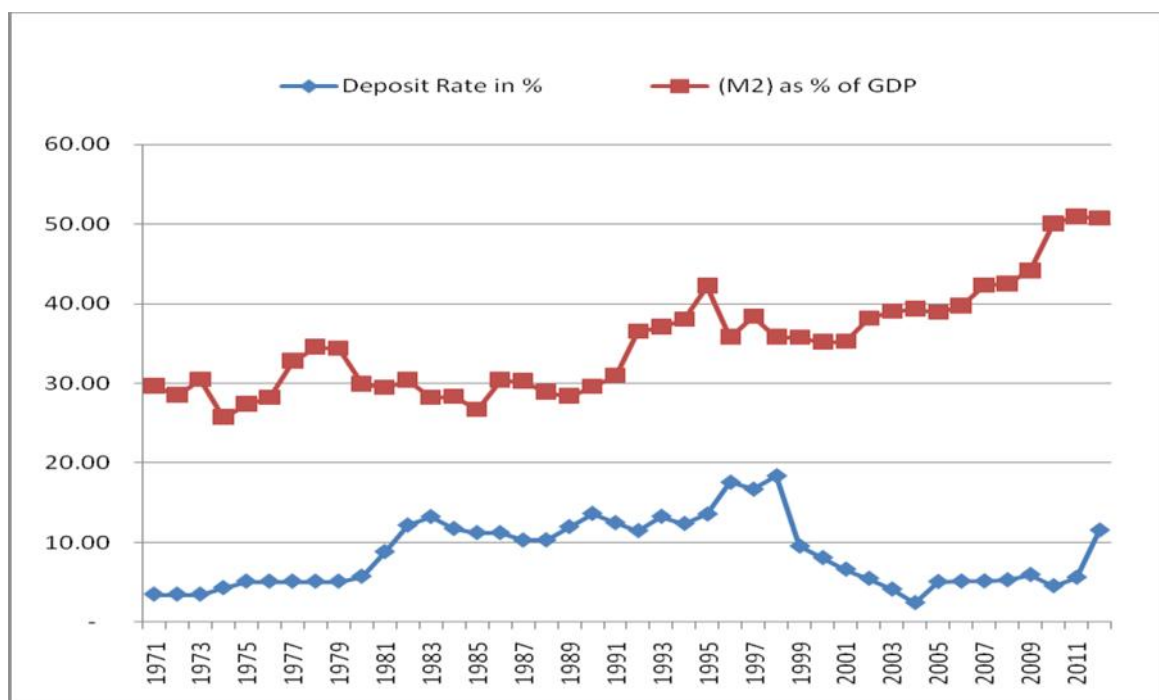
Source: World Bank Databank, 2013.

From 2002 to 2012, real GDP grew on average by 4.23 per cent annually. During the same period, gross domestic savings was 7.3 per cent of GDP on average. The gross domestic saving rates of Kenya fluctuated over the study period. In Kenya, gross domestic savings rates have generally been low. The gross domestic savings was 17.30 per cent of GDP on an average for the whole period under study (1971 – 2012). Kenya’s domestic savings ratio was 19.38 per cent of GDP on average through the period 1963 - 1980, which is fairly high compared to the period 1990-2012. However, from 1990 to 2012, gross domestic savings rate averaged 16.40 per cent of GDP annually. Gross domestic savings showed a downward trend between 1993 and 2012. In 2011, the gross domestic savings was at 13.52 per cent of GDP (World Bank, 2012). The ratio of gross domestic savings to GDP was 15.25 per cent in 2003 but stood at 12.50 per cent of GDP in 2012. Consequently, the gross domestic saving ratio in

Kenya represents a relatively low value compared to countries at the same level of development, whose mean saving rates lie between 20 and 30 percent in countries such as Angola, Nigeria, and Malaysia.

On the other hand, the current account balance (as a percentage of GDP) witnessed a remarkable deficit and decline during the period study with a mean of about 3.33 per cent during 1971 - 2012, experienced small surplus between 1993-1994 and 2001-2002 and thereafter witnessed an increasing deficit which eventually stood at about 10.5 per cent of GDP in 2012. It can also be seen that the GDP growth rate averaged about 4.57 per cent during the period 1971-2012 and was high between 1970s and 1980s, declined to negative 0.8 per cent in 1992, reached the peak of 7 per cent in 2007 and eventually declined to 4.3 per cent in 2012.

Figure 2: Trends in Kenya’s Broad Money (M2) and Deposit Rate



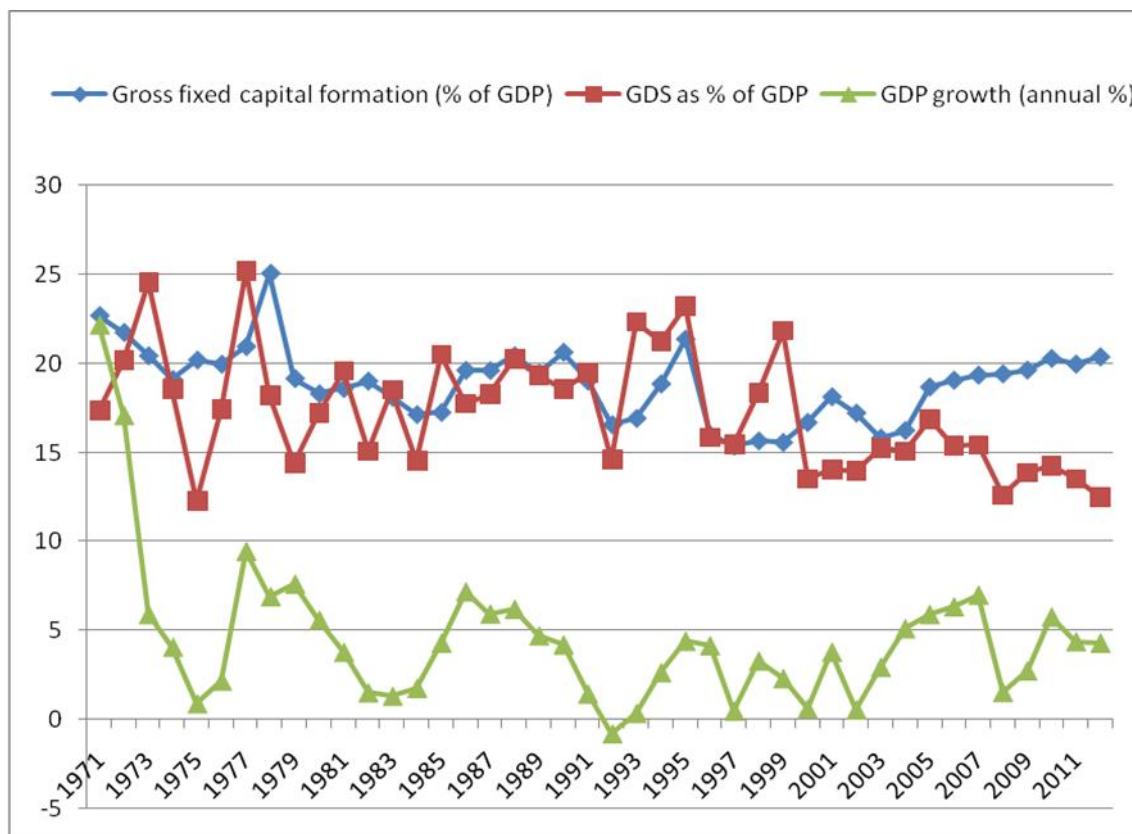
Source: World Bank Databank, 2013.

According to Figure 2, the broad money supply (M2) as percentage of GDP was 35 per cent on average during 1971–2012, and it was about 51 per cent in 2012. Interest rate on bank

deposits recorded a positive sign on an average of about 8.62 per cent throughout the period 1971–2012, but witnessed a low growth rate in 2000-2004 eventually standing at 11.57 per cent in 2012.

The Kenya’s saving and investment record over 1971-2011 is shown in Figure 3.

Figure 3: Trends in GDP Growth Rate, Savings and Gross Fixed Capital Formation



Source: World Bank Databank, 2013.

The average gross investment rate is about 18.9 per cent of GDP. An investment ratio of this order, combined with Kenya’s average GDP growth rate of 4.6 percent per annum since 1971, implies an incremental capital-output ratio of approximately 4.11. The average savings ratio to GDP of 17.3 percent is some 1.6 percent lower than the investment ratio, implying on average that Kenya has been a net importer of capital from abroad. Kenya’s gross domestic savings and gross fixed capital formation experienced low growth rates until 1996 after

which gross domestic savings fell below domestic investment. The gross domestic savings remained well above 15 percent between 1970s and 1995 and even briefly exceeded 25 percent during 1977. It subsequently fell to below 15.15 percent between 1996 and 2012. Such a low saving rate cannot sustain long term economic growth.

Despite Kenya's notable improvement in economic performance, it continues to face constraints to its desired development path. The level of domestic savings and investments are still too low to support self-sustained growth and this has been a serious concern to both policy-makers and academia. This study therefore seeks to fill this knowledge gap by empirically examining the determinants of gross domestic savings in Kenya.

1.3 Statement of the Problem

Kenya continues to face a potential shortage of resources to finance public and private investments due to low domestic saving rates which leads to slow economic growth rates. A country's economic progress depends largely on the ability of a nation to mobilize the necessary savings to finance capital formation in order to increase the rate of economic growth and development. It is argued that low domestic saving rates may lead to low economic growth rate. Low economic growth rate in Kenya is largely due to lack of sufficient domestic resources.

When domestic resources are not enough to finance investment requirements, external sources are allowed to augment meagre local resources and this makes the country highly sensitive to external shocks. Thus, mobilizing resources through domestic savings will continue to be a priority source of investment financing in order to minimize vulnerability to international economic fluctuations and shocks. In Kenya, this is of great interest. Empirical work on determinants of saving has been motivated by the deteriorating gross domestic

savings rate which has been declining with time and do not show substantial progress as compared to the levels of gross domestic saving in SSA.

Although, some studies have been carried out on determinants of gross domestic savings in Kenya, more research is needed to explain the decline and low levels of gross domestic savings. If the issue of low and declining gross domestic savings rate is not addressed promptly, there would not be enough internally-generated resources to finance self-sustained economic growth and development. Savings, capital accumulation and growth are inter-related, thus there is need to identify the determinants of gross domestic savings in a developing country in order to address the chronic lack of generated internal resources to propel economic growth.

1.4 Research Questions

The following are some of the research questions of the study:

- (a) What factors determine gross domestic savings rate in Kenya?
- (b) What is the impact of economic growth on gross domestic saving rate (GDS) and direction of causality in Kenya?
- (c) What is the effect of financial sector development or deepening on the gross domestic savings rate?
- (d) Does gross domestic saving respond to changes in real deposit rate of interest?
- (e) What is the effect of the current account deficit on domestic savings rate in Kenya?
- (f) What is the effect of public savings on gross domestic savings in Kenya?

1.5 Objectives of the Study

The primary objective of this study is to identify the determinants of gross domestic savings rate (GDS) in Kenya.

In light of this, the paper has the following specific objectives:

- i) To determine the direction of causality and impact of GDP growth on gross domestic saving rate in Kenya.
- ii) To determine the impact of financial development on the gross domestic savings behaviour in Kenya.
- iii) To determine the impact of public savings, current account balance, deposit rate and per capita income on gross domestic savings in Kenya
- iv) Use (i) to (iii) above to suggest policy measures to adopt in mobilizing domestic savings to support self-sustained economic growth and development in Kenya.

1.6 Justification and Limitations of the Study

Kenya like other developing economies aim at reducing reliance on foreign borrowing and donor-assistance. This can be achieved by raising domestic saving rates to mobilize capital for economic growth. In order to raise the saving rate, the government needs to manipulate determinants of gross domestic savings. This could help policy-makers to formulate more appropriate policies on real deposit rate of interest, capital mobilization and accumulation for the development of Kenya.

The estimation of domestic savings function to identify the factors that determine domestic saving behaviour will be appropriate for policy makers in making decisions towards promotion of gross domestic savings. Based on the determinants of gross domestic savings, policy makers could have better powers over savings by controlling the relevant and important variables in the desired direction so as to foster self-sustained economic growth and development.

1.7 Scope of the Study

This paper used time series data covering the period 1971 to 2012. This period is important because it covers both Structural Adjustments Programs (SAPs) reform period (1975 to 1990)

and post-reform period (1991 to 2012). This period is crucial in the sense that it captures the periods in which gross domestic savings was moderately high in early 1970s and 1980s, and 1990s up to 2000s when gross domestic savings was declining with time.

1.8 Organization of the Study

After the introduction, the next chapter reviews both theoretical and empirical literature on the determinants of gross domestic savings. This is then followed by Chapter Three which set out the methodology and estimation technique where the model to be estimated is specified, variables to be used are defined, and data sources and pre-estimation (diagnostic tests) tests are described. Chapter Four discusses data analysis and findings of the study. Finally, Chapter Five presents the summary of the study, conclusions, policy recommendations and areas for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section presents a review of both theoretical and empirical literature on gross domestic savings. The first section reviews theoretical literature on determinants of savings in both developed and undeveloped countries. The second section reviews empirical literature on the determinants of gross domestic savings mobilization. The last section concludes the chapter by giving an overview of the empirical literature. In discussing the determinants of domestic savings, gross domestic savings refers to the total sum of the savings of the three economic sectors i.e. households, businesses and government in a given economy.

2.2 Theoretical Literature

The gross domestic savings rate of a given country is determined by various factors. The most important factors are those related to growth of per capita income, growth of income, demographic structures such as dependency ratio and population growth rate, the government budget deficit, the interest rate, macroeconomic stability, the extent of financial sector development, and external variables such as foreign direct investment and current account deficit. In this section, the paper tries to analyze the theoretical framework of these determinants of savings rate.

Theories of Savings

2.2.1 Absolute Income Hypothesis (AIH)

Most studies that have been done both in the developed countries and in the less developed countries have emphasized the dominant role that income plays as one of the determinants of savings. Keynes (1936) link consumption and saving to the level of income through the concept of the Marginal Propensity to Consume (MPC) or consumption (or savings) function.

He argues that consumption and savings have a stable relationship with current income. Keynes thus stresses that savings would increase with absolute income (disposable income).

2.2.2 The Life Cycle Hypothesis (LCH)

One of the major determinants of domestic savings ratio is the growth of income as suggested by the life-cycle hypothesis of savings. The life-cycle hypothesis was proposed by Ando and Modigliani (1963) and provides a theoretical framework of most determinants of saving behaviour used in recent empirical studies. This theory assumes that an individual seeks to maximize the present value of life time utility subject to the income of an individual i.e. the budget constraint. This theory predicts that the consumption and the decision to save in a particular period depend on expectations about life time income of an individual. In this theory, the life time of an individual is divided into a youth period, working period and a retirement period. Individuals are assumed to be net savers during the working period and net dissavers during the youth and retirement periods.

2.2.3 The Permanent Income Hypothesis (PIH)

This theory was developed independently by Friedman (1957). This theory states that choices made by economic agents regarding their consumption/saving pattern are determined not by current income but by their measured longer term income expectations. This is sometimes referred to as consumption smoothing because individuals will save more than the MPS in times of high-income levels and dissave when income levels are low or during retirement period. Permanent income takes into account the long-time expectation over a planning period and a steady state and the consumption maintained over a planning period given the individual's present wealth (Muradoglu and Taskin, 1996).

2.2.4 The McKinnon-Shaw Hypothesis

This theory was developed independently by McKinnon (1973) and Shaw (1973). It states that financial market should be liberalized and that developing economies allow demand for real money balances, real interest rates and investment rates to be determined by market forces. McKinnon (1973) and Shaw (1973) argue that the rate of return on savings, as measured by interest rate would have a positive effect on saving rates. McKinnon and Shaw (1973) argued that policies that lead to financial repression reduce the incentives to save. Reduced savings result in reduced investment which in turn leads to lower growth. Hence they concluded that higher interest rates resulting from financial liberalization prompt households to increase savings.

The willingness and ability to save represents an inter-temporal choice between present and future levels of consumption. The real interest rate has an overall positive effect on savings. High interest rates encourage economic agents to postpone present consumption in order to yield future interest income from the savings. However, governments over the years have deliberately kept interest rates below market clearing levels by way of promoting domestic savings and this has been less impressive because saving levels continue to decline since the lowered return on savings do not adequately offset the rising inflation.

Because of this, McKinnon (1973) and Shaw (1973) explain the role of government in mobilising savings through the financial repression hypothesis. The hypothesis examines the effect of government policy in preventing through controls the real interest rates from adjusting to competitive levels to clear the market. McKinnon (1973) argues that with controlled interest rates it is likely that not all economic agents will access credit and this can lead to two-fold scenario; where those firms that can access subsidised credit would embark on capital-intensive projects and those not favoured by the policy would only carry out a short maturity projects with huge returns. Also, another result of financial repression

according to McKinnon (1973) and Shaw (1973) is that it substitutes market for non-market forces from determining interest rates. This is manifested through rationing of the available funds to the investors.

This analysis concludes that removing financial restrictions in countries where interest rates are controlled exerts a positive effect on growth rates towards their competitive market equilibrium (Gemech and Struthers, 2003). Many countries have embarked on financial liberalisation programmes in order to make real returns on savings more competitive and attractive to savers. This was devised as a way of maximising savings, investment and growth. Yet there is a trade-off between interest rates and investment levels. It is therefore necessary to strike a balance between saving and investment promotion that is achieved through interest rate adjustments.

2.2.5 Rational Expectations Hypothesis (REH)

Hall (1979) estimated the consumption function based on expectations. The estimated consumption function used the weak efficiency assumptions i.e. the belief that past values can be used to explain the present values (Bodie et al., 2004). Hall concluded that past consumption values determine current consumption behaviour assuming that consumers are rational. This theory assumes that economic agents keep track of their consumption patterns. Consumption (c) decision at any time, say t , takes into account known information and expectations of the consumer about the future flow of income (Branson, 1989). If consumption is expected to fall then the economic agent will smooth out. For example, when consumption is expected to fall then the individual will adjust by saving more. Similarly, when consumption is expected to rise then the individual will have to either deplete their saved income or borrow in order to meet the required level of consumption.

2.3 Review of Empirical Literature

The Empirical studies that examined the determinants of gross domestic savings in developed and developing countries used different methods. Most studies used techniques like co-integration and error correction models which allow for heterogeneity in parameters and dynamics across countries, to determine the long-run determinants of saving rates.

A lot of empirical studies on determinants of gross domestic savings rate have been done both in developed and developing countries (for example, see Mahmoud (2008); Nwachukwu and Egwaikhide (2007); Ahmed (2011); Kidane (2010); Emmanuel and Ahmad (2001); Ahmad and Marwan, (2003)). Some of these studies focused mainly on relationship between demographic factors like fertility rates, the dependency ratio, life expectancy and savings rates. Majority of other studies examined a variety of macroeconomic variables such as income, real interest rate, and fluctuations in terms of trade, growth of money supply, government expenditure and openness of economy to capture the main determinants of savings rate. Furthermore, many studies used a mixed of demographic factors and macroeconomic factors. This study shall review various empirical studies that have been done capturing various factors that determine the saving performance.

In an attempt to investigate determinants of domestic saving performance for the period 1980-2005 in Egypt, Mahmoud (2008) used a variety of determinants that included growth per capita income, real interest rate, the ratio of broad money supply (M2) to GDP, budget deficit and current account deficit using co-integration test and error correction model. The study found a statistically significant and positive effect of growth of per capita income, real interest rate and inflation on domestic savings rate. However, it found that budget deficit, current account deficit and money supply had significant and negative effects on domestic savings performance in Egypt.

In Ethiopia, Kidane (2010) examined the determinants of gross domestic savings for the period 1971-2009. The study used variables such as per capita income, inflation rate, total dependence ratio, real interest rate, the ratio of broad money supply (M2) to GDP, growth of tax revenue and lagged gross domestic savings. The model was estimated using co-integration and error correction model. The results of the estimated model provided evidence of a statistically positive effect of growth of per capita income and growth of tax revenue on gross domestic savings. On the other hand, real interest rate, the ratio of broad money supply (M2) to GDP, lagged gross domestic savings and dependence ratio seemed to have negative effects on gross domestic savings in Ethiopia.

In Nigeria, Nwachukwu and Egwaikhide (2007) analyzed the determinants of private saving model for the period 1970-2005 using an Error-Correction Model. The study used variables such as real per capita income, growth rate of real per capita income, real interest rate, rate of inflation, public saving rate, external debt service ratio, terms of trade and the degree of financial depth. The estimated results reveal that the per capita income, rate of inflation, terms of trade, external debt service ratio and public saving rate have positive and significant impact on private saving rate. Also, the real interest rate on bank deposits and growth rate of real per capita income have a significant negative impact on private savings. However, the degree of financial depth had negative but insignificant impact on private saving in Nigeria.

Ahmed (2011) analyzed empirically the determinants of domestic savings in a number of African countries using variables such as per capita income, interest rate on deposits and the age dependency ratio. He estimated the model using ordinary least squares technique applied to cross-sectional data obtained from a set of from African Countries. He established from the results that African domestic savings were positively correlated with income and negatively correlated with commercial banks deposit rate and the age dependency ratio.

In Malaysia, Ahmad and Marwan, (2003) examined empirically the determinants of gross saving rate using the Johansen (1990) co-integration and error-correction model for the period 1960-2000 to address non-stationarity problem of time series variables. In this study, they used variables like export rate, interest rate, foreign direct investment, tax rate, dependency ratio and economic growth. The estimated results indicate that in the long run, savings rate is determined by dependency ratio, economic growth, interest rate and foreign direct investment. Moreover, short-run error-correction model shows that, saving rate is also determined by tax rate and growth of exports.

Giovannini (1985) estimate interest elasticity of saving using cross-sectional data for Malaysia, Burma, Singapore, India, Korea, Taiwan and Philippines, over different periods of time. He used an aggregate saving equation of the Keynesian type similar to the one used by Fry (1978). The estimated results revealed that savings rates respond positively to the rate of interest in developing countries.

Emmanuel and Ahmad (2001) using Granger-Causality test (co-integration test), examined the causality between economic growth and the growth rate of domestic savings for Kenya, Zambia, Congo, Ghana, South Africa, Nigeria and Côte d'Ivoire. The study discovered that empirical results for Ghana, Kenya, Nigeria and Zambia indicate that economic growth Granger causes growth of domestic saving and that there is a long run relationship between economic growth and growth rate of savings

Mohan (2006) examined the direction of causality and impact between domestic savings and economic growth for a number of countries with different levels of income and economic growth. The results revealed that the direction of causality runs from economic growth to domestic savings. Also, income level in a country is found to play a significant role in determining the direction of causality between domestic savings and economic growth. This

is similar to Modigliani (1970) finding that has shown that there is a large and highly significant positive correlation between saving and growth in a cross section of countries.

Paiva and Jahan (2003) examined empirically the determinants of private saving in Brazil using data for the period 1965-2000. The study used variables such as per capita income, inflation, m2, public savings, terms of trade and ratio of urban population to labor force. The study found that per capita income, inflation, terms of trade and m2 have a positive and significant impact on the private saving rate. Furthermore, the public saving and ratio of urban population to labor force have a negative impact on private saving rate.

Narayan and Al Siyabi (2005) empirically investigated determinants of national savings in Oman and the variables used include money supply, current account balance and rate of urbanization. They estimated the model by the bounds testing and examined the long-run and short-run effects of determinants of national savings in the country. The results concluded that money supply, urbanization rate and current account balance had long-run statistically significant impacts in Oman.

In Pakistan, Khan et al. (1994) examined the determinants of national saving rate. The model used variables such as foreign aid, income, real interest rate, changes in terms of trade, and openness of economy, dependency ratio and foreign capital inflows. The estimated results indicated that per capita GNP, real interest rate, change in terms of trade and openness of the economy have positive and significant impact on national saving in Pakistan. However, it was found that debt/ GNP ratio and dependency ratios have negative and significant impact on national saving.

In an attempt to analyze the determinants of private saving in India, Athukorala and Sen (2004) estimated a saving rate function using the life-cycle model. The results indicate that the spread of banking facilities, the growth level of per capita income, the rate of inflation

and the real interest rate have positive and significant impact on domestic saving in India. However, terms of trade and remittances from abroad have a negative and significant impact on the saving rate. The study noted that public saving is different from private saving in India.

Metin_Özcan and Özcan, (2005) used a sample of 15 countries in the Middle East and North Africa to investigate the determinants of private savings. The model used variables such as growth of income, per capita income, public savings, inflation and m2. The findings revealed that the growth rate of income, per capita income and inflation have a positive and significant impacts on private savings. The study also indicated that public savings has negative impact on private savings. The other important conclusion is that countries with well developed financial sector always are likely to encourage accumulation of private savings.

To examine the long-run determinants of aggregate private saving rates in a dynamic panel of developing countries during the post Second World War period, Sarantis and Stewart (2001) used panel co-integration and integration tests. The estimated results indicated that the long-run equilibrium saving function can be obtained. The study also found that determinants of aggregate private saving rates are numerous and vary from one country to another across developing countries.

In another study, Hallaq (2003) using OLS technique, investigated the determinants of private savings in Jordan. The model used many variables such as dependency ratio, government savings, financial deepening, GDP growth rate, GDP per capita income, the real interest rate, inflation rate, and terms of trade. The estimated results revealed that the dependency ratio and government savings have negative and significant impacts on private savings. Moreover, financial deepening, GDP growth rate and GDP per capita income have positive and

significant impacts on private savings. Furthermore, in Jordan, the real interest rate, inflation rate, and terms of trade seem to have no significant impacts on the private saving rate.

In another empirical study carried out using data from ten Asian countries for the period 1961-1988, Fry (1991) examined the effects of economic growth, terms of trade, foreign capital, interest rate and population growth on savings rate. In his study, he used a reduced form model. It was found that variables such as economic growth and interest rate were positive and significant while foreign debt and dependency ratio were negative and significant which means that these are some of important factors which affect saving behaviour in Asian countries. Using a similar model, Fry (1994) estimated a domestic saving function for Malaysia for the period 1971-91. The estimated results found that economic growth has a positive impact on domestic savings, while dependency ratio and foreign capital had negative effect on domestic saving rate. The variables used in the model were statistically significant.

In Kenya, Mweha *et al.* (1990) examined the impact of real interest rates on mobilization of savings using the McKinnon (1973) and Shaw (1973) hypothesis. Their model used variables such as demand for real money balances, interest rate, private savings and the growth of real income. The estimated results found that the private savings rate and demand for real money balances do not have significant impact on a real deposit interest rate. In addition, the growth rate of real income does have positive and significant impact on private savings rate in Kenya.

Tiriongo (2005) analyzed the determinants of aggregate domestic private savings using OLS estimation technique in Kenya. He used demographic variables such as young and old age dependency ratios, real per capita income, indicators of financial sector development, deposit rate used at central bank, current account deficit, spread of interest rate, terms of trade,

inflation rate and income tax. The findings indicated that aggregate private savings in Kenya are significantly determined by the ratio of M2 money to GDP, real gross per capita income growth, current account deficit, deposit rate and the old age dependency ratio.

2.4 Overview of Empirical Literature

It can be concluded from the Overview of Empirical Literature that determinants of savings rates are several. Some empirical studies revealed that variables such as GDP growth rate and GDP per capita growth rate represent the most important determinants of gross domestic savings (Mahmoud 2008; Kidane 2010; Emmanuel and Ahmad 2001). Also, budget deficit and current account deficit had negative impact on saving rate. While lagged gross domestic saving rate, interest rate, broad money and inflation rate appeared to have an ambiguous impact on saving levels and thus the significance of these variables was mixed between studies (Athukorala and Sen 2004; Mahmoud 2008; Nwachukwu and Egwaikhide 2007; Ahmed 2011; Kidane 2010; Ahmad and Marwan 2003).

Nevertheless, factors which have successfully explained determinants of domestic savings rates in one country would not be certainly appropriate or successful in another country due to differences in economic, social, and demographic conditions among countries. Some of these factors may be significant in one case, but not in others, and thus they should be carefully examined taking into consideration the characteristics of each case. Thus, this study tries to determine factors that explain gross domestic savings rate in Kenya, which may help policy makers to formulate policies that enhance domestic saving rates.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter deals with the methodology used in analyzing determinants of gross domestic savings in Kenya. Sections 3.2 and 3.3 outline theoretical framework and empirical model specification respectively. The definition of variables, data sources and estimation procedures are also explained in this chapter.

3.2 Theoretical Framework

The theoretical model used in this study is derived from the seminal works of McKinnon (1973) and Shaw (1973) and is reformulated to incorporate other variables that have strong relationship with gross domestic savings in Kenya. This framework is appropriate for Kenya because it has been used by many researchers in developing economies. Furthermore, this framework captures some of the variables that have been explained by the relevant literature and the model specifically incorporates the variables that are captured in the major theories of savings.

McKinnon and Shaw (1973) argued that policies that lead to financial repression reduce the incentives to save. Reduced savings result in reduced investment which in turn leads to lower growth. Hence they concluded that higher interest rates resulting from financial liberalization prompt households to increase savings. McKinnon theory focuses also on response of demand for real money and investment to different rates of return on assets. McKinnon-Shaw complementarity hypothesis can be expressed as follows:

$$M/P = L(Y, d - \pi^e, I/Y); L_Y > 0, L_{I/Y} > 0, L_{d - \pi^e} > 0 \dots \dots \dots (1)$$

where, M/P is demand for money balances, Y is real income, I/Y is ratio of real investment to real income, d is nominal interest rate on savings and time deposits, π^e is expected

inflation rate, and $d - \pi^e$ is real interest rate. Equation (1) gives the long-run real money demand function. L_Y represents the impact of income on money demand. Hence, an increase in the income generates a strong demand for money. $L_{I/Y}$ represents the response of money demand to investment rate. Hence, investment increases the monetary saving. L_{d^e} represents a positive impact of real interest rate on money demand.

Under equilibrium condition, the ratio of actual investment to income (I/Y) must correspond to existing savings in the economy, hence

$$I/Y = S/Y = F(r, d - \pi^e) \dots\dots\dots (2)$$

where, S/Y is the ratio of actual gross domestic savings to income and r is rate of return on capital. Real deposit rates are usually below equilibrium level under a financially repressed economy, thus a positive relationship exists between savings and the real deposit rate ($d - \pi^e$). This is because a rise in interest rates towards equilibrium induces economic agents to shift from other assets to savings. Equation 2 is a private sector investment function which depends on real interest rate.

To establish the relationship between savings and growth in the demand for real money balances, we differentiate equations 1 and 2 then divide their differentials to obtain;

$$\frac{d[M/P]}{d[S/Y]} = \frac{d[M/P]/d(i)}{d[S/Y]/d(i)} = \frac{I(i)}{f(i)} > 0 \dots\dots\dots (3)$$

Equation 3 gives a positive relation between savings rate and the demand for real money balances. Thus savings rate can be incorporated as one of the determinants of demand for real money balances as follows;

$$M/P = L(Y, S/Y, d - \pi^e, I_G/Y) \quad L_Y > 0; L_{S/Y} > 0; L_{I_G/Y} > 0; L_{d^e} > 0 \dots\dots\dots (4)$$

In the model, a rise in real interest rates leads to an increase in savings and also growth in the demand for real money leading to an increase in savings. Complementarity hypothesis works

both ways in that the conditions of money supply have first-order impact on decision to save and invest, thus a savings function that involves demand for real money is given as follows;

$$S/Y = f(Y, r, M/P, S_G/Y, U) \dots\dots\dots (5)$$

Empirical Model Specification

In order to estimate the determinants of gross domestic savings in Kenya, the saving function in Equation 5 is re-specified to include growth of per capita income (GPCI) and a proxy for external savings. The study used the difference between exports and imports to obtain current account balance. Based on the above discussion, the functional relationship between gross domestic savings rate (GDS/Y) and its determinants is expressed as:

$$GDS/Y = f(GGDP, PCI, MS/Y, RDR, PS/Y, CA/Y, U)\dots\dots\dots (6)$$

The specific econometric model can thus be explicitly expressed as follows:

$$(GDS/Y)_t = \beta_0 + \beta_1 PCI_t + \beta_2 GGDP_t + \beta_3 RDR_t + \beta_4 (MS/Y)_t + \beta_5 (CA/Y)_t + \beta_6 (PS/Y)_t + U_t \dots\dots\dots (7)$$

where, **GDS/Y** is the gross domestic savings as a proportion of GDP, **GGDP** is the growth rate of the real Gross Domestic Product (GDP), **PCI** is the real per capita income, **RDR** is the real deposit rate of interest on bank deposits, **MS/Y** is the ratio of broad money supply (M2) to GDP, **PS/Y** is public savings as a proportion of GDP, and **CAB/Y** is the current account balance expressed as a proportion of GDP.

In the model, t represents time period under analysis, U_t is the error term and is used to capture the unobserved effects and assumed to have zero mean and non-serial correlation, β_1 to β_6 are co-efficients of associated independent variables; and β_0 is the constant intercept of the equation.

3.3 Variable Definition and Priori Expectations

Gross Domestic savings (GDS)

In this study, Gross Domestic savings (GDS) is given as dependent variable and expressed as a percentage of GDP. This is a total domestic savings by government, firms and households in a given year. Savings could be in terms of bank deposits; loans and invested funds.

Growth Rate of Gross Domestic Product (GGDP)

This is expressed as percentage of GDP and this is a measure of economic growth. Countries with higher economic growth rates are expected to have higher saving ratios than countries with lower growth rates. Thus, a positive relationship is expected between GDP growth rate and gross domestic savings.

GDP Per Capita Income (PCI)

The real per capita income is expressed as GDP divided by the population in a given year. The absolute income hypothesis and the permanent income hypothesis predict a positive effect of income on domestic savings.

Real Deposit Rate (DR)

This is an interest rate on bank deposits and refers to rates offered to savers for demand, time, or savings deposits. This variable will serve as the relative price of current consumption with respect to future consumption. A positive relationship between gross domestic savings and real deposit rate is expected.

Broad Money (MS)

This is a proxy for measuring financial sector and market development. Broad money supply is the ratio of broad money (M2) to GDP. It is believed that there exists a potential positive effect of the financial sector development on gross domestic savings.

Current Account Balance (CAB)

This gives the difference between total exports and imports and is expressed as the ratio of GDP [(imports – exports)/GDP]. A negative relationship is expected between current balance and gross domestic savings rate.

Public Savings (PS)

Fiscal balance is defined as the difference between government taxes and expenditure. This is expressed as percentage of GDP and is used to evaluate the Ricardian equivalence for Kenya. A negative relationship is expected between gross domestic savings and fiscal balance.

3.4 Data Type and Sources

This study used mainly time series secondary data for analysis covering the period 1971-2012. The data was obtained from the World Development Indicators (2012), World Bank databank, Economic Surveys of Kenya (various issues) and Statistical Abstract of Kenya (various issues).

3.5 Estimation Technique

This study used time series data analysis and the model was estimated using co-integration and error correction models using E-views 7 software package. The values and signs of the coefficients obtained from the estimated model helped in answering the questions stated in the research questions/hypothesis.

3.6 Diagnostic Tests

Diagnostic tests were used to establish whether the model was consistent or not. These tests involved test for normality, serial correlation and heteroskedasticity test, and checking correct model specification using the Ramsey RESET test.

3.7 Unit Root Test

The procedure for analysis of time series data involved determining the stationarity of each variable by checking for the presence of unit roots by the use of Augmented Dickey-Fuller (ADF) test to reflect long-run relationship. This was done by testing for unit roots to correctly test the hypothesis concerning the variables having unit roots (integrated of at least order one).

3.8 Granger Causality test

The Granger causality test was used to determine whether gross domestic savings in Kenya causes growth of income or vice versa. The need to establish Granger causality arises out of the fact that the presence of co-integration between two variables does not necessarily prove the direction of causality. In this paper, Granger causality test was employed to determine the direction of causality between gross domestic savings and economic growth.

3.9 Co-integration Test and Error Correction Model (ECM)

The co-integration test was used for checking the stationarity of the residuals (u_t) from the long-run relationship. The step is to test for the presence of co-integration among the explanatory variables. The linear combination of the variables in the Equation (8) is co-integrated if the residuals are integrated of degree zero. In this step, the first differential of variables and lagged residuals from the long-run equation was used to estimate a short-run error correction equation, which modelled the short-run dynamics.

This study used the general model to anticipate the presence of both stationary and non-stationary variables. The general model based on Mahmoud (2008) aims to minimize the possibility of estimating spurious relations while retaining long-run information. The dynamic relationship includes lagged independent variables, plus the lagged value of the residual from the co-integrating regression (U_{t-1}), in addition to the first difference of

variables, which appear in the right hand side of the long-run relationship in equation (9). This means that if actual equilibrium value is too low, the error correction term will rise and if it is too high, the error correction term will reduce it. The dynamic relationship is given as following:

$$\Delta(\text{GDS}/Y)_t = \alpha_0 + \alpha_1 \Delta \text{GGDP}_t + \alpha_2 \Delta \text{PCI}_t + \alpha_3 \Delta \text{RDR}_t + \alpha_4 \Delta (\text{MS}/Y)_t + \alpha_5 \Delta (\text{CA}/Y)_t + \alpha_6 \Delta \text{PS}_t + \alpha_7 \text{ECM}_{t-1} + v_t \dots \dots \dots (8)$$

CHAPTER FOUR
EMPIRICAL ESTIMATION RESULTS

4.1 Introduction

This chapter discusses data analysis and findings of the study. The first part presents the stationarity test, followed by co-integration and error correction model estimation. The last part discusses regression results and interpretation.

4.2 Stationarity Test

A unit root test was conducted on all variables in both levels and first differences using Augmented Dickey-Fuller (ADF). The results of these tests are presented in Table 4.1 which

Table 4.1 Augmented Dickey-Fuller Test for Unit Root

Variables	At Level		At First Difference	
	Statistics	Critical Value	Statistics	Critical Value
GDS	-0.4680	-3.6010 (at 1%) -2.9350 (at 5%)	-6.1940	-3.6010 (at 1%) -2.9350 (at 5%)
GGDP	-4.1408	-3.6010 (at 1%) -2.9350 (at 5%)		
GPCI	-0.9301	-3.6010 (at 1%) -2.9350 (at 5%)	-5.8585	-3.6010 (at 1%) -2.9350 (at 5%)
RDR	-1.8476	-3.6010 (at 1%) -2.9350 (at 5%)	-4.9874	-3.6010 (at 1%) -2.9350 (at 5%)
M2	-0.4804	-3.6010 (at 1%) -2.9350 (at 5%)	-7.4284	-3.6010 (at 1%) -2.9350 (at 5%)
CAB	0.9629	-3.6010 (at 1%) -2.9350 (at 5%)	-5.7790	-3.6010 (at 1%) -2.9350 (at 5%)
PS	-1.7564	-3.6010 (at 1%) -2.9350 (at 5%)	-5.5235	-3.6010 (at 1%) -2.9350 (at 5%)

Source: Author's own computation with E-views 7

show that the hypothesis of the presence of a unit root cannot be rejected in most variables at levels except Growth Rate of Gross Domestic Product (GGDP) variable which is stationary at

levels. However, the hypothesis of presence of unit root is rejected in first differences which show that all variables are stationary after first differencing.

4.3 Cointegration Model Estimation

After having tested for the presence of unit root among the variables both at levels and first differences, the next step was to test whether all variables had long run relationship. This was established by use of the Johansen-Juselius Co-integration Technique (Johansen and Juselius, 1990). This technique involves analyzing stationarity of the residuals (e_t) from the long run relationship. If the residuals are stationary, then it indicates that the independent and dependent variables are co-integrating. Consequently, it means that there exists a long run relationship or equilibrium between independent and dependent variables. Tables 4.2 and 4.3 show the results of co-integration test.

Table 4.2 Unrestricted Co-integration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.793285	155.4881	125.6154	0.0002
At most 1	0.542305	92.43163	95.75366	0.0828
At most 2	0.495405	61.16957	69.81889	0.2012
At most 3	0.330626	33.80964	47.85613	0.5123
At most 4	0.230991	17.75313	29.79707	0.5844
At most 5	0.152547	7.247007	15.49471	0.5491
At most 6	0.015534	0.626234	3.841466	0.4287

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Table 4.3 Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.793285	63.05650	46.2314	0.0004
At most 1	0.542305	31.26206	40.07757	0.3450
At most 2	0.495405	27.35993	33.87687	0.2446
At most 3	0.330626	16.05651	27.58434	0.6610
At most 4	0.230991	10.50612	21.13162	0.6962
At most 5	0.152547	6.620773	14.26460	0.5349
At most 6	0.015534	0.626234	3.841466	0.4287

Max-eigen-value test indicates 1 co-integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values.

The results presented in Tables 4.2 and 4.3 show that the null hypothesis of no co-integration ($e = 0$) is rejected at 5% level of significance. This conclusion is based on both the trace and maximum Eigen value (λ -max) statistics. Trace and maximum eigen value statistics indicate that there exist one co-integrating equation at the 5% critical value and the p-value 0.0004 is less than the 0.05 level of significance. Thus, the variables in the model are co-integrated which leads to an important conclusion that there is a common trend among the variables, which means that there exists a long-run relationship between growth of per capita income, real interest rate on deposits, broad money, public savings, current account balance, and gross domestic savings in Kenya.

Since all variables are co-integrated, then we proceed to run the long run relationship. Table 4.4 shows estimated co-integration model.

Table 4.4: Co-integration Model Estimates (t- statistics in parentheses)

Variables	Co-efficient	P-Value
Constant	23.54041 (2.536725)	0.0157
PCI	5.826667 (0.014975)	0.9881
RDR	-0.055174 -0.722918)	0.4744
M2	-0.165129 (-1.125733)	0.2677
PS	-0.296226 (-3.270949)	0.0413
CAB	-0.813556 (-6.083986)	0.0000
Dependent variable = GDS Number of Observations = 42 R-squared = 0.803167 Adj R-squared = 0.775829 F-statistics = 29.37914 Prob>F = 0.000000 Durbin- Watson Stat = 1.607405		

Source: Author's computation with E-views 7

Table 4.4 shows that real per capita income (PCI) has a positive and statistically insignificant impact in the long-run on gross domestic savings at 5% significance level. The current account balance (CAB) has a negative and significant impact in the long-run on gross domestic savings at 1% level of significance. Also, public savings (PS) has a negative and statistically significant impact in the long-run on gross domestic savings at 5% significance level. However, broad money (M2) and real deposit rate (RDR) exerted negative but insignificant impact on gross domestic savings in the long run at 5% significance level.

All the independent variables jointly determined the gross domestic savings in the long-run since the p-value of F-statistics is less than 5%. Individual significance of the variables was determined by looking at p-value. Also, the adjusted R^2 is about 77%, which means that in

the long-run, changes in explanatory variables explain 77% variations in the gross domestic savings ratio in Kenya during the period (1971-2012). The Durbin-Watson statistics is 1.61 which means that there is absence of autocorrelation.

4.4 Error-Correction Model (ECM)

It was noted that GGDP variable was stationary at level but other variables were non-stationary and became stationary after first difference. However, estimating a model with first differenced variables leads to a loss of crucial long-run equilibrium. In order to bridge both the long-run and short-run equilibriums, an error-correction model is used. Table 4.5 shows the error correction model estimation.

Table 4.5: Error-Correction Model Estimates (t- statistics in parentheses)

Variable	Co-efficient	P-Value
CONSTANT	-0.204128 (-0.746993)	0.4607
D(GDS _{t-1})	-0.209135 (-2.050178)	0.0489
D(GGDP)	0.174365 (1.857012)	0.0728
D(PCI)	0.000846 (2.118169)	0.0423
D(DR)	-0.054791 (-1.514546)	0.1400
D(M2)	-0.058741 (-0.484929)	0.6311
D(PS)	-0.273136 (-3.314611)	0.0023
D(CAB)	-0.804117 (-6.471619)	0.0000
ECM _{t-1}	0.630638 (7.953118)	0.0000
Dependent variable = D(GDS) Number of Observations = 41 R-squared = 0.868308 Adj R-squared = 0.834323 F-statistics = 25.54972 Prob>F = 0.000000 Durbin- Watson Stat = 2.462841		

Source: Author's computation with E-views 7

The table shows that the current account balance (CAB) and public savings (PS) are negative and have statistically significant impact on gross domestic savings in the short-run at 1% significance level. The lagged gross domestic savings $D(GDS_{t-1})$ has a negative and significant impact on gross domestic savings in the short-run at 5% significance level. The real per capita income (PCI) and economic growth (GGDP) have positive impacts on gross domestic savings in the short-run at 10% significance level. The real interest rate on deposits (RDR) and broad money (M2) have statistically insignificant impacts on gross domestic savings in the short-run at 5% significance level. The error-correction term (ECM_{t-1}) is 0.63 which means that the speed of adjustment is 63% which shows that the model will correct disequilibrium position at the rate of 63% annually. All the independent variables jointly determined the gross domestic savings in the short-run since the p-value of F-statistics is less than 5%. The Durbin-Watson Statistics is 2.46 which shows that there is no autocorrelation.

4.5 Granger Causality Test

Table 4.6: Granger Causality Test Estimates

Direction of Causality	P-Values	Lag	Decision	Outcome
GGDP does not cause GDS	0.0239	2	Reject HO	GGDP Causes GDS
GDS1 does not granger cause GDS	0.9892	2	Accept HO	GDS1 does not cause GGDP
GGDP does not granger cause GDS	0.0084	4	Reject HO	GGDP Causes GDS
GDS1 does not granger cause GDS	0.985	4	Accept HO	GDS1 does not cause GGDP
GGDP does not cause GDS	0.0411	6	Reject HO	GGDP Causes GDS
GDS1 does not granger cause GDS	0.9402	6	Accept HO	GDS1 does not cause GGDP
GGDP does not cause GDS	0.0336	8	Reject HO	GGDP Causes GDS
GDS1 does not granger cause GDS	0.6085	8	Accept HO	GDS1 does not cause GGDP

Source: Author's computation with E-views 7

The need to establish Granger causality arises out of the fact that the presence of co-integration between two variables does not necessarily prove the direction of causality. Table 4.6 establishes a unidirectional causality running from economic growth (GGDP) to gross domestic savings (GDS) since p-value of the lag GGDP causing GDS is less than 0.05.

4.6 Discussion of the Estimated Results

The paper examined major determinants of gross savings in Kenya for the period 1971-2012. The co-integration test indicated that the variables used in the model were co-integrated which means that there is a long-run equilibrium between the independent variables and the gross domestic savings.

The model estimates indicate that the current account balance is found to have negative but very statistically significant impact on gross domestic savings both in the short and long-run at 1% significance level. This implies that a one percent increase in current account balance would result to 0.80 and 0.81 percentage point decrease in gross domestic savings in both the short and long-run respectively. It can be argued that an increase in current account deficit increases foreign savings and thus reinforces the argument that persistent current account deficit has a negative impact on gross domestic savings. An increase in foreign saving is associated with a partial decline in private saving due to the fact that foreign saving could act as a substitute to domestic saving. Therefore, this empirical finding is consistent with priori expectations that current account balance affects savings negatively. The result is consistent with the findings of Özcan et al. (2003), Mahmoud (2008), Narayan and Al Siyabi (2005) and Tiriongo (2005).

The public savings as a measure of fiscal balance recorded a negative and statistically significant impact on gross domestic savings both in the short and long-run at 5% significance level. This means that a one percent increase in the public savings leads to a 0.27 and 0.29 percentage point decrease in gross domestic savings in the short-run and long-run respectively. The result confirms the view that public savings has significant impact on gross domestic savings. This result shows that government savings affect private savings negatively and thus, Ricardian Equivalence does not strictly hold for Kenya. This finding is consistent with the works of Mahmoud (2008), Nwachukwu and Egwaikhide (2007).

In addition, the results found that the real per capita income has positive and significant impact on gross domestic savings in the short-run and has positive but insignificant impact in the long-run at 5% significance level. This supports the argument that growth of income at individual level is a major determinant of gross domestic savings in developing countries in the long-run. Therefore, this empirical finding is consistent with priori expectations that the real per capita income affects savings positively. This finding is consistent with the works of Kidane (2010), Hallaq (2003), Ahmed (2011), and Khan et al. (1994).

The results from Granger Causality test established unidirectional causality which runs from economic growth (GGDP) to gross domestic savings (GDS) since p-value of the lag GGDP causing GDS is less than 0.05 at various lags. Therefore, this empirical finding is consistent with priori expectation that economic growth causes affects savings.

In conclusion, it is important to note that all the independent variables jointly determine the gross domestic savings in the long run since the p-value of F-statistics is less than 0.05. The error-correction term (ECM_{t-1}) is 0.63 which means that the speed of adjustment is 63% which shows that the model will correct disequilibrium position at the rate of 63% annually. All the independent variables jointly determined the gross domestic savings in the short-run since the p-value of F-statistics is less than 5%. Also, the adjusted R^2 is about 83%, which means that in the long-run, changes in explanatory variables explain 83% variations in the gross domestic savings ratio in Kenya during the period (1971-2012). The Durbin-Watson statistics is 2.46 which mean that there is absence of autocorrelation.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY RECOMMENDATION

5.1 Introduction

This chapter presents the summary of the study, conclusions, policy recommendations and areas for further research.

5.2 Summary of the Study

This study examined the major determinants of gross domestic savings rate (GDS) in Kenya using the annual data for the period 1971-2012. The macroeconomic variables used include the economic growth, real per capita income, real deposit interest rate and broad money, public savings and current account balance as proportion of GDP. The model was estimated using co-integration and error-correction models.

The study conducted a unit root test using Augmented Dickey Fuller test to check for the presence of unit root both at levels and first difference to avoid regressing non-stationary variables. The test showed that all variables contained unit root at levels except economic growth. However, all variables were stationary after first difference.

The co-integration test showed that the variables in the model were co-integrated, meaning there existed a long run relationship between identified determinants of savings and the gross domestic savings. The model estimates indicate that the current account balance exerts a negative but very statistically significant impact on the gross domestic savings in both the short-run and long-run. Also, the public savings as a measure of fiscal balance recorded a negative and statistically significant impact on gross domestic savings in both the short-run and long-run.

The results from Granger Causality test established unidirectional causality running from economic growth (GGDP) to gross domestic savings (GDS). However, economic growth had positive but significant impact on gross domestic savings both in the short run and long run at 10% significance level.

In addition, the real per capita income has positive and significant impact on gross domestic savings in the short-run and has positive but insignificant impact on domestic savings in the long-run. Whereas financial deepening (M2) and real deposit rate (RDR) were found to have negative but statistically insignificant impact on the gross domestic savings both in the short run and long run.

5.3 Conclusions

Since savings, capital accumulation and growth are inter-related, there is a need to understand the determinants of the gross domestic savings in a developing country in order to address chronic lack of generated internal resources to propel economic growth. It is usually taken that increasing domestic savings rate in Kenya has a great role to play in promoting and sustaining high growth rate and thus increasing investment rate. This study contributed to economic literature by identifying major determinants of gross domestic savings in Kenya using annual data for the period 1971-2012.

Statistical evidence from this study showed that the long run relationship between domestic savings and its determinants differ with its short run dynamics. Empirical results showed that current account balance is found to have negative but very statistically significant impact on the gross domestic savings both in the short-run and long-run. Also, public savings recorded a negative and statistically significant impact on gross domestic savings both in the short-run and long-run.

In addition, the real per capita income is found to have positive and significant impact on gross domestic savings in the short-run and has positive but insignificant impact on domestic savings in the long-run. The study also found unidirectional causality running from economic growth (GGDP) to gross domestic savings (GDS).

However, financial deepening (M2) and real deposit rate (RDR) were found to have negative but statistically insignificant impact on the gross domestic savings both in the short run and long run.

5.4 Policy Recommendations

This study has important elements that can help the Kenyan economy and other developing economies to mobilize domestic resources in order to increase domestic savings to stimulate investment and growth.

The current account deficit as a measure of foreign savings has been found to play a negative statistically significant role in affecting gross domestic savings in Kenya. Hence, the important policy question is: what should policy makers do to reduce negative impact of current account deficit on domestic savings? The policy actions should focus on measures that reduce current account deficit and these measures should include expanding exports and focusing on local alternative sources of imports. The rationale for this recommendation is based on the fact that resources meant for savings and investments within the country are spent on foreign goods which lead to volatility in foreign exchange rate, depreciation of local currency due to massive external debts and interest payments.

In this study, public savings recorded a negative and statistically significant impact on gross domestic savings in both the short-run and long-run. This explains that higher government savings could partially crowded out private savings, and Ricardian Equivalence does not strictly hold for Kenya. Thus, policy makers should ensure that government controls spending

so as not to adversely affect gross domestic savings. The government should embark on policies and reforms that broaden the tax base and improve tax administration. These reforms would increase government revenues which reduces fiscal deficits and enhances gross domestic savings in Kenya.

Empirical results also show that the real per capita income has positive and significant impact on gross domestic savings in the short-run and has positive but insignificant impact on domestic savings in the long-run. The policy actions should focus on measures that increase the level of income of people in the country.

Finally, the study also found unidirectional causality which runs from economic growth (GGDP) to gross domestic savings (GDS). The policy actions should focus on measures that promote output expansion which enhance growth of savings.

The study concludes that there is a potential for increased domestic savings and this calls for policy changes and political will among policy makers who should put more emphasis on current account deficit, public savings, income and economic growth that influence savings.

5.5 Areas for Further Research

The paper recommends that further research be done using cross-sectional data in order to capture household and demographic effects on domestic savings.

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APPENDIX

Appendix 1: Data for the Research Paper

Year	Gross domestic savings (% of GDP)	GDP growth (annual %)	GDP per capita Income (in real terms)	Real Deposit interest rate (%)	Broad money (% of GDP)	Current Account Balance as (% of GDP)	PS/Y as % of GDP
1971	17.37	22.17	26591.92	-3.4	29.67	6.55	-4.17
1972	20.18	17.08	30037.62	-0.1	28.54	2.14	-4.94
1973	24.54	5.90	30674.95	-10.4	30.49	1.28	-6.17
1974	18.53	4.07	30773.54	-10.7	25.71	7.22	-5.93
1975	13.45	0.88	29919.81	-6.71	27.39	4.69	-3.02
1976	20.94	2.15	29451.08	-13.8	28.18	-0.70	-3.32
1977	27.09	9.45	31056.51	-11.8	32.80	-3.37	-3.21
1978	20.04	6.91	31982.67	2.05	34.53	9.75	-2.37
1979	12.27	7.62	33144.03	-0.51	34.35	5.86	-5.27
1980	18.12	5.59	33692.82	-3.8	29.93	6.38	-8.41
1981	19.55	3.77	33654.17	-2.01	29.47	3.36	-11.01
1982	16.96	1.51	32879.77	0.61	30.42	4.90	-11.15
1983	18.66	1.31	32065.56	1.43	28.18	2.26	-9.95
1984	14.51	1.76	31420.84	1.58	28.34	5.30	-12.86
1985	20.48	4.30	31575.99	2.94	26.68	4.85	-12.09
1986	17.72	7.18	32627.09	2.54	30.39	4.05	-13.54
1987	19.20	5.94	33344.28	4.91	30.24	5.09	-10.69
1988	20.22	6.20	34185.98	3.88	28.90	5.23	-15.95
1989	17.77	4.69	34573.90	2.23	28.40	7.09	-14.43
1990	18.53	4.19	34825.29	3.03	29.58	5.64	-18.23
1991	19.46	1.44	34173.86	-0.03	30.98	1.51	-4.36

1992	16.51	-0.80	32817.57	-7.4	36.52	0.41	-3.92
1993	22.56	0.35	31911.04	-12.4	37.07	-4.95	-6.42
1994	22.11	2.63	31772.98	-4.62	38.02	-2.81	1.62
1995	15.26	4.41	32225.11	2.38	42.23	6.56	2.2
1996	8.09	4.15	32646.80	-24.4	35.79	6.91	0.63
1997	6.46	0.47	31943.45	5.29	38.42	8.68	1.79
1998	8.13	3.29	32151.78	11.46	35.81	8.56	2.65
1999	8.99	2.31	32055.15	5.36	35.77	6.53	-3.45
2000	7.28	0.60	31416.12	2.02	35.16	10.13	2.33
2001	8.71	3.78	31749.82	5.07	35.24	10.08	-1.14
2002	9.76	0.55	31077.81	4.55	38.16	5.38	-0.41
2003	10.52	2.93	31135.78	-2.06	39.02	5.96	-2.43
2004	10.71	5.10	31851.75	-4.69	39.33	6.26	3.04
2005	10.19	5.91	32836.56	0.18	38.91	7.46	0.72
2006	7.77	6.33	33992.25	-2.6	39.71	10.72	2.1
2007	8.20	6.99	35411.06	-0.45	42.32	10.92	1.57
2008	5.10	1.53	35005.09	-7.91	42.54	14.14	1.38
2009	6.58	2.74	35013.09	3.29	43.94	13.27	-2.91
2010	7.46	5.80	36062.85	2.59	49.70	12.16	-2.56
2011	4.19	4.42	36654.71	-6.51	49.95	16.57	0.07
2012	2.92	4.55	37302.51	2.17	51.16	17.38	-5.41

Source: World Bank Data bank, 2014