DETERMINANTS OF DOMESTIC PRIVATE INVESTMENTS IN KENYA

BY

ERNEST ZECHARIAH MBAYE

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Declaration

I declare that this is my own work and has never been presented for the award of any degree in any other university in Kenya. All references cited and data sources have been fully acknowledged.

Signed…………………………   Date………………………

Ernest Z. Mbaye

Approval

This paper has been submitted with my approval as the university supervisor.

Signed……………………..   Date……………………….

DR. ODHIAMBO SULE

Dedication

To God Almighty, my Strength and Guide, and my beloved mother.

Acknowledgement

Special thanks to God Almighty, Great Jehovah, who has me given me all the strength, will and guidance throughout this exercise. I also acknowledge the contribution made by my supervisor, Dr. Odhiambo Sule for his positive criticism and recommendations.

I wish to also thank all my friends and relatives who in one way or another helped me realize the completion of this project. May God richly bless each and everyone.

Abstract

Private investment is the engine of growth in any economy. It is a major source of employment besides positively contributing to national output. With this in mind, we set out to investigate what determines new levels of domestic private investments in Kenya. The study used data covering the period 1970-2010. The estimated long-run regression shows that real GDP growth rate, real exchange rate and broad money supply have a positive and significant effect on private investment. Others like trade policy, domestic savings, lending rates and foreign aid have a positive but insignificant impact on private investments. Markets play a major role when it comes to new investments. This microeconomic variable has never been studied in past studies to see how markets affect new levels of investments. This study has attempted to establish the impact of markets, even though this impact has not been quantified.

Private sector credit and political regimes have a negative but significant influence on private investments. Public investment, real deposit rates, public debt, inflation, foreign exchange reserves and financial liberalization have a negative but insignificant impact on private investments.

In view of the positive contribution of public investment, the study suggests policies such as increasing allocation of public funds for capital accumulation. Since real lending rates have a negative influence, it is important to reduce cost of credit through monetary policies.

He study is a guide to policy makers, economists and researchers in applying macroeconomic principles in real life economics of domestic private investments.

Abbreviations

ADF – Augmented Dickey-Fuller

DW – Durbin Watson

ECM – Error Correction Model

EN – Engle -Granger

GDP – Gross Domestic Product

GFCF – Gross Fixed Capital Formation

GOK – Government of Kenya

LM – Langrange Multiplier

PP – Philips-Perron

OLS – Ordinary Least Squares

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CHAPTER ONE

1.0 Introduction

1.1 Background Information

Economists define investments as the accumulation of newly produced physical entities, such as factories, machinery, houses, and goods inventories. Investments can also be defined as putting money into an asset with the expectation of capital appreciation, dividends, and/or interest earnings.

Investment also denotes change in physical stock of capital in a time period. The Investment Promotion Act (IPA 2004) defines investment as the contribution of local or foreign capital by an investor, including the creation of, or the acquisition of business assets by or for business enterprises, and includes expansion, restructuring, improving or rehabilitating of a business enterprise.

Most or all forms of investment involve some form of risk, such as investment in equities, property, and even fixed interest securities which are subject, among other things, to inflation risk. It is indispensable for project investors to identify and manage the risks related to the investment

The private sector plays a critical role in the overall macro-economic development in any country. Private investment forms a significant portion of a country's Gross Domestic Product (GDP). If investments grow, GDP also grows. Over the years the government of Kenya has been formulating programs to help stimulate private investments in the country. Since the public sector can only employ a limited number of people, with unemployment rate standing at about 40% in Kenya, it therefore cannot be gainsaid that the private sector remains a potential source for employment both in Kenya and even in the developed world.

Understanding the factors that affect the private sector will go a long way in helping solve some of the economic challenges in developing countries. Private investment stimulates demand for goods and services according to demand management theories of Keynes (1946) as well as increasing employment opportunities. While all governments appreciate the need for private sector development, knowledge about factors that influence this crucial sector remains scanty. Very few people have any basic insight as what to consider before investing in a commercial undertaking in Kenya. There are numerous factors that affect private investments, both which are quantitative and qualitative. Qualitative variables include real GDP, real interest rate, inflation, public investments, public debt, exchange rate, levels of savings, foreign exchange reserves, deposit rates, broad money supply as ratio of GDP, openness of the economy (trade

policy), foreign direct investments, foreign aid, etc. Non-quantitative variables include corruption, governance, efficiency of contracts, markets and others.

Since the 1970s, in Kenya, private investment as a percentage of GDP has been teetering between 7% and 16% (World Bank, Economic Surveys).This percentage hit an all time low in 2000 to stand at 7.47% due to various factors, both political and economic, while it stood at 14.2% in 1978 due to the coffee boom that was experienced that year. By the end of 2003, it had started picking up and reached 15.46% in 2007. The decline in private investments in 1980s could be attributed to financial liberalization and other structural adjustment programs that were introduced in the 1980s.

Kenya has been pursuing the Vision 2030 objectives since 2003. To help the country realize this vision, one of the challenges was to increase investments by at least by 22% of GDP per annum up to 2013 and thereafter, private investments are expected to grow by at least 24% per annum for the remaining period between 2014 and 2030. This is not an easy task. It calls for concerted efforts in mobilizing and allocating resources in line with the realization of this objective. Equally important is the growth in public sector investment, which has risen from 2.49% of GDP in 2005 to 6.08% in 2010 (GOK, Economic Surveys). This can only be achieved by raising development expenditure, increasing revenue collection, increased donor-funded development projects and prudent borrowing (both domestic and foreign) in order to improve infrastructure (GOK, 2008).

1.2 Macroeconomic Background
It is imperative that we give a brief background of the macroeconomic environment over the past years. With the right policy prescriptions, domestic private investments can significantly increase and add onto the national income.

Kenya's GDP growth rate plummeted in the mid 1970s to 1.5% in 1975 only for it to stabilize again in the late 1970s up to 7.9% in 1978. This could be attributed to the coffee boom that year. The economy shrank, however, in 1983 and 1984 to 1.6% in the two years, and stabilized again to stay between 4% and 6% up to 1990. In 1991, it dipped to 1.4%, only for it to hit an all time low of -1.08% in 1992 and -0.09% in 1993 following the introduction of multi party politics. A similar dismal performance of 0.29% was also recorded in 1997 following another general election. The economy managed to revive in the next two years, only to dip again in 2000 and 2002 at 0.59% and 0.29% respectively. The year 2002 was also another election year. It started picking up again from the year 2003 at 2.78% and rose steadily to 6.99% in 2007 when the country was gearing up for another general election. In 2008, however, it shrank again to 1.53%, the major reason being the post election violence. (GOK, 2009). Things started looking up, though, in 2009 when the economy grew by at least 3% .The economy has more or less been static at a

growth rate of between 4% and 5% up to 2012, now expected to grow at over 5% in 2014 (World Bank, Economic Survey, 2014)

The Kenyan economy remains small compared with the rest of the world. The sluggish economic growth in mid 1970s, mid 1980s and early 1990s can be attributed to such factors as an influx of imports with little exports, thereby raising prices; and credit crunch when it became increasingly difficult to borrow from the outside. Structural adjustment programs of 1980s introduced by the Bretton Woods institutions did not help matters. The only hope lay in increasing level of exports. Table 1 below shows real GDP from 1970-2012 (figures in US dollars).

Table 1 Kenya's Real GDP in US Dollars

Year	1970	1975	1980	1985	1990	1995	2000	2005	2010	2012
GDP (Million USD)	2.23	4.95	10.10	8.79	12.18	11.94	12.32	19.37	32.12	40.69

Source: World Bank National Accounts Data,& GOK, Economic Survey, various issues

Source: Author

The above figure shows that Kenya recorded steady and increasing growth from the first decade since independence up to the late 1970s. But owing to external shocks like the oil crises of 1973-74 brought about by Yom Kippur War, Iranian Revolution (1979-80), Gulf war (1990-91)and the Iraqi Invasion (2003), the economy declined and continued shrinking (Blanchard, 2007). The situation was worsened by droughts in 1979, 1984, 1992, 1994, 2000 and 2004, and the subsequent freezing of aid and grants in 1992 and 1997 (Ronge and Kimuyu, 1997). All these factors led to an increased import bill given few exports. This resulted in unfavorable balance of payments, current account deficits, accelerating inflation and exchange rate depreciation (Njeru and Randa, 2001). The situation was worsened by the fact that demand for Kenyan goods abroad dwindled due to the global recession of 1980s. Subsequently, private investments fell, and economic growth similarly fell (GOK, 1986)

Khan and Reinhart (1990) found that there is a positive relationship between private investments and economic growth. Increase in private investments will lead to increased economic growth. A decline in private investments will lead to a decrease in economic growth. Table 2 below shows the positive relationship between investment and national income.

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Table 2 Domestic Private Investment as a % of GDP and Real GDP Growth

Year	1970	1975	1980	1985	1990	1995	2000	2005	2010
Private Inv. (%)	14.2	11.3	8.23	10.65	10.91	13.51	7.47	16.21	14.28
Real GDP Growth(%)	5.3	1.5	5.6	4.1	4.1	4.2	0.6	5.9	5.5

Source: World Bank National Accounts Data,& GOK, Economic Survey, various issues

Source: Author

Kenya's investment opportunities are massive, and huge potential exists in various sectors of the economy. Citing agriculture as the backbone of the Kenyan economy, a lot still needs to be done to increase productivity in this sector. Agriculture in Kenya contributes about 25% to the overall GDP, a majority of the farmers being engaged only in subsistence farming. Opportunities exist in agribusiness, where farmers need not only produce for their own consumption but also as a means of earning a living. There is need to move away from overreliance on rain-fed agriculture to irrigation schemes including in semi-arid and arid areas. There is need to develop new industries and processing plants to create jobs. The manufacturing sector has been a beneficiary of government support in form of tax waivers on imported components, increased investment allowances on industrial buildings and manufacturing machinery from 60% to 100% since 2004, and the abolishment of some trade licenses since 2005 (GOK, 2006). Other sectors in the lead are mining and quarrying, construction, tourism and financial services.

1.3 Concepts, Volumes and Trends of Investments and Related Variables in Kenya
(GOK, 1960) shows that an assessment of the Gross Fixed Capital Formation (GFCF) gives an indication of the total investment being made within a territory during an accounting period. GFCF represents investments in physical assets including replacement of depreciated plant and machinery. This comprises residential, non-residential structures, other construction works like power lines, water supply works, roads, docks and bridges, machinery, land, plantations etc. According to GOK (1994), investment is measured by GFCF, relating to the stock of domestic reproducible tangible assets, especially the actual physical assets for use either directly or indirectly in economic activity on repeated occasions. Capital

formation therefore, measures expenditure on non-current assets, which represents a gross addition to stock of capital in the economy.

A major impediment to private sector investment has been poor infrastructure development. Emphasis here is on poor road network in the country. Infrastructure development is part of the development expenditure of the government. In Kenya, development expenditure has always been low compared with recurrent expenditure. In1980, development spending stood at 10.09 % of GDP, and in 1990, it was 9.74 %. In 2000, it stood at 9.24 % (GOK, Economic Surveys). Table 3 below shows the total investments, both private and public over the years in the country.

Table 3 Total Investments, Private and Public in Local Currency

Year	1980	1985	1990	1995	2000	2005	2010
Priv.inv(m)	4,434	10,741	21,436	62,837	72,255	229,437	350,000
Public Inv. (millions)	5,443	6,670	19,124	36,659	89,459	35,291	168,504

Source: World Bank National Accounts Data, and GOK, Economic Survey, various issues

Source: Author

It can be seen that investment levels rose steadily in the 1980s into the third and fourth decades after independence. However, public investment plummeted in 2002 but then picked up again from 2004 onwards. According to Greene and Villanueva (1991), factors causing low investments in 1980s included falling prices of agricultural exports, huge foreign debt, a fall in private external financing and the implantation of structural adjustment programs in a bid to bring about improvements in balance of payments account. It can also be noted that over the years private investment is generally higher than public investment. This can be attributed to the fact that the government has been trying to cut down on its expenditure given constraints in revenue collection. Table 4 below shows total investments as a percentage of GDP between 1980 and 2010.

Table 4 Total Investments, Private and Public, as a % of GDP, 1980-2010

Year	1980	1985	1990	1995	2000	2005	2010
Private Inv. (%)	8.23	10.65	10.91	13.51	7.47	16.21	14.28
Public Inv. (%)	10.09	6.62	9.74	7.88	9.24	2.49	6.08
Total (%)	18.32	17.27	20.65	21.39	16.71	18.70	20.32

Source: World Bank National Accounts Data, and GOK, Economic Survey, various issues

Source: Author

1.4 Problem Statement

Studies have been conducted and confirmed that private investment is the key driver of economies. However, investment levels in Kenya remain low as evidenced by data on private investment as a percentage of GDP in Fig.4. The highest percentage ever recorded was in 2005 when investment stood at 16.21% of GDP. But to realize the Vision 2030, private investments are expected to grow by at least 24% of GDP each year leading to the year 2030. It is therefore, imperative that we understand its determinants since low levels of investment would be a cause for concern because they affect growth and development. Similarly, low levels of investment increase the vulnerability of the economy according to Mlambo and Oshikoya (2001). Kenya has already launched the Vision 2030 initiative, which aims at transforming Kenya from a low income economy to a middle income country by 2030. This project emphasizes the importance of public private partnerships (PPPs) to steer the economy to a higher level and to create employment opportunities for the youth. Challenges exist, key among them being policy formulation that can help spur private investment to promote and sustain long term economic growth.

It is then important for policy makers to assess how the private sector responds to government policies. It is easier to scare away potential investors than it is to attract them. There is need for increased private investments if the Vision 2030 is to be realized, else, it shall simply be a pipe dream. It therefore becomes important to know the determinants so as to formulate appropriate policy measures and their implications.

1.5 Objectives of the Study

This study has objectives which are threefold:

- To analyze the factors that influence domestic private investments in Kenya.

- To estimate the impact of these factors on domestic private investments.

- To draw conclusions and prescribe policy recommendations.

1.6 Research Questions
Research questions to be addressed include the following;

- What factors influence domestic private investments in Kenya?

- How do these factors affect domestic private investments?

- What are the policy measures to be put in place to encourage new domestic private investments in Kenya?

1.7 Significance of the Study
Kenya has been emphatic about encouraging new investments as a way of creating new jobs for the youth. The government has even established funds like the Youth Enterprise Development Fund, Women Enterprise Fund, among other initiatives to encourage new small and medium enterprises (SMEs). This study seeks therefore to establish policy options that will stimulate private enterprises as a way of promoting economic growth.

The study will use data from 1970 up to 2010. Most of the variables used are macroeconomic. Past studies have largely concentrated on studying the behavior of macroeconomic variables and how they impact on private investments. This study will attempt to capture not only the macroeconomic determinants, but also the effects of one or more of the microeconomic variables, especially the effects of market demand on new investments.

1.8 Scope of the Study
The study focuses on establishing factors that affect domestic private investments in Kenya over a period between 1970 and 2010.

1.9 Organization of the Study
This research paper consists of five chapters organized as follows;

- Chapter One presents the introduction and a brief background of the economy, macroeconomic issues in Kenya, the problem statement, research objectives and research questions, significance of the study, scope and organization of the study.

- Chapter Two focuses on literature review, both theoretical and empirical, on investment behavior in a bid to tailor the study on Kenya.

- Chapter Three outlines methodological approach and sources of data and type.

- Chapter Four analyses data and interprets the empirical results.

- Chapter Five summarizes the study conclusions and policy recommendations.

<div align="center">CHAPTER TWO</div>

2.0 LITERATURE REVIEW

2.1 Introduction

This paper sets out to investigate what determines level of new business ventures and how these factors impact on overall investments, the dependent variable being private investments as a ratio of GDP, which depends on the factors earlier mentioned.

There has been little information concerning determinants of domestic private investments in Kenya as noted by Ronge and Kimuyu (1997) where they argue that Kenya had been studied in cross country studies by Blejer and Khan (1984), Greene and Villanueva (1991) and Oshikoya (1994). Kenya was pooled in a group of growing economies of African economies. Kenya has specific determinants of investments as seen in these studies. For Kenya alone, studies have been conducted by Ronge and Kimuyu (1997) and Matin and Wasow (1992) for the periods 1964-1996 and 1964-1988 respectively.

A lot of literature has been written about determinants of private investments. This chapter seeks to review the existing literature relevant to this study. Under this chapter, sec 2.2 shall deal with theoretical review of literature, while sec. 2.3 shall focus on the practical (empirical) evidence of the existing literature. Sec 2.4 shall summarize the chapter. This study will focus on determinants of domestic private investments in Kenya. While past studies have tended to confine themselves to macroeconomic determinants of investments, this study will go a step further to examine the effects of some microeconomic factors such as market demand on investments. Private firms are driven by the urge to make profit, unlike the public sector whose major aim is to provide services and an enabling environment

for economic activity to thrive. Therefore, there is need to formulate appropriate policies that will help spur new private investments in the country. Thus, it becomes necessary to study these factors that will affect policy prescription which eventually will affect levels of new investments.

2.2 Theoretical Literature Review

The simple accelerator model asserts that investment spending is proportional to the change in output and is not affected by the cost of capital. This theory was advanced by Clark (1917). The simple (also called naïve) accelerator model was based on the view that firms install new capital when they need to produce more. Therefore, firms would invest if output was expected to change, but they would not otherwise undertake net investment. The simple accelerator model did a reasonable job of explaining the data but was regarded as inadequate since it failed to take the costs of investing into account.

Much research has been devoted to the question of whether the cost of capital significantly affects investment. If the accelerator model is extended by relating investment to current and past changes in income, it seems in some studies to do a better job in explaining investment than the neoclassical model. This finding would imply that the cost of capital is not a major determinant of the rate of investment.

James Tobin (1969) propounded the theory of Tobin Q. Tobin Q is the ratio of market value of a firm to replacement cost of capital. When the ratio is more than one, firms will want to invest more capital, such that investment will be rapid. When the ratio is equal to one or unity, then firms would be indifferent as to whether to invest more capital or not. When the ratio is less than one, then the firm would be better off selling the existing assets than acquiring new ones. One critique of Tobin Q is that it is difficult to measure or quantify replacement costs. For empirical consideration, the average Q, which is the ratio of the market value of the existing stock of capital to its replacement costs, is often used instead of the marginal Q which is hard to measure.

Tobin Q's application to developing countries is limited in the sense that it makes oversimplifying assumptions such as perfect capital markets, perfect flow of information and little or no public investment. Developing countries lack well-developed capital markets and suffer from financial repression, huge national debts, influx of imports and macroeconomic instability (Ag'enor and Montiel, 1996). Kenya, for a long time has suffered the effects of corruption and bad governance, and it would be important to see how these two factors affect domestic private investments.

Keynes (1936) advanced his theory of investment based on 'animal spirits'. He stated that despite the fact that investment and savings must be identical *expost*, savings and investment decisions are generally taken by different decision-makers hence there was no reason why *ex post* savings should equal *ex ante* investments. Keynes formulated an investment function of the form $I = I_0 + i_{(r)}$, where I is investment, I_0 is

autonomous investment and $i_{(r)}$ is interest rates. Investment is inversely proportional to interest rates. The higher the interest rate, the less likely the firm will be willing to undertake any given investment project. In this regard, Keynes stated that firms rank various investment projects depending on the internal rate of return (IRR), or marginal efficiency of investment. Given a certain rate of interest, firms would choose projects whose IRR exceeded the rate of interest. The criticism of this theory was that ranking of investments may most likely be dependent on interest rates.

According to Tinbergen (1939) fluctuations in investment activity are mainly determined by fluctuations in profits earned. Tinbergen introduced variables representing liquidity and financial constraints which have frequently appeared as determinants of business investment in his alternative theory of investment. To rationalize his theory, Tinbergen argues that profits earned measure expected profits. Secondly, the rate of investment may be constrained by availability of funds. He further notes that if internal sources of funds are exhausted, the firm may opt to source for funds externally to finance its investment.

Jorgenson (1963, 1967) questioned the inclusion of cash flow in an investment equation. He propounded a model that would replace cash flow with proxies for the neoclassical cost of capital. In his analysis, the desired capital stock is proportional to output and user cost of capital which in turn depends on price of capital goods, real interest rate, tax structure and depreciation rate. The neoclassical theory has been criticized on account of its inconsistency in its assumptions of perfect competition and exogeneity of output. The assumption on the static expectations about future prices, then output and interest rates also overlooks the fact that investment is a forward-looking process (Ronge & Kimuyu, 1997).

McKinnon and Shaw (1973) came up with the neoliberal theory emphasizing the importance of financial deepening and high interest rates in stimulating growth. They argue that developing economies suffer financial repression (controls of interest rates in a downward direction) and should such economies be freed from such financial repression, savings would grow, thus growth in investments and income. Under this approach, there is a positive relationship between investments and interest rates. The reason is that a rise in interest rates increases the volumes of savings through financial intermediaries thereby raising funds for investments, a phenomenon dubbed by Mckinnon (1973) as the *conduit effect*. Therefore, while it may be true that a rise in interest rates reduces demand for new investments, realized investment actually increases because of increase in funds. This conclusion can only be valid if the capital market is in disequilibrium with the demand for funds being more than the supply.

According to Blanchard and Abel (1983), the empirical failure of these traditional views of investment and their lack of practicality of some of their foundations have led to emergence of new ideas of investment which lay emphasis on three pertinent features of most investment decisions overlooked by

conventional approach (Serven, 1997). These views are irreversibility, uncertainty and timing of investment.

The element of policy uncertainty was introduced by Rodrik (1991) as a determinant of private investment. His argument is such that whenever a policy reform is fronted, it is highly unlikely that the private sector will see it as being fully sustainable. Some reasons given for this is that the socioeconomic and political structures that earlier supported the policies may re-emerge. There is also fear of unexpected consequences which may lead to a reversal. Private investors must respond to the signals generated by the framework to show that after the introduction of economic policy reform, if the policy perceived to be unsustainable or is seen as uncertain, then private investment is likely to fail.

The element of irreversibility was introduced by Pindyck (1991) where he argues that disinvestment is more expensive than positive investment because capital goods have a low resale value and are specific to the firm. Where there is irreversible investment, the net present value must be modified. This is so since once an investment is made; the firm cannot reverse it should economic conditions change for worse. This lost option value is the opportunity cost which must be included as part of the cost. Therefore, waiting before investing is an opportunity cost that is analogous with the current profits so as to determine the best time to invest.

According to Dixit and Pindyck (1994), most investments have three key features. First, fixed capital investment are partly or wholly irreversible. Second, the initial cost is a partially sunk cost since it cannot be recovered completely by selling off the capital once it is put in place. Third, there is an element of uncertainty about investment rewards, hence investors can simply attach probabilities to the timing of an investment, or postpone it in order to get more information about the future.

2.3 Empirical Literature Review

Given that most traditional models are difficult to apply in developing economies, more relevant theories have been developed to incorporate theories that exhibit features similar to these countries. They have modified traditional models to capture constraints to private investments. Below are some of the empirical studies done in developing countries.

Studies conducted by Greene and Villanueva (1991) in Kenya found that private investment is directly proportional to real GDP growth, the level of per capita incomes and the rate of public sector investment. Yet it is negatively related to real interest rates, domestic inflation, the ratio of debt to GDP and debt service ratio.

Blejer and Khan (1984) examined the effect of government policy on private investment in 24 developing countries. Their results show that private investment is directly proportional to changes in GDP, availability of credit and public investment.

Chibber and Shafik (1990) studied the impact of currency devaluation on private investment in Indonesia. They found that devaluation limits private investment in the short-run. This can be attributed to higher import costs for capital goods which limit private sector profits and inhibit new investments. If exports rise and imports fall, and if the supply side is weak in the short-run, then private investments will be squeezed, unless the burden is put on private consumption or government expenditure. They found out that these effects are reversed in the long-run because the real exchange rate depreciation leads to restructuring of local industry to meet rising export demand and to improvements in efficiency which increase profits and this encourages private investments.

Sako (1993) investigated the determinants of private investment in Pakistan and found that these determinants depend mainly on the structure and characteristics of the economy. The results show a positive relationship between private investment and growth in GDP; private sector credit and public investment. Their paper breaks down public investment into infrastructural and non-infrastructural investment. They found that non-infrastructural investment is negatively correlated with private investment while infrastructural investment is positively related to private investment.

Matin and Wasow (1992) studied the effect of changes in the restrictiveness of foreign exchange allocation and changes in real exchange rate in Kenya. Their model stressed the effect of resource constraint on private investment behavior. They found that Kenya's failure to implement adjustment programs after the collapse of the coffee boom and disintegration of the East African Common Market reduced private investments drastically in 1980s. Major causes were reduced private sector credit, falling stocks of public infrastructure and fewer imports. The model, however, did not capture the effect of public debt on private investment behavior.

Serven and Solimano (1993) argue that there are many factors that affect private investment in developing countries, key among them being GDP growth, real exchange rate, public investment, real interest rates, public debt and uncertainties. They argue that the stringent monetary and credit policies adopted in stabilization packages affect private investment by raising the real cost of credit as well as interest rates. Such packages increase the opportunity cost of retained earnings and they raise the user cost of capital hence reducing investment.

Ronge and Kimuyu (1997) conducted a research on Kenya using data covering 1986-1996. They used the flexible accelerator model, modified it to capture resource constraints faced by the private investors in developing economies. Their findings how that availability of credit, foreign exchange reserves and public investment have a positive impact on private investment in Kenya. Public debt and real exchange rate negatively impact private investment. The authors lay more emphasis on analyzing effects of domestic debt vis-a-viz the overall debt effect. Their study also found out that real interest rate is not significant in affecting private investments in Kenya owing to the presence of financial repression during the period under review. However, how the government uses debt does not appropriately capture the government's borrowing requirements; budget deficits or credit to the public sector would be a better measure of government's borrowing requirements. Large deficits crowd out the private sector.

Bwire (1993) studied Kenya and estimated a private investment function that show that private investment was influenced by the rate of GDP growth, inflation rate and foreign debt service. The use of external debt service, however, only captures the short-term effects on private investment where it is of no major concern as is the size of public debt which captures long-term effects.

Kiptui (2005) shows that economic growth is the most important determinant of private investment. He also cites the openness of the economy as determinant of investment where firms have to brace themselves for increased competition from foreign companies. He introduced a dummy variable to represent liberalization in 1990s which suggests negative effects of liberalization on private investments. His study found that increase in imports negatively affects investments as well as local currency depreciation. He also notes that a negative relationship exists between private investment and inflation.

Bwonde (2000) studied the effects of macroeconomic reform policy indicators on private investment. He found that private investment is positively affected by economic growth, real interest rate, lagged investment ratio, foreign exchange reserves, real exchange rate, domestic savings and private sector credit. However, lagged real interest rates, public investment and external debt have a negative effect on private investment.

Kurokawa, et al (2008) found that major impediments to private sector investments are access to finance and finance costs, access to electricity, corruption, tax administration, skill levels and transport. Many of these constraints are due to market and government failures.

The researcher sampled out a number of private enterprises in Nairobi County including vehicle dealers, restaurants, and textile shops to find out if customer demand is fundamental before starting a new business. Even though markets cannot be quantified, we assigned a dummy variable representing

customer demand. The dummy variable was to take on the value of one if markets are an important determinant of private investment, and zero if the numbers of those interviewed deem it not important.

2.4 Overview of Literature

From the foregoing discussion, generally, investment behavior depends majorly on three broad segments; neoclassical model, accelerator theory, liquidity theory and uncertainty theories. The problem is that these theoretical models are analyzed in the context of developed economies. Application of most of these models in developing countries is limited by mostly data unavailability on variables like capital stock. Another challenge as their application in LDCs is the structural rigidities of growing economies given the underlying assumptions like perfect competition, perfect information flow, liquidity constraints (Sioum, 2002, Ronge & Kimuyu, 1997). Developing countries are mainly exporters of primary products, heavy importers of intermediate goods and importers of manufacturing components. They suffer from high national debt, financial repression, political interference and macroeconomic instabilities. All these hamper the application of conventional models in developing countries, unless they are modified.

Empirical studies on determinants of domestic private investments in developing countries have opted to shift from the traditional theories and focus more on the role of the financial sector development. Most studies have adopted the flexible accelerator model designed to capture clear institutional and structural features of these economies. These studies combine features of the flexible accelerator model, neoclassical and structural models in a bid to emphasize the effects of constraints on private investments in LDCs. Generally, these studies show that aggregate demand, credit availability and physical infrastructure are key determinants of private investments in growing economies.

This study shall adopt the neoclassical flexible accelerator model formulated by Jorgensen (1967). We also seek to introduce the effect of market demand on new private investments.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction
This chapter expounds on the conceptual framework, the model specification, definition and measurement of the determinants and data sources and types.

3.2 Conceptual Framework
The conceptual framework explains the relationship between the dependent and independent variables. In this study, the dependent variable is the ratio of private investment to GDP and the independent variables are real GDP growth, inflation rate, public investments, real exchange rate, lending rates, deposit rates, openness of the economy, broad money supply, private sector credit, foreign exchange reserves, domestic savings, public debt among others.

3.3 Model Specification
The model adopted for this study is developed from the neoclassical flexible accelerator model formulated by Jorgensen (1967). Reason for the adoption of this model is that it ranks the most popular amongst all investment theories. But in view of underdeveloped countries, the flexible accelerator model has been used in actual research due to data limitations and other structural rigidities and constraints.

This section provides the model specification for determinants of domestic private investments identified in the literature review. There is no general consensus on the determinants of private investments, therefore, to formulate the investment equation, we have to first estimate the standard accelerator investment model and thereafter incorporate other variables until a more robust model is formulated.

According to the accelerator theory, investment is a function of economic growth. In the long-run, the desired capital stock (K) is assumed to be directly related to levels of income (Y).

$$K_t \quad Y_t$$

$$K = Y_t \ldots\ldots\ldots\ldots.(1)$$

where is a constant. Differentiating the equation with respect to time, t;

$$K_t = Y_t \ldots\ldots\ldots\ldots(2)$$

where the is the difference operator.

To obtain an equation for the relationship between investment and desired capital stock, the conventional capital accumulation identity is used to identify investment, I;

$$K_t = (I - \ ) K_{t-1} + I_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

where   refers to depreciation of capital. From equation (3) we can obtain the following equation;

$$K_t - K_{t-1} = I_t - \ K_{t-1} \ldots\ldots\ldots\ldots\ldots\ldots\ldots(4)$$

Rearranging the expression and assuming   = 0, we can solve for I_t to yield the following equation;

$$K_t = I_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(5)$$

Equation (5) can be substituted in equation (2) to obtain;

$$I_{I t} = \ + \ Y_{1t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(6)$$

This equation represents the basic investment function. But we need to account for the slow adjustment of the actual capital stock to the desired capital stock, lagged values of the dependent variable can be introduced into the expression to yield the following;

$$I_t = \ 1_{t-1} + \ _1 \ Y_t + \ _2 \ Y_{t-1} + \ _t \ldots\ldots\ldots\ldots.(7)$$

where the first two terms on the right hand side are lagged investment and income growth rates respectively. $_1$ represents coefficients while Y_{t-1} represents lagged growth rate of output. $_t$ is the disturbance (error) term which captures the effects of omitted variables.

The final equation can thus be estimated;

$$I_t = \ 1_{t-1} + \ _1 \ Y_t + \ _2 \ Y_{t-1} + X_t + \ _t \ldots\ldots\ldots\ldots(8)$$

where X_t represents some of the variables that are applicable in the developing countries such as financial factors, policy-related factors, neoclassical factors, open economy factors and general macroeconomic factors.

Our model for domestic private investments can now take the following form;

PRINV/GDP = f (RGDPG, INFL, RER, PUBINV/GDP, RLIR, RDIR, OPEN, FRES, PCREDT, M2/GDP, DSAV, FAID, PUBDEBT, DBTSER, DUM92, DUMGOV, DUMMKT)

Therefore, to estimate the parameters   , the equation can take the following form;

PRINV/GDP = $_0$ + $_1$ RGDPG + $_2$ INFL + $_3$ RER + $_4$ PUBINV/GDP + $_5$ RLIR + $_6$ RDIR + $_7$ OPEN + $_8$ FRES + $_9$ PCREDT + $_{10}$ M2/GDP + $_{11}$ DSAV + $_{12}$ FAID + $_{13}$ PUBDEBT + $_{14}$ DBTSER +

where PRINV/GDP is the dependent (endogenous) variable being the ratio of domestic private investments to GDP. Exogenous (independent) variables include:

RGDPG which is the real GDP growth rate

INFL which is inflation rate

RER which is the real exchange rate

PUBINV/GDP which is the ratio of public investment to GDP

RLIR which is real lending interest rate

RDIR which is real deposit rate

OPEN which is openness of the economy i.e. exports plus imports as a ratio of GDP

FRES which is foreign exchange reserves

PCREDT which is private sector credit

M2/GDP which is broad money supply as a ratio of GDP

DSAV which is domestic savings

FAID which is foreign aid

PUBDEBT which is public debt (both domestic and foreign debt)

DBTSER which debt service

   is the error term

We also include dummy variables to represent financial liberalization which takes on the value of zero before multi partyism in 1992, and one from 1992 onwards, hence DUM92.

Another dummy variable, DUMGOV, represents governance. It takes on the values of one during Kenyatta's regime, zero during Moi's reign, and one during Kibaki's tenure. This is because during Kenyatta's time, most macroeconomic variables were increasing. They, however, started falling during Moi's time, and started increasing again during Kibaki's regime. This specification has been used in most studies, including Mlambo and Oshikoya (2001), Ronge and Kimuyu (1996).

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Another dummy variable, DUMMKT, represents market demand. This is an area which has been largely ignored in most studies, and it would be interesting to know how market demand affects private investments. It takes on the value one if market demand is important, and zero if market demand is not important.

3.4 Description of Variables and the Expected Signs

The real GDP_{t-1} growth represents the accelerator in the neoclassical theory of the flexible accelerator according to Jorgensen (1967). As far as the economic environment is concerned, given investor expectations, there is one lag period of the GDP growth rate (GDP_{t-1}). The neoclassical investment theory asserts that the real GDP growth rate influences private investment in a positive way (Greene and Villanueva, 1991), Oshikoya (1994) and Khan and Reinhart (1990). Thus the accelerator coefficient is expected to be positive.

Inflation rate will somewhat influence new investments. This is because high prices mean citizens save little, since most of their income goes to financing their daily purchases. Macroeconomic stability is an important consideration for would-be entrepreneurs. It provides a predictable economic environment which enables investors benefit from profitable ventures (Serven and Solimano, 1993). Macroeconomic stability is pegged on inflation and public debt. High inflation raises the cost of capital thereby increasing investment risk in the long-run. In the same breadth, huge public debt triggers inflation through increased government borrowing. Large public debt negatively affects private investment by crowding out or reducing funds available to private enterprise, given that the returns from new investments are used to service the existing debt (Cohen, 1994). Domestic borrowing will crowd out the private sector. The other downside of a huge public debt as a share of GDP is that it can lead to debt overhang where the government has difficulties servicing its debts thereby eroding its future prospects to borrow. Yet the coefficients of these indicators are unclear since if borrowed money can be used effectively, without wastage, then this can yield positive results which can create economies of scale and encourage private investments. However, if such funds are used mainly on recurrent expenditure, this can crowd out the private sector. The debt burden remains though, on future generations who have to service these loans.

Real exchange rate is the indicator for external stability. Real exchange rate is an important determinant of private investment in the Kenyan context, since Kenya is heavily dependent on imports of capital and manufactured goods. Exchange rate depreciation promotes exports while at the same time rendering imports expensive. The opposite happens when exchange rate appreciates, rendering exports expensive. Given that Kenya is a net importer, the coefficient of real exchange rate is largely expected to be negative.

Public investment is the sum total of both domestic and externally funded development expenditure. According to Ag'enor (2004) public investment can affect growth in various ways. First, public investment in infrastructure development increases public capital formation and the overall rate of physical capital accumulation. Second, public investment increases productivity thereby increasing output. Physical capital increases the development of human capital formation. If these two complement each other, an increase in public investment would lead to more private investment as well as improve the productivity of capital. Public investment can enhance private investment returns through improved transport and communication systems, and other infrastructure works (Greene and Villanueva, 1991). The downside is that public investment may also crowd out private investment; thereby reducing the economy's potential to generate and sustain more output. Crowding out effects are highly pronounced where public investment are majorly financed from increased taxes, which reduces levels of savings, and by increased borrowing from domestic markets, which pushed up domestic lending rates, and also leads to credit rationing in the private sector. Because of these ambiguous effects of public investment, the sign of public investment coefficient cannot be determined a priori.

A crucial determinant of domestic private investments is real interest rates. In this study, we adopt the use of central bank rate (CBR) which determines commercial banks' lending rates. According to the neoclassical theory of investment, interest rates are negatively related to investment. High interest rates mean high cost of credit which in turn discourages investment. Therefore, we expect a negative coefficient of this variable in relation to investment.

We can also focus on real deposit rates. According to McKinnon and Shaw (1973) high deposit rates have a positive contribution on investment through the savings channel. They argue that high deposit rates encourage financial deepening by increasing savings and more efficient resource allocation. Low deposit rates discourage savings which of course reduces banks' ability to create credit. We therefore expect a positive relationship between real deposit rates and investment.

Openness of the economy also affects private investment. It represents the competitiveness of the economy in relation to other economies. From it, a country formulates its trade policy. It is calculated s a ratio of exports and imports to GDP as advanced by Frankel and Romer (1999). Foreign trade enlarges commodity markets. Through exports, a country earns foreign exchange which is further used in importation of capital goods for investments; hence the coefficient of this variable is largely expected to be positive.

Another important determinant of private investment is availability of credit to the private enterprise. This is channeled through financial institutions which mobilize savings and advance credit to borrowers. We

would also incorporate another variable here, M2/GDP, which is the level of broad money as a ratio of GDP. This measures the levels of financial deepening which provides funds for investment. Therefore, these financial variables are expected to impact positively on levels of investment, hence they have a positive co-efficient.

Domestic savings are important as far as investments are concerned. Investment is financed through loans or savings. Even borrowed funds are those saved by individuals in financial institutions. Savings therefore, impact positively on investment. The higher the savings, the more likely we shall have higher investments. The coefficient for this variable is hence positive.

We examine one more pertinent variable, which is foreign aid. Foreign aid can be tied or free aid. Tied aid is pegged on certain conditions. Free aid means the government can spend the money any way it wishes. In the 1980s, the Bretton Woods institutions came up the Structural Adjustment Programs (SAPs) in developing countries. Key among them was privatization of publicly-owned enterprises. This way, foreign aid could help promote private sector investments. Aid can also promote private investment if donors channel it through local enterprises and NGOs. Aid flows also tend to ease the burden on capital accumulation for some developing countries. This can help increase consumption and investment. Debate rages on, whether foreign aid has a positive or negative effect on developing countries, therefore, its effect is ambiguous.

3.5 Data Sources and Type

This study shall incorporate use of secondary data. Data is time-series covering the span of 1970 – 2010. Data sources are as follows;

- Private investment as a percentage of GDP: IFC (2000) and GOK, Economic Surveys

- Real GDP growth annual percentage: GOK, Economic Surveys, various issues

- Inflation annual percentage: GOK, Economic Surveys, various issues

- Real exchange rate: Ryan 2002 and GOK, Economic Surveys, various issues

- Public investment as a share of GDP: IFC (2000) and GOK, Economic Surveys, various issues

- Real lending interest rate: Ryan 2002 and GOK, Economic Surveys, various issues.

- Real deposit interest rate: Ryan 2002 and GOK, Economic surveys, various issues

- Private sector credit: Ryan 2002 and GOK, Economic Surveys, various issues.

- Broad money supply as a share of GDP: Ryan 2002 and GOK, Economic Surveys, various issues

- Domestic savings: GOK, Economic Surveys, various issues.

- Foreign Aid: GOK, Economic Surveys, various issues

- Public Debt: Ryan 2002 and GOK, Economic Surveys, various issues.

- Openness of the economy: GOK, Economic Surveys, various issues.

- Public debt service: Ryan 2002, and GOK, Economic Surveys, various issues.

3.6 Estimation Technique

To study the relationship between the dependent variable and the independent variables, the variables of domestic private investments will be regressed on the equation for private investments using the ordinary least squares (OLS) estimation technique.

Economic analysis posits that there is long-run equilibrium relationship between the variables under consideration. Applied econometrics, when trying to estimate the long-run relationship, implies the variables are constant in terms of means and variances but not dependent on time (Gujarati et al 2007). The empirical relationship can be established as;

$$Y_t = \ + X_t \ _t + \ _t$$

where Y_t is private investment as a ratio of GDP, and   and   are the parameters to be estimated. X_t represents determinants affecting private investment in year t, and $_t$ is the error term with mean zero, measuring the effects of omitted variables (Ghura and Goodwin,2000). Nonetheless, most time series data have unit roots (are non-stationary). Regression of time series data yields spurious results. With this in mind, the t-statistic and F-test based on this estimation procedure become misleading.

3.6.1 Unit Root Testing

To test for stationarity or order of integration of each series of variables, unit root tests are used. Dickey and Fuller (1979) and Phillips and Perron (1988) suggested two tests:

i)   Augmented Dickey-Fuller (ADF) Test

ii)   Phillips-Perron (PP) Test

The two tests are used in order to resolve their inherent limitations. ADF tests include extra differentiated terms in the equation. Some degrees of freedom are lost rendering the test inadequate. On the other hand, under the PP test, autocorrelations of the error term are mainly negative with the actual size much greater than the nominal size. There is need to make non-stationary time series data stationary in order to come up with meaningful results before regression is done. If results show existence of unit roots, then we difference the variables to make them stationary.

3.6.2 Co-integration Tests

These are done in case of non-stationarity of the series in order to determine long-run relationships. Co-integration exists if two or more stationary or non-stationary time-series data move together in the same direction. If results show existence of a co-integration vector, then we have to make use of error correction model (ECM) that gives both the short-run and long-run relationship of the equation. Co-integration vectors have a cause and effect relationship; hence we should be able to test which one causes the other.

3.6.3 Diagnostic Tests

OLS estimation technique can only hold if its assumptions are not violated. In this study, we used multicollinearity test, the histogram normality test, the auto-regressive conditional heteroscedasticity (ARCH) test, the Breusch-Godfrey serial correlation test, the Ramsey reset test, cumulative sum (Cusum) test, cusum of squares test, recursive estimate test and recursive co-efficients test. The results are attached to the long-run and short-run regression results accordingly.

CHAPTER FOUR

4.0 EMPIRICAL ANALYSIS AND PRESENTATION OF FINDINGS

4.1 Introduction

This chapter analyses data and presents results. Sec. 4.2 outlines the estimation procedure and Sec. 4.3 presents empirical results. Sec 4.4 discusses diagnostic tests used.

4.2 Estimation Procedure.

4.2.1 Tests for Stationarity

Unit root testing is used to test for stationarity of time series data. This is a stationary test for the proposition that in an autoregressive statistical model of time series, the autoregressive parameter is one i.e Ho: = 1 against H_1 < 1. Stationary time series exhibits mean reversion in that it fluctuates around a constant long-run mean; has a finite variance that is time invariant, and has a theoretical correlogram that diminishes as lag length increases. On the contrary, non-stationary data used in estimation procedure produces t-statistic which is unreliable. The t-statistic has infinite variances, and the mean or variance are dependent on time. Unit root tests for non-stationary variables should be done first by OLS regression to avoid spurious results. Spurious regression yields a high R^2 and t-statistic that is significant, but the results are economically meaningless. Regression is only meaningful for data with no trend, so data with trends have to be de-trended first. We use the Augmented Dickey-Fuller (ADF) test and the Philips-Perron (PP) test.

ADF test is a test for larger and more complicated set of time series model. This can be done by introducing two or more lags of the dependent variable so we have white noise residuals. The ADF statistic used is a negative number. The more negative, the stronger the rejection of the hypothesis that there is a unit root. Unit root tests in levels and first difference is shown below.

Table 5 Augmented DF and PP Unit Root Test Statistic

Variable	ADF in Levels 5% Critical Value= -1.95	PP in Levels 5% Critical Value=-1.95	ADF First Difference 5%CV=-1.95	PP First Difference 5% CV= -1.95	Order of Integration
PRINV/GDP	-0.29	-0.29	-6.23	-6.23	I(1)
RGDPG	-1.34	-1.34	-5.92	-5.92	I(1)
INFL	-1.46	-1.46	-6.13	-6.13	I(1)
RER	-0.81	-0.81	-9.32	-9.32	I(1)
PUBINV/GDP	-0.31	-0.31	-8.34	-8.34	I(1)
RLIR	-0.42	-0.42	-6.82	-6.82	I(1)
RDIR	-0.76	-0.76	-5.39	-5.39	I(1)

OPEN	5.63	5.63	-3.67	-3.67	I(1)
FRES	5.84	5.84	-4.56	-4.56	I(1)
PRCDT	9.12	9.12	-7.86	-7.86	I(2)
M2/GDP	0.14	0.14	-6.45	-6.45	I(1)
DSAV	4.23	4.23	-3.87	-3.87	I(1)
FAID	1.62	1.62	-4.86	-4.86	I(1)
PUBDBT	1.36	1.36	-5.68	-5.68	I(1)
DBTSER	0.69	0.69	-7.65	-7.65	I(1)

Results in Table 5 indicate non-stationarity of most variables except credit to the private sector, openness of the economy, foreign exchange reserves and domestic savings. A variable is non-stationary if the estimated ADF test is smaller than the critical value in absolute terms and vice versa. This means some variables have to be differenced to make them stationary. They are integrated of order one i.e I (1) and are found to be I ($_0$) at 5% level of significance after differencing once. Though the private sector credit, foreign exchange reserves, openness of the economy and domestic savings are stationary at all levels, first difference tests for these variables were done to ascertain the prerequisites for co-integration.

Some variables are correlated with others whist some are correlated with the dependent variable. For example, real GDP growth and private investment are jointly determined. Real exchange rate and real lending rates are correlated; public debt and debt service are also correlated. They cannot be dropped because they are needed. Econometric methodology used can help address the problem.

4.2.2 Testing for Co-integration

Though some variables may be stationary individually, their combination may be co- integrated. Non-stationary series are said to be co-integrated if their linear combination is stationary. i.e I ($_0$). Co-integration implies that regression of non-stationary series yields meaningful but not spurious results. For co-integration to exist the non-stationary series must be integrated of the same order. All the above variables are integrated of order one { I($_1$) }.

We used Engle-Granger (1987) to test for co-integration. Under this method, there is some adjustment process that prevents errors in the long-run from becoming larger indefinitely (error correction mechanism – ECM). We first estimate a static model using OLS. Second, we generate the residuals and evaluate their order of integration using ADF unit root test. It should be noted that in this test the usual ADF critical values are not appropriate hence Engle and Granger calculated the appropriate values against which this test can be resolved. Results showed that the residuals were stationary i.e I($_0$) which supports existence of co-integration in the equation. The residuals are then entered into the Error Correction Model to replace the term level. Results are shown below.

Table 6 Engle-Granger Two-Step Co-integration Test Statistic in Levels

Residual	ADF Statistic	5% Critical Value	Inference
ECM	-6.878	-3.71	$I_{(0)}$

4.3 Long-Run Equilibrium

Long-run equation is estimated in levels to reveal the long-run effects of the regressors. The main reason for long-run co-integration is to obtain the model residuals but not to be concerned with significance of variables. Table below shows the OLS estimated coefficients of each variable and their t-statistic and probability values.

Table 7 Long-Run Regression Results

Dependent Variable   : PRINV/GDP
Estimation Technique : OLS
Date   : 17/10/2014
Sample   : 1970-2010
Observations   : 41

Variable	Coefficient	Standard Error	t-Statistic	Probability
C	0.08452	0.034562	2.6845	0.02023
RGDPG	0.36125	0.12453	2.8512	0.01254
INFL	-0.37817	0.2451	-1.6452	0.13483
RER	0.57417	0.2123	2.4621	0.04231
PUBINV/GDP	0.05452	0.1847	0.36541	0.89412
RLIR	-0.97454	0.0651	-1.1254	0.53124
RDIR	-0.32654	0.2416	-1.63245	0.15422
OPEN	0.01244	0.0461	0.9875	0.87434
FRES	6.65E-09	2.34E09	0.03245	0.94321
PRCDT	-2.94E-08	1.23E-08	-2.5684	0.03693
M2/GDP	0.03512	0.08512	2.1254	0.04872
DSAV	4.23E-07	2.34E-07	1.9452	0.08743
FAID	2.09E-09	2.64E-09	0.9421	0.46213
PUBDBT	-8.32E-08	5.12E-08	-1.451	0.23412
DBTSER	2.12E-08	2.24E-08	0.9785	0.36125
DUMPOLR	-0.05124	0.01643	-0.1132	0.84311
R^2	0.81421	Mean dependent variance		0.12115
Adj.R^2	0.74255	S.D dependent variance		0.02134
S.E of Regression	0.00861	Akaike info. Criterion		-6.541174
S.Sq. Residuals	0.00232	Schwartz criterion		-5.622458
Log Likelihood	141.7114	F-Statistic		6.23912
DW Statistic	2.31745	Prob. (F-Statistic)		0.000187
Diagnostic Tests Serial Correlation (Breusch-Godfrey LM Test (F-Stat) ARCH Test (F-Stat.) Normality (Jarque-Bera) (X^2 Stat.)	0.8941 (0.5419) 3.4651 (0.0821) 0.9241 (0.7541) 0.4956 (0.8978)			

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White Heterosc. Test F-Stat	5.6401(0.01775)
Stability Test (Ramsey-Reset Test (F-stat.)	

The model therefore can be restated as follows;

PRINV/GDP = 0.08452 + 0.36125RGDPG - 0.37817INFL + 0.57417RER + 0.05452PUBINV/GDP - 0.97454RLIR - 0.32654RDIR + 0.01244OPEN + 6.65FRES - 2.94PCRDT + 0.03512M2/GDP + 4.23DSAV + 2.09FAID - 8.32PUBDEBT + 2.12DBTSER - 0.05124DUMPOLR

All variables show a positive sign of coefficients except inflation rate, real lending rates, real deposit rates, private sector credit, public debt and the dummy representing political regimes. Positive coefficients show the long-run positive relationship while negative coefficients show a negative long-run relationship.

4.3.1 Unit Root Test for Residuals

We have to establish if the co-integration model is valid. We can o this by carrying out a unit root test on residuals obtained from the long-run equation as shown in table above, by testing their stationarity condition. The null hypothesis of a unit root and hence of no co-integration (Ho: = 0) is based on a t-statistic with non-normal distribution. The decision-rule is to reject the null hypothesis of no co-integration if the t-value associated with   is more negative than t-calculated. The ADF test shows that the null hypothesis in the long-run equation of non-stationary series can be rejected. The results of the unit root test of the residuals are shown in table 6.

The ADF test statistic (-6.878) is more negative than the t-critical (-3.81). Decision is to reject the null hypothesis that the residuals are non-stationary. The conclusion is that residuals are stationary indicating co-integration between domestic private investment and independent variables exists. We therefore proceed to estimate the error correction model.

4.3.2 Error Correction Model

The ECM version of the equation was estimated in order to derive the short-run coefficients of the domestic private investments model. The error correction term {ECT (-1)} was derived as the lagged residuals generated from the estimated static long-run co-integration equation.

After studying data characteristics, the equation of domestic private investments was estimated using OLS. OLS is widely used because it is simple to apply. In order to analyze both the short-run and long-run investment behavior regarding the explanatory variables, a domestic private investment function was developed and estimated at levels to determine the long-run behavior, and then re-estimated on differenced terms. The estimation on differenced terms is to determine the short-run behavior and the adjustment process by which short-run dynamics adjust towards equilibrium. This study involves use of inferential statistics especially the t-statistic to test the hypothesis. A general-to-specific approach was utilized where insignificant regressors were sequentially deleted to arrive at the preferred specification as shown in Table 8 below. The ECM is in differenced form to ensure stationarity of variables.

Table 8 Short-Run Parsimonious Model

Dependent Variable   : D (PRINV/GDP)
Estimation Technique: OLS
Date   : 17/10/2014
Sample (adjusted)   : 1970-2010
Observations   : 40 after adjusting end points

Variable	Coefficient	Standard Error	t-Statistic	Probability
C	0.002513	0.001328	1.185401	0.2546
D(RLIR)	-0.084579	0.021463	-3.042578	0.0048
D(RGDPG)	0.236542	0.087462	3.011542	0.0064
D(RER)	0.034694	0.009105	4.245887	0.0032
D(M2/GDP)	0.784231	0.321456	2.784213	0.0155
D(POLR)	-0.427851	0.005478	-2.942310	0.1247
D(FAID)	2.94E-07	1.42E-07	2.104262	0.0572
ECM (-1)	-0.545235	0.114512	-4.012475	0.0016
R^2	0.762114	Mean dependent variance		-0.000842
Adj. R^2	0.68475	S.D dependent variance		0.0142315
S.E of Regression	0.007641	Akaike info criterion		-6.674512
S.Sq. Residuals	0.001764	Schwartz criterion		-6.432148
Log Likelihood	134.1045	F-Statistic		11.78541
DW Stat.	2.041452	Prob. (F-Statistic)		0.00002

Table 8 shows short-run regression results. The model is significant with an F-statistic of 11.785 and the p-value almost zero. Results indicate that the most important determinant of domestic private investment is real GDP growth, followed by private sector credit. Broad money supply also follows closely with real exchange rate, real deposit rates and political regimes which are statistically significant in the short-run.

The ECM has the correct sign and is significant at 10% level. This variable corrects the long-run equilibrium. The coefficient of the disturbance term is -0.54 implying that after a shock in the economy, it takes about 5 years for private investment to restore its equilibrium. The implication is that disequilibrium can persist for a long period of time hence explaining the significance of the lagged effects on private investment.

4.4 Diagnostic Tests

OLS assumptions must hold if the results are to be trustworthy. The following tests for diagnosis were done.

4.4.1 Multi-collinearity of the Independent Variables

Contrary to normal regressions where multicollinearity amongst the regressors is often seen as a problem, such multicollinearity is necessary in the context of a co-integrating static regression. If variables do not follow similar trends overtime, then no linear combination of the time series will be stationary; hence multicollinearity will be of good use. Co-integration means Granger-causality. Explanatory variables correlation matrix was used to test for the presence of multicollinearity in the regression equation. According to Gujarati et al (2007), where multicollinearity exists, the coefficient of the two variables is in excess of 0.8. e.g. public debt is highly correlated with debt service, domestic savings, private sector credit and foreign exchange reserves. Domestic savings is also correlated with foreign exchange reserves and openness of the economy. The variables are not correlated in the short-run.
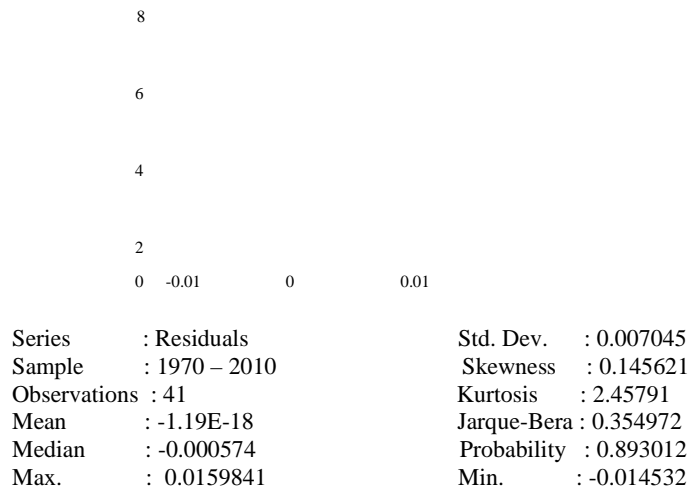
Table 9: Correlation Matrix of the Short-Run Model

	RLIR	FAID	RGDPG	DPOLR	M2/GDP	RER
RLIR	1.000000					
FAID	0.185481	1.000000				
RGDPG	-0.164522	0.162151	1.000000			
DPOLR	-0.361243	0.191542	0.554109	1.000000		
M2/GDP	0.142724	0.307512	0.264108	0.641321	1.000000	
RER	0.047514	-0.254179	-0.641325	-0.501475	-0.640021	1.000000

4.4.2 Normality of the Random Variable

One assumption of the OLS is that the error term is normally distributed with a mean zero, and has a constant variance across observations. When this is not the case, it means that OLS estimates cannot be reliable even though they are best linear unbiased estimators. We employed the Jarque-Bera test to test for the null hypothesis of normality. Table 10 below shows that the model is normally distributed.

Table 10: Histogram Normality Test

```
8

6

4

2

0    -0.01         0          0.01
```

Series	: Residuals	Std. Dev.	: 0.007045
Sample	: 1970 – 2010	Skewness	: 0.145621
Observations	: 41	Kurtosis	: 2.45791
Mean	: -1.19E-18	Jarque-Bera	: 0.354972
Median	: -0.000574	Probability	: 0.893012
Max.	: 0.0159841	Min.	: -0.014532

4.4.3 Autocorrelation of the Error Term

In the presence of autocorrelation, OLS estimators are unbiased but not efficient. They have minimum variance among all linear unbiased estimators. To test for the null hypothesis of no serial correlation of order one, the Breusch-Godfrey Lagrange Multiplier (LM) serial correlation test was used. The order was ascertained through the Akaike and Schwartz information criterion. Testing a higher order autocorrelation led to a higher penalty with respect to degrees of freedom as per the two criteria.

Table 11: Autocorrelation (Serial) Test

Breusch-Godfrey Serial Correlation LM Test

F-Statistic	0.512452	Probability	0.612045
Obs.* R^2	2.244612	Probability	0.364212

4.4.4 Autoregressive Conditional Heteroscedasticity

Autoregressive Conditional Heteroscedasticity (ARCH) occurs when the error term variance is auto correlated to the squared error term in the previous period. ARCH in itself does not invalidate standard OLS inference; however, ignoring ARCH may result in loss of efficiency. The ARCH LM test was used to test for the presence of ARCH effects.

Table 12: ARCH LM Test

F-Statistic	0.003014	Probability	0.956642
Obs.* R^2	0.002674	Probability	0.953715

4.4.5 Correct Model Specification

It is important to find out whether the model has omitted some variables, or has incorrect functional form, or if there is correlation between explanatory variables and the residuals. To test for the presence of model misspecification, we employed the Ramsey Reset test to fit the residuals.

Table 13: Ramsey Reset Test

F-Statistic	2.148	Probability	0.1813
Log Likelihood ratio	11.7	Probability	0.0061

4.4.6 Model Stability

After assessing the stability of the residuals, no structural break was seen; hence the residuals are quite stable. To support this, it is essential to find out whether the model we found is stable for the entire period of study; that is, we have to test for parametric stability. The methodology used is based on cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) which were propounded by Brown et al (1975). The cumulative sum test uses the cumulative sum of recursive residuals based on the first n observations and is updated recursively and plotted against break point. The cumulative sum of squares employs the squared recursive residuals and follows the same procedure. If the plot of the cumulative sum and cumulative sum of squares stays within the 5% critical bound, the null hypothesis that all coefficients are stable cannot be rejected. However, if either of the parallel lines is crossed then the null hypothesis of parameter stability is rejected.

4.5 Overall Results Interpretation

Table 7 presents the regression results for existence of a long-run relationship between the domestic private investment as a ratio of GDP and the many macroeconomic variables. The aggregate model is significant with F-statistic of 6.239 and probability 0.0002 i.e. the probability is less than 5% hence the model is significant. The model explains 81.4% of the fluctuations of private investment brought about by changes in the explanatory variables with an adjusted R^2 of 74.3%. The Durbin Watson statistic is greater than 2 meaning the variables are co-integrated.

These results are in tandem with most of the economic results found in literature review. Significant variables in the model include the constant, dummy variable for political regimes, private sector credit, inflation, real deposit rates, real exchange rate and real GDP growth. For instance, real GDP growth rate is positively related to private investment such that a 1% increase in output raises domestic private investments by 0.36%.

Real GDP was included to capture the accelerator effects with faster growth expected to accelerate rates of investment. When real GDP growth changes 1%, domestic private investment increases by 0.36% in the long-run and 0.236% in the short-run. The coefficient of real GDP growth is positive and statistically significant both in the short-run and long-run suggesting that output recovery will boost the share of domestic private investment in the long-run. This confirms earlier studies by Ronge and Kimuyu (1997) that real GDP growth is a determinant of private investment.

Macroeconomic instability adversely affects private investments. Serven (1998) used inflation as the epitome of macroeconomic instability. The results show that inflation is negatively related to domestic private investments. A 1% increase in inflation reduces private investment by 0.38% but it is not significant. Therefore, inflation causes low levels of private investment since domestic investors foresee a low return on capital (Heranandez-Cata, 2000).

Public investment has a positive but insignificant impact on private investments. This suggests evidence of crowding in. A 1% increase in public investments leads to a 0.05% increase in private investments. Public investment in Kenya stimulates growth in the long-run. The government of Kenya has been investing heavily in major infrastructure projects over the past few years. This increases the supply capacity and promotes new investments.

Real lending rates have a negative but insignificant impact on private investments. A 1% increase in real lending rates leads to approximately 0.97% decrease in investments. This supports the neoclassical theory that interest rates are negatively related to investments.

In the long-run real deposit rates are negatively related to domestic private investment. A 1% change in real deposit rate results to 0.36% decrease in investments. This implies that private investment in Kenya does not support the McKinnon-Shaw (1973) hypothesis in the long-run. McKinnon and Shaw argued that a rise in interest rates increases the volume of financial savings thus raising funds for investments. However, events before multi party politics in 1992 could have adversely affected private investment. But after financial liberalization in 1993, financial repressions were reduced hence high deposit rates were meant to induce savings and investments. This shows that deposit rates in Kenya do not encourage savings or possibly few Kenyans can afford to save.

Trade policy proxied by the sum of imports and exports has a positive impact on private investment. A 1% change in trade policy of the economy leads to a small increase of 0.01% in private investments. This shows free trade has opened up the economy which attracts private investment.

Stock of foreign exchange reserves positively affects private investments in the long-run. However, the effect on private investments is negligible. Private investors do not concern themselves with levels of foreign exchange reserves in the economy.

The relationship between private investments and financial variables is captured by credit to private sector and broad money supply. Private sector credit is surprisingly negatively related to private investments and is significant. This shows funds to the private sector do not go to finance new investments. Due to rampant poverty, most people would borrow to finance other matters like education, healthcare and basic necessities. On the contrary, broad money supply is positively related to private investment and has a significant effect on private investments.

Savings has a positive effect on private investments. Savings finance investments. This implies investors gain immensely from retained earnings. A 1% rise in savings will bring about 4.2% increase in private investments. Dismal economic performance and heavy taxes aimed at financing huge debt burden discourage savings hence slowing down investments.

It is worthwhile to report on the positive impact of foreign aid on private investment though insignificant. This could be attributed to conditionalities tied to aid flows including development of the private sector. Foreign aid boosts private investment if used to fund public expenditure on development. Aid therefore reduces taxation on private enterprises. Infrastructure development attracts more private investments.

Public debt has a significant negative influence on private investments. A 1% increase in debt results in 8.32% decrease in private investments. Huge public debt triggers inflation through increased government borrowing. Because of this increased borrowing, crowding out occurs. This reduces private investments hence confirming earlier results by (Cohen, 1994), who argues that returns from new investments are used to service the existing debt. The other downside of a huge public debt as a share of GDP is that it can lead to debt overhang where the government has difficulties servicing its debts thereby eroding its future prospects to borrow

Political regimes have adversely affected domestic private investments. The dummy variable representing political regimes has a negative sign and is significant at 5% level. This shows that political uncertainty which prevailed during the second president's time, especially the attempted coup in 1982, the transition to multi party politics in 1992, and the struggle for his succession led to macroeconomic uncertainty and discouraged private investors. This coupled with poor governance led to poor economic performance in 1980s and 1990s.

The table below summarizes the variables and the signs of the estimated parameters.

Table 14 Summary of Variables and Coefficient Signs

Variable	Coefficient Sign	Impact on Private Investments
Real GDP Growth Rate	Positive	Significant
Inflation	Negative	Insignificant
Real Exchange Rate	Positive	Significant
Public Investment	Positive	Insignificant
Real lending Rates	Negative	Insignificant
Real Deposit Rates	Negative	Insignificant
Openness of the Economy	Positive	Insignificant
Foreign Exchange	Positive	Insignificant
Private Sector Credit	Negative	Significant
Broad Money	Positive	Significant
Domestic Savings	Positive	Significant
Foreign Aid	Positive	Insignificant
Public Debt	Negative	Significant
Debt Service	Positive	Significant

CHAPTERB FIVE

5.0 Conclusions and Policy Prescriptions

5.1 Introduction

In this chapter we draw conclusions of the findings. Sec 5.2 summarizes, and Sec. 5.3 prescribes policy recommendations. Limitations and direction for further research is shown in Sec. 5.4.

5.2   Summary and Conclusions

This study has investigated the determinants of domestic private investments in Kenya between 1970 and 2010. OLS regression analysis was used based on co-integration and error correction model (ECM) of Engle and Granger (1987).

Econometric results of this study support the existence of a short-run dynamic adjustment and the long-run equilibrium relationship between these macroeconomic variables and domestic private investments. The study shows that in the long-run, political regimes and credit to the private sector negatively affect private investment, while real GDP growth, real exchange rate and broad money supply positively affect private investment.

In the short-run, real GDP growth, real exchange rates, broad money and real deposit rates have a positive and significant impact on domestic private investment.

5.3   Policy Prescriptions

On an aggregate level, our study shows that domestic private investment is determined by majorly macroeconomic variables such as GDP growth rate, real exchange rates, domestic savings, foreign aid and public investment. Taken together, the variables explain a significant amount of fluctuations in levels of domestic private investment. These results hence encompass information on the possible future policy formulation in Kenya.

5.3.1   Increased Public Investment on Infrastructure, Security and Human Capital Formation

Major policy prescriptions from the results include allocation of public funds to capital accumulation. This boosts the private sector. In order to increase new levels of domestic private investments, the government should increase investment on infrastructure development and human capital formation through education. More funds need to be channeled to development expenditure as opposed to recurrent expenditure. There is also need to increase efficiency of public investment. Tough action should be taken against public institutions which do not spend their allocations optimally. This way, funds will be absorbed in the economy for accelerated growth.

5.3.2 Improving the Investment Climate

Macroeconomic stability is an integral part of any investment activity in a country. It provides a more reliable economic environment which enables investors take advantage of profitable opportunities, (Serven and Solimano, 1993). Macroeconomic stability indicators include inflation, public debt and exchange rates. High inflation rates negatively affect profits. High national debt reduces a country's credibility to borrow. Huge debts could possibly be a prelude to more heavy future taxes. Proper

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utilization of borrowed funds is necessary to spur new investments. Volatile exchange rates render international trade unpredictable. All these need to be checked to enhance investor confidence.

5.3.3 Structural Reform Programs

Structural reforms are important in determining the actual and future profitability of private investments. Structural reform index incorporates an indicator of trade policy. Openness of the economy positively affects private investments even though insignificantly. In this regard, policy makers should formulate policies that promote exports and reduce imports. Export-led growth is key with agricultural protection and subsidization to enable local industries compete internationally.

Another structural reform index incorporates private sector credit. From the results, private sector credit has a negative impact on domestic private investments. This could be due to the fact that loans are used for purposes other than investment.

5.3.4 Increasing Donor Funds and Encouraging Economic Partnerships

Private investments can alleviate economic hardships and create jobs as envisaged in Vision 2030 (GOK, 2007). Donor funds are needed, so are economic partnerships, in major infrastructure areas like transport and communication, energy etc. Foreign aid and loans supplement domestic taxes. Care should be exercised, however, to ensure these aid flows are not misappropriated and that they are used efficiently and effectively.

5.3.5 Increasing Productivity

Real GDP has a significant positive effect on domestic private investments. There is a general consensus that growth is necessary but not sufficient for poverty reduction. The World Bank (2000) came up with results showing that it is the quality of human capital that is more important than the quantity. Therefore, policy makers should direct their attention to improving welfare of the masses in terms of increased per capita incomes, proper healthcare, education and proper nutrition if output is to increase.

5.4 Limitations of the Study

Domestic private investment is influenced by several factors which include macroeconomic factors, microeconomic factors and meso-economic factors. This paper focused majorly on macroeconomic variables. The researcher carried out a survey in Nairobi in an attempt to capture the effects of markets on new investments. Though a majority of those interviewed considered availability of markets a major determinant of investments, yet the dummy variable representing markets was dropped because of the nature of data. It would pose a problem regressing cross-sectional data together with time series data. There is plenty of room for further study, though, which should focus more on microeconomic and meso-

economic factors like governance, corruption, enforcement of laws relating to contract etc and investigating how these factors affect domestic private investments.

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