

**EFFECTS OF FISCAL POLICY ON PRIVATE
INVESTMENT IN KENYA (1964 – 2010)**

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**A Thesis Submitted to the School of Economics in Fulfillment of the
Requirements for the Award of Doctor of Philosophy Degree in Economics of
Kenyatta University**

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DECLARATION

This thesis is my original work and has not been presented for award of a degree in any other university or any other award.

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DEDICATION

I dedicate this thesis to my dear wife Grace and to my daughters Gloria and Stacy.

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ACRONYMS AND ABBREVIATIONS

ADF:	Augmented Dickey Fuller
EPZs:	Export Processing Zones
ECM:	Error Correction Model
GDP:	Gross Domestic Product
IMF:	International Monetary Funds
KIPPRA:	Kenya Institute for Public Policy Research and Analysis
KRA:	Kenya Revenue Authority
OECD:	Organization for Economic Cooperation and Development

OLS:	Ordinary Least Squares
PP:	Philip - Perron
SAPs:	Structural Adjustment Programmes
VAR:	Vector Auto - Regression
VARMA:	Vector Auto - Regressive Moving Average
VAT:	Value Added Tax
WB:	World Bank

OPERATIONAL DEFINITION OF TERMS

Budget deficit: A situation where government receipts fall short of its expenditure.

Debt crisis: A situation in which a country, usually a Less Developed Country (LCD), finds itself unable to service its debts.

Deficit financing: It is any effort made by the government to finance budget deficit either through borrowing or creation of new notes and coins.

Causality: Is the ability of past values of one variable to predict another variable.

Cointegration: Existence of a long-run economic relationship between variables.

Financial repression: This is a mechanism by which government buy foreign bonds in an effort to sterilize currency.

Fiscal discipline: Government adherence to the budgeted expenditure and revenue estimates for a particular fiscal year.

Fiscal policy: It is stimulation of economic and social development by central government through pursuing a policy stance that ensures a sense of balance between taxation, expenditure and borrowing consistent with sustainable growth.

Investment: Refers to the addition of capital stock in an economy given by the value of that part of aggregate output for any given year that takes the form of construction of new structures, changes in business inventories and acquisition of new capital equipment.

Monetary policy: The exercise of the central bank's control over the quantity of money and the level of interest rates in order to achieve economic stability.

Private investment: It is the accumulation of physical and liquid stock for productive purpose. This is done by private persons who could be nationals or foreigners in the country.

Public expenditure: Refers to the amount spent on goods and services, public debt servicing, and on capital investment by the government.

Ricardian equivalence: A proposition that the government will be indifferent in financing its expenditure through borrowing or by taxes because their long-run effect will be similar.

Tax evasion: This is a deliberate effort by the tax payer to reduce tax liability or not to pay tax at all.

Tax: It refers to a compulsory contribution imposed by the public authority to all persons that fall under certain tax jurisdiction, irrespective of the benefit they receive from the government.

Vector autoregressive: Is a forecasting technique in economics that does not distinguish between endogenous and exogenous variables but is concerned with the path through time of a vector of variables.

ABSTRACT

Private investment in Kenya has been low for the last four decades. This has stimulated much concern to the policy makers' bearing in mind that investment is a key variable influencing economic growth. The government of Kenya has over the years designed economic policies with an aim of rejuvenating private investment which was robust during the first decade of independence before deteriorating in the other decades. Fiscal policy has been a major focus towards this direction. The main purpose of this study was to investigate the effects of fiscal policy on private investment in Kenya from 1964 to 2010. The study adopted modified flexible accelerator model to enlighten on the economic relationship between private investment and the other variables. It applied vector auto-regression modeling technique and error correction model to estimate the effects of fiscal policy variables on private investment. The study made use of semi-annual time series data for the period 1964 to 2010. Since some of the variables were stationary at levels while others became stationary at first difference, the study used Johansen cointegration tests to determine long-run relationship between private investment and the aforementioned fiscal variables. Further, the Granger-Causality test was undertaken to determine economic relationship between the variables. The results of the study revealed that fiscal policy design and implementation matters to private investment levels in Kenya. The study found that taxes, government expenditure, government debt servicing and fiscal reforms could either promote or deter private investment both in the short-run and in the long-run. The study concludes that appropriate measures

ought to be taken while coming up with fiscal policy framework to ensure that as it achieve other objectives of the government, growth of private investment is taken into account.

CHAPTER ONE

INTRODUCTION

1.1 Importance of Private Investment

Private investment usually impacts positively on economic, social and political development of a country. This type of investment is a good source of employment creation in the country through capital accumulation for productive endeavors. It is able to stimulate economic activity and long-term economic growth by expanding the capacity for production of goods and services (Ahuja, 2007). Availability of more commodities has a bearing on consumption, which enhances the welfare of consumers. To create and sustain economic growth, developing countries need to maintain private investment at a sizeable proportion of Gross Domestic Product (GDP). Gillis, Perkins, Roemer and Sodgrass (1987) proposed that this proportion should not be less than 15 per cent of GDP at any time, and that the country should target and sustain private investment level of at least 25 per cent of GDP. Increase in private investment may lead to increase in government revenue as a result of taxes from the earnings of factors of production (United Nations, 1993; Ahuja, 2007).

Growth in private investment also leads to public investment to complement private sector efforts. This is motivated by an increase in the demand of essential public services that give impetus to private sector development. Public investment

is vital in reducing cost of production for the private investors, especially the one directed towards physical infrastructure development (Kahuthu, 1999). Private investment by foreign citizens operating in a country is an important link between developing and developed countries. Like trade, it provides an important channel for global integration and technological transfer. This impact directly on the national output through its contribution to higher factor productivity, changes in product and research and development. It can also have an indirect impact through collaboration with local research and development institutions and technology transfer to local downstream and upstream producers (Republic of Kenya, 1965; Ochieng, 1992).

1.2 Trends in Private Investment in Kenya

Kenya has experienced low and sharp fluctuations in private investment over the years. The trends of private investment in Kenya are presented in Figure 1.1

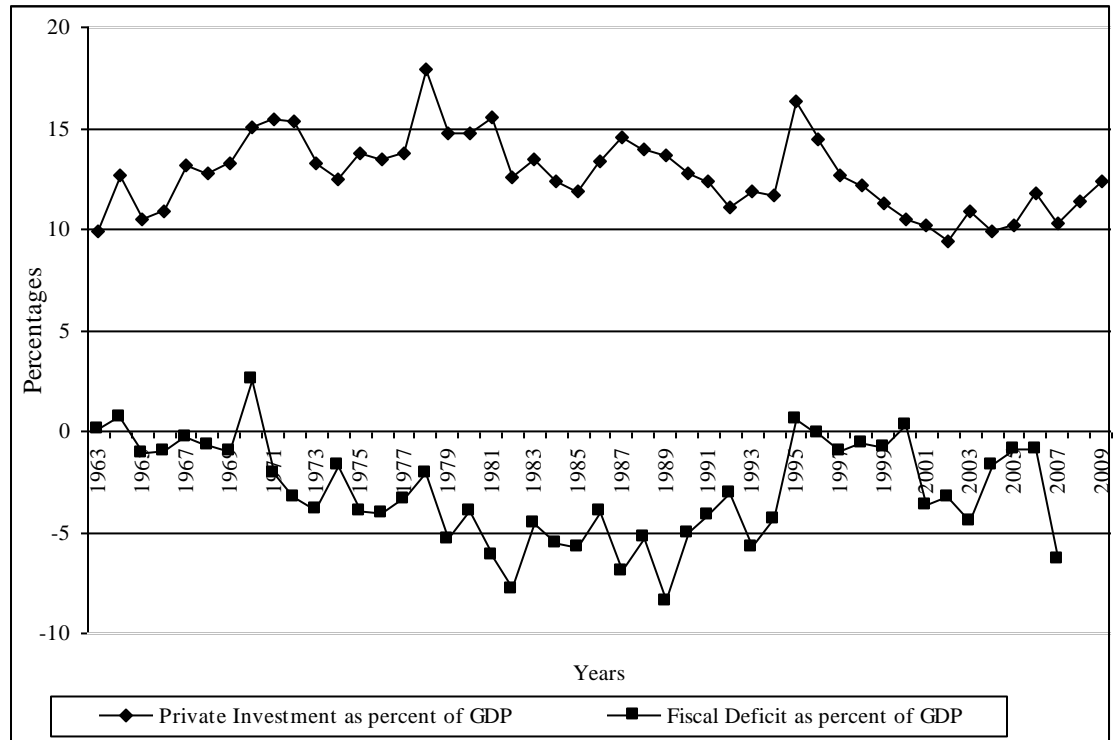


Figure 1.1: Trends in Private Investment and Fiscal Deficits in Kenya (1963–2009)

Source: World Bank (2007) *African Data Base CD-ROM* and Republic of Kenya's *Economic Surveys and Statistical Abstracts* (various issues).

Private investment made a remarkable growth in the period 1963 - 1970. This upward trend can be attributed to sheer commitment demonstrated by the government in promoting private investment. Notably, this is the time when the government published Sessional Paper No. 10 of 1965 on African Socialism and its Application to Planning in Kenya. This paper articulated the measures which

were necessary to promote private investment in Kenya (Republic of Kenya, 1965). The private investment declined moderately in the period between 1971 and 1977. This is possibly blamed on first oil crisis of 1973 and severe drought of 1974. Heavy government investment leading to public sector domination could also have crowded-out of private investment (Republic of Kenya, 1965).

The sharp increase of private investment in 1978 could have been caused by the effects of coffee boom of 1976/1977. This boom increased average household's income and savings and hence investable funds became adequate. However, the failure to implement adjustment policies following the collapse of the coffee boom and that of East African Community in 1977 undermined private investment. Notably, the disintegration of East African Community severely affected production due to limited market for commodities. Similarly, the second oil crisis of 1979, drought of 1984, the debt crisis and departure from low interest rate policy by the government in early 1980s may be blamed for the downward trend of up to mid 1980s (Legovini, 2002; Kimani, 2005; Were, Ngugi & Makau, 2006). The fiscal disciplinary measures that focused more on prudent borrowing and reduced expenditure adopted in mid 1980s may have brought sanguinity in the economy about future prospects hence resulting to slight growth in investment in 1986 and 1987. At the same time, the government announced a package of fiscal measures aimed at providing impetus to the private sector and enhancing its complementarity role to the government's efforts of revitalizing the economy. The

role of the fiscal policy was articulated in Sessional Paper No. 1 of 1986 on Economic Management for Renewed Growth, which laid down strategy of the Kenyan economy shifting from being state controlled to a relatively market driven one (Republic of Kenya, 1986).

The period between 1988 and 1994 is associated with a sharp down turn in private investment. It decreased from 14.5 per cent observed in 1987 to 11.6 per cent in 1994 and this could be attributed to a number of factors. First, the introduction of structural adjustment programmes by the World Bank (WB) and International Monetary Fund (IMF) in 1986 may have failed to achieve the desired results. Secondly, the withdrawal of donor funds led to government increasing domestic borrowing thereby crowding-out private investment through an increase in cost of capital. Lastly, the events associated with the first multi-party election in 1992 before and after election, such as policy reversal for fear of losing patronage and political interference in the civil service, created uncertainties which may have discouraged private investors (Wagacha, 2000; Kabubo - Mariara & Kiriti, 2002; Republic of Kenya, 2003; Were *et al.*, 2006).

In 1995, there was a high growth in private investment as it increased to 16.4 per cent which is the second best performance in the whole period as shown by Figure 1.1. This could have resulted from the success of policies laid down in Sessional Paper No. 1 of 1994 on Recovery and Sustainable Development, where there was

re-allocation of budget resources towards the core functions of the government with an aim of maximizing the productivity of public expenditure. Implementation of these policies and optimism surrounding its application may have crowded-in private investment (Republic of Kenya, 1994). This did not last for long as declining trends again emerged in 1996 and by the year 2002, private investment was 9.4 per cent as revealed by Figure 1.1. This decline may be attributed to a number of factors. First, hotly contested election in 1997 resulted to the tribal clashes, second destruction of physical infrastructure by *El Nino* rains in 1998, and lastly, cut on development expenditure to achieve budget deficit target of at most 2.5 per cent of GDP as stipulated by Sessional Paper No. 1. of 1986 stifled private investment (Republic of Kenya, 1986, 2002 and 2003; Kiptui, 2005). Figure 1.1 also indicates that the increasing trends emerged again in 2003. However, the rise in private investment lacked robustness expected after the political and economical transformation that took place in 2003. This could be blamed on the poor implementation of the Economic Recovery Strategy (ERS) of 2003 and slow pace of other reforms that resulted to strained relationship with donors and withdrawal of funding (Ondieki, 2005; Mwakalobo, 2009; Republic of Kenya, 2009).

1.3 Overview of Kenya's Fiscal Policy

After independence in 1963, the Kenya government opted to increase expenditures on development and social services and at the same time pay debts. Consequently, taxes were increased steadily across the board (King, 1979). Sessional Paper

No.10 of 1965 on African Socialism and its Application to Planning in Kenya was published and among other things, it proposed progressive taxation system and public expenditure geared towards the provision of public goods to promote private investment (Republic of Kenya, 1965). During the period of 1963–1977, the government of Kenya was able to finance all its current expenditure and part of its development expenditure using recurrent revenue receipts, and hence incurred minimal fiscal deficit. From the late 1970s after a series of both internal and external shocks, the government experienced chronic fiscal deficit. The persistence of these deficits was attributed to uncontrolled public expenditure and possibly an inelastic tax system. The rising fiscal deficit was financed by domestic and foreign borrowing, and in 1980's, the two were almost at par. However, dwindling foreign aids inflows in early 1990's pushed the government into excessive domestic borrowing and inflationary financing (Mureithi and Moyi, 2003; Wawire, 2003; Kiptui, 2005; Wawire, 2006).

The fiscal policy in Kenya was affected immensely by the Structural Adjustment Programmes (SAPs) initiated in the early 1980's and later detailed in the Sessional Paper No. 1 of 1986 on Economic Management for Renewed Growth. The main emphasis of the policies in this document was to limit the role of the government to that of providing public utilities and maintaining law and orders. Instead, market forces were to be relied upon to mobilize resources for economic growth and development with an aim of crowding-in private investment (Republic of Kenya,

1986). To meet the expectations of these donor initiated SAPs, the government increased its outlay on infrastructure to promote smaller towns and rural centers by among other things improving roads network, installation of power and water facilities. However, the path of realization of benefits resulting from this SAPs seemed patchy and elusive. The country continued to experience large fiscal deficits and macro economic instability persisted (Wagacha, 1999). Faced with the problem of persistent budgetary deficit and debt repayment crisis that crowded-out private investment and led to deterioration of economic growth, the government made several attempts to change the situation by undertaking fiscal reforms. The main aim of these reforms was to create an enabling environment for the economic activities to take place by transforming fiscal institutions in order to ensure that no obstacles stood on the way of economic prosperity. The reforms also revolved around adequate revenue generation for the government, budget rationalization by regulating public expenditure and prudent public debt management (Mureithi and Moyi, 2003). The following are some of fiscal reforms that have been undertaken by government with an aim of rejuvenating the economy and giving private investors incentives.

To increase revenue base, value added tax (VAT) was introduced in 1990 to replace sales tax which had been introduced in 1973. This shift was motivated by the argument that VAT relative to sales tax had higher revenue potential, and that its collection and administration were more economical, efficient and expedient.

In 1993, export compensation was abolished to save government revenue and to limit the abuse of the incentive by some unscrupulous local manufacturers. Export duty was also abolished to give impetus to export growth (Republic of Kenya, 1990; Mureithi and Moyi, 2003). In 1991, government of Kenya established a parastatal reform committee to implement the privatization process. The privatization process was aimed at giving impetus to the private sector to participate in ownership of formerly state assets and, as a result, provide technological and managerial skills (Republic of Kenya, 1992; Kiptui, 2005). Based on the policies laid down in Sessional Paper No. 1 of 1994 on Recovery and Sustainable Development, there was re-allocation of budget resources towards the core functions of the government with the aim of maximizing the productivity of public expenditure and, as a result, crowding-in private investment (Republic of Kenya, 1994).

In 1995, government embarked on an organizational reform that would modernize tax collection in Kenya. It established Kenya Revenue Authority (KRA) with an aim of strengthening revenue collections and harmonizing the separate tax collection arms. It was mandated to put in place an efficient and effective system to seal the widespread loopholes in the tax system, bring down the vice of tax evasion, and enlist as many eligible taxpayers into the tax net as possible (Republic of Kenya, 1995; Wawire, 2006). To demonstrate its commitment in undertaking economic reforms, the government unveiled a policy document by the

name Economic Recovery Strategy for Wealth and Employment Creation for 2003 – 2007. This document identified key policy actions necessary to spur the recovery of the Kenyan economy. Measures were proposed for enhancing revenue collection, expenditure restructuring, and a monetary policy that supports the achievement of economic growth without putting into jeopardy price stability objective. Three fiscal reforms were singled out as being necessary to achieve sustainable development. Firstly, the government wanted to maintain revenues at above 21 per cent of GDP. Secondly, the government was to restructure expenditures to be growth and pro poor oriented. Lastly, the government was to focus its deficit financing on non-domestic sources to eliminate chances of crowding-out private investment (Republic of Kenya, 2003).

In 2007, the Vision 2030 was unveiled as a long-term development blueprint for the country. The aim of Kenya Vision 2030 was to make the country globally competitive and a prosperous nation with a high quality of life by the year 2030. It aims at transforming Kenya into a newly industrialized, middle income country providing a high quality of life to all its citizens in a clean and secure environment. The Vision 2030 laid down prudent fiscal framework focusing on government expenditure, revenue and borrowing policies imperative in the realization of set objectives. This was to be achieved by maintaining a strong revenue position, restructuring outlays toward development expenditures, increasing project financing from development partners, and judicious recourse to domestic and

foreign borrowing to build infrastructure. These measures were geared towards achieving private investment growth from 15.6 per cent of GDP in 2006/07 to 22.9 per cent in 2012/13, and to over 24 per cent of GDP during the period 2020/2021 to 2030 (Republic of Kenya, 2007). The Vision 2030 is the main policy document which is directing the government fiscal policy.

Despite immense fiscal reforms, the overall budget deficit has been quite erratic from year to year and total expenditure has consistently exceeded revenues except in some few years. The trends of fiscal deficit in Kenya are presented in Figure 1.1. During 1960s up to mid 1970s, the government of Kenya was able to finance all its current expenditure and part of its development expenditure using recurrent revenue receipts. As a result, it incurred minimal fiscal deficits which as a ratio of GDP averaged 1.8 per cent as shown by Figure 1.1. This was made possible by a healthy flow of donor assistance in terms of grants and projects aid (Legovini, 2002; Mureithi & Moyi, 2003). From the late 1970s to mid 1990s, after a series of both internal and external shocks, the government experienced chronic fiscal deficits. Figure 1.1 also indicates that fiscal deficits averaged 4 per cent in late 1970s, rose to an average of 5 per cent in the 1980s, peaking at 8.4 per cent in 1989. The persistence of these deficits was attributed to uncontrolled public expenditure and possibly to an inelastic tax system (Mureithi & Moyi, 2003; Kiptui, 2005). To bring down the deficit, it was imperative that the government improved domestic revenue mobilization while keeping public expenditures under

control. Neither tax policy nor tax administration managed to mobilize additional resources on a sustainable basis (Mureithi & Moyi, 2003; Kosimbei, 2009).

Additionally, the Kenyan government failed to implement prudent fiscal policies in terms of public expenditure management; hence, these deficits remained high until 1994. The large financing requirements put continued pressure on inflation and exchange rates and strained trade and financial liberalization policies (Wagacha, 1999). Due to immense pressure exerted by World Bank and IMF for sanity in the budgetary process, the government undertook stringent stabilization policies. They included retrenchment of civil servants, privatization of public corporations, and introduction of cost sharing schemes among others. These measures succeeded in bringing down the deficits in the latter part of the 1990s where an average of 1 per cent was recorded as shown by Figure 1.1. However, in the 2000s, fiscal deficits rose again and the average recorded in Figure 1.1 was more than 3.5 per cent. This could be attributed to increase in government expenditure resulting from ambitious free primary education, nationwide improvement of infrastructure and diverse economic stimulus programmes established to rejuvenate the economy whose growth stagnated at the beginning of that decade. In addition, swelling fiscal deficits could have resulted from impropriety in handling of public funds. In fact, fiscal indiscipline has been the single largest problem in the Kenyan economy, one that the government has not been able to tackle to date. While quite efficient in raising revenues, the Kenyan

government has been unable to curb the rise in expenditure. In a vicious cycle, continued upward pressure on expenditure became a by-product of fiscal indiscipline (Kiptui, 2005; Wawire, 2006; Mwakalobo, 2009).

Persisting fiscal deficits facing Kenyan economy has been a major setback to the growth of private investment. In most cases, government has resulted to financing these deficits by undertaking domestic borrowing resulting to increased cost of borrowing and credit unavailability for private sectors. In addition, accumulated fiscal deficits become public debt and obviously taxes will be increased in the future to finance its repayment. Private investors faced by all these challenges have little motivation to expand, which account for low private investment in Kenya (Kiptui, 2005; Republic of Kenya, 2007; Kosimbei, 2009).

1.4 Fiscal Policy and Private Investment

The fiscal policy of a country can promote or impede growth of private investment. Productive public expenditures crowd-in private investment, especially when it is complementary in nature. Government expenditure relating to enforcement of property rights and maintenance of public order can exert a positive effect on private investment by contributing to better use of existing capital and labour. Increased government expenditure on security can lower production cost by reducing the need to protect factors of production. This acts as a stimulant to profit maximizing investors, which prompts them to expand their

establishment (Barro & Sala – I – Martin, 1992; Trotman, 1997). Government expenditure on infrastructure such as transport and communication networks facilitates private investors' efficient access to the productive regions. Infrastructure expenditure may also be in the form of provision of electricity and other energy sources, which are imperative ingredients for growth of private investment (Stiglitz, 1989).

On the other hand, public expenditure can crowd-out private investment if it is financed by increasing taxes or through borrowing. Heavy tax burden reduces the disposable income for individuals, which results to a reduction in consumption, lower savings and hence lower investment. Borrowing to finance government expenditure has a crowding-out effect on private investment. When the public and private sectors compete for funds in the financial market, cost of borrowing increases, which is a disincentive to private investors. Lastly, public expenditure financed through borrowing implies that more taxes will be levied in the future to repay the debt, which is a disincentive to private investors (Ahmed, 1999).

The level of taxation is very cardinal in determining private investment. Heavy taxation, especially direct taxes, stifles private investment. Taxes have negative implication on cost of production and on profitability. This is because most of the resources available for private investment are diverted and channeled to public use, thereby crowding-out private investment. Import taxes can also be used to

protect local infant industries from unhealthy competition posed by cheap imports. This promotes private investment in the industries that produce import substitutes.

However, if import taxes are imposed on inputs and capital used by local producers, it will increase cost of production, which discourages private investment (Bhatia, 1998). Taxes can also be used in promoting investment in certain economic zones initially not very popular to investors. This is applicable in Kenya where the government extends tax holidays, tax exemptions, remissions and other tax benefits to the investors in specified sectors of the economy or regions. In Kenya, special economic zones referred to as Export Processing Zones (EPZs) are examples of how tax favours can be used to encourage private investment (Investment Promotion Centre, 2000). In addition, government uses taxes to discourage investment in certain sectors which are not economically productive or which produces sumptuary goods such as liquor and cigarettes (Wawire, 2000; Karingi, Kimenyi & Ndung'u, 2001). In addition to fiscal policy, private investment is affected by other factors. For instance, if a country adopts restrictive monetary and credit policies, it will affect investment in two ways. First, the real cost of bank rises through an increase in interest rates. Secondly, they increase the opportunity cost of retained earnings. Some of the other determinants of private investment include internal rate of return, inflation rate, terms of trade, savings rates, credit availability, economic growth, exchange rates, investment environment and economic openness. Government can design appropriate policies

targeting these factors with an aim of promoting private investment (Asante, 2000).

1.5 The Statement of the Research Problem

Private investment has been recognized as one of the pillars for achieving sustainable economic growth (Kahuthu, 1999; Seruvatu & Jayaraman, 2001). Studies done in Kenya on economic reforms such as Mureithi and Moyi (2003), M'Amanja and Morrissey (2005), Wawire (2006), Mwakalobo (2009), among others, have justified undertaking of economic reforms on the basis that such reforms create a conducive environment for investment by removing the bottle necks that frustrate private investment. Fiscal reforms have been undertaken in Kenya with an aim of rejuvenating the economy whose growth slowed down hardly a decade after independence. Tax modernization, budget rationalization and prudent public debt management are examples of reforms that have been undertaken with an aim of making the economy more efficient by giving private investors impetus for establishment.

The ratio of private investment to GDP in Kenya in the period 1963 – 2009 averaged 12.7 per cent as shown in Figure 1.1. This percentage is below the levels being experienced in successful economies and which is required to spur economic growth needed for employment creation and poverty reduction (World Bank, 1995). In fact the World Bank (1995) and Republic of Kenya (2007) stressed on the need to achieve higher economic growth through increased private investment.

According to Herandez-Cata (2000), the ratio of private investment to GDP averaged 16 per cent in Latin America, 18 per cent in developed countries and 16.5 per cent in newly industrialized countries in Asia. Gillis *et al.* (1987) proposed that this proportion should not be less than 15 per cent of the GDP at any time, and that the country should target and sustain private investment level of at least 25 per cent of GDP. To attain economic growth of 10 per cent and sustain it, private investment as a ratio of GDP targets in the Kenya's Vision 2030 should be at least 22.9 per cent by the year 2013, and above 24 per cent by the year 2030 (Republic of Kenya, 2007). However, in 2009 this ratio was only 12.4 per cent, implying that realizing the set target in Vision 2030 can be elusive if efforts are not made to increase private investment.

The studies done in Kenya on private investment such as Matwang'a (2000) and Kiptui (2005) concentrated on the determinants of private investment. None of the studies assessing the effect of fiscal policy on private investment in Kenya intensively disaggregate fiscal policy variables. The effects of fiscal policy on private investment have therefore not received much attention despite the fact that the Kenyan government has intensively used fiscal policy for its promotion. It is therefore not clear what effects fiscal adjustment processes have on private investments. This forms the thrust of the study.

1.6 Research Questions

The study sought answers to the following questions:

- (i) What are the relative influences of various taxes on private investment in Kenya?
- (ii) What are the relative effects of various components of government expenditure on private investment in Kenya?
- (iii) How does the government debt servicing affect private investment in Kenya?
- (iv) What are the effects of fiscal policy reforms on private investment in Kenya?
- (v) What policy implications can be drawn from the research findings?

1.7 Objectives of the Study

The overall objective of the study was to analyze the effects of fiscal policy on private investment in Kenya. The specific objectives of the study were to:

- (i) Examine the relative influences of various taxes on private investment in Kenya.
- (ii) Analyze the relative effects of various components of government expenditures on private investment in Kenya.
- (iii) Determine the effects of government debt servicing on private investment in Kenya.
- (iv) Investigate the effects of fiscal policy reforms on private investment in Kenya.
- (v) Draw policy implications from the research findings.

1.8 Significance of the Study

This study is important in that it sheds light on the effects of the fiscal policy position on private sector performance. It contributes to the existing literature on economic reforms in Kenya. The results are useful in designing effective fiscal policy programmes that can propel economic performance to achieve the desired level of development through private investment. The study provides an insight to the policy makers on the choice of reforms programmes as well as providing guidelines on the implementation of such reforms to promote robust economic performance. In addition, the study creates an understanding on the different category of fiscal variables and how they affect the overall welfare of different economic agents. This is desirable for the budget making process since it can be used as a guiding principle when allocating national resources under different votes. The study contributes to the body of knowledge on the effectiveness of fiscal adjustment in achieving sustainable economic growth. It also provokes researchers to critically evaluate the effectiveness of different government policies in order to prescribe or suggest to the policy makers the best course of action for achieving economic goals.

1.9 Scope and Organization of the Study

The study was limited to the period 1964 to 2010 for two reasons. First, the period was long enough to capture the effect of fiscal policy on private investment. Secondly, time series data was available for this period of time. The study is

organized in three chapters. The foregoing chapter gave the background of the study and its objectives. Chapter two is devoted to the review of the relevant literature both theoretical and empirical. Chapter three highlights the research design and the methodology that was used in undertaking this study. Empirical results are presented in chapter four, and summary, conclusion and policy implications are presented in chapter five.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, both theoretical and empirical literature on the relationship between fiscal policy and private investment are reviewed. The first section reviews the theory and exposes the theoretical foundations that elucidate on the effects of fiscal policy on private investment. The second section reviews the empirical literature on this area. The final section deals with an overview of the empirical literature where the critique and the summary of the literature are done.

2.2 Theoretical Literature

In this section, a review of the major theoretical arguments regarding the linkages between private investment and fiscal policy is done. Economic theory suggests a number of approaches that can illuminate on the behaviour of investment. Keynesian, Neo-classical and Real option approaches are some of the theories and are explained in the sections that follow.

2.2.1 Keynesian Approach

It is Keynes (1936) who first called in to attention the existence of an independent investment function in the economy. The heart of the analysis was the observations that, although savings and investment must be equal at equilibrium,

savings and investment decisions were made by different people. The implication of his argument was that there was no reason why ex-ante savings should equal ex-ante investments. Keynesian approach further proposed that firms ranked various investment projects depending on their internal rate of return. Thus, given a rate of interest or cost of capital, an investor would choose a project whose internal rate of return exceeded the rate of interest. The Keynesian economists also formulated the accelerator theory, which made investment a linear proportion of changes in output. In the accelerator model, expectations, profitability and capital costs played no role. A more general form of the accelerator model was the flexible accelerator model. The basic notion behind this model was that, the larger the gap between the existing capital stock and the desired capital stock, the greater would be the firm's rate of investment. Within the framework of the flexible accelerator model, output, internal funds, cost of external financing and other variables may be the determinants of desired capital stock. Under the Keynesian approach, fiscal policy could influence investment by either its implication on interest rates or by determining the speed of adjustment between actual and desired investment (Blejer and Khan, 1984).

2.2.2 Neo-Classical Approach

Tobin (1969) developed a neo-classical model in an attempt to explain investment behaviour. According to Tobin, what mattered was the relation between the increase in the market value of the capital asset due to the installation of an

additional unit of capital and its replacement cost. Given that V_t was the market value of the capital asset and $P_t' K_t$ was the replacement value of the assets where P_t' was the price of capital assets for investment goods K at a time t , the ratio $q_t = V_t / P_t' K_t$ was derived from a mathematical process of a firm's optimization problem, whereby a firm chose inputs to maximize the discounted sum of expected cash flows. When the increase in the market value of the additional unit exceeded (or was less than) the replacement cost, the firm would want to increase (or decrease) their existing capital stock. This ratio, commonly referred to as marginal "q", could differ from unity because of delivery lags and adjustment or installation costs.

Jorgenson and Hall (1971) formulated an alternative neo-classical approach, which was a version of the flexible accelerator model. In this approach, the desired, or optimal capital stock was proportional to output and the user cost of capital, which in turn depended on the price of capital goods, the real rate of interest, rate of depreciation and the tax structure. Lags in the decision making and delivery created a gap between the current and desired capital stocks, giving rise to an investment equation for the change in the capital stock.

Mc Kinnon (1973) and Shaw (1973) emerged with another neo-classical approach which emphasized on the importance of financial deepening and high interest rates

in stimulating growth. The core of their arguments rested on the claim that developing countries suffered from financial repression which was generally equated with controls on interest rates in a downward direction, and that if these countries were liberated from their repressive conditions, it would induce saving, investments and growth. The neo-classical approach implied that fiscal policy could be instrumental in determining investment activities. Depending on how it was formulated and implemented, fiscal policy would have an impact on savings rates, cost of borrowing, tax structure and government borrowing all of which affected credit availability for potential investors (Kiptui, 2005).

2.2.3 The Real Option Approach

The element of uncertainty in investment theory has received much attention due to irreversible investments and policy inconsistency (Arrow, 1968; Pindyck, 1991). The argument is that since capital goods are often firm specific and have low-resale value, dis-investment is more costly than positive investment. The theory was developed by considering a firm's problem of deciding the optimal time to pay a sunk cost in return for a project of a certain value. Pindyck (1991) and Rodrick (1991) argued that, for some establishments, the firm could not disinvest should market condition change adversely, and this could increase uncertainties for the potential investors. Policy uncertainty was also considered as an important determinant of private investment. When a policy reform is introduced, it is very unlikely that the private sector would see it as one hundred

per cent sustainable, and therefore, it may not lead to more investment. Real option approach advocates for consistency in macroeconomics policies such as monetary and fiscal policies in order to eliminate any uncertainties that may be prohibitive to the private investment.

2.3 Empirical Literature

Several empirical studies have investigated the relationship between fiscal policy and private investment. Blejer and Khan (1984) examined the impact of government economic policy on private investment in some 24 developing countries. Flexible accelerator model was adopted to explain economic relationship between investment and the factors that affect it. It was found that the level of private investment was related positively to the change in expected real GDP, availability of funds for private investment, and by the level of private capital inflows. Negatively, investment was related to excess productive capacity as measured by the shortfall of actual GDP from its trend. The findings also suggested that there was long-run complementarity of private to public investment, but short-run substitutability in the sense that short-run increases in public investment appeared to crowd-out private investment.

Schmidt-Hebbel (1995) study on the impact of the public expenditures in Ghana and Zimbabwe on the economic performance concluded that deep fiscal adjustment was necessary for achieving high economic growth. In Ghana, private

investment remained very low with peaks and troughs corresponding to years when public investment was high or when a change in government occurred. Public investment tended to crowd-out private investment. The Zimbabwean case was similar in that public sector crowded-out private investment as the government financed its deficits by using non-market mechanisms. As the public sector required more resources from the private sector to finance its deficit, it restricted foreign exchange allocation to the private sector, thus containing and crowding-out private investment. This substantially affected the growth potential, hence resulting to under performance of the Zimbabwean economy. The study never analyzed the effect of both consumption and investment expenditure on economic performance.

Moshi and Kilindo (1999) researched on the impact of government policy on private investment in Tanzania. The principal policy instruments linked to private investment were variation in bank credit, government expenditure on investment, the exchange rate, GDP growth and foreign exchange availability. A simple model of private investment was estimated by ordinary least square method. The study established a direct empirical link between government policy and private capital formation. The result indicated that public investment crowded-out private investment, but the effect depended on the way in which public investment was introduced into the model. When a distinction was made between infrastructural

investment and non-infrastructure investment, complementarity between infrastructure investment and private investment was evident. The reduction of public sector investment in socio-economic infrastructure was found to constrain private sector investment.

The findings of this study further highlighted the significance of flow of credit to the private sector. Monetary policy that directs credit to the private sector according to the study is expected to encourage private investment. This emphasizes the changing environment in the financial sector. In this regard, it is market forces and interest rate policy rather than the repressive financial measures that existed in Tanzania during economic socialism that are likely to determine credit allocation. The study further identified the supply of foreign exchange to the country as being another imperative issue affecting private investment. A smooth inflow of foreign exchange to finance imports requires suitable exchange and interest rate policies.

Nonetheless, the research findings encountered several drawbacks. First, diagnostic tests that would have proved some variables as non-stationary were not done. Second, alternative specifications in differences or ratios to GDP were attempted, but the results were not very different from the ones reported. Third, the estimations might have been affected by small-sample bias, simultaneity bias and specification bias due to the short period covered. Fourth, the variables used, and

the exclusion of some important determinants of investment, like the interest rate, could also have affected the results.

Asante (2000) carried out an investigation on determinants of private investment behaviour in Ghana. In the study, a time series analysis was complemented with a cross-sectional survey. The time series analysis made use of ordinary least squares (OLS) to determine the relative effects. Independent variables were both of fiscal and non fiscal in nature. The fiscal variables in the time series model were nominal public investment as a percentage of nominal GDP and corporate tax as a percentage of total tax revenue. The study found that the growth of real credit to the private sector had a positive and a statistically significant effect on private investment. This was strongly supported by the survey results, which suggested that credit had been a problem that still remains for private investors.

Macroeconomic instability was identified as a major hindrance to private investment in this study. The results also showed that public investment was complementary to private investment. It suggested that military takeovers could have created a climate hostile to private investment. The survey results indicated that taxes were major constraint to investment, a finding that was contradicted by time series analysis, which found its coefficient being statistically insignificant.

In a study of determinants and constraints of private investment in Kenya, Matwang'a (2000) used regression analysis and co-integration technique to establish the long-run and short-run private investment model. The estimated coefficients for savings, GDP growth and public investment concurred with theoretical expectation of positive influence on private investment. Debt ratio and inflationary uncertainty were found to influence private investment negatively. The partial adjustment parameter had a positive and a significant effect thus indicating divergence between the actual and desired levels of investment within a particular period. The study concluded that the traditional models of investment were inappropriate for explaining the behaviour of private investment in developing countries since they were developed to explain this behaviour in developed countries. Most of these models did not capture circumstances like uncertainty, civil wars, debt overhang, among others, which are peculiar to developing countries.

Mlambo and Oshikoya (2001) did a research on the relationship between macroeconomic policy factors and private investment in Africa covering the period 1970 – 1996. The study focused on panel data regressions for a sample of forty developing countries from Africa, East Asia, Latin America and South Asia. The following equation was estimated using static ordinary least squares (OLS).

$$PRIVY = f(GDPGR, GDPPC, PUBINV, FBALY, \Delta PCRY, PRATE, LRER, EDY, U)$$

Where, PRIVY is the private investment, GDPGR is the real GDP growth, GDPPC is the real per capita GDP, PUBINV is the public investment, FBALY is the fiscal balance, $\Delta PCRY$ is the share of domestic credit to the private sector, PRATE is the real interest rate, LRER is the real exchange rate, EDY is the share of external debt in GDP and U is a variable to capture uncertainty in inflation. The study yielded some imperative results on how macroeconomic policies affected investment. First, investment behavior was affected by the economic environment in which entrepreneurs operate. This indicated the importance of providing an appropriate macroeconomic environment, mainly by following sound fiscal, monetary, trade and competition policy. Secondly, public sector reforms had an influence on private investment behaviour. Thirdly, financial reforms were found to reduce financial repression by limiting the monetization of fiscal deficit, liberalizing interest rates and eliminating credit controls. The study, however, assumed that the data for all variables were stationary at level, which is a far fetched assumption for time series data. The results could have improved if the time series properties of the data were tested, and instead of static OLS, error-correction model (ECM) could have been employed.

Alesina, Ardagna and Perotti (2002) evaluated the effects of fiscal policy on private investment using a panel of 18 OECD countries over the period 1960-1996. The investigation was based on Tobin q model, which highlights the central role of profits as a determinant of investment. The study made a breakdown of

spending into the government wage bill, purchases of goods by the government and transfers. On the revenue side, in addition to total taxes, the study considered separately taxes on labor income, indirect taxes and business taxes. Such aggregation was justified on the basis that the main emphasis was on the channel through which fiscal policy affected investment through labor-market. The focus of the study was not on the differences between government investment and consumption of goods and services, and thus they were lumped together. Business and labour income taxes were separated to check their possible direct effects on profits and capital formation.

The investigation found the following: First, increases in public spending increased labor costs and reduced profits, and as a result, investment declined. Second, increases in taxes reduced profits and investment. However, the magnitude of these effects on the revenue side was smaller than those on the expenditure side. Labor taxes had the largest negative effect on profits and investment. Third, the size of the coefficients suggested that there was nothing special in the behavior of investment during periods of large or small fiscal adjustments. Lastly, the study suggested that different composition of the stabilization package could account for the observed difference in private investment growth rates. Thus, to understand properly the effect of fiscal policy on private investment, it is imperative to disaggregate different revenue and expenditure components.

Vergara (2004) investigated on the relationship between the corporate income tax reform and the performance of private investment. Macroeconomic and microeconomic evidence were found to be consistent with the hypothesis that the reduction in the corporate income tax is one of the determinants in the investment boom. Macroeconomic evidence for the period 1975-2003 in Chile indicated that the tax reform explained an increase in private investment of three percentage points of GDP. The study indicated that tax reforms, which involved the reduction in corporate tax rates, resulted to impressive macroeconomic performance by almost all standards. GDP growth averaged 7.6 per cent between 1985 and 1997, while unemployment and inflation dropped in a scenario of overall macroeconomic stability. Private investment showed an impressive performance, climbing from 12 per cent of GDP in 1984-86 to 22.5 per cent of GDP in 1995-97. Information on 87 publicly held companies was used to construct a panel for the period 1980-2002. The microeconomic evidence confirmed that investment was positively affected by the tax reform. Either with the statutory tax rate or with taxes actually paid by firms, the results indicated that lower taxes induced a higher private investment ratio. The findings also showed that there are two channels through which taxes affect investment. On the one hand, higher taxes increase the cost of capital and on the other hand, they reduce internal funds available for investment.

Tondl (2004) did a study on macroeconomic effects of fiscal policies in the acceding countries of Eastern Europe. Concerning the investment effect of fiscal policies, the estimates indicated a strong non-Keynesian effect of corporate taxes and employers' social security contributions in Eastern countries. The increase in these fiscal variables did not reduce investment growth. This implied that there could be relatively low corporate taxes without risk of low investment. The study, however, suggests that enormous social security contributions may sooner or later become a problem for investment. The investment effect of subsidies was unclear from the estimates, which could be either positive or negative. A negative relation may be evident if subsidies indicate regulation and state intervention so that investment is discouraged. There may also be a negative relation if the business climate is promising and investment increases despite a decline of subsidies, which then are redundant.

Kiptui (2005) examined Kenya's fiscal adjustment process and its effect on private investment in Kenya from 1972-1999. Error correction model and co-integration analysis were used in the study. The approach of the study was to analyze the determinants of private investment and then concentrate on the fiscal variables in the results interpretations. The fiscal variables identified included budget deficits, government consumption expenditure, tax burden and public debt. The findings suggested that debt servicing problem crowded-out private investment. The econometric analysis demonstrated that budget deficits had statistically significant

lagged effects on private investment, suggesting that the benefits of fiscal restraint are not realized immediately. The study further asserted that benefits of fiscal restraint were even larger considering that domestic and foreign debt service, total debt stock and tax burden all had negative effects on private investment. The results also indicated that public investment had negative effects on private investment. Lastly, it was found that government consumption expenditure had positive effects on private investment. Use of error correction model in the study illuminates on the relative effects or elasticities of independent variables without providing information on how long the effect will last. In addition, the study assumed that private investment was the dependent variable arbitrarily. Some of the variables in the model could be influenced by private investment. This assumption definitely affects the outcome of the model estimation negatively.

M'Amanja and Morrissey (2005) investigated the impact of fiscal policy and related variables on growth in Kenya. The study used cointegration analysis and error correction Model to evaluate some of the important variables affecting growth in Kenya. The results suggested that boosting government investment could enhance its complementarity role to private investment and growth. The government should increase its own investment in areas that are beneficial to the private sector and eschew from those that compete with or crowd it out. In the same vein, any austerity measures aimed at reducing government expenditure should not be achieved through budgetary cuts on development budget, since this

reduces public investment. The study found that the private investment was very volatile in case of internal or external shocks. The major limitation of the study is that it never disaggregated fiscal variables thoroughly into different sub categories in order to assess the effect of each separately.

Kimani (2005) studied the relationship between budget deficit financing and private investment in Kenya using a vector-auto-regressions analysis. The study found that domestic borrowing crowds-out private investment in Kenya. This could imply that the government does not use the resources from domestic borrowing for investment in public utilities like infrastructure. On the contrary, the results implied that domestic borrowings resulted to government competing for scarce resources from financial sector with the private investors. With this competition, the interest rate goes up making cost of borrowing unbearable for the prospecting investors.

Lesotho (2006) did an investigation on the determinants of private investment in Botswana. This study used a methodology that combined the static OLS with the co-integration and error correction model procedures to establish both the short-term and long-term effects simultaneously. The results of this study postulated that private investment in Botswana was affected by important macroeconomic variables. It showed that macroeconomic factors affected private investment both in the short-term and in the long-term. The short-run variables were public

investment, bank credit to the private sector and the real interest rate. The long-run variables were GDP growth and real exchange rates. This study indicated that real output growth was a positive and statistically significant determinant of private investment in Botswana in the long-run. It suggested that there would be a reduction in the level of private investment with adverse effects on the short-term productive capacity of the private sector when the sector is squeezed for credit. Thus, the finding confirms the importance of the links between the financial sector and real economic activities on the economic growth process. The findings showed that public investment crowds-out the private sector investment. The real exchange rate in the research measured the effect of exchange rate policy on private investment. The results proved that an appreciation of the real exchange rate would positively affect private investment in the long-term. The real interest rate had a positive and statistically significant effect on the private investment.

In their investigation to determine the effect of corporate taxes on investment and entrepreneurship, Djankov, Ganser and Ramalho (2009) conducted a survey by sampling 85 countries in all continents. The results presented evidence that effective corporate tax rates had a large and statistically significant adverse effect on corporate investment and entrepreneurship. It further indicated that this effect was robust on controlling for other tax rates, including personal income tax and the VAT and sales tax, for measures of administrative burdens, tax compliance, property rights protection, regulations, economic development, openness to

foreign trade, seignorage, and inflation. Lastly, the higher effective corporate income tax was also associated with lower investment in manufacturing, a larger unofficial economy and greater reliance on debt as opposed to equity finance.

Khan and Gill (2009) conducted a study with a view to examine the presence of crowding-out effect of public borrowing on private investment in Pakistan. The model for investment function was specified and estimated considering public borrowing, GDP and interest rate as independent variables. A long-run relationship was estimated and analyzed by performing unit-root test and co-integration test. The error correction model was estimated for short-run relationship. The main findings of the study confirmed with statistical significance that there was no crowding-out effects in Pakistan, rather, the crowding-in effect was evident. This result was indeed somewhat paradoxical in terms of conventional wisdom whereby increase in public borrowing crowds-out private investment. This was attributed to such factors as excess liquidity in the banking system, relatively sustainable public debt scenario, government expenditures for transfer payment program, significant development expenditure for producing those goods and services which had the potential to discharge positive externalities, government micro-credit program and black money linkages.

The study recommended that, in case of existence of excess liquidity and the possibility of crowding-in effect, fiscal authority ought to foster private investment

and hence economic growth through expanding borrowing backed by public expenditure. However, the overall criteria that public expenditure authority ought to ensure are the transparency and efficiency in its programs. This study had a limitation in that it never segregated borrowings into different categories and consider them separately, which could have made the analytical framework parsimonious.

Kosimbei (2009) used time series data for the period between 1963 and 2007 to investigate on the relationship between budget deficits and macroeconomic performance in Kenya. The specific objectives of the study were to describe the budget process, explain the sources of budget deficits, investigate the various methods used by government of Kenya to finance budget deficits, to analyze the effects of budget deficits and selected macroeconomics variables and finally to establish the types of relationship that exist between budget deficits and selected macroeconomic variables. The study was underpinned on the Mundel-Flemming model, and it used auto-regressions modeling techniques to achieve the objectives.

The findings indicated that the budgeting process had loop holes, which perpetrated budget deficits. The impulse response functions further revealed that budget deficits have a significant effect on private consumption, private investment, money supply, treasury bills rate, current account and real GDP. Johansen cointegration tests revealed a long-run relationship between budget

deficits and the selected macroeconomics variables. The study recommended that the government of Kenya ought to formulate a firmer fiscal policy that would minimize budget deficits because they affect economic performance in Kenya.

Using structural vector auto-regressions modeling techniques and time series data from 1965 to 2007, Karumba (2009) study analyzed the extent to which institutional factors impacted on private investment. The study found out that tax administration had a negative impact on private investment and that investment promotion impacted negatively on private investment in Kenya. The impact of shocks due to tax administration were found to be dominant compared to those of liberalization policies, while the impact of investment promotion shocks was lesser, compared to that of liberalization of the Kenyan economy.

The study concluded that, among the institutional factors that were considered for analysis, tax administration was of a greater importance to private investors. Therefore, an efficient tax administration ought to have been put in place and properly enhanced before liberalization of the economy. By doing this, the study concluded that economic liberalization would have achieved its objectives of enhancing economic growth through increased private investment.

Maingi (2010) studied on the impact of government expenditure on economic growth in Kenya. The specific objectives of the study were to investigate the

relationship between the components of government expenditure and economic growth, examine the effects of the components of government expenditure on GDP growth rate and to analyze the effects of government expenditure reforms on economic growth. The data used were government expenditure components that included expenditure on government investment, physical infrastructure, education, health care, public debt servicing, economic affairs, general administration and services, defense, public order and national security, and government consumption.

The study applied vector auto-regression estimation technique using the annual time series data for the period 1963 to 2008. The Johansen cointegration tests revealed a long-run relationship between GDP growth rate and the selected components of government expenditure. Further, the Granger- Causality test indicated bi-directional causality between GDP growth rate and components of government expenditure. The results of impulse response functions and variance decomposition revealed that all the components of government expenditure used in the study have effect on economic growth. Furthermore, the study established that government expenditure reforms were paramount for economic growth.

2.4 Overview of Literature

Generally, most of the studies undertaken in this area ignored the aspect of consistency and the credibility of the government fiscal policy. They never

considered the effects of policy reversal and the underlying effects on the private sector. Similarly, there seem to be some inconsistency in these literature findings given that the economic theory has provided the relationship between some of the variables and private investment performance. Khan and Gill (2009), for instance, found that public debt did not impede private investment performance but instead promoted it in Pakistan. Schmidt-Hebbel (1995) and Kiptui (2005) found that public investment did not complement private investment. These findings seem to contradict economic theory about the nature of relationship between these variable. This could be explained by the methodology used and the manner in which fiscal variables were defined with a possibility that they were not adequate in capturing fiscal stance for the respective countries.

Most of the reviewed studies used estimation techniques that were inadequate in accounting for complexity of relationship between macro economic variables. For instance, the studies done on Kenya such as Matwang'a (2000) and Kiptui (2005) evaluated the relationship between fiscal variables and private investment using OLS and error-correction model (ECM). Stringent condition was imposed that private investment was the one being influenced by the other variables without adequate justification. Therefore, the results of the study could not be very informing as the case could have been if the method such as (VAR) was applied to complement regression.

This study employed more elaborate econometric techniques that account for the complexity of the relationship between the specified variables. The time series data used in this study, for instance, was tested for the presence of unit roots by conducting appropriate stationarity tests. Further, cointegration test was performed from which inference on the long term relationships between variables were derived. The Vector Auto-Regression (VAR) was used to generate the impulse response functions that were used to account for the effects of fiscal policy on private investment.

The study further undertook reasonable dis-aggregation of fiscal variables so as to assess the effects of each individually on private investment. This is unlike past studies such as Kiptui (2005), Khan and Gill (2009), among others, where some variables were lumped together, a possible explanation of why findings contradicted economic theory. This makes the present study unique compared to all others reviewed in the literature. Generally, the reviewed literature enlightens on what variables are likely to capture fiscal policy stance and therefore was adopted in this study to analyze the relationship between private investment and fiscal policy.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The chapter presents both the theoretical and empirical model adopted for the study. The variables used in the study are defined. The data, the sources and the methods used in the analysis are explained.

3.2 Research Design

This study aimed at establishing the effects of fiscal policy on private investment in Kenya. Quantitative data was used in the study to answer the research questions posed in chapter one. The study used the time series data for the period 1964 to 2010. The collected data were analyzed using Vector auto-regressive (VAR) modeling technique and the error-correction model was generated after undergoing time series properties tests.

3.3 Theoretical Framework

The theoretical literature on the investment maintains that fiscal policy can either crowd-in or crowd-out private investment depending on how this policy is designed and implemented (Keynes, 1936). The analytical framework underlying this position is fashioned in this study in line with the flexible accelerator model

that is based on Keynesian investment theory. This model is reformulated to take into account the effect of other factors affecting private capital stock accumulation as proposed by Blejer and Khan (1984).

To derive the theoretical framework for this study, the partial adjustment model is expressed as:

$$\Delta I_t = \beta(I_t^* - I_{t-1}) \dots\dots\dots (3.1)$$

where I_t^* is desired or optimal investment at a time t , I_t is actual investment at time t , and β is the partial adjustment coefficient reflecting the assumption that the rate at which firms move from actual level of investment to the desired or optimal level is gradual involving lags. The equation (3.1) implies that the change in investment is a partial adjustment to the gap between the desired and actual investment. Regarding production function, the study used a Domar type production function that relates output to the stock of capital. The desired capital stock K_t^* was assumed to be proportional to the expected output y_t as given in equation (3.2).

$$K_t^* = \delta y_t \dots\dots\dots (3.2)$$

δ represents input-output ratio which is assumed to be constant. This specification assumes a fixed factor proportions production function. This is justified on the grounds of existence of surplus labour in Kenya and thus

production is constrained by the size of capital stock. Suppose that because it takes time to build, plan and install new equipment, the actual stock of capital adjust to the difference between the desired capital stock at the current period and the actual stock in the previous period. The actual private capital stock in period t can be expressed as:

$$K_t = K_{t-1} + I_t - \alpha K_{t-1} \dots\dots\dots (3.3)$$

where K_t is the current period's capital stock, K_{t-1} is the previous period's capital stock and α is the rate of depreciation. Equation (3.3) represents the simplest version of the flexible accelerator model. To see its implication, it can be noted that by definition, gross private investment at a time t is given as:

$$I_t = K_t - K_{t-1} + \alpha K_{t-1} \dots\dots\dots (3.4)$$

By introducing the lag operator L given as $LK_t = K_{t-1}$ and assuming steady state situation, equation (3.4) becomes;

$$I_t^* = [1 - (1 - \alpha)L] K_t^* \dots\dots\dots (3.5)$$

where I_t^* is the desired investment at time t . By combining equation (3.2) and (3.5) the result is expressed as:

$$I_t^* = [1 - (1 - \alpha)L] \delta y_t \dots\dots\dots (3.6)$$

Substituting equation (3.6) into (3.1), a dynamic flexible accelerator model is obtained as given by equation (3.7).

$$\Delta I_t = \beta \left([1 - (1 - \alpha)L] \delta y_t - I_{t-1} \right) \dots \dots \dots (3.7)$$

The dynamic flexible accelerator model imply that the rate at which firms move from actual level of investment to the desired or optimal level is gradual involving lags, and that the variation in investment depends on output.

This study adopted the approach used by Blejer and Khan (1984), which allows private investment to vary with economic conditions. The study further formed a hypothesis that the size of partial adjustment coefficient β , depends on both fiscal and non-fiscal variables. This stipulation can be formally expressed as;

$$\beta = f \left(\frac{\sum_{j=1}^m x_{jt}}{I_t^* - I_{t-1}}, \frac{\sum_{i=1}^k z_{it}}{I_t^* - I_{t-1}} \right) \dots \dots \dots (3.8)$$

where x_{jt} is a vector of fiscal variables, z_{it} is a vector of non – fiscal variables.

Fiscal and non-fiscal variables are expressed in relation to the size of the discrepancy between actual and desired level of investment. In this specification, the above hypothesized factors affect investment through the process of adjustment from actual investment towards desired levels. In a linear form, equation (3.8) can be represented as:

$$\beta = \mu_o + \frac{1}{I_t^* - I_{t-1}} \left(\mu_i \sum_{i=1}^k x_{it} + \mu_j \sum_{j=1}^m z_{jt} \right) + \varepsilon_t \dots\dots\dots (3.9)$$

where μ_o is the intercept, μ_i and μ_j are the coefficients of fiscal and non-fiscal variables, respectively, while ε_t is a white noise error term. By substituting equation (3.9) into (3.1) and solving for I_t , the obtained equation is expressed as:

$$I_t = \mu_o I_t^* + \mu_i \sum_{i=1}^k x_{it} + \mu_j \sum_{j=1}^m z_{jt} + (1 - \mu_o) I_{t-1} + \varepsilon_t \dots\dots\dots (3.10)$$

In the equation (3.10), I_t^* , the desired investment is not observable. By substitution of equation (3.6) into equation (3.10) the result is expressed as:

$$I_t = \mu_o [1 - (1 - \alpha)L] \delta y_t + \mu_i \sum_{i=1}^k x_{it} + \mu_j \sum_{j=1}^m z_{jt} + (1 - \mu_o) I_{t-1} + \varepsilon_t \dots\dots\dots (3.11)$$

Equation (3.11) imply that investment is not only explained by changes in output as proposed by the classical flexible accelerator model (Shapiro, 1992), but also by a vector of both fiscal and non-fiscal variables. In the spirit of Blejer and Khan (1984), these variables are found to be affecting the adjustment process from actual to the desired or optimal level of investment.

3.4 Empirical Model

The model to be estimated in this study is derived following Blejer and Khan (1984) but using fiscal variables only. However, output was retained because it is a core variable in the flexible accelerator model in explaining variation in

investment. The aggregate effect of non fiscal variables was therefore captured through the variations in output. Fiscal reforms have influence on private investment. In Kenya, the major fiscal reforms which have taken place include the establishment of KRA, creation of export processing zones, economic liberalization, giving of tax amnesty and government expenditure downsizing. To capture the effects of these reforms on private investment, a vector of dummy variables were included in the model. The general form of the model which was estimated is as given in equation (3.12);

$$I = f(Y, MT, VAT, ED, CIT, DX, RX, BD, FS, DS, D1, D2, D3, D4, D5).....(3.12)$$

where I is the private investment, Y is output, CIT is income tax, VAT is value added tax, ED is excise duty, MT is import tax, DX is development government expenditure, RX is recurrent government expenditure, BD is budget deficit, FS is foreign debt service and DS is domestic debt service. A vector of dummy variables are also specified in equation (3.12) where $D1$ is the establishment of KRA, $D2$ is economic liberalization, $D3$ is tax amnesty, $D4$ is expenditure downsizing while $D5$ is the creation of EPZs.

However, the investment model given in equation (3.12) imposes stringent condition that investment is the dependent variable while the variables in the right hand side of equation the (3.12) are independent. This condition is introduced in an adhoc manner since economic theory does not provide adequate evidence on

the granger causality between these variables. Investment could be impacted by changes in these variables and on the other hand its variations could also affect these variables. Sims (1972) argued that the division of variable into endogenous and exogenous variables, as done in the structural models, is arbitrary and that VAR models could avoid that by treating all variables as endogenous. It is further asserted that in the VAR model, cross variable effects are automatically included as each variable is regressed on its own lagged value and lagged values of all other variables. Sims (1972) modeling philosophy was adopted in this study and the modified flexible accelerator model only played the role of identifying variables of interest.

3.5 Definition and Measurement of Variables

Private Investment (I): It is the capital accumulation by the private agents for productive purposes. It was obtained by deducting government investment from gross fixed capital formation.

Income Tax (CIT): This is the tax imposed on income of individuals and companies. It was measured by aggregating the taxes that fall under this category.

Value Added Tax (VAT): This is an indirect tax on the domestic consumption of goods and services levied at each stage in the chain of production and distribution from raw materials to the final sale, based on the value added at each stage. It was derived through summing up of all taxes on value added paid by different agents in the economy.

Excise Duty (ED): It is a domestic tax on the production or sale of a commodity in a given country. It was measured by summing up all taxes falling under this category.

Import tax (MT): It is the tax levied on imports by the custom authorities of a country to raise state revenue or to protect domestic industries from efficient or predatory foreign competitors. It was measured by aggregating the taxes that fall under this category.

Development Government Expenditure (DX): It is the government expenditure on capital overheads. It was measured by the total government expenditure less recurrent expenditure.

Recurrent Government Expenditure (RX): It is the current expenditure for purchase of goods and services at all levels of government. It encompasses purchases of materials, office supplies, fuel and lighting, salaries and wages, travel services and payment of rent. It was measured by recurrent expenditure on labour costs and other goods and services.

Budget Deficit (BD): It refers to the total government revenue less total expenditure. It measures that portion of expenditure which is financed through borrowing and by printing of notes and coins. It was measured by deducting total expenditure (re- current and capital) from total revenue (tax and non-tax).

Foreign Debt Service (FS): It refers to the interest plus principal payment by the government for all external debt. It was measured by aggregating the amounts of all such interest and principal for any given year.

Domestic Debt Service(DS): It refers to the interest plus principal paid by the government for all domestic debt. It was derived by summing up all payments to local lenders for different years by the government.

Output (Y): It refers to the total value of final goods and services produced within the economy at any given period. It was measured by the GDP for any given year.

Establishment of KRA(D1): It is the restructuring of government revenue collection institution leading to the establishment of Kenya Revenue Authority in 1995 as a semi autonomous revenue collection government agent. It was taken to be equal to one in the years KRA has been in existence and zero otherwise.

Economic Liberalization (D2): It refers to shift from government controlled economy to an almost free market economy. It was taken to be equal to one in years 1986 and after ward when major economic liberalization started and zero otherwise.

Tax Amnesty (D3): It is a conditional forgiveness of tax evaded in the past and interest or penalties charged for tax evasion. It was taken to be equal to one in years 1997, 1998, 2001 and 2005 when there were major tax amnesties and zero otherwise.

Expenditure Downsizing (D4): It refers to reduction in cost as a result of reducing civil servants. It was equal to one in the years 1991, 1993, 1994 and 2002 when Kenyan government implemented golden hand shake and comprehensive civil service reforms and zero otherwise.

Creation of EPZs (D5): This refers to the establishment of special economic zones in 1990 with an objective of giving monetary and non monetary incentives to the firms operating in the designated areas. It was taken to be equal to one in the years when EPZs have been in operation and zero otherwise.

3.6 Data Type and Source

The study used published data for the period 1964 to 2010. The data was derived from Statistical Abstracts, Economic surveys, Central Bank of Kenya's Quarterly Economic Reviews and Annual Reports, Sessional Papers, International Monetary Fund financial statistics (CD-ROMs), African Development indicators, World Bank's African Database (CD – ROM). Substantial amount of information was also obtained through visits to Ministry of Finance, Kenya Revenue Authority (KRA), Kenya Institute of Public Policy Research and Analysis (KIPPRA), African Economic Research Consortium (AERC), World Bank local offices, Ministry of Planning, National Development and Vision 2030, among other credible sources.

3.7 Data Collection

Data collection was preceded by identification of the data sources and designing of suitable data collection template. For the data on a given variable that was collected from more than one source, caution was taken to ensure consistency of such data. This only happened for those cases where the original source did not have the data for the entire series.

The data was taken in calendar years because private investment and gross domestic product data were in calendar years. The data series that were in fiscal years were converted into calendar years by getting simple average of two semi-annual series that fell on the same calendar year. In order to increase the degree of freedom, the annual data was converted into semi-annual periods through getting average for any given calendar year.

The time-series data for average GDP was converted from nominal values to its real values by dividing nominal values with the GDP deflator using 2000 as the base year. The deflator was chosen because it is the most comprehensive price index for GDP (Branson, 1989 and Wawire, 2006). Furthermore, it measures inflation correctly, since it is a weighted average of the changes in all prices of newly produced goods in the economy. Hence, it has the advantage of incorporating all the newly produced goods in the economy and allows for changes in composition of output. The data for other variables were also converted from

nominal into their real values. The study used the inflation rate to deflate such data from the effect of increase in prices. It cumulated the inflation rates for the period of study from the earlier years onward and then divided each nominal value with the corresponding cumulated inflation.

3.8 Time Series Properties

3.8.1 Stationarity Tests

Time series analysis was central to empirical modeling of the effects of fiscal policy on the private investment. The non-random behaviour of the time series data could undermine the usefulness of the standard econometrics methods if it was applied directly without considering time series properties of the data (Russel & Mackinon, 1993; Gujarati, 1995). To test for stationarity in the variables used in the study, the formal statistical tests for the presence of a unit root were undertaken. The two main methods which were applied are Augmented Dickey-Fuller (ADF) and Philips Perron (PP) tests as explained (Dickey & Fuller, 1979) and (Philips and Perron, 1988) respectively. This was due to the fact that, the data generating process was not an AR(1) process. Therefore, the ADF was correctly specified in the higher-order case (Engle & Granger, 1987). The ADF procedure attempts to retain the validity of the tests based on white – noise errors in the regression model by ensuring that the errors are indeed white- noise. On the other hand, (PP) procedures correct for serial correlation through a parametric correction to the standard statistic (Stock, 1994).

The basic equation used in the PP test remains the same as the one used in the ADF test. The ADF tests the null hypothesis that $\rho = 0$ against an alternative that $\rho < 0$ in the autoregressive equations:

(i) ADF without intercept and trend

$$\Delta y_t = \rho y_{t-1} + \sum_{i=1}^k \delta_i \Delta y_{t-i} + u_t \dots \dots \dots (3.13)$$

(ii) ADF with an intercept but no trend

$$\Delta y_t = \alpha + \rho y_{t-1} + \sum_{i=1}^k \delta_i \Delta y_{t-i} + u_t \dots \dots \dots (3.14)$$

(iii) ADF with both the intercept and trend

$$\Delta y_t = \alpha + \beta_t + \rho y_{t-1} + \sum_{i=1}^k \delta_i \Delta y_{t-i} + u_t \dots \dots \dots (3.15)$$

In this study, both ADF and PP techniques were used to test for the presence of unit roots.

3.8.2 Cointegration

Cointegration refers to the existence of a long-run equilibrium relationship between variables. The idea of long-run equilibrium implies that two or more variables may wander away from each other in the short-run but move together in the long-run (Enders, 1995). The use of cointegration technique allowed the study to capture the equilibrium relationship between non-stationary series within a

stationary model following Adam (1998). It permitted the combination of the long-run and short-run information in the same model and overcame the problem of losing information which could have occurred when attempting to address non stationary series through differencing (Adam, 1998). Cointegration technique made it possible to capture the information of non-stationary series without sacrificing the statistical validity of the estimated equation (Stock and Watson, 1988).

Two main tests for cointegration, namely Johansen cointegration test and the Granger two-step methods were used. Johansen’s methodology, which was expressed as a vector autoregression (VAR) of order P , is given by:

$$y_t = u + A_1 y_{t-1} + \dots + A_p y_{t-p} + \varepsilon_t \dots \dots \dots (3.16)$$

where y_t is a $n \times 1$ vector of innovations. This VAR can be re-written as

$$\Delta y_t = u + \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-1} + \varepsilon_t \dots \dots \dots (3.17)$$

where

$$\Pi = \sum A_i - I \text{ and}$$

$$\Gamma_i = - \sum_{j=i+1}^p A_j \dots \dots \dots (3.18)$$

If the coefficient matrix Π reduced rank $r < n$, then there exist $n \times r$ matrices α and β each with rank r , such that $\Pi = \alpha\beta'$ and $\beta' y_t$ is stationary. r is the number

of cointegrating relationships. The elements of α are known as the adjustment parameters in the vector correction model, and each column of β is a cointegrating vector. It has been shown that for a given r , the maximum likelihood estimator of β defined the combination of y_{t-1} that yielded the r largest canonical correlations of Δy_t with Δy_{t-1} after correcting for lagged differences and deterministic variables (Johansen, 1995). Johansen proposed two different likelihood ratio tests of the significance of these canonical correlations and thereby the reduced rank of the Π matrix. The trace test and maximum Eigen value test are shown in equation (3.19) and (3.20), respectively.

$$J_{trace} = -T \sum_{i=r+1}^n \ln(1 - \lambda^i) \dots \dots \dots (3.19)$$

$$J_{max} = -T \ln(1 - \lambda^i) \dots \dots \dots (3.20)$$

where T is the sample size and λ^i is the i^{th} largest canonical correlation. The trace test tested the null hypothesis of r cointegrating vectors against the alternative hypothesis of n cointegrating vectors. The maximum Eigen value test, on the other hand, tested the null hypothesis of r cointegrating vectors against the alternative hypothesis of $r + 1$ cointegrating vectors.

The residual based cointegration test introduced by Engle and Granger (1987) by analogy of equation (3.21) involves testing the significance of the coefficient in the Ordinary Least Squares (OLS) regression of:

$$\Delta u = \rho u_t + \varepsilon_t \dots \dots \dots (3.21)$$

where u_t is the residual. The test postulates that if the residuals from the OLS estimation of the non-stationary variables are stationary, then the series are cointegrated. If the residuals exhibited a stationary trend, it implies that the error-correction model (ECM) could not be run. Instead, estimation could be done on the variables at their first difference. However, the long-run characteristics of the data would be lost. Therefore, the study used the Johansen cointegration method to test for the long-run relationship between the variables.

3.9 Estimation Techniques

3.9.1 Vector Auto-Regression (VAR) analysis.

The estimation process encountered a challenge of determining what variable adequately captures fiscal policy stance so that it may be included in the empirical equation. The literature has demonstrated that no single variable appear to be the best variable to estimate in ascertaining the effect of fiscal policy on private investment. Further, economic theory does not provide adequate information on Granger causality between fiscal policy and private investment. Therefore, following Fu, Taylor and Yucel (2003) and Sims (1972 and Sims (1980), the study adopted a VAR model for estimating simultaneous shocks to more than one variable and used that to investigate unexpected and equivalent structural shocks. VAR modeling techniques was used to achieve the four objectives stated in

chapter one. These objectives include: to investigate the relative effects of various taxes on private investment; analyze the relative effects of the components of government expenditures on private investment; determine the effects of government debt servicing on private investment; and investigate the effects of fiscal policy reforms on private investment. Use of VAR in the study was on the justification that it is a theory free method used for the estimation of economic relationships (Sims, 1980).

The study mainly considered fiscal variables in the VAR since the main focus was on the fiscal policy and its effects on private investment. Three different types of VAR exist: The reduced form VAR, the recursive VAR and the structural VAR. The recursive and structural VAR have the same form at the level of matrix equations. The reduced VAR sidestepped the need for structural modeling by modeling every endogenous variable in the system as a function of the lagged values of itself and of all the endogenous variables in the system (Engle & Granger, 1987). The reduced form and the recursive VAR models are statistical models that utilize no economic structure beyond the choice of variables. The compact form of a VAR model is represented as:

$$X_t = A_0 + A_1 X_{t-1} + A_2 X_{t-2} + \dots + A_p X_{t-p} + \varepsilon_t \dots \dots \dots (3.22)$$

where A_0 is $n \times 1$ vector of constant terms, A_1, A_2, \dots, A_p are $n \times n$ matrices of coefficients, X_t is $n \times 1$ vector of endogenous variables and ε_t is a

vector of serially uncorrelated error terms that have a mean of zero and a covariance of matrix ϕ . In the VAR model, each variable was regressed on a constant variable A_{ij} , p lags of itself, and p lags of each of the other variables in the model and the disturbance term ε_t .

The longer lag lengths are normally appropriate since they fully capture the dynamics of the system being modeled and increasing the parameters. However, given the data limitations, lag length determination became a major challenge. This is because, longer lags reduce the degree of freedom and the problem is further compounded by data limitations. Therefore, there was a need to have a trade-off between having a sufficient number of lags and a sufficient number of parameters to estimate. The choice of p (the number of lags) was determined using the Akaike information criteria (AIC) and the Schwartz information criteria (SIC).

Recursive VAR was used to examine the interrelationships among a set of economic variables and to analyze the dynamic effect of random disturbance on the system of variables. Various diagnostic tests were performed to find out the stability and statistical soundness of the estimated model. These included Cusum test, Arch residual test, Ramsey reset test and white noise tests, among others. In the framework, each variable irrespective of whether it was measured at levels or a

given difference level was treated systematically. This implies that all variables in the system contained the same set of regressors (McCoy, 1997). There were no exogenous variables and no identifying restrictions. Economic theory therefore played only the role of specifying what variables was to be included. The variables of interest in this study to test for the effects of fiscal policy on private investment were: private investment (I_t), recurrent government expenditure (RX), developmental government expenditure (DX), domestic debt service (DS) and foreign debt service (FS). Others included; budget deficit (BD), value added tax (VAT), income tax (ICT), import tax (MT), output (Y) and excise duty (ED). The study also made use of the following dummies; establishment of KRA (DI), economic liberalization ($D2$), tax amnesty ($D3$), expenditure downsizing ($D4$), and creation of EPZs ($D5$).

3.9.2 Impulse Response Analysis

VAR usually yield coefficient estimates which are meaningless because of the lack of theoretical underpinning. However, the coefficient estimates were used in the derivation of impulse responses and in forecasting error decomposition. Impulse response analysis linked the current value of the error-term to the future values of X_t or similarly, the current and past values of the error-term to the current values of X_t . Forecast error decomposition measured how important the error in the j^{th} equation was for explaining unexpected movements in the i^{th} variable (Stock

and Watson, 2001). An impulse response enabled the study to trace the effect of one time shock to one of the innovations on the current and future values of the endogenous variable. These impulse responses were obtained from a Vector-Auto Regression Moving Average (VARMA). The coefficient of the VARMA representation, described how a shock to a particular variable at one moment in time shifts the expected time path of each variable, in the model compared with its expected evolution had the shock not occurred.

3.9.3 Variance Decomposition

While the impulse response functions traced the effects of shocks to one endogenous variable on the other variables in the VAR, variance decomposition separated the variation in an endogenous variable into the component to the VAR. To determine what proportion of the variance in a series was due to its own shock and other identified shocks, forecast error variance decomposition technique, which allocates weights to each identified shock in the system at every forecast horizon for a particular variable was used (Odour, 2008). Over a short horizon, the ‘own shock’ dominates the variance forecast and shocks to other variables in the system may gain importance relative to own shock, as the horizons lengthens. The study carried out variance decomposition to determine the proportions of the shocks in private investment that were accredited to fiscal policy variables and therefore established their relative importance in determining private investment in Kenya.

3.9.4 The Error-Correction Model

The regression of private investment against fiscal variables enabled the study to get the effects of these variables on private investment. However, the study could not apply ordinary least squares method (OLS) directly since not all variables were stationary at levels. Differencing the time series prior to estimating model could have only described the relationship between changes in variables and disregarded the long-run relationship between private investment and fiscal variables. ECM model adopted by this study assumes that the short-run effects occur when the economy is still in disequilibrium, and that the long-run effect occurs when the economy moves to equilibrium (Enders, 1995). The long-run equation 3.12 was lagged one period to derive the error correction mechanism, which was included in the error correction model. The coefficients in the ECM, describe the effect of a unit change of a given fiscal variable on the private investment.

CHAPTER FOUR

EMPIRICAL FINDINGS

4.1 Introduction

This chapter presents the findings of the study. First, it determines time series properties of the data to avoid spurious results. Second, it explains the relationship between private investment and the fiscal policy variables, which include budget deficit, development expenditure, recurrent expenditure, domestic debt service, foreign debt service, income tax, import tax, excise duty, value added tax, economic liberalization, the establishment of KRA, tax amnesty, government expenditure downsizing, and the establishment of EPZs. Third, the relative effects of various taxes on private investment are estimated. Fourth, the relative influences of various components of government expenditures on private investment are ascertained. Fifth, the effect of government debt servicing on private investment is determined. Lastly, the effects of fiscal policy reforms on private investment are established.

4.2 Time Series Properties

4.2.1 Stationarity Analysis

Since this study used time series data, it was imperative to test whether data was stationary at levels or needed to be differenced to make them stationary. This was to give assurance on the validity of the results obtained after data analysis. The

data series were tested for stationarity using the Augmented Dicky-Fuller (ADF) and Phillips-Perron (PP) methods. The stationarity test results are presented in Tables A3 and A4 in the appendix III. The results in Table A3 show that income tax and value added tax were stationary at levels at 5 per cent significant level. For all the other variables, the null hypothesis for the presence of unit roots was accepted, thus, the variables were non-stationary at levels. Since most of the variables were non-stationary, it was necessary to difference them. Table A4 in appendix III shows the results after differencing non-stationary variables once.

At first differences, most macroeconomic data become stationary (Kelly & Mavrotas, 2003). The results in Table A4, in appendix III indicate that apart from income tax and value added tax which were stationary at levels, other variables became stationary at 5 per cent after first differencing. Therefore, the stationarity test revealed that income tax and VAT were integrated of order zero, $I(0)$, while private investment, developmental expenditure, recurrent expenditure, budget deficit, excise duty, import tax, foreign debt service, domestic debt service and GDP were all integrated of order one, $I(1)$.

4.2.2 Cointegration Analysis

Since all variables were integrated of order one $I(1)$ with the exception of income tax and value added tax as indicated in Table A3 and A4 in the appendix III, the

test to determine if the variables were cointegrated or not was imperative. Income tax and value added tax, both of which were integrated of order zero, $I(0)$, were included in the model. Their inclusion in the model increased the number of cointegration relationships (Kelly & Mavrotas, 2003). In this study, Johansen approach, which is a multivariate autoregressive model, was used. The Johansen technique represents advancement over the single equation estimation technique, since it allows the possibility of dealing with more than one cointegrating vector (Johansen, 1995). The technique, also allows for the separation of the long-run equilibrium relationships and the short-run dynamics. The Johansen cointegration test results are presented in Table A5 in the appendix IV.

In the Johansen procedure, the likelihood ratio (LR) is used to test the significance of estimates of Eigen values. The results in Table A5, in appendix IV showed the existence of a cointegrating relationship between private investment, budget deficit, developmental expenditure, recurrent expenditure, domestic debt service, foreign debt service, income tax, import tax, value added tax, excise duty and GDP. The LR test indicated nine cointegrating equations at 5 per cent level of significance. This meant that the variables had a long-run relationship, which could not necessarily hold in the short-run (Enders, 1995). The evidence of cointegration also ruled out the possibility of spurious correlation. Moreover, the cointegration tests results presented in Table A5, in appendix IV revealed that the variables in their level form had a long-run relationship, and hence the model

estimation was done using the standard Sims-type VAR at levels (Enders, 1995). Nevertheless, the cointegration results did not point to the direction of the long-run relationship between variables. Since there was evidence of cointegration, then this implied that there must have been Granger-causality from private investment to fiscal policy variables, or vice versa, or both. Therefore, the next step was to carry out Granger-causality tests to know the direction of causality.

4.2.3 Granger-Causality Tests

This is a technique for searching the direction of causation between variables after the existence of cointegration (Kalyoncu & Yucel, 2006). Granger-causality test was used to determine whether one time series is useful in forecasting another (Enders, 1995). This test was done after ensuring that all variables were stationary whether at levels, as was the case of income tax and value added tax, or at first difference for all the other variables. Table A6 in the appendix IV shows the results of Granger causality tests. The Granger causality test revealed that there were either bi-directional or uni-directional relationships between fiscal policy variables and private investment. The bi-directional causality with private investment was witnessed in the case of budget deficit, import taxes and development expenditure. This meant that variations in private investment could lead to changes in budget deficit, import taxes and in development expenditure. On the other hand, fluctuations in private investment could have resulted from

oscillation in the values of these three fiscal policy variables. The variables that had a uni-directional causality with private investment included: foreign debt service, domestic debt service, GDP, income tax, VAT, excise duty, recurrent expenditure, economic liberalization, establishment of KRA, tax amnesty, expenditure downsizing and establishment of EPZs. These variables were found to be useful in predicting values of private investment. In this case, they were required to be only on the right hand side of the equation.

In terms of intensity in the ability to predict values of private investment, foreign debt service, development expenditure, recurrent expenditure, domestic debt service, VAT, excise duty and budget deficit were found to be important in influencing private investment. In fact, in all of them, the null hypothesis that they could not predict values of private investment was rejected at 1 per cent significance level. In a nutshell, the Granger-causality test gave evidence that in most of the variables, the prediction power in the values of private investment was substantial. This suggested that sound fiscal policy design does not impede private investment but rather fosters it. Additionally, private investment was found to have a bearing on the values of development expenditure, import tax and budget deficit. This elucidate on how imperative private investment could be in managing budget deficits, its complementarity role to the government development agenda or in managing external balance. The Granger-causality results, however, never gave information on direction of causality in terms of whether the variables were

positively or negatively related. It was therefore invaluable to determine the nature of the relationship between fiscal variables and private investment, and this study adopted VAR analysis to establish the correlation.

4.3 VAR Estimation and Diagnostic Tests

The use of VAR estimation technique enabled the study to capture the effect of one standard shock on the fiscal policy variables on the private investment. This enabled the study to know whether the effect of the shock was short-run or long-run in nature. The VAR diagnostics tests were imperative to determine the appropriateness of the generated VAR model. The time series data used for the purpose of VAR estimation was the one which was stationary either at levels or after first difference. In order to increase the degrees of freedom so as to facilitate lagging of variables, the data used were semi-annual. Under the VAR estimations, each variable is expressed as a function of its own present and past values, as well as a function of other variables' present and the past values, and thus, adequate degrees of freedom are required. Lagging variables once was considered to be optimal using Akaike, Schwarz and Hannan Quin information criteria. After the VAR was estimated, several diagnostic tests were carried out to help check its appropriateness. These tests were imperative to avoid spurious estimation results. The results of these diagnostic tests are given in Table A7, in the appendix. The roots of characteristic polynomial, revealed that VAR satisfied the stability condition, since all roots were within unit cycle. The residual serial correlation was

absent at lag 1 and the VAR also passed the normality test as shown by the results of residual multivariate normality test. Lastly, as shown in Table A7 in the appendix V, the tests revealed that there was no problem of heteroscedasticity in the VAR estimates.

The relationships of the VAR as presented in Table A8, in appendix, describe the dynamic response of the model to the identified shocks. The VAR results were used to generate impulse response functions and forecast error variance decomposition (FEVD) analysis, which, offered useful representation of the model's behavior. The impulse response function traced the effect of a one standard deviation shock, on each variable in the VAR, over a given time horizon. A shock to the i^{th} variable directly affects the i^{th} variable, and is also transmitted to all the endogenous variables through the dynamic structure of the VAR (Enders, 2004).

The ordering of variables used in this study was based on the relationship presented in equation (3.12) in chapter three. This ordering was also consistent with the variance decomposition analysis postulation that the variation to shocks were more pronounced in the initial periods of the shock, and the influence reduced with the lags as the percentage variation of the other variables in the model increased. In the VAR model, the variables were ordered as follows: private investment, output, development expenditure, domestic debt service, budget

deficit, foreign debt service, VAT, excise duty, recurrent expenditure, income taxes and import taxes. The dummy variables included were establishment of KRA, economic liberalization, tax amnesty, expenditure downsizing and establishment of EPZs. The impulse response of each of the fiscal variables to a one standard deviation positive shock was generated over a 40 period equivalent to 20 years period since the data in this study was taken as semi-annual.

4.4 Regressions Estimation and Diagnostic Tests

Since it was established that the variables were cointegrated, the study proceeded to estimate the error correction model. The error correction model (ECM) was useful in determining the short-run relationships in the system and also showing whether there is adjustment to the long-run equilibrium. The use of ECM was motivated by the fact that some of the variables were order $I(1)$ while others were order $I(0)$, and therefore, long-run relationship could not be assumed. It was found to be more appropriate to focus on the variable of interest in this study, which is private investment and estimate the model using it as a dependent variable.

The study first lagged the variables once, in order to get the long-run relationship between private investments and fiscal variables. The regression results giving long-run relationship are given in Table A11 in the appendix. The residuals of the

estimated long-run equation were then used to generate the error correction term, which was then applied in the error correction model.

After the ECM was estimated as shown in Table A12 in the appendix VII, several diagnostic tests were carried out to help check its appropriateness. These tests were imperative to avoid spurious estimation results. The results of these diagnostic tests are given in Table A10, in appendix VII. The normality test for the residual distribution shows that the errors are normally distributed. This is due to the fact that the Jarque-Bera statistic is not significant. The Breusch-Godfrey Serial Correlation LM test (lag 1) fails to reject the null hypothesis, thus, indicating that there was no serial correlation. The ARCH test (lag 2) indicates the absence of auto-regressive conditional heteroskedasticity in the residuals. White's test also indicates non-existence of heteroscedasticity in the residuals from the least squares regression. The Ramsey RESET test (lag 2) indicates that the F-statistic and the Log Likelihood ratio are not significant. This shows that the model was correctly specified.

The goodness of fit statistic shows an Adjusted R-squared of 0.64. This means that the independent variables jointly explain 64 per cent of variations in the private investment in Kenya. This therefore, implies that changes in fiscal variables and GDP, explain 64 per cent of private investment in Kenya in the short-run. As

shown in the model estimation results in Table A11, in appendix VII, the error correction term is negative and significant as expected. The negativity of the ECM term, meant that the model converged to the long-run equilibrium. The speed of adjustment to the long-run equilibrium is 61.8 per cent. This implies that 61.8 per cent of the disequilibrium in the private investment is corrected in the first year.

4.5 The Effect of Various Taxes on Private Investment

The first objective of the study was to analyze the effects of various taxes on private investment. The motivation behind establishing these effects was to determine whether taxes in Kenya affect private investment as proposed by some studies (Kiptui, 2005; Djankov, Ganser and Ramalho, 2009). To achieve this objective, this study estimated error correction model to give short-run dynamics between aforementioned taxes and private investment. In addition, vector autoregression, which is a modeling technique, was used to get impulse responses and variance decomposition analysis of value added tax, income tax, excise duty and import tax on private investment. The impulse responses graphs shows, the results of the responses of private investment over the 40 period horizon, to one standard deviation positive shock to each of the four taxes in the VAR estimates.

a) The Effect of Value Added Tax on Private Investment

The effect of one standard deviation shock to VAT on private investment is shown in Figure 4.1

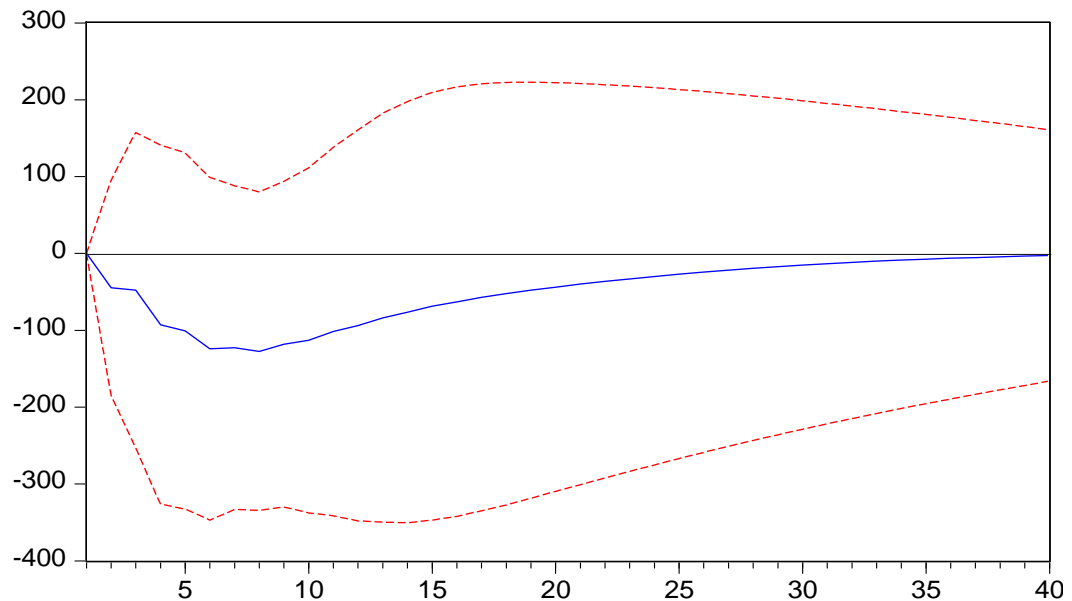


Figure 4.1: The effect of VAT on private investment
Source: Constructed from the study data

The response to one standard deviation innovation to VAT resulted in a stable time path, which declined to zero with respect to private investment as shown in Figure 4.1. The effect of a one standard deviation shock on VAT, would last for thirty six semi-annual periods after which it disappears. The effect was persistently on the negative territory. This implies that the imposition of VAT deterred private investment. The regression analysis gave similar results as shown in Tables A11 and A12, in appendix VII that VAT hindered private investment, since the coefficient had negative sign. However, this coefficient was found to be statistically not significant at 5 per cent significance level. On its inception, VAT

was meant to address the problem of over relying on direct taxes such as personal income taxes and corporate taxes which were hindering the growth of private investment since both their impact and incidence was on one person (Republic of Kenya, 1990; Mureithi & Moyi, 2003). However, it turned out that the enthusiasm with which VAT was received by the private investors faded out. The rent seeking activities of the tax officials; increase in the commodities that are subject to VAT; complicated tax system, with stringent compliance requirements, as well contraction in demand for the commodities as a result of increase in price due to forward shifting of VAT, being the possible explanation as to why VAT had been a setback to private investment (Mureithi & Moyi, 2003; Wawire, 2006; Wawire, 2011).

b) The effect of Income Tax on Private Investment

The effect of one standard deviation shock to income tax on private investment is shown in Figure 4.2.

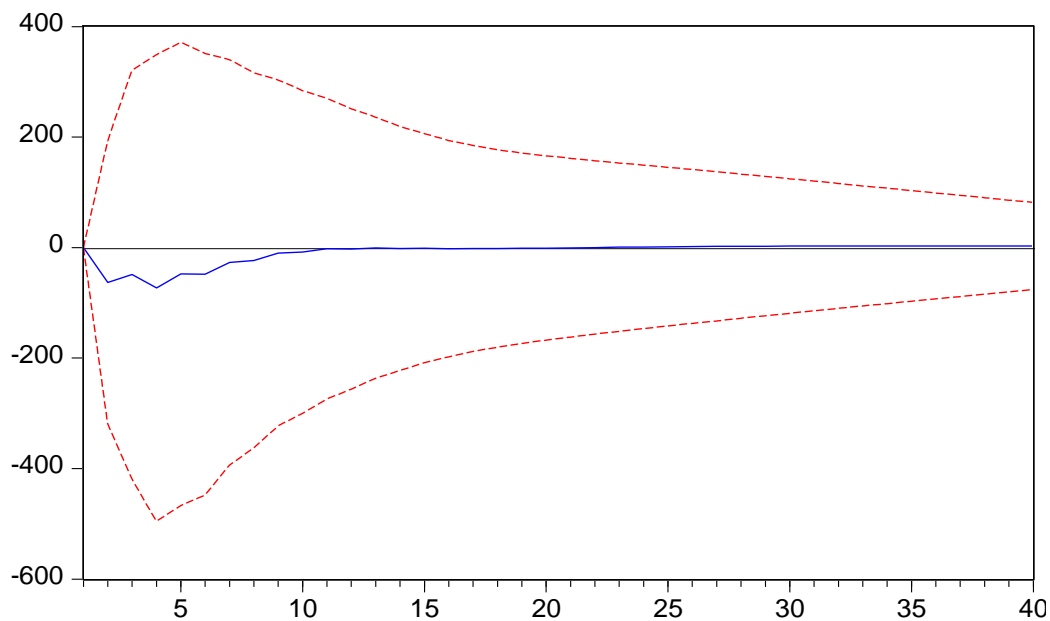


Figure 4.2: The effect of income tax on private investment
 Source: Constructed from the study data

The response to one standard deviation innovation to income tax resulted in a stable time path that declined to zero with respect to private investment after twelve semi-annual periods as shown in Figure 4.2. The negative effect lasted for ten semi-annual periods after which it fizzled out. This result was supported by the regression result shown in Tables A11 and A12 in the appendix VII. The coefficient of income taxes had negative sign, indicating that increase in these taxes only resulted to suppression of private investment, since the return is reduced marginally. The regression result however, indicated that the coefficient of this variable was statistically insignificant at 5 per cent level. The evidence of negative effect agrees with the results obtained by Vegara (2004) and Djankov *et al.* (2009), who found that income tax was an impediment to private investment.

Income tax reduces the return on the investment thereby discouraging expansion of their activities. The fact that the government of Kenya is currently subjecting its residents to heavy income taxes, normally at very high rates compared to other countries in the region, has accelerated capital flight thus affecting private investment levels adversely. Moreover, most of the reforms that have taken place on income tax have been biased towards improving revenue sources for the government, and to some extent, in favour of low income earners whose economic status do not propel them towards investment.

The result suggests that income taxes in the short-run have an effect of throttling the objectives of reform measures, since they result to disincentive to save, to invest and to work, and violates the principle of convenience (Bhatia, 1998; Mureithi & Moyi; 2003, Wawire, 2006). Figure 4.2 shows that the effect on private investment of the income tax is not pronounced and is short lived. Probably, this could have resulted from the declining emphasis on direct taxes due to large cases of tax evasion motivated by inefficient tax collection mechanism. This implies that many private investors are not influenced by income tax, since they can evade it as well (Wawire, 2006).

c) The Effect of Excise Duty on Private Investment

The effect of one standard deviation shock to excise duty on private investment is shown in Figure 4.3.

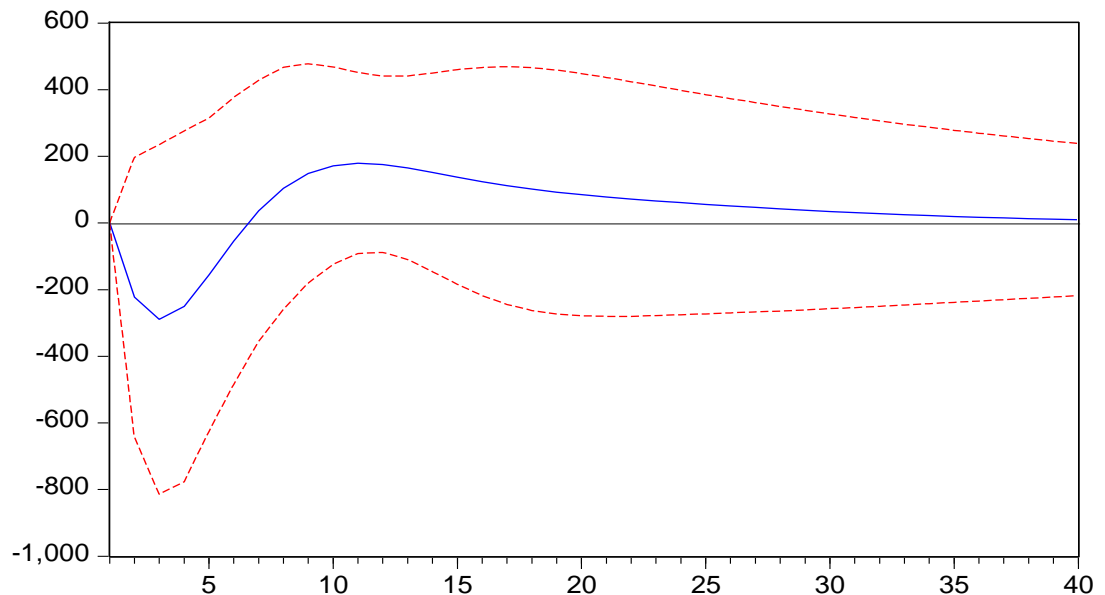


Figure 4.3: The effect of excise duty on private investment
Source: Constructed from the study data

The response to one standard deviation innovation in excise duty resulted in a stable time path, which declined to zero with respect to private investment as shown in Figure 4.3. The effect of one standard deviation shock on excise duty took thirty eight semi-annual, periods to fizzle out. The effect was initially on the negative side for six semi-annual periods, and then moved to positive territory for thirty two semi-annual periods, before moving to the equilibrium. This suggests that excise duty has a mixed effect on the private investment and the effect is felt for long in the economy. On the other hand, the regression result indicated that

private investment and excise duty were positively correlated and that the coefficient of this variable was statistically significant at 5 per cent level. The impulse response result is in support of Karingi *et al.*, (2001) study, which revealed that high excise duty were major impediments to the industrial growth, especially alcohol sector which contributes about 60 per cent of excise revenue.

There is no existing literature on the positive effect of excise duty on private investment, and therefore this study makes an important contribution in this area. The positive effect of excise duty could be attributed to the diversion of resources from enterprises suffering from the predicaments of heavy taxes to those ones whose existence is being encouraged. Excise duty on demerit goods raise their prices, reduce their demand and hence their production (Karingi *et al.*, 2001). As a result, factors of production engaged in manufacturing of such sumptuary commodities may be shifted to the production of socially useful commodities. In the case of Kenya, such diversions could have taken place in the form of establishment of new industries. This could have led to the opening up and development of new regions, resulting in the expansion of business enterprises, which could be complementing each other or competing in their activities. Thus, imposition of excise duty on socially undesirable goods could have resulted into expansion in private investment.

d) The Effect of Import Tax on Private Investment

Figure 4.4 shows the effect of a one standard deviation shock on the import taxes on private investment.

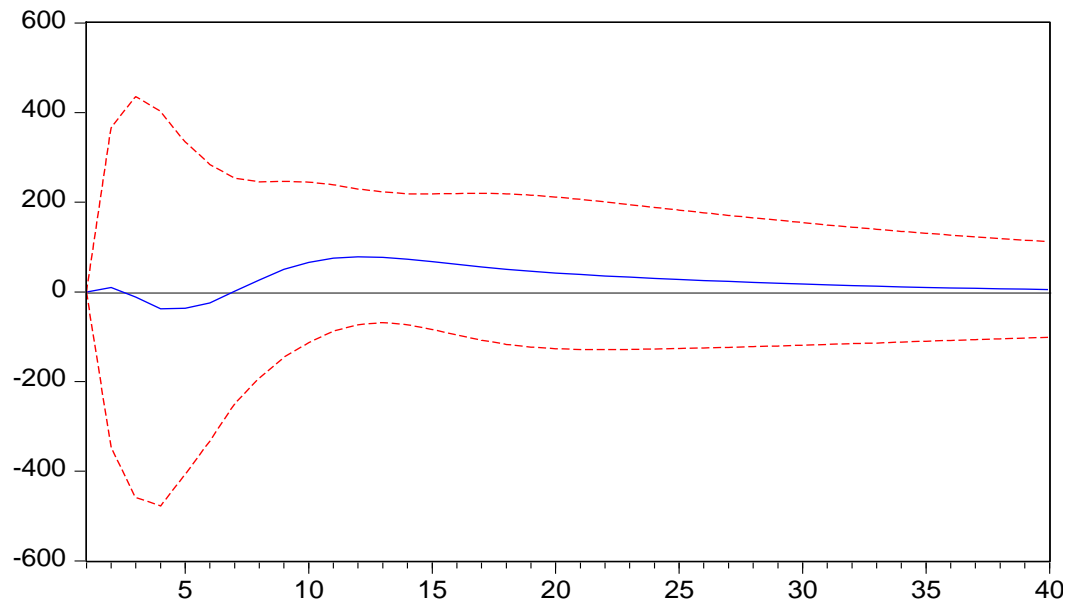


Figure 4.4: The effect of import tax on private investment
Source: Constructed from the study data

The response of private investment to one standard deviation of import taxes resulted in a stable time path, which declined to zero. The results showed that a one standard deviation shock on import taxes has a mixed effect on private investment that lasted for forty semi-annual periods. In the short-run, import taxes had a negative effect on private investment but in the long-run its effect was positive. This suggests that import tax had a mixed effect on private investment, both in the short-run and in the long-run. The regression result supported the impulse response finding that import taxes encouraged private investment. The

coefficient of this variable was positive and statistically significant at 5 per cent level. In the existing literature, the effect of import tax is found to be more of an encouragement to private investment instead of an impediment. Newbery (1987) and Coady (1997) argued that import taxes and barriers on international trade of any sort tend to encourage domestic production of final consumer goods while permitting relatively free imports of capital or intermediate goods. This tends to be associated with high rates of effective protection, high cost of domestic production, and creating a bias against exports. Consequently, while reducing the dependence of the country on imports of final consumption goods, the economy becomes highly dependent on imports of intermediate goods. The positive effect could also have been as a result of increase in aggregate demand through the multiplier effect as result of expansion of local business enterprises. This could be the possible a explanation as to why the effect of import taxes was more on the positive territory.

The negative effect could have resulted from imported capital goods becoming very expensive despite being essential in production of commodities. The effect of this is to impede or slow down private investment activities. Similarly, import tax on raw material may lead to increase in prices for the commodities. This effectively results to contraction in demand, especially for those goods that are not very essential to the consumers. According to Keynes (1936), if effective demand is less, then production of goods and services will fall which will, result in capital

goods used in production becoming idle. This may prompt owners of these capital goods to cease or downsize their operations. Similarly, the prospective investors may reconsider their plans and establish their enterprises elsewhere. This scenario provides a possible explanation as to why the effect of import tax was on the negative region for four semi-annual periods.

4.6 The Effect of Government Expenditure on Private Investment

The second objective of the study was to examine the effects of various components of government expenditure on private investment. Government expenditure may crowd-in or crowd-out private investment. Several studies done in Kenya gave conflicting findings about the effect of government expenditure on private investment. For instance, Kiptui (2005) found that recurrent expenditure promoted private investment while M'Amanja and Morrissey (2005) finding was that only development expenditure mattered for private investment. The present study estimated vector auto-regression model and subsequently used impulse responses and variance decomposition analysis to achieve this objective. In addition, the study estimated ECM to determine the short-run relationships between private investment and fiscal variables, and to show whether there is adjustment to the long-run equilibrium.

a) The Effect of Development Expenditure on Private Investment

Figure 4.5 shows the effect of a one standard deviation shock on the government expenditure on private investment.

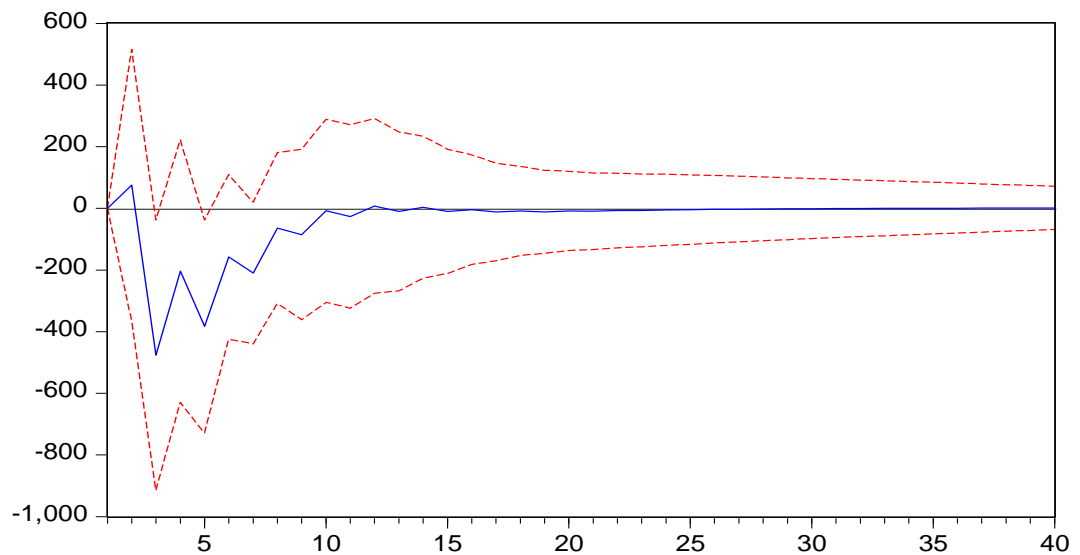


Figure 4.5: The effect of development expenditure on private investment
Source: Constructed from the study data

The response to one standard deviation to development expenditure resulted in a stable time path, which declined to zero with respect to private investment as shown in Figure 4.5. The effect of a one standard deviation shock on development expenditure on private investment lasted for twelve semi-annual periods on the negative territory, and then remained at the equilibrium. The impulse response graphs indicated that, even though the effect was on negative territory for long, it had upward trends for better part of the time when the effect was felt. This means that development expenditure promotes private investment. This implies that there

was complementarity between development expenditure and private investment. The regression results in support of impulse response, found that development expenditure and private investment are positively correlated. This result actually indicated that the coefficient of development expenditure was not only positive but statistically significant at 5 per cent level. Seruvatu and Jayaraman (2001) findings on factors affecting capital accumulation in Fiji correspond to the regression result of this study. In their study, it was found that government participation in accumulating physical capital on the infrastructure positively affect private investment.

Essentially, there is no reason why government expenditure on development should not complement private investment. What is required is reallocation of funds towards activities that supports private investment. Development expenditure on areas such as roads, railways, ports, communication, water and electricity could increase the productivity of inputs in the private sector, thus promoting their expansion. High government expenditure on transport, communication and energy could create an enabling environment for businesses to thrive through reduced cost of production. This will effectively result to increase in private investment in the long-run.

b) The Effect of Recurrent Expenditure on Private Investment

Figure 4.6 shows the effect of a one standard deviation shock on recurrent government expenditure on private investment.

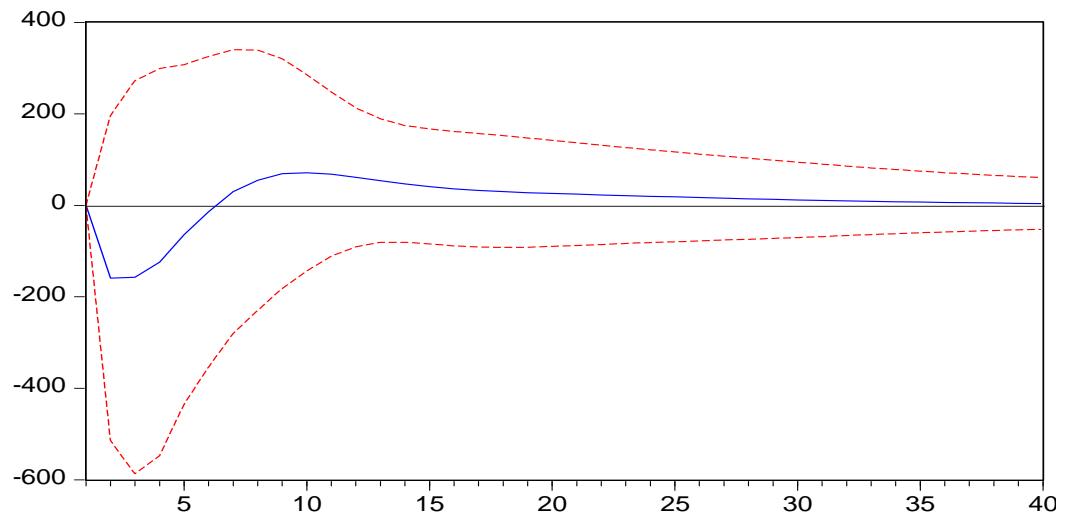


Figure 4.6: The effect of recurrent expenditure on private investment
Source: Constructed from the study data

The response to one standard deviation innovation in recurrent expenditure resulted in a stable time path, which declined to zero with respect to private investment as shown in Figure 4.6. The effect of one standard deviation shock on recurrent expenditure, took thirty six semi-annual periods to fizzle out. The effect was initially on the negative side for six semi-annual periods, and then moved to positive territory for thirty semi-annual periods, before converging to the equilibrium. This suggests that recurrent expenditure has a mixed effect on the private investment and the effect is felt for long in the economy. However, this expenditure promotes private investment because the effect takes longer in the

positive territory. The regression results supported VAR results and showed that recurrent expenditure led to growth in private investment. The coefficient of this variable had a positive sign, but was statistically insignificant at 5 per cent. This finding corresponds to Kiptui (2005), who got similar results using ordinary least squares.

The possible explanation of this result is that expenditure was incurred in areas such as education and health, which are instrumental in increasing the labour productivity and lowering cost of production to the investors. It is worth noting that expenditure on health and education is a major part of government of Kenya's budget. On the other hand, if the government could have incurred much of its expenditure in buying goods locally, it could have resulted to expansion of domestic industries and thus growth in private investment (M'Amanja and Morrissey, 2005; Maingi, 2010). According to Poot (2000), government expenditure on education, even of a recurrent nature, is positive on private investment, since it constitutes investment in human capital which is increasingly becoming an important determinant of private investment.

4.7 The Effects of Government Debt Servicing on Private Investment.

The third objective of the study was to determine the effects of government debt servicing on private investment in Kenya. This was done through the estimation of vector auto-regression model, and subsequent use of impulse responses and

variance decomposition analysis of government domestic debt servicing, government foreign debt servicing and budget deficit. The study also estimated ECM in order to adequately meet the stated objective.

a) The Effect of Domestic Debt Service on Private Investment

Figure 4.7 shows the effect of a one standard deviation shock on domestic debt service on private investment.

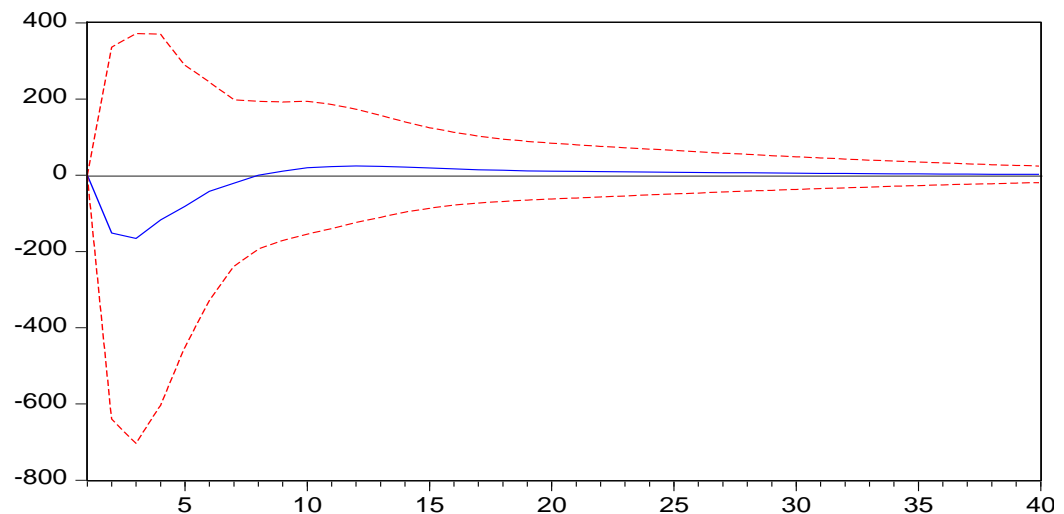


Figure 4.7: The effect of domestic debt service on private investment
Source: Constructed from the study data

The response to one standard deviation innovation to domestic debt service resulted in a stable time path which declined to zero with respect to private investment as shown in Figure 4.7. The results show that a one standard deviation shock on domestic debt service would have an effect on private investment that would last for twenty four semi-annual periods. In the first eight semi-annual

periods, the effect was negative and the remaining sixteen semi-annual periods it was positive. However, the fact that the effect was mostly on the positive side implied that domestic debt service was beneficial to private investment. The regression results supported this finding. The coefficient of domestic debt service was found to be positive and statistically significant at 5 per cent.

This finding is in line with results in Khan and Gill (2009), but contradicts most of the literature in this area such as Kiptui (2005). Thus in the short-run, domestic debt service may impede private investment, but in the long-run it promotes it. The probable explanation of this mixed effect could be that in order to service domestic debt, taxes may have been raised, thus hindering private investment. In the long-run, however, as the government paid lenders in domestic market, there would be more money for the private sector to borrow, thus pushing lending rates down. The implication of decrease in cost of borrowing is to promote private investors, hence, expanding their activities.

b) The Effect of Foreign Debt Service on Private Investment

Figure 4.8 shows the effect of a one standard deviation shock on foreign debt service on private investment.

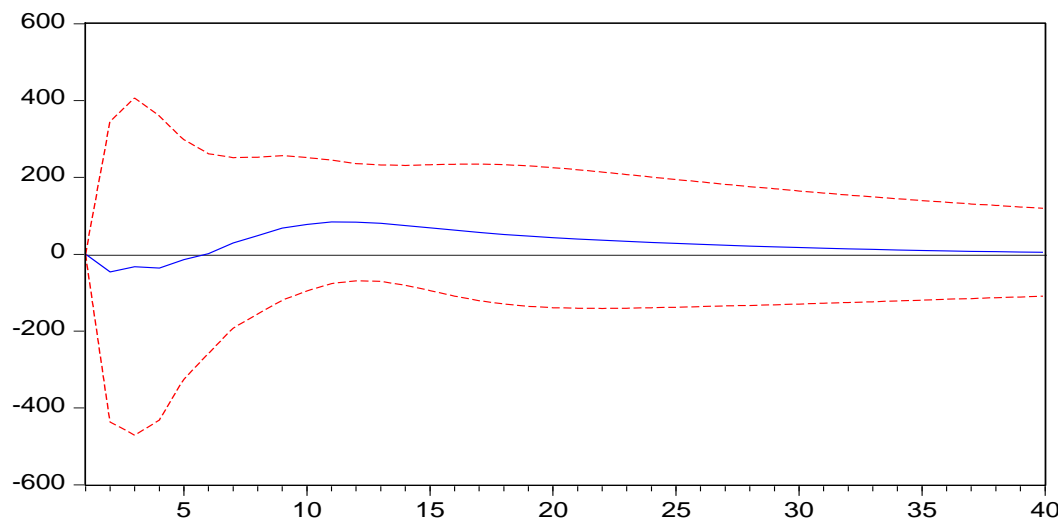


Figure 4.8: The effect of foreign debt service on private investment
 Source: Constructed from the study data

As shown in Figure 4.8, it would take thirty six semi-annual periods for an effect of one standard deviation innovation, on foreign debt service with respect to private investment to fizzle out. The results show a mixed effect of one standard deviation shock on foreign debt service. In the first six semi-annual periods, the effect is on the negative territory and in the remaining thirty semi-annual periods, the effect is on the positive territory. Since it was in the positive territory for thirty semi-annual periods compared to six semi-annual periods in the negative territory, the finding suggests that foreign debt service promotes private investment. Though it contradicts the common belief that debt service hampers private investment, Khan and Gill (2009) had similar results. According to Barro (1974), the fact that the government is able to meet its international obligations in debt repayment sends a signal to the private sector about the direction of economic policies and the

credibility of the authorities' commitment to manage the economy efficiently. Such stability facilitates long term planning and investment decisions by the private sector. Thus, the initial negative effect of foreign debt service on private investment could be explained by the actual or anticipated increase in tax to repay debt as was found by Eaton (1987) while the positive effect could be an expression of confidence by private investors in the government's ability in managing the economy.

The regression results indicated that private investment was positively correlated with foreign debt service. However, the coefficient of this variable was statistically insignificant at 5 per cent. Eaton (1987), Borensztein (1990) and Mlambo and Oshikoya (2001) studies found that a high debt to GDP ratio has a strong negative effect on private investment rates in developing countries. They argued that the presence of large external burdens constitute an uncertainty in the macroeconomic environment, which hampers investment activities. They also viewed higher debt repayment as a reduction to funds available for investment in the economy. These studies also found that a heavy debt overhang reduces the incentive to invest, because of the anticipated foreign tax on future income and returns on investment. The fact that the present study findings is that private investment is enhanced by government ability to meet its international financial obligation suggests that the effects of debt repayment on private investment depend on the unique circumstances surrounding the economic activities of a particular country.

c) The Effect of Budget Deficit on Private Investment

Figure 4.9 shows the effect of a one standard deviation shock on budget deficit on private investment.

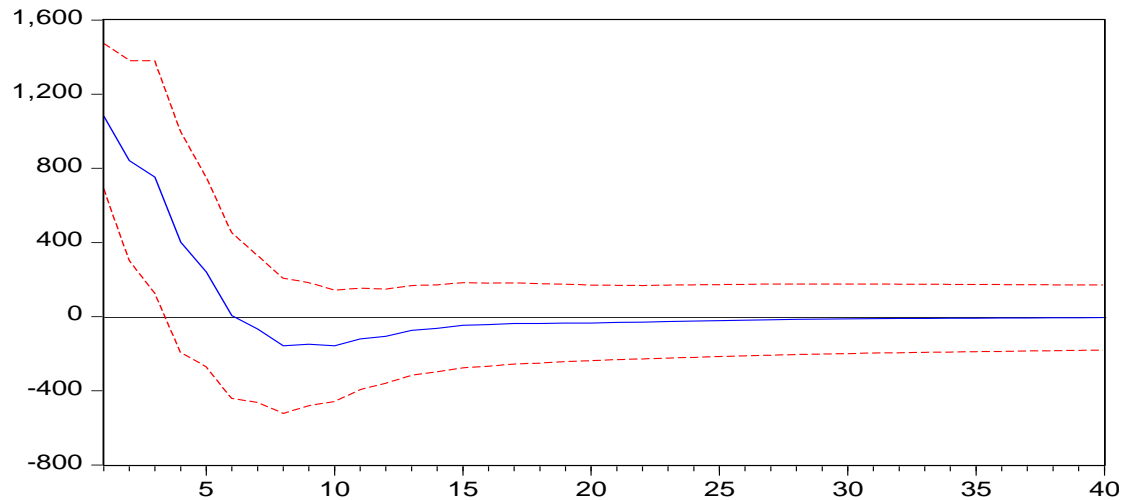


Figure 4.9: The effect of budget deficit on private investment.
Source: Constructed from the study data

The response to one standard deviation innovation to budget deficits results in a stable time path that declines to zero with respect to private investment as shown in Figure 4.9. The effect of a one standard deviation shock on budget deficits on private investment would last for thirty semi-annual periods, after which it reduces to zero. The effect was initially positive for a period of six semi-annual periods and then moved to negative side until it fizzled out. This suggests that budget deficits affect private investment negatively because the magnitude of the effect last for twenty four semi-annual periods in the negative territory. The regression results supported this finding, since the coefficient of budget deficit was negative and statistically significant at 5 per cent. The implication of this finding is that

private investors will view large fiscal deficit as a sign of macroeconomic instability, and therefore hold back their investment. This result is consistent with the findings of Mlambo and Oshikoya (2001), Kiptui (2005) and Kosimbei, Wawire and Kimani (2010). Since budget deficit measures the government's borrowing requirement, other things being equal, large budget deficit could have crowded-out the private sector investment as a result of less access to bank credit, and higher real interest rates. On the other hand, large fiscal deficit is an indication of unstable economic policy stance. The risk and uncertainty associated with this instability could have hindered private investment due to irreversibility in most of the investments (Njuru, 2004).

4.8 The Effect of Fiscal Policy Reforms on Private Investment

The fourth objective of this study was to analyze the effect of fiscal policy reforms on private investment. To attain this objective, the dummies for establishment of KRA, expenditure downsizing, establishment of EPZs, tax amnesty and economic liberalization were included in the VAR model estimation. The impulse responses and variance decomposition for the given dummies were analyzed and interpreted. The study also made use of regression analysis to complement VAR model estimated.

a) The Effect of Establishment of Kenya Revenue Authority on Private Investment

Establishment of KRA was captured by a dummy in the case of organizational restructuring of the revenue collection activities, resulting in the formation of semi-autonomous government agent in charge of consolidating all government revenue into one kitty. This dummy assumed the value of one during the years KRA has been in existence, and zero otherwise. Figure 4.10 shows the effect of a one standard deviation shock on establishment of KRA on private investment.

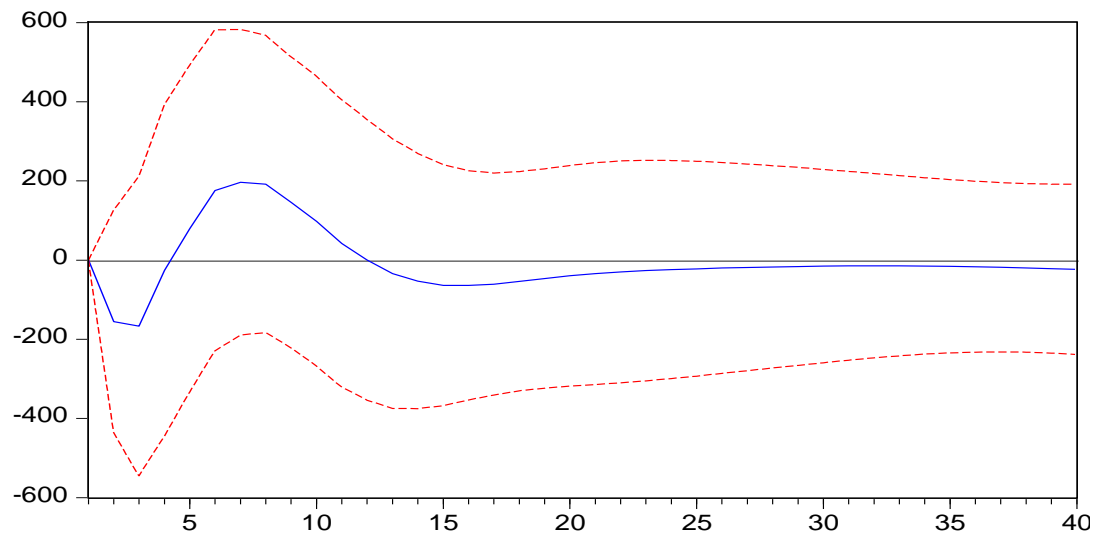


Figure 4.10: The effect of establishment of KRA on private investment
Source: Constructed from the study data

Upon its establishment, KRA led to decline in private investment for the first four semi-annual periods. This could have resulted from fear that the new institution would increase the number of taxes charged or that loopholes for tax evasion

would be blocked, and therefore returns on investment would diminish. The shock led to the improvement in private investment between second and twelfth semi-annual periods. The possible explanation could be that investors developed confidence in the new institution, in terms of its efficiency, due to reduced bureaucracy in its activities as well as reduction in rent-seeking behavior resulting from major reforms which were carried out in tax collection and management. However, private investment embarked on a downward trend before finally fizzling out towards the end of the period as shown in Figure 4.10. The regression result indicated that the dummy for KRA had negative coefficient, which was also statistically significant at 5 per cent.

As noted by Mureithi and Moyi (2003), introduction of a new tax administration system, as a semi autonomous government institution, was expected to provide efficient tax services to tax payers (investors), and therefore, make them prefer Kenya over other destination for private investment. The regression and VAR results are in support of the view that when bottlenecks hindering efficient operation of tax system are eradicated, with an introduction of more proficient tax collection agency, investors would be more encouraged to set up their enterprises in Kenya. The empirical findings that establishment of KRA hindered private investment in Kenya was similar to Karumba (2009). This result could be attributed to the fact that investors were scared of a more tight tax system, which would make tax avoidance and evasion impossible. In addition, it could be that

there was an accompanying increase in taxes which made investors to prefer other low tax destinations.

b) The Effect of Economic Liberalization on Private Investment

Economic liberalization was captured by a dummy in the case of institutional changes in the economy in terms of government control. It was equal to one in years 1986 and afterwards when major economic liberalization started, and zero otherwise. Figure 4.11 shows the effect of a one standard deviation shock on economic liberalization on private investment.

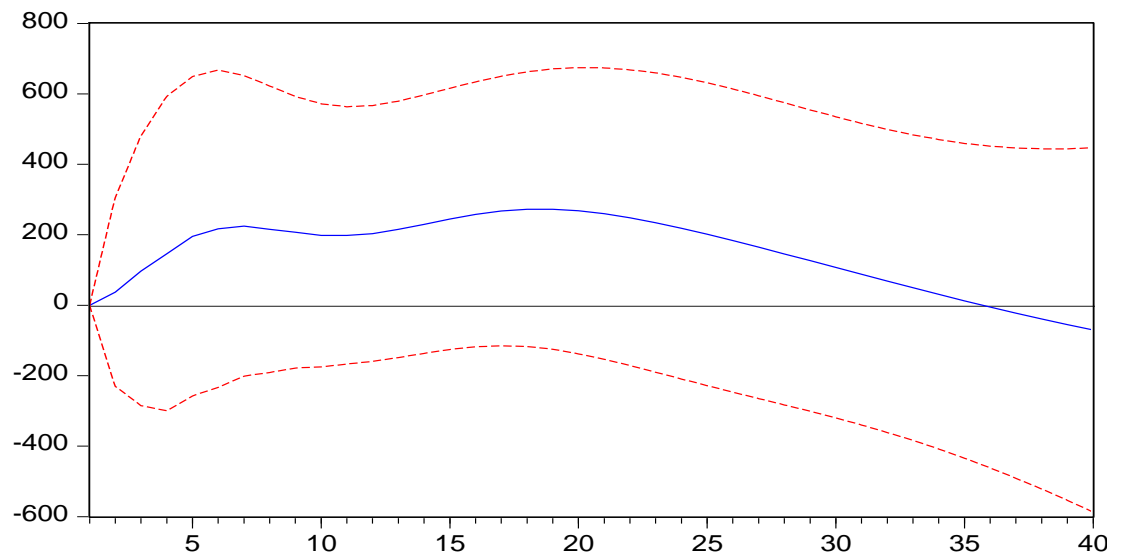


Figure 4.11: The effect of economic liberalization on private investment
Source: Constructed from the study data

Upon the introduction of economic liberalization measures, there was a commendable improvement in private investment for the first thirty six semi-annual periods, before the effect of the shock turned to the negative territory in the

last four semi-annual periods. Liberalization was expected to promote private investment by opening more ventures previously limited to the public sector. The findings that liberalization measures promotes private investment, supports the views of Moshi and Kilindo (1999), who found that a well implemented liberalization measure creates an enabling environment for the private sector to prosper, as stringent controls by the government, that hinders its operations, are eradicated. The outcome is also supported by Nakamba (1998) study, which noted that economic liberalization that leads to floating exchange rate and price decontrol was a powerful engine towards growth of investment in Zambia. The regression results indicated that with economic liberalization, there was incentive to invest in Kenya. The coefficient of this dummy was positive and was statistically significant at 5 per cent. Liberalization poses challenges to private investors who are unable to cope with the competition in the short-run. The regression results, therefore, indicate that private investors in Kenya were able to survive the negative repercussion of liberalization.

c) The Effect of Tax Amnesty on Private Investment

Tax amnesty was captured by a dummy variable in the case of conditional forgiveness of tax evaded in the past, and interest or penalties charged for tax evasion. It was equal to one in year 1997, 1998, 2001 and 2005 when there were tax amnesties, and zero otherwise. Figure 4.12 shows the effect of a one standard deviation shock on tax amnesty on private investment.

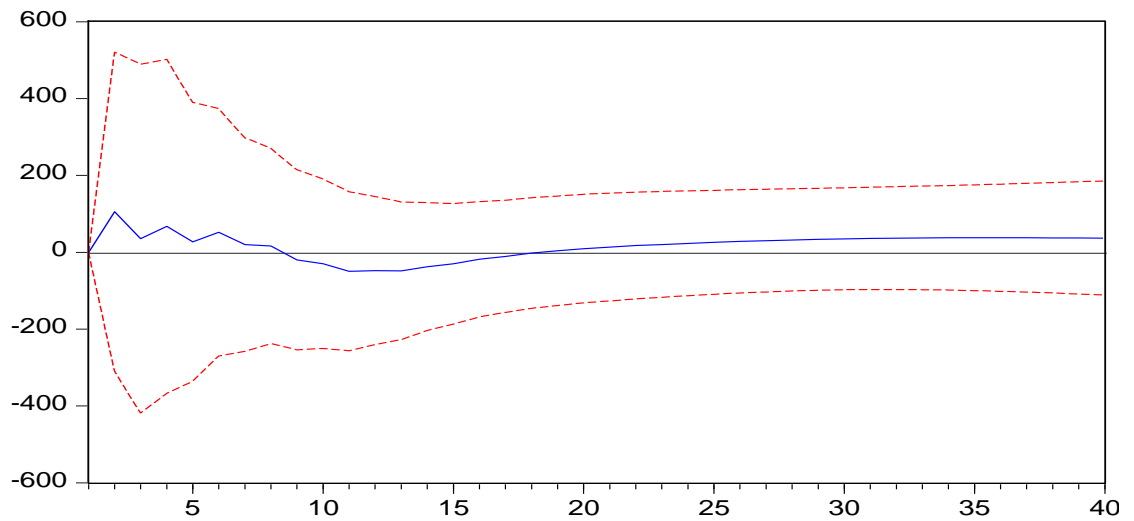


Figure 4.12: The effect of tax amnesty on private investment
 Source: Constructed from the study data

The response to one standard deviation innovation to tax amnesty resulted to increase in private investment for the first eight semi-annual periods. The negative performances followed, and continued until the eighteen semi-annual periods beyond which the performance of private investment was positive. In a nut shell, tax amnesty impacted on the private investment positively. This impulse response finding was confirmed by regression result in which the coefficient of tax amnesty dummy was found to be positive and statistically significant at 5 per cent level. The effect of tax amnesty having positive effect on private investment implied that by extending tax amnesty to delinquent tax payers, it would mean that investors would have an opportunity to declare their income truthfully. Thus, the fear of the taxes being backdated or taxpayers being harassed by corrupt tax officials with frequent and unrealistic demand will vanish (Mureithi & Moyi, 2003; Wawire, 2003; Wawire, 2006).

d) The Effect of Expenditure Downsizing on Private Investment

Expenditure downsizing was captured by a dummy representing reduction in costs as a result of reducing the number of civil servants. It assumed the value of one in the years 1991, 1993, 1994 and 2002 when the government implemented the golden hand shake and comprehensive civil service reforms, and zero otherwise. The effect of one standard deviation shock to policy on expenditure downsizing on private investment is presented in Figure 4.13.

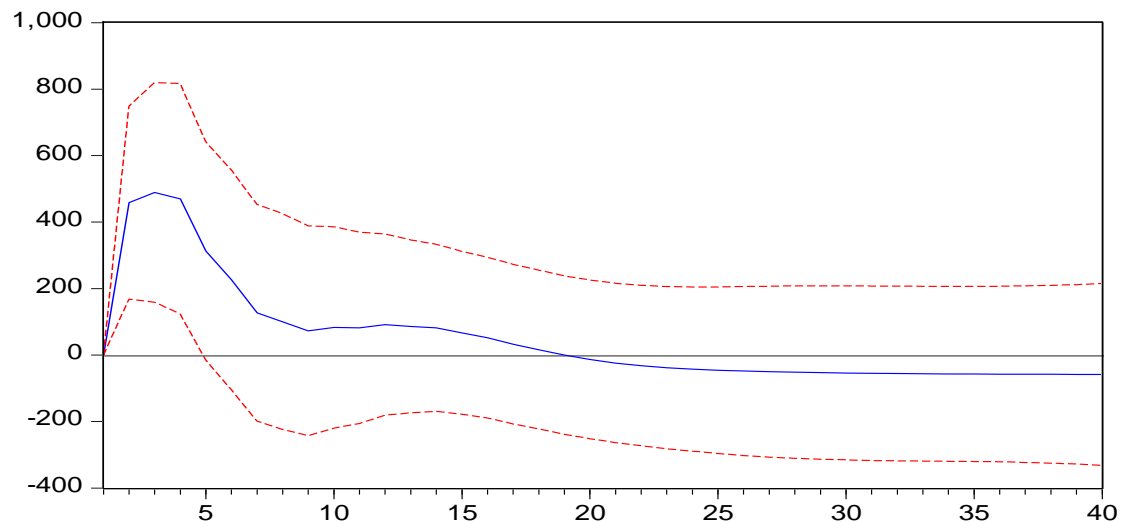


Figure 4.13: The effect of expenditure downsizing on private investment
Source: Constructed from the study data

The effect of one standard deviation shock on expenditure downsizing on private investment was in both positive and negative territories in the period. The effect was initially an instantaneous positive for the first nineteen semi-annual periods, before declining to negative for the remaining period of twenty two semi-annual periods, but it never fizzled out. The fact that the effect was in the negative

territory and declining for most of semi-annual periods, indicates that expenditure downsizing never promoted private investment. The regression result supported the finding that expenditure downsizing discouraged private investment. This dummy variable had negative coefficient which was statistically significant at 5 per cent.

As noted by Mlambo and Oshikoya (2001), policy reversal and lack of commitment to implement civil service reforms never helped to improve the private investment environment. The political bickering surrounding the whole process of retrenchment of civil servants created uncertainty to the investors, and this could be the possible explanation as to why the effect of expenditure downsizing went to the negative territory and actually persisted (Mwakalobo, 2009).

e) The Effect of Establishment of EPZs on Private Investment

Establishment of EPZs was captured by a dummy taking the value of one from 1990 onwards when the government established EPZs through an Act of Parliament, and zero otherwise. EPZs were established to give impetus to the export growth. The incentives that were given covered areas such as tax holiday, zero rating of exports, duty free imports for the capital and intermediate goods, investment deductions for the factory buildings and plant and machinery. The

effect of a one standard deviation shock to establishment of EPZs on private investment is presented in Figure 4.14.

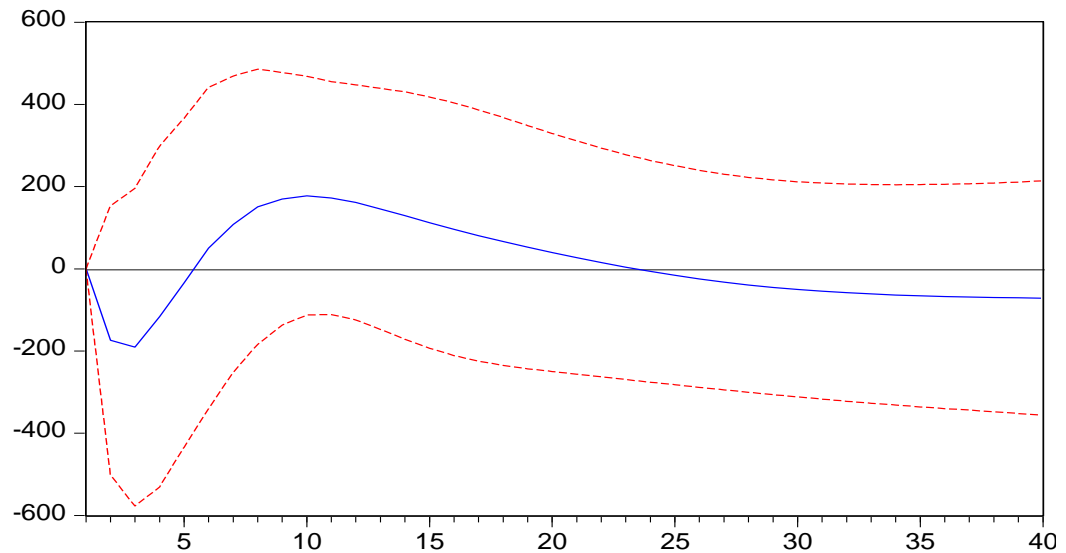


Figure 4.14: The effect of establishment of EPZs on private investment
 Source: Constructed from the study data

Upon their introduction, EPZs had a negative effect on private investment, which was maintained from the time of shock (1990) up to the sixth semi-annual period. This showed that EPZs upon their inception, dampened private investment. This could be explained by lack of market for the products since most enterprises were more export oriented, hence facing massive competition from commodities produced by more technologically advanced countries. From the sixth to twenty fourth semi-annual periods, private investment was on the positive territory, beyond which it remained on the negative territory. The fact that the effect dwelt more on the negative side implied that the establishment of EPZs was an impediment rather than incentive for the growth of private investment. This is

contrary to the expected results because the purpose of earmarking special economic zones with variety of incentives was to encourage more local and foreign investors to establish enterprises.

It was expected that with the massive incentives given by the government, private investment would increase, but the results contradicted these expectations. The possible explanation could be due to competition for factor inputs which were not abundant. Some investors were forced to downsize or relocate to other countries, since the opportunity provided in Kenya was not lucrative as earlier expected (Mireri, 2000). The regression result indicated that establishment of EPZs deterred private investment, since the coefficient of this dummy was a negative and statistically significant at 5 per cent.

4.9 Forecast Error Variance Decomposition Analysis

The forecast error variance decomposition (FEVD) technique was used by this study to determine the proportion of the variance in private investment series that was due to own and other identified shocks at a given period, following Enders (1995) and Stock and Watson (2001). Under FEVD technique, the variations in the variables that brought about changes in private investment were analyzed. This was an alternative method to the impulse response functions for examining the effect on private investment of shock in fiscal variables. The technique determined how much of the forecast error variance in private investment was explained by

innovations in each of the explanatory variables over a series of a time horizon (Enders, 1995). It was important to consider the ordering of the variables when conducting FEVD analysis. This was because, in practice, the error terms of the equation in the VAR are correlated, so the results depended on the ordering of the variables in the equation estimated in the model.

Table 4.1 shows the decomposition of the variation in private investment into its (significant) component shocks. The results in the table show the variations in private investment in some of the semi-annual periods up to the 40th semi-annual period.

Table 4.1 Variance Decomposition of Private Investment

Variables	1 st period	8 th period	16 th period	24 th period	32 th period	40 th period
Private investment	100.00	60.34	53.49	49.93	48.04	46.73
Output	0.00	1.58	1.46	1.44	1.39	1.40
Developmental expenditure	0.00	6.91	6.19	5.80	5.68	5.65
Recurrent expenditure	0.00	0.27	0.26	0.26	0.34	0.46
Income taxes	0.00	0.82	0.89	1.83	2.82	3.31
Value added tax	0.00	0.80	1.47	1.46	1.56	1.79
Import taxes	0.00	2.42	4.6	4.96	5.02	4.97
Excise duty	0.00	5.06	6.06	5.94	6.23	6.81
Domestic debt service	0.00	0.90	1.26	1.29	1.6	1.23
Foreign debt service	0.00	3.82	3.55	3.50	3.59	3.73
Budget deficit	0.00	3.74	3.45	3.28	3.17	3.07
Establishment of KRA	0.00	1.62	1.79	1.75	1.69	1.65
Economic liberalization	0.00	1.16	2.50	2.43	2.42	2.60
Tax amnesty	0.00	2.10	5.13	8.81	9.62	9.39
Expenditure Downsizing	0.00	0.21	0.27	0.26	0.31	0.38
Establishment of EPZs	0.00	8.26	7.61	7.05	6.88	6.84

Source: Constructed from the study data

The full results of FEVD analysis of private investment are given in Table A9, in appendix VI. The results show that most of the variations in private investment were due to its own shock at 100 per cent in the first semi-annual period. The variations of own shocks in private investment reduced to 90.97 per cent in the second semi-annual period, and even to a lower level as the forecasting horizon increased. By the fortieth semi-annual period, the variations due to private investment own shock was 46.73 per cent. It was further noted that the variations in private investment in the first semi-annual period brought about by other variables, was zero, implying that on impact, the variations in private investment were totally own shock.

Further observations of the results reveal that the effects of other variables apart from private investment in the system increased relatively with the increase in forecast period. This implies that private investment had feedback effects with the variables in the system, and the effects were multi-directional. The results in Table 4.1 indicate that development expenditure had a greater effect on private investment compared to recurrent expenditure for the whole period. This implies that much of the government expenditure ought to be incurred towards capital items. In addition, prudent designing of development expenditure is imperative, so as to concentrate on those areas that are known to complement private investment. This view was supported by Kahuthu (1999), Seruvatu and Jayaraman (2001), and Kiptui (2005), who noted that public investment was vital in reducing cost of

production for the private investors, especially the one directed towards physical infrastructure development, since it played a complementarity role.

The results in Table 4.1 further reveals that, concerning variations in private investment caused by taxes, contributions by the excise duty were the largest, followed by import tax, income tax and then value added tax in that order. This underscored the role played by indirect taxes in influencing private investment compared to direct taxes. This could imply that, private investors feel more of the pinch when production inputs and final product are taxed compared to taxing their profit. The possible explanation of this could be inability on the part of investors to shift these taxes to final consumer due elastic demand associated with most of the commodity in the market. Value added tax is exceptional in this case because businessmen are agents of the government in collecting VAT and are entitled to a refund for the input tax paid on commodities which are later on sold after value addition (Republic of Kenya, 2007). It is also possible, that income tax paid by many investors was negligible because there existed wide range of capital allowances enjoyed by them for the capital expenditure incurred in the advancement of business.

This finding was a unique because most of the studies in this area took tax burden in lump sum without disaggregating them into different categories. This implied that relative importance of each tax in influencing private investment was not

under pinned in those studies. For instance, Kiptui (2005) had tax burden as a single variable without considering heterogeneous features of different taxes in Kenya. Consequently, policy makers were denied adequate information imperative in designing tax policy, which would promote private investment.

The results further reveal that foreign debt service was more imperative in causing variations in private investment than domestic service. This suggests that rationalization policies ought to favour external debts compared to domestic debt if the objective is to promote private investment. In addition, Table 4.1 indicates that budget deficit caused substantial variations in private investment comparable to that of foreign debt service. The correlation between the two may be explained by the fact that the government of Kenya relied more on external debt to finance its fiscal deficit as indicated by Mureithi and Moyi (2003).

Regarding fiscal reforms, the variance decomposition results underscored the importance of economic liberalization, and government expenditure downsizing in causing variations in private investment. This implied that liberalization measures ought to have been intensified so as to give private investors space to operate with little government interferences. Through expenditure downsizing, government made concerted effort towards restoring confidence to the private investors that government was in control of its expenditure, even though these measures never succeeded in promoting private investment. Variations in private investment

caused by establishment of KRA and EPZ were minimal, while tax amnesty caused lowest variations compared to all other variables in the study period. This implies that extension of tax amnesty had a negligible effect in encouraging private investment.

In summary, this section reveals that taxes, government expenditure, debt servicing methods and fiscal policy reforms have effects on the private investment, which lasts for at least forty semi-annual periods. The impulse response functions and the FEVD analysis have shown that the effects of fiscal policy on private investment are far reaching and they are felt for long periods of time. During the initial semi-annual periods, the own series shocks explained most of the error variance but its effect reduced with the passage of time. The largest proportion of the variance was taken by development expenditure, foreign debt service, income tax, excise duty, import taxes and economic liberalization. However, their proportions declined over time. Recurrent expenditure, domestic debt service, value added tax, tax amnesty and establishment of KRA and EPZs did not affect the variance very much within the forty semi-annual periods.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

5.1 Introduction

This chapter recapitulates the study and makes conclusions based on the results. The policy recommendations stemming from the research findings and areas for further research are also presented.

5.2 Summary

The low levels of private investment in Kenya has been of concern to policy makers, especially its implication on the realization of one of the Kenya Vision 2030 targets of scaling economic growth to 10 per cent, and sustaining it for a long period. Studies have noted that imprudent fiscal policy can be a major impediment to the private investment in an economy. Since independence in 1964, the Kenya government has intensively used fiscal policy as a tool to influence its economic activities. Several policy documents have been published to outline government intentions regarding its fiscal policy. The fact that private investment to the GDP ratio averaged 12.7 per cent over the study period, which is below the levels experienced by the successful economies of the world, gave the impetus to the study on the effects of fiscal policy to the private investment.

The first objective of the study was to examine the effect of various taxes on private investment. To achieve this objective, this study regressed private investment against fiscal policy variables. The ECM was estimated so as to capture both short-run and long-run adjustment processes. Annual time series data for the period 1964 to 2010 were used. The ECM was estimated because some of the variables in the data were not stationary at levels and therefore had to be differenced to avoid spurious regression results. The study went a step further in determining the effect of various taxes on private investment. It used the vector auto-regression model, which yielded impulse responses and variance decomposition analysis of value added tax, income tax, excise duty and import tax. The impulse responses functions, and variance decomposition analysis revealed the results of the responses of private investment over the horizon of forty semi-annual periods to one standard deviation positive shock to each of the four taxes in the VAR estimates.

The results showed that income tax and value added tax deterred private investment. However, the effect of income tax was short lived but that of value added tax persisted. The result further indicated that excise duty and import taxes had mixed outcomes on private investment. However, the effect was more on positive territory, which led to a conclusion that excise duty and import tax promoted the activities of private investors. Thus, the result from both VAR and ECM showed that taxes had mixed effects on private investment.

The second objective was to analyze the relative influence of various components of government expenditure on private investment. The study used both regression estimation and the vector auto-regression modeling techniques. The results revealed that development government expenditure impacted on private investment over a short period of time. The results further disclosed that recurrent government expenditure had mixed effects on the private investment. However, the gravity of the positive effect was more significant leading to conclusion that recurrent government expenditures foster private investment activities.

The third objective was to determine the effect of government debt servicing on private investment. The study employed both vector auto-regression modeling and regression estimation techniques. The findings indicated that domestic debt service was beneficial to private investment. In the short-run domestic debt service may impede private investment, but in the long-run it promotes it. The results further indicated that foreign debt service had mixed outcome on private investment. In the short-run it impacted negatively on private investment, but positively in the long-run. Therefore, the finding suggested that both foreign and domestic debt service promoted private investment. Lastly, it was found that budget deficit has a crowding-out effect on private investment.

The fourth objective was to investigate the effects of fiscal policy reforms on private investment in Kenya. The study used error correction model and vector auto-regression techniques to achieve this objective. Five fiscal reforms considered to be imperative in having bearing on private investment were establishment of KRA, economic liberalization, government expenditure downsizing, tax amnesty and establishment of EPZs. The impulse response results revealed that the introduction of a new tax administration system by KRA in 1995 had a negative effect on private investment in Kenya.

The study also revealed that upon the introduction of economic liberalization measures, there was a commendable improvement in private investment. In fact, liberalization was expected to promote private investment by opening more ventures, previously limited to the public sector. Tax amnesty had mixed effects but it was predominantly on the positive territory leading to a conclusion that it encourages private investment in Kenya. The study revealed that expenditure downsizing had mixed effect on private investment. Lastly, the study found that EPZs had a negative effect on private investment.

This study is unique in that, unlike the majority of the past studies reviewed in literature that used static OLS estimation technique to evaluate the relationship between fiscal policy and private investment, this study used ECM estimation technique together with VAR modeling technique. The benefit of using these two

approaches is the fact that besides getting the effects of fiscal policy on private investment, the study was able to go a step further and evaluate the nature of effect on private investment. The study found that even though some variables had their coefficients being negative or positive, their effect were short lived, which calls for different policy measures than if the effect persisted for a long time.

Further, in contrast with most of the other studies conducted in Kenya, this study concentrated on the fiscal policy tools to examine their bearing on private investment. This study further disaggregated fiscal policy variables into their components in order to evaluate their effects adequately. This was unique, since no other study had used this approach. Majority of studies done in Kenya on private investment focused on the determinants of private investments. In case any fiscal variable was considered in these studies, it was taken as an aggregate, therefore, disregarding its internal components and characteristics. In this case, fiscal policy roles in promoting private investment were not adequately evaluated despite government relying on the fiscal policy to influence economic activities.

5.3 Conclusion

The study concludes that fiscal policy is imperative in determining private investment in Kenya. Different taxes have different effects on private investment both in the short-run and long-run. The government plays a leading role in determining the economic activities by designing prudent public debt management

policies as well as increasing productive public expenditure. Financing budget deficit, from either domestic or foreign borrowing, will have their own repercussions on private investment. The study found that fiscal reforms are paramount in re-shaping the economy whose performance has been disappointing. These reforms are mostly geared towards making the existing institutions more performance-based or creating other efficient institutions or programmes. The establishment of both KRA and EPZs for instance, was found to hinder the activities of private investment. It is therefore evident that fiscal adjustment process has to be carried out with a lot of caution if private investment was to be promoted in the country.

5.4 Policy Implications

The government should re-allocate funds towards project that are beneficial to the private sector, and eschew from those that compete with or crowds-it out. This is because the finding of the study indicated that development expenditure crowds-in private investment. Given this outcome, the government ought to increase its expenditures on those items that enter private production functions as productive public inputs hence enhancing expansion of private investment. Such productive government development expenditure include expenditure on transport and communication infrastructures, health and education facilities, buildings, plant, machinery and equipment; all of which generate positive externalities that raise

private investment. In addition, this will increase marginal productivity of the factor inputs and create an enabling environment for private investment.

The government should streamline its expenditure as a way of reducing fiscal deficit. This due to the fact that the results of the study showed that budget deficit was an impediment to private investment. Reducing budget deficit is imperative to mitigate its undesirable effects on domestic prices, interest rates, balance of payment and exchange rate. Tax chargeability should be evaluated, and the tax system overhauled by the government because if it is left unchanged, it may produce many unintended distortions in allocation of resources. Particularly, government should streamline tax collection activities, remove bureaucracies associated with tax administration as well as ensuring integrity within the ranks of tax officials.

The government should rely more on indirect taxes such as excise duty and import taxes. This is because the study finding indicated that these taxes crowded-in private investment. These taxes are elastic and generate revenue with limited administrative costs. They are also less inconveniencing to the tax payers because they are hidden in the prices of the commodity being transacted, and therefore their increase may not necessarily lead to contraction in demand of the targeted commodities. This would therefore mean that government revenue will not be affected, and at the same time private investment would not be hindered. Private

investors will only act as agents of government in collecting these taxes while the money burden bearer will be on the final consumers.

The government should streamline its allocation to the debt servicing. This is because public debt servicing was found to reduce the resources that could otherwise have been allocated to more productive sectors of the economy. The reduction in public debt can be achieved by reducing government borrowing and ensuring that borrowed loans are concessional in nature. This means that since the government would have a long repayment period at a lower interest rate, the burden on public debt would be lesser.

The government should embark on fiscal reforms in the areas that enhance private investment. This is because the findings of this study showed that fiscal reforms are imperative to private investment. An important component of these reforms is institutional reform of tax collection authority through establishment of KRA. The findings indicate that establishment of KRA deterred private investment. In order to enhance robustness and efficiency in tax administration, with ultimate goal of promoting private investment, KRA should consult all stakeholders, especially Kenya Private Sector Alliance on matters that impact negatively on private investors. Proper and adequate consultations in policy formulation will be essential in eliminating the bottlenecks that suffocate private investors' activities.

In addition the government should re-evaluate the role of EPZs in consultation with all stakeholders. This is because the result showed that establishment of EPZ was not instrumental in promoting private investment. It would be imperative if government consider re-structuring the incentives given to the firms operating under this programme. This ought to be done with an aim of creating an enabling environment to the already existing and the firms intending to join this programme. The Government should also direct adequate resources towards increasing their competitiveness in the international market where local firms faces stiff competition from technologically advanced and more efficient firms.

Regarding economic liberalization, the government ought to continue with measures that frees the economy from strict government control. This is informed by the findings which indicated that economic liberalization enhanced private investment. However, if government adopts free market economic system, it should ensure that strict measures are put in place to regulate the activities of private agents, which could be counterproductive to the investors in the country. For instance, too much liberalization, that result to expansionary monetary and fiscal policies compared to those of the trade partners, will lead to increased imports and capital outflow, hence resulting to balance of payment deficit which negatively affects private investment.

The government should embark on selective expenditure downsizing. This is because the finding of the study indicated that expenditure downsizing was counterproductive to private investment. The government ought to target areas which are not likely to crowd-out private investment. If it is a must that expenditure be cut on areas likely to impede private investment, government should consider involving private sector in provision of certain services through Public-Private Partnership (PPP). Joint efforts between government and private sector, in provision of services such as infrastructure, energy, health and education will ease the burden to the government without affecting investment environment.

Lastly, occasional and wisely executed tax amnesty measures should be considered by the government. This is because the findings indicated that giving tax amnesty to tax payers was encouraging private investors. First, tax amnesty ought to be given to those investors whose expansion has been hindered by rent seeking activities of the corrupt tax officials. Second, tax amnesty ought not to be too frequent. This is because, the faithful investors will be made to carry heavy burden of high taxes, since the government will have to increase tax rates or introduce more taxes to bridge the revenue gap emanating from tax evasion. This could result to relocation of despondent investors to other destinations with no such setbacks. Lastly, the tax amnesty should never be anticipatable. If it is anticipated, it would encourage tax evasion on the errant tax payers as well as apathy on the faithful investors; this may slow down investment activities.

5.5 Areas for Further Research

First, the study suggests that a research which will involve field survey be conducted to assess the non-quantitative effects of fiscal variables on private investment. This will provide an opportunity to get first hand information from private investors as to how government policies influence their investment decisions. Second, the study suggests that a research be conducted on the effect of economic integration on private investment in Kenya, especially the recent and very vibrant Eastern African Community. This is because, economic integration results to opening up of new markets and increases competition which are likely to influence the investment behaviours' of the firms.

It is important to mention that the government may have other objectives other than promoting private investors when it is designing fiscal policies. Policies that are geared towards income redistribution, poverty eradication, achieving fiscal sustainability may not be very attractive to investors and yet paramount to the society.

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APPENDICES
Appendix I: Raw Data

Table A.1: Raw Data for Private Investment and Fiscal Variables (1963-2010) in Million Ksh

YEARS	Y	RX	ICT	EDT	MT	DX	BD	FS	DS	PIV	VAT	D1	D2	D3	D4	D5
1963	6441	1080.80	267.60	120.40	273.80	281.60	3.40	32.80	30.60	637.00	NA	0	0	0	0	0
1964	7120	1138.40	269.20	124.86	317.84	272.40	52.60	41.00	29.80	903.00	NA	0	0	0	0	0
1965	7139	1265.20	317.80	125.98	343.92	285.00	-81.20	56.80	39.60	930.00	NA	0	0	0	0	0
1966	8224	1370.60	375.80	169.48	401.54	327.00	-84.20	80.40	14.20	1224.00	NA	0	0	0	0	0
1967	8751	1488.20	476.60	209.96	399.04	391.60	-26.40	90.60	-10.00	1644.00	NA	0	0	0	0	0
1968	9595	1610.20	502.40	235.86	436.60	489.20	-65.40	88.00	22.20	1790.00	NA	0	0	0	0	0
1969	10416	1822.80	632.80	263.04	487.00	614.20	-103.20	83.60	57.20	1875.00	NA	0	0	0	0	0
1970	11499	2226.34	809.20	305.36	574.42	909.78	290.80	217.40	-23.00	2254.00	NA	0	0	0	0	0
1971	12845	2573.40	937.20	324.10	630.08	1037.04	-265.80	132.80	99.40	2884.00	NA	0	0	0	0	0
1972	13776	2791.56	1069.00	336.76	539.86	1236.56	-446.00	164.00	74.00	3302.00	54.06	0	0	0	0	0
1973	15790	3274.52	1124.80	416.94	795.44	1328.80	-611.00	172.70	188.00	3645.00	639.80	0	0	0	0	0
1974	18776	4181.00	1531.40	453.46	842.24	1849.00	-312.00	202.16	270.96	4075.00	937.26	0	0	0	0	0
1975	21140	4971.86	1796.80	412.60	983.62	2490.32	-832.00	239.24	381.70	4837.00	1185.48	0	0	0	0	0
1976	25562	5740.28	2149.40	564.40	1057.18	2455.00	-1040.00	295.42	430.42	5808.00	1308.44	0	0	0	0	0

1977	32699	8046.18	2846.80	769.44	2083.94	3761.62	-1091.00	623.42	588.98	7800.00	1855.26	0	0	0	0	0
1978	35601	9672.44	3021.40	980.46	2025.48	5362.88	-727.00	625.06	683.64	10280.00	1995.38	0	0	0	0	0
1979	39543	10000.72	3437.00	1189.06	2049.64	4859.12	-2100.00	838.86	736.72	10809.00	3098.14	0	0	0	0	0
1980	44648	13824.00	3951.60	1204.80	2919.00	5419.00	-1790.00	1353.28	1024.50	12451.00	3588.00	0	0	0	0	0
1981	51641	16605.00	3993.40	1279.28	3674.24	5841.38	-3149.00	2151.76	1544.26	14508.00	3895.90	0	0	0	0	0
1982	58214	19353.36	4624.60	1479.06	3305.84	4460.50	-4525.00	2618.56	3224.26	13364.00	3917.50	0	0	0	0	0
1983	66218	19893.02	5023.00	1588.56	3424.38	5059.08	-3002.00	4373.02	1080.28	14349.00	5062.38	0	0	0	0	0
1984	72550	23969.18	6019.40	1575.60	3043.58	6465.70	-3995.00	3895.62	3343.84	16143.00	5471.00	0	0	0	0	0
1985	100831	26386.72	7162.40	1780.80	4236.80	6181.98	-5796.00	4740.70	3465.94	17631.00	6065.86	0	0	0	0	0
1986	117472	32017.58	7714.60	2125.40	4934.20	9243.64	-4707.00	5166.18	4887.22	23064.00	7950.40	0	1	0	0	0
1987	131169	35805.02	9089.60	2461.12	5473.72	8172.08	-9064.00	5677.00	5111.60	25735.00	10399.14	0	1	0	0	0
1988	151194	50887.38	10240.40	6005.56	10240.50	12608.24	-8004.00	7376.32	11308.76	30359.00	9774.92	0	1	0	0	0
1989	171589	48411.24	11983.00	6959.36	11983.06	14709.06	-14405.00	7460.78	11357.18	33156.00	9461.94	0	1	0	0	0
1990	195536	68598.88	14261.60	6143.70	14261.56	24396.42	-9943.00	12285.06	17088.40	40560.00	12140.28	0	1	0	0	0
1991	224232	79317.68	17027.80	6809.20	5118.78	18612.54	-9322.00	11978.06	26016.80	42670.80	18555.40	0	1	0	1	1
1992	264475	95530.76	19970.40	8367.10	9183.00	23193.76	-8192.00	9468.44	51502.24	43776.80	22142.72	0	1	0	0	1
1993	333616	159621.52	36767.20	11125.34	14792.78	20532.22	-19229.00	30684.80	72460.00	56505.20	28994.34	0	1	0	1	1
1994	400700	139490.56	43505.84	19332.26	18598.28	26124.20	-17510.00	28368.40	37558.14	75616.20	24533.86	0	1	0	1	1
1995	465654	155908.78	48082.32	22611.84	21175.68	27683.64	-2693.00	29877.12	38299.94	99497.20	28403.72	1	1	0	0	1
1996	687998	156898.60	48375.02	23687.22	22594.06	26843.90	-690.00	26460.34	32501.38	110142.00	29850.08	1	1	0	0	1

1997	770312	291064.52	55577.90	28381.62	24567.06	24074.58	-7918.00	29150.38	144302.68	118535.00	34468.10	1	1	1	0	1
1998	850808	223086.80	55234.90	28733.16	28443.92	20249.70	-5304.00	31214.64	66955.70	133366.00	39204.76	1	1	1	0	1
1999	906928	206571.50	53316.99	28493.06	28605.16	19583.60	-7191.00	34475.62	43869.95	141403.00	40944.19	1	1	0	0	1
2000	967838	235065.90	53428.93	28317.99	28803.74	33364.50	3214.00	16116.48	64386.83	161714.00	50220.92	1	1	0	0	1
2001	1020020	281096.80	55861.95	39980.00	27302.00	30034.10	-37185.00	29261.45	85996.74	185186.00	50871.68	1	1	1	0	1
2002	1035370	281301.90	70140.28	44042.89	24396.09	29523.20	-33813.00	31234.09	59507.01	178466.00	56135.25	1	1	0	1	1
2003	1138060	321754.10	77409.73	40085.26	25214.00	54558.00	-50711.00	26734.60	87644.52	179254.00	58853.08	1	1	0	0	1
2004	1286460	335336.40	99312.47	44151.22	23531.72	40140.96	-21054.00	15922.28	92384.65	207196.00	75995.66	1	1	0	0	1
2005	1445480	370209.00	114629.06	46645.62	20511.43	62382.00	-13518.00	17008.53	89991.44	264912.00	79925.91	1	1	1	0	1
2006	1642400	402248.00	130719.00	56123.00	27927.00	106597.00	-14971.00	17894.09	112056.29	309402.00	96497.01	1	1	0	0	1
2007	1833511	501718.54	165078.00	61905.51	32944.35	162896.23	-57857.67	23831.82	118290.27	309781.00	111904.51	1	1	0	0	1
2008	2111173	533452.00	194155.00	69872.00	36181.00	160713.00	-54433.21	23871.16	101375.44	239525.00	126854.00	1	1	0	0	1
2009	2365453	620470.00	228168.00	74644.00	41372.00	184794.00	167887.74	24317.18	121959.85	292488.00	146791.00	1	1	0	0	1
2010	2551161	691563.00	268291.00	86205.00	48903.00	306692.00	157243.00	NA	NA	238938.00	172360.00	1	1	0	0	1

Sources: Republic of Kenya's Economic Survey and Statistical Abstracts, Various Issues. Nairobi. Government Printer and World Bank (2007) African Data Base CD-ROM. Washington DC: World Bank.

Key :

PIV	=	Private investment	Y	=	GDP
RX	=	Recurrent expenditure	ICT	=	Income taxes
EDT	=	Excise duty	MT	=	Import taxes
DX	=	Development expenditure	BD	=	Budget deficit
FS	=	Foreign debt service	DS	=	Domestic debt service
VAT	=	Value added tax	D1	=	Establishment of KRA
D2	=	Economic Liberalization	D3	=	Tax amnesty
D4	=	Government expenditure downsizing	D5	=	Establishment of EPZs

Appendix II: Refined Data

Table A.2: Real Data for Private Investment and Fiscal Variables (1963-2010) in Million Ksh

Years	Real PIV	Real GDP	Real RX	Real DX	Real ICT	Real EDT	Real VAT	Real MT	Real BD	Real FS	Real DS	D ₁	D ₂	D ₃	D ₄	D ₅	GDP Deflator	Inflation rate
1964	16041.67	98888.889	23116.7	5770.833	5591.667	2554.792	NA	6162.9167	583.3333	768.75	629.167	0	0	0	0	0	7.2	2.1
1965	11042.17	86012.048	14479.5	3357.831	3536.145	1511.084	NA	3986.506	-172.289	589.157	418.072	0	0	0	0	0	8.3	3.5
1966	9880.734	85666.667	12090.8	2807.339	3181.651	1355.321	NA	3419.5413	-758.716	629.358	246.789	0	0	0	0	0	9.6	2.6
1967	10622.22	86131.89	10588.1	2661.481	3157.037	1405.333	NA	2965.1111	-409.63	633.333	15.5556	0	0	0	0	0	10	2.6
1968	10798.74	93518.519	9743.4	2769.811	3078.616	1401.95	NA	2627.7987	-288.679	561.635	38.3648	0	0	0	0	0	10	2.4
1969	10471.43	98729.858	9808.57	3152.571	3243.429	1425.429	NA	2638.8571	-481.714	490.286	226.857	0	0	0	0	0	11	1.6
1970	8258	105981.57	8098.28	3047.96	2884	1136.8	NA	2122.84	375.2	602	68.4	0	0	0	0	0	11	7.5
1971	8951.22	113271.6	8361.92	3391.672	3042.509	1096.62	NA	2098.4321	43.55401	610.105	133.101	0	0	0	0	0	11	3.7
1972	9070.381	195404.26	7866.51	3333.724	2941.642	969.0029	NA	1715.4545	-1043.7	435.191	254.252	0	0	0	0	0	7.1	5.4
1973	8077.907	208862.43	7053.58	2982.977	2550.93	876.3953	806.814	1552.6744	-1229.07	391.512	304.651	0	0	0	0	0	7.6	8.9
1974	6509.275	211918.74	6286.27	2679.427	2239.629	733.8954	1329.73	1380.8432	-778.246	316.071	386.981	0	0	0	0	0	8.9	16.3
1975	5779.507	219067.36	5935.71	2814.086	2158.366	561.6472	1376.615	1184.0856	-741.894	286.252	423.256	0	0	0	0	0	9.7	17.8
1976	6110.792	234513.76	6149.33	2838.875	2265.327	560.8496	1431.642	1171.527	-1074.63	306.923	466.2	0	0	0	0	0	11	10
1977	6817.635	370736.96	6907.04	3114.539	2503.106	668.2565	1585.02	1573.7074	-1067.64	460.341	510.721	0	0	0	0	0	8.8	12.7
1978	8042.705	275123.65	7881.95	4058.941	2610.409	778.4253	1712.918	1828.0338	-808.719	555.374	566.112	0	0	0	0	0	13	12.6
1979	8728.891	419777.07	8142.86	4230.96	2673.179	897.9801	2108.245	1686.7219	-1170.12	605.927	587.897	0	0	0	0	0	9.4	8.4
1980	8705.09	436441.84	8916.44	3846.602	2765.195	895.9057	2502.298	1859.521	-1455.84	820.412	659.139	0	0	0	0	0	10	12.8
1981	9219.904	462732.97	10406.6	3851.019	2717.168	849.5486	2559.473	2254.87	-1689.12	1198.71	878.509	0	0	0	0	0	11	12.6
1982	8270.623	470987.06	10670.1	3056.938	2557.27	818.4985	2318.516	2071.2404	-2277.15	1415.53	1414.99	0	0	0	0	0	12	22.3
1983	7567.723	490867.31	10717.2	2599.558	2634.517	837.6898	2452.179	1837.8536	-2055.43	1909.22	1175.46	0	0	0	0	0	13	14.6

1984	7932.362	495560.11	11410.6	2998.122	2872.633	823.1426	2740.213	1682.6119	-1820.24	2151.05	1150.92	0	0	0	0	0	15	9.1
1985	8318.719	611467.56	12402.9	3115.192	3246.749	826.6995	2841.591	1793.197	-2411.58	2127.17	1677.29	0	0	0	0	0	16	10.8
1986	9530.445	655170.11	13677.8	3612.557	3484.075	914.8009	3282.496	2147.7752	-2459.72	2320.11	1956.24	0	1	0	0	0	18	10.5
1987	10980.87	694383.27	15261.6	3918.929	3781.323	1032.07	4129.059	2342.0162	-3098.78	2439.96	2249.96	0	1	0	0	0	19	8.7
1988	11960.34	737172.11	18484.5	4430.772	4121.535	1805.262	4301.505	3350.58	-3639.23	2783.22	3501.14	0	1	0	0	0	21	12.3
1989	12805.44	771880.34	20019.9	5507.52	4480.524	2613.895	3878.399	4480.5565	-4517.94	2991.35	4569.75	0	1	0	0	0	22	13.5
1990	13971.95	804013.16	22177.8	7411.956	4974.337	2483.522	4094.431	4974.3404	-4614.86	3742.58	5391.5	0	1	0	0	1	24	15.8
1991	14684.33	815685.7	26096.8	7588.031	5520.36	2285.268	5415.61	3419.2555	-3398.91	4280.72	7605.01	0	1	0	1	1	27	19.6
1992	13911.75	809039.46	28137.8	6727.76	5954.007	2442.276	6549.424	2301.5417	-2818.47	3451.32	12474.9	0	1	0	0	1	33	27.3
1993	14056.91	812112.95	35765.7	6129.237	7953.126	2732.33	7168.077	3360.7766	-3843.71	5628.43	17376.3	0	1	0	1	1	41	46
1994	17136.37	833402.66	38795.3	6051.416	10411.55	3950.402	6942.698	4330.8768	-4765.11	7659.3	14269.5	0	1	0	1	1	48	28.8
1995	22618.63	870218.65	38155.4	6950.121	11830.04	5417.734	6837.714	5137.427	-2609.53	7523.32	9798.25	1	1	0	0	1	54	1.6
1996	26462.91	906333.82	39485.9	6883.052	12175.88	5844.365	7353.421	5525.0871	-427.039	7111.52	8937.3	1	1	0	0	1	76	9
1997	28072.31	910641.92	54991.8	6250.734	12761.22	6391.952	7895.676	5789.482	-1056.71	6826.75	21704.4	1	1	1	0	1	85	11.2
1998	30430.18	940535.04	62110.6	5354.467	13386.42	6899.587	8899.838	6403.8391	-1597.25	7292.22	25520.5	1	1	1	0	1	90	6.6
1999	32733.98	962053.68	51186.4	4745.449	12932.08	6817.515	9548.362	6796.4117	-1488.56	7825.86	13203	1	1	0	0	1	94	5.8
2000	35270.77	967838	51389	6161.054	12420.98	6610.548	10608	6680.114	-462.765	5886.91	12596.8	1	1	0	0	1	100	10
2001	39827.78	1004451	59260.9	7278.829	12547.75	7841.331	11606.5	6441.5316	-3900.23	5209.87	17265.6	1	1	1	0	1	102	5.8
2002	41560.23	1009920	64274.1	6806.549	14400.25	9602.616	12229.36	5908.3531	-8114.06	6913.78	16629	1	1	0	1	1	103	2
2003	39986.59	1039514.1	67410.7	9398.748	16493.41	9403.996	12853.6	5545.5053	-9448.25	6479.84	16448.9	1	1	0	0	1	109	9.8
2004	42087.78	1092349.5	71562.9	10313.54	19246.59	9174.088	14686.21	5308.8347	-7815.84	4645.71	19606.7	1	1	0	0	1	118	11.8
2005	50331.34	1154905.7	75218.1	10929.95	22808.27	9679.834	16622.77	4695.4318	-3685.71	3510.75	19443.1	1	1	1	0	1	125	9.9
2006	60454.11	1225397.3	81311.3	17787.26	25826.11	10817.75	18570.83	5098.7821	-2998.84	3673.96	21268.2	1	1	0	0	1	134	6
2007	64592.43	1307502.7	94300.7	28113.21	30857.19	12312.59	21740.2	6350.0261	-7597.4	4352.8	24029.5	1	1	0	0	1	140	4.3
2008	55429.47	1450479.6	104457	32654.82	36249.55	13297.43	24092.69	6975.3128	-11331.1	4813.62	22166.1	1	1	0	0	1	146	16.2

2009	52570.45	1424851.5	114024	34141.01	41731.52	14280.24	27040.02	7663.3399	11210.92	4761.69	22068.7	1	1	0	0	1	166	10.5
2010	52090.37	1441024.5	128605	48175.46	48662.91	15766.42	31283.18	8848.7551	31869.31	NA	NA	1	1	0	0	1	177	4.1

Source: Own Calculations

Appendix III: Unit Root Results

Table A.3: Unit Roots Tests Results

Variables	Test at Levels	Unit Root Test			
		ADF test		PP test	
		t-statistic	Critical Value (5%)	t-statistic	Critical Value (5%)
Private Investment	Constant	0.8688	-2.8943	0.4387	-2.8929
	Constant and Trend	-1.7129	-3.4611	-2.0652	-3.4589
Income Tax	Constant	3.1530*	-2.8936	15.2737**	-2.8929
	Constant and Trend	2.9207	-3.4599	10.9520**	-3.4589
Value Added Tax	Constant	3.7035**	-2.9018	10.5961**	-2.9007
	Constant and Trend	5.0452**	-3.4753	4.9443**	-3.4709
Excise Duty	Constant	2.7231	-2.8951	3.8647**	-2.8929
	Constant and Trend	0.8654	-3.4623	-0.0541	-3.4589
Import tax	Constant	0.0792	-2.8943	-0.5298	-2.8929
	Constant and Trend	-2.6260	-3.4611	-3.2530	-3.4589
Recurrent Expenditure	Constant	3.1936*	-2.8951	5.5818**	-2.8929
	Constant and Trend	1.9170	-3.4623	0.6063	-3.4589
Budget Deficit	Constant	-1.7500	-2.8943	-0.7151	-2.8929
	Constant and Trend	-1.0668	-3.4611	-0.0283	-3.4589
Foreign Debt Service	Constant	-0.9056	-2.8952	-1.1539	-2.8936
	Constant and Trend	-1.6582	-3.4635	-1.8434	-3.4600
Domestic Debt Service	Constant	0.5213	-2.8951	-0.8663	-2.8936
	Constant and Trend	-1.9997	-3.4622	-3.2872	-3.4600
GDP	Constant	0.8340	-2.8929	1.6774	-2.8929
	Constant and Trend	-2.9957	-3.4589	-2.9575	-2.4589
Development Expenditure	Constant	2.5104	-2.8951	6.5310**	-2.8929
	Constant and Trend	2.3114	-3.4623	3.6413*	-3.4589

*(**) denotes rejection of the hypothesis at 5% (1%) significant level

Source: **Constructed from the study data**

Table A.4: Unit Roots Tests Results

Variables	Test at first difference	Unit Root Test			
		ADF test		PP test	
		t-statistic	Critical Value (5%)	t-statistic	Critical Value (5%)
Private Investment	Constant	-5.3348**	-2.8943	-9.9967**	-2.8932
	Constant and Trend	-5.8808**	-3.4611	-10.4073**	-3.4594
Excise Duty	Constant	-1.8126	-2.8951	-10.7510**	-2.8932
	Constant and Trend	-3.8174*	-3.4623	-13.1622**	-3.4594
Import tax	Constant	-4.2858**	-2.8943	-9.7415**	-2.8932
	Constant and Trend	-4.7915**	-3.4611	-10.4844**	-3.4594
Recurrent Expenditure	Constant	-1.0569	-2.8951	-10.5588**	-2.8932
	Constant and Trend	-2.7629	-3.4622	-13.7283**	-3.4594
Budget Deficit	Constant	-9.0214**	-2.8943	-9.7256**	-2.8932
	Constant and Trend	-9.1007**	-3.4611	-10.0424**	-3.4594
Foreign Debt Service	Constant	-6.7216**	-2.8951	-9.4854**	-2.8940
	Constant and Trend	-6.7010**	-3.4623	-9.4398**	-3.4605
Domestic Debt Service	Constant	-9.8754**	-2.8951	-9.4859**	-2.8940
	Constant and Trend	-10.0320**	-3.4623	-9.4690**	-3.4605
Output	Constant	-11.4409**	-2.8932	-11.4709**	-2.8932
	Constant and Trend	-11.6263**	-3.4594	-12.0336**	-3.4594
Development Expenditure	Constant	2.7025	-2.8951	-10.1533**	-2.8932
	Constant and Trend	1.6153	-3.4623	-11.4221**	3.4594

*(**) denotes rejection of the hypothesis at 5% (1%) significant level

Source: Constructed from the study data

Appendix IV: Cointegration and Granger Causality Tests

Table A.5: The Johansen Cointegration Test

Private investment, output, income tax, value added tax, excise duty, import tax, development expenditure, recurrent expenditure, budget deficit, foreign debt service, domestic debt service				
Lags interval: 1 to 2				
Eigen value	Likelihood Ratio	5 Per cent Critical Value	1 Per cent Critical Value	Hypothesized No. of CE(s)
0.497203	366.8688**	285.1425	300.2879	None
0.493865	318.0514**	239.2354	253.2348	At most 1
0.485451	269.7038**	197.3709	210.0548	At most 2
0.472703	222.5268**	159.5297	171.0905	At most 3
0.466388	177.0873**	125.6154	135.9732	At most 4
0.429038	132.4932**	95.75366	104.9615	At most 5
0.406403	92.70257**	69.81889	77.81884	At most 6
0.301530	55.67216**	47.85613	54.68150	At most 7
0.229203	30.19292*	29.79707	35.45817	At most 8
*(**) denotes rejection of the hypothesis at 5% (1%) significant level				
L.R. test indicates 9 cointegrating equations at 5% and 1% significant level				

Source: Constructed from the study data

Table A.6: Granger Causality Tests

Null Hypothesis	F-Statistic	Lags	Probability	Conclusion
Budget deficit does not Granger causes private investment	3.89850 ^{**}	4	0.0060	Bi-directional
private investment does not Granger causes Budget deficit	24.2390 ^{**}	4	0.0000	
Economic liberalization does not Granger causes private investment	3.67870 [*]	2	0.0293	Uni-directional causality running from economic liberalization private investment
private investment does not Granger causes economic liberalization	0.06057	2	0.9413	
Foreign debt service does not Granger causes private investment	3.29425 ^{**}	5	0.0096	Uni-directional causality running from foreign debt service to private investment
Private investment does not Granger causes Foreign debt service	0.50141	5	0.7743	
Development expenditure does not Granger causes private investment	8.54582 ^{**}	4	0.0000	Bi-directional
Private investment does not Granger causes Development expenditure	5.66708 ^{**}	4	0.0005	
Recurrent expenditure does not Granger causes private investment	4.15412 ^{**}	3	0.0085	Uni-directional causality running from recurrent government expenditure to private investment
Private investment does not Granger causes Recurrent expenditure	1.45296	3	0.2333	
Domestic debt service does not Granger causes private investment	3.53368 ^{**}	6	0.0040	Uni-directional causality running from domestic debt service to private investment
Private investment does not Granger causes domestic debt service	1.40540	6	0.2242	
Income tax does not Granger causes private investment	2.43273 [*]	6	0.0334	Uni-directional causality running from income tax to private investment
Private investment does not Granger causes Income tax	0.70809	6	0.6441	
GDP does not Granger causes private investment	4.36090 [*]	1	0.0396	Uni-directional causality running from GDP to private investment
Private investment does not Granger	0.85195	1	0.3585	

causes GDP				
Establishment of EPZs does not Granger causes private investment	3.67870 [*]	2	0.0293	Uni-directional causality running from establishment of EPZs to private investment
Private investment does not Granger causes establishment of EPZs	0.06057	2	0.9413	
Establishment of KRA does not Granger causes private investment	3.76107 [*]	2	0.0271	Uni-directional causality running from establishment of KRA to private investment
Private investment does not Granger causes establishment of KRA	0.47047	2	0.6263	
Tax amnesty does not Granger causes private investment	3.67358 [*]	2	0.0294	Uni-directional causality running from tax amnesty to private investment
Private investment does not Granger causes tax amnesty	2.39590	2	0.0971	
VAT does not Granger causes private investment	3.17190 ^{**}	8	0.0054	Uni-directional causality running from VAT to private investment
Private investment does not Granger causes VAT	0.60237	8	0.7714	
Import tax does not Granger causes private investment	0.067746	7	0.006905	Bi-directional
Private investment does not Granger causes import tax	0.082489	7	0.005699	
Expenditure downsizing does not Granger causes private investment	2.07587 [*]	10	0.0398	Uni-directional causality running from expenditure downsizing to private investment
Private investment does not Granger causes expenditure downsizing	0.37921	10	0.9513	
Excise duty does not Granger causes private investment	3.97275 ^{**}	6	0.0017	Uni-directional causality running from excise duty to private investment
Private investment does not Granger causes Excise duty	0.42179	6	0.8623	
*(**) denotes rejection of the hypothesis at 5%(1%) significance level				

Source: Constructed from the study data

Appendix V: VAR Diagnostic Statistics and VAR Estimation Results

Table A.7: VAR Diagnostic Statistics

VAR Condition Check	Statistic	Conclusion
Stability condition	Roots of the polynomial are within unit cycle. Highest is 0.935356	VAR is stable
Lag Exclusion Test	Wald test for 1 lags, Chi-square = 7701.771 p-value = 0.0000	1 lags is important
Residual Serial Correlation	LM test statistic = 421.2734 P-value = 0. 0.4303	No serial correlation at lag order 1
Residual Multivariate Normality	Jarque-Bera test statistic (joint) = 15.1013 p-value = 0.1284	Residuals are multivariate normal.
Residual Heteroscedasticity	Chi-square = 1894.091 p-value = 0.058	Residuals are not heteroscedasticity

Source: **Constructed from the study data**

Table A.8: VAR Estimation Results

		PIV	Y	DX	DS	BD	FS	VAT	EDT	RX	ICT	MT	D1	D2	D3	D4	D5
PIV (-1)	Coefficient	0.507	5.607	0.387	0.134	-0.462	-0.016	0.117	0.024	0.239	0.174	-0.004	0.000	-0.000	-0.000	0.000	-0.000
	Standard Error	0.109	2.576	0.063	0.176	0.153	0.036	0.027	0.021	0.187	0.042	0.025	0.000	0.000	0.000	0.000	0.000
	t-statistic	4.643	2.176	6.153	0.757	-3.030	-0.455	4.375	1.1674	1.280	4.148	-0.162	0.541	-1.132	-0.112	0.159	-1.004
Y (-1)	Coefficient	0.005	0.170	-0.001	0.001	0.004	0.000	-0.000	-0.000	0.001	-0.001	0.000	-0.000	-0.000	0.000	-0.00	0.000
	Standard Error	0.006	0.140	0.003	0.010	0.008	0.002	0.001	0.001	0.010	0.002	0.001	0.000	0.000	0.000	0.000	0.000
	t-statistic	0.808	1.209	-0.288	0.139	0.536	0.095	-0.09	-0.128	0.127	-0.328	0.361	-0.564	-0.179	1.897	-0.06	0.084
DX (-1)	Coefficient	0.542	-0.847	-0.634	-0.034	-0.516	-0.008	-0.326	-0.006	-0.264	-0.622	0.014	-0.000	0.000	-0.000	-0.00	-0.000
	Standard Error	0.187	4.410	0.108	0.302	0.261	0.061	0.046	0.035	0.320	0.072	0.042	0.000	0.000	0.000	0.000	0.000
	t-statistic	2.898	-0.192	-5.899	-0.112	-1.975	-0.137	-7.119	-0.171	-0.825	-8.670	0.344	-0.245	0.071	-0.086	-0.62	-0.478
DS (-1)	Coefficient	0.352	-4.375	0.123	0.326	-0.358	0.145	-0.048	-0.038	-0.018	-0.002	0.127	-0.000	0.000	0.000	0.000	0.000
	Standard Error	0.288	6.790	0.166	0.465	0.402	0.094	0.071	0.054	0.493	0.110	0.065	0.000	0.000	0.000	0.000	0.000
	t-statistic	1.221	-0.644	0.743	0.702	-0.891	1.551	-0.683	-0.694	-0.036	-0.017	1.956	-0.954	1.850	0.017	0.382	0.572
BD (-1)	Coefficient	0.053	-3.733	-0.196	0.058	0.648	0.002	-0.109	-0.005	-0.020	-0.203	-0.010	-0.000	-0.000	0.000	-0.00	0.000
	Standard Error	0.111	2.607	0.064	0.179	0.154	0.036	0.027	0.021	0.189	0.042	0.025	0.000	0.000	0.000	0.000	0.000
	t-statistic	0.480	-1.432	-3.084	0.327	4.197	0.047	-4.017	-0.223	-0.104	-4.786	-0.402	-0.986	-0.817	0.628	-0.27	0.480
FS (-1)	Coefficient	-1.351	-6.527	0.439	-0.452	-0.511	0.579	0.102	-0.294	-0.389	-0.038	0.018	-0.000	-0.000	-0.000	-0.00	0.000
	Standard Error	0.636	14.996	0.366	1.027	0.888	0.207	0.156	0.120	1.088	0.244	0.143	0.000	0.000	0.000	0.000	0.000
	t-statistic	-2.124	-0.435	1.199	-0.440	-0.576	2.799	0.656	-2.459	-0.359	-0.156	0.124	-1.901	-0.763	-0.203	-1.91	0.560
VAT (-1)	Coefficient	-0.157	-0.671	0.020	-0.353	-0.453	0.124	0.914	0.067	-0.025	0.076	-0.050	-0.000	-0.000	0.000	-0.00	0.000

	Standard Error	0.327	7.702	0.188	0.527	0.456	0.106	0.080	0.061	0.559	0.125	0.074	0.000	0.000	0.000	0.000	0.000
	t-statistic	-0.481	-0.087	0.108	-0.668	-0.992	1.165	11.411	1.090	-0.045	0.607	-0.679	-1.119	-0.440	0.679	-1.01	2.293
ED (-1)	Coefficient	-0.371	13.411	-0.299	-0.180	0.309	0.526	-0.415	0.588	0.351	-0.161	0.253	0.000	0.000	0.000	-0.00	0.000
	Standard Error	0.745	17.569	0.429	1.203	1.040	0.242	0.183	0.140	1.275	0.286	0.168	0.000	0.000	0.000	0.000	0.000
	t-statistic	-0.497	-0.763	-0.698	-0.149	0.297	2.169	-2.270	4.1938	0.275	-0.564	1.509	0.647	1.574	0.007	-1.10	1.1534
RX (-1)	Coefficient	-0.569	5.191	-0.107	0.342	0.232	-0.106	0.085	0.034	0.789	0.092	-0.123	0.000	-0.000	0.000	0.000	-0.000
	Standard Error	0.297	6.992	0.171	0.479	0.414	0.096	0.073	0.056	0.507	0.114	0.067	0.000	0.000	0.000	0.000	0.000
	t-statistic	-1.919	0.742	-0.625	0.715	0.559	-1.101	1.163	0.612	1.555	0.810	-1.841	0.354	-2.006	0.050	0.181	-0.432
ICT (-1)	Coefficient	0.164	1.836	0.262	0.093	0.462	-0.054	0.138	-0.030	0.083	1.127	0.080	0.000	0.000	-0.000	0.000	-0.000
	Standard Error	0.269	6.329	0.154	0.433	0.375	0.087	0.066	0.051	0.459	0.103	0.060	0.000	0.000	0.000	0.000	0.000
	t-statistic	0.612	0.290	1.698	0.214	1.232	-0.620	2.102	-0.601	0.180	10.949	1.323	1.057	0.947	-0.699	0.610	-1.976
MT (-1)	Coefficient	1.323	-0.869	-0.398	-1.680	-0.160	0.194	-0.381	0.238	-0.915	-0.188	0.677	0.000	0.000	0.000	0.000	0.000
	Standard Error	0.658	15.500	0.378	1.061	0.918	0.214	0.161	0.124	1.125	0.252	0.148	0.000	0.000	0.000	0.000	0.000
	t-statistic	2.011	-0.056	-1.053	-1.582	-0.174	0.906	-2.366	1.925	-0.813	-0.744	4.577	1.255	1.484	0.512	1.221	0.867
D1 (-1)	Coefficient	-126.7	1620.7	1497.8	795.52	2042.2	-941.58	532.98	-498.25	-593.38	1529.9	237.29	0.806	-0.048	0.017	0.274	-0.308
	Standard Error	1321.4	31147	760.0	2132.9	1844.1	429.43	323.76	248.55	2259.6	506.6	297.24	0.077	0.081	0.087	0.168	0.167
	t-statistic	-0.095	-0.520	-1.970	0.372	-1.107	-2.192	-1.646	-2.004	-0.262	-3.019	-0.798	10.445	-0.597	0.200	1.628	-1.848
D5 (-1)	Coefficient	-292.80	19102.	1298.9	318.83	309.96	570.76	51.461	177.17	1246.8	259.45	366.55	0.088	0.880	0.026	-0.01	0.535
	Standard Error	1251.9	29509	720.06	2020.8	1747.1	406.85	306.73	235.48	2140.8	480.02	281.61	0.073	0.077	0.082	0.159	0.158
	t-statistic	-0.233	-0.647	-1.803	0.157	0.177	1.402	0.167	0.752	0.582	0.540	1.301	1.199	11.442	0.313	0.056	3.387

D2 (-1)	Coefficient	458.36	3145.4	171.55	1595.3	612.41	-338.84	233.26	-123.01	565.99	202.67	186.80	-0.025	0.094	0.932	0.026	-0.156
	Standard Error	983.29	23176	565.52	1587.0	1372.1	319.53	240.90	184.94	1681.3	377.00	221.17	0.057	0.060	0.064	0.125	0.124
	t-statistic	0.466	-0.135	0.303	1.005	0.446	-1.060	0.968	-0.665	0.336	-0.537	0.844	-0.430	1.553	14.450	0.209	-1.261
D3 (-1)	Coefficient	3652.8	17354.	1268.2	4190.4	407.72	396.29	866.60	217.06	-5130.0	1634.6	142.63	0.078	0.052	-0.003	0.310	0.065
	Standard Error	1147.7	27051	660.09	1852.5	1601.6	372.97	281.18	215.87	1962.6	440.05	258.16	0.067	0.071	0.075	0.146	0.145
	t-statistic	3.182	-0.641	-1.921	-2.262	0.254	1.062	-3.081	1.005	-2.614	-3.714	0.552	1.160	0.736	-0.038	2.124	0.450
D4 (-1)	Coefficient	5242.7	9570.5	1071.0	1842.8	217.21	-468.07	1038.8	412.74	-2794.8	1062.4	245.96	0.173	0.117	0.029	0.279	0.164
	Standard Error	1605.0	37831	923.11	2590.6	2239.8	521.59	393.23	301.89	2744.5	615.39	361.03	0.094	0.099	0.105	0.204	0.202
	t-statistic	3.266	-0.252	-1.160	-0.711	-0.097	-0.897	-2.641	1.367	-1.0183	-1.726	0.681	1.846	1.184	0.276	1.366	0.812
C	Coefficient	120.62	23597.	704.63	458.73	479.34	-21.494	135.85	-16.871	17.977	465.90	74.234	0.014	-0.009	0.019	0.044	-0.017
	Standard Error	466.33	10991.	268.20	752.69	650.76	151.54	114.25	87.712	797.41	178.79	104.89	0.027	0.029	0.031	0.059	0.059
	t-statistic	0.258	2.146	-2.622	0.609	-0.736	-0.142	-1.189	-0.192	0.022	-2.605	-0.707	0.507	-0.299	0.621	0.745	-0.292
Adj. R ²		0.615	0.036	0.524	0.228	0.572	0.415	0.995	0.589	0.476	0.994	0.480	0.949	0.944	0.930	0.394	0.404
F-statistic		8.206	1.168	5.960	2.330	7.032	4.199	922.15	7.461	5.090	829.59	5.154	83.927	77.221	60.922	3.930	4.052
Akaike AIC		18.164	24.484	17.058	19.122	18.830	15.91	15.351	14.822	19.237	16.247	15.181	-1.333	-1.230	-1.100	0.224	0.207
Schwarz SC		18.697	25.017	17.591	19.655	19.364	16.44	15.884	15.356	19.770	16.780	15.714	-0.800	-0.697	-0.567	0.757	0.741

Source: Constructed from the study data

Key :

Y = GDP RX = Recurrent expenditure ICT = Income taxes EDT = Excise duty MT = Import taxes
DX = Development expenditure BD = Budget deficit FS = Foreign debt service DS = Domestic debt service VAT = Value added tax
D1 = Establishment of KRA D2 = Economic Liberalization D3 = Tax amnesty D4 = Government expenditure downsizing
D5 = Establishment of EPZs PIV = Private investment

Appendix VI: Variance Decomposition Results

Table A.9: The Results of Variance Decomposition of Private Investment

Period	S.E.	PIV	GDP	DX	DS	BD	FS	VAT	ED	RX	ICT	MT	D1	D2	D3	D4	D5
1	1925.58	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2422.47	90.97	0.83	0.04	0.04	1.21	1.11	0.09	0.54	0.29	0.01	0.16	0.41	0.52	0.02	0.19	3.58
3	2757.67	78.08	1.32	4.39	0.37	2.07	2.44	0.11	2.32	0.24	0.17	0.73	0.68	0.88	0.14	0.16	5.91
4	2918.45	70.34	1.58	4.61	0.57	3.38	3.49	0.10	4.09	0.22	0.29	1.32	0.62	0.94	0.38	0.20	7.87
5	3040.79	64.81	1.64	6.50	0.84	3.78	3.90	0.15	5.09	0.25	0.50	1.77	0.64	0.88	0.76	0.19	8.31
6	3105.90	62.68	1.64	6.57	0.91	3.94	4.00	0.31	5.28	0.26	0.63	2.05	0.93	0.87	1.22	0.21	8.49
7	3158.90	61.23	1.61	7.03	0.92	3.83	3.92	0.54	5.14	0.28	0.76	2.25	1.29	0.96	1.68	0.21	8.37
8	3198.72	60.34	1.58	6.91	0.90	3.74	3.82	0.80	5.06	0.27	0.82	2.42	1.62	1.16	2.10	0.21	8.26
9	3235.86	59.31	1.54	6.87	0.91	3.71	3.74	1.03	5.16	0.26	0.86	2.64	1.78	1.41	2.46	0.21	8.12
10	3270.21	58.28	1.52	6.73	0.97	3.68	3.69	1.21	5.40	0.27	0.86	2.90	1.84	1.67	2.77	0.21	8.02
11	3301.85	57.27	1.49	6.62	1.03	3.67	3.65	1.33	5.65	0.26	0.85	3.22	1.82	1.91	3.08	0.23	7.93
12	3330.83	56.34	1.48	6.51	1.10	3.63	3.63	1.40	5.86	0.26	0.83	3.55	1.79	2.11	3.40	0.24	7.87
13	3357.17	55.51	1.47	6.41	1.16	3.59	3.60	1.44	5.99	0.26	0.82	3.89	1.77	2.27	3.76	0.26	7.81
14	3381.49	54.77	1.47	6.33	1.21	3.54	3.58	1.46	6.05	0.26	0.83	4.18	1.77	2.38	4.16	0.27	7.76
15	3404.41	54.10	1.46	6.26	1.24	3.49	3.57	1.47	6.07	0.26	0.85	4.42	1.78	2.46	4.63	0.27	7.69
16	3426.35	53.49	1.46	6.19	1.26	3.45	3.55	1.47	6.06	0.26	0.89	4.60	1.79	2.50	5.13	0.27	7.61
17	3447.65	52.93	1.46	6.13	1.28	3.42	3.53	1.47	6.04	0.26	0.95	4.73	1.80	2.53	5.67	0.27	7.53
18	3468.32	52.42	1.46	6.07	1.29	3.40	3.51	1.47	6.01	0.27	1.04	4.81	1.80	2.53	6.22	0.27	7.44
19	3488.33	51.93	1.46	6.02	1.29	3.37	3.50	1.46	5.98	0.26	1.14	4.87	1.80	2.53	6.76	0.27	7.36
20	3507.52	51.47	1.46	5.97	1.30	3.35	3.49	1.46	5.96	0.26	1.26	4.90	1.79	2.51	7.27	0.26	7.28
21	3525.78	51.05	1.45	5.92	1.30	3.33	3.49	1.46	5.95	0.26	1.40	4.93	1.78	2.49	7.74	0.26	7.21
22	3542.97	50.65	1.45	5.88	1.30	3.31	3.49	1.46	5.94	0.26	1.54	4.94	1.77	2.47	8.15	0.26	7.15
23	3559.04	50.27	1.44	5.84	1.29	3.29	3.49	1.46	5.94	0.26	1.68	4.95	1.76	2.45	8.51	0.26	7.09
24	3573.98	49.93	1.44	5.80	1.29	3.28	3.50	1.46	5.94	0.26	1.83	4.96	1.75	2.43	8.81	0.26	7.05
25	3587.80	49.62	1.43	5.78	1.29	3.26	3.50	1.47	5.96	0.26	1.98	4.97	1.74	2.41	9.06	0.27	7.01
26	3600.55	49.33	1.43	5.75	1.28	3.24	3.51	1.48	5.98	0.27	2.12	4.98	1.73	2.40	9.26	0.27	6.98
27	3612.33	49.06	1.42	5.73	1.28	3.23	3.52	1.49	6.00	0.28	2.25	4.99	1.73	2.39	9.40	0.28	6.95
28	3623.22	48.82	1.41	5.71	1.27	3.22	3.53	1.50	6.04	0.29	2.38	5.00	1.72	2.39	9.51	0.28	6.93
29	3633.34	48.60	1.41	5.70	1.27	3.20	3.55	1.51	6.08	0.30	2.51	5.00	1.71	2.39	9.58	0.29	6.91
30	3642.78	48.40	1.40	5.69	1.26	3.19	3.56	1.53	6.12	0.31	2.62	5.01	1.70	2.40	9.62	0.30	6.90
31	3651.68	48.21	1.39	5.68	1.26	3.18	3.57	1.54	6.17	0.32	2.73	5.01	1.70	2.41	9.63	0.31	6.89
32	3660.14	48.04	1.39	5.68	1.26	3.17	3.59	1.56	6.23	0.34	2.82	5.02	1.69	2.42	9.62	0.31	6.88
33	3668.28	47.87	1.38	5.67	1.25	3.16	3.61	1.59	6.29	0.35	2.91	5.02	1.68	2.44	9.59	0.32	6.87
34	3676.21	47.71	1.38	5.67	1.25	3.15	3.62	1.61	6.35	0.37	2.99	5.02	1.68	2.46	9.56	0.33	6.87

35	3684.02	47.55	1.38	5.67	1.25	3.13	3.64	1.64	6.42	0.38	3.06	5.01	1.67	2.48	9.52	0.34	6.86
36	3691.81	47.39	1.38	5.66	1.24	3.12	3.66	1.67	6.49	0.40	3.13	5.01	1.67	2.50	9.48	0.35	6.86
37	3699.66	47.23	1.38	5.66	1.24	3.11	3.68	1.70	6.57	0.42	3.18	5.00	1.66	2.53	9.44	0.36	6.85
38	3707.66	47.07	1.38	5.66	1.24	3.10	3.69	1.73	6.65	0.43	3.23	4.99	1.66	2.55	9.41	0.37	6.85
39	3715.86	46.91	1.39	5.66	1.23	3.08	3.71	1.76	6.73	0.45	3.27	4.98	1.66	2.58	9.39	0.38	6.84
40	3724.32	46.73	1.40	5.65	1.23	3.07	3.73	1.79	6.81	0.46	3.31	4.97	1.65	2.60	9.39	0.38	6.84

Source: **Constructed from the study data**

Appendix VII: Regression Diagnostic Statistics and Estimation Results

Table A.10: Regression diagnostics Statistics

Test	Statistic	Conclusion
Heteroskedasticity Test: ARCH	F – statistics 2.357905 P – value 0.094127 Obs R ² 24.14872 P - value 0.190509	No autoregressive conditional heteroskedasticity
Breusch-Godfrey Serial Correlation LM Test	F – statistics 0.077044 P – value 0.926191 Obs R ² 0.276619 P - value 0.870829	No serial correlation
Normality Test	Jarque-Bera 0.754327 P - value 0.68580	Errors normally distributed
Ramsey Reset test	F – statistics 1.051830 P – value 0.398580 Log likelihood ratio 5.536761 P - value 0.136453	No model misspecification

Source: Constructed from the study data

Table A.11: Long-run Relationships Regression Results

Variable	Coefficient	Standard Error	t - Statistic	Probability value
Value added tax (-1)	- 0.774059	0.476523	- 1.624389	0.3226
Income tax (-1)	- 0.383939	0.283478	- 1.354387	0.3975
Excise duty (-1)	2.792676***	0.675431	4.134658	0.0017
Import tax (-1)	2.689892**	0.808750	3.325987	0.0372
Development expenditure(-1)	0.446585**	0.114578	3.897654	0.0147
Recurrent expenditure(-1)	0.481045	0.287121	1.675410	0.1823
Domestic debt service(-1)	0.559589***	0.186745	2.996542	0.0063
Foreign debt service (-1)	0.503384	0.321789	1.564329	0.4256
Budget deficit (-1)	- 0.427598***	0.137896	- 3.100876	0.0096
Establishment of Kenya Revenue Authority	- 2717.6024**	1190.142	- 2.283427	0.02438
Economic liberalization	3756.786038***	906.782	4.142987	0.0071
Tax amnesty	3754.3502**	1054.567	3.560087	0.0237
Government expenditure downsizing	- 2673.004194**	1287.263	- 2.076502	0.0345
Establishment of Export Processing Zones	-3115.846227**	1042.915	- 2.987632	0.03346
Gross Domestic Product	2.541254**	1.173565	2.165414	0.0326
C	73.669966	312.594	0.235673	0.7689
R-squared	0.784409	Mean dependent var	1339.32	
Adjusted R-squared	0.750377	S.D. dependent var	1795.57	
S.E. of regression	2506.866	Akaike info criterion	18.68026	
Sum squared resid	3.64E+08	Schwarz criterion	19.17844	
Log likelihood	-675.1698	Hannan-Quinn criter.	18.87899	
F-statistic	12.1384	Durbin-Watson stat	1.008196	
Prob(F-statistic)	0.000000			

(*) represents level of significance at 5%(1%) respectively

Source: Constructed from the study data

Table A.12: Error correction model results

Variable	Coefficient	Standard Error	t - Statistic	Probability value
Value added tax	- 0.420465	0.387317	- 1.085582	0.2822
Income tax	- 0.292336	0.320088	- 0.913299	0.3649
Excise duty	3.037022***	0.806029	3.767883	0.0004
Import tax	1.745261**	0.761424	2.292103	0.0255
Development expenditure	0.109112***	0.031176	3.499869	0.0003
Recurrent expenditure	0.369239	0.300921	1.227031	0.2117
Domestic debt service	0.766543**	0.298870	2.564804	0.0130
Foreign debt service	0.651602	0.673686	0.967219	0.3376
Budget deficit	- 0.166270***	0.073256	- 2.269700	0.0021
Establishment of Kenya Revenue Authority	- 3060.940**	1405.209	- 2.178281	0.01736
Economic liberalization	2437.253**	1055.221	2.309709	0.01956
Tax amnesty	3208.144***	1160.146	2.765294	0.0077
Government expenditure downsizing	- 4845.918***	1681.151	- 2.882500	0.00650
Establishment of Export Processing Zones	- 3093.089**	1344.372	- 2.300769	0.02349
Gross Domestic Product	1.98754**	0.976486	2.0354	0.04372
ERROR (-)	- 0.617835***	0.146233	- 4.225003	0.0001
C	76.63710	505.4830	0.151612	0.8800
R-squared	0.697458	Mean dependent var	1205.378	
Adjusted R ²	0.639589	S.D. dependent var	3105.836	
S.E. of regression	2061.141	Akaike info criterion	18.30055	
Sum squared resid	2.38E+08	Schwarz criterion	18.83395	
Log likelihood	-650.9702	Hannan-Quinn criteria	18.51312	
F-statistic	6.717719	Durbin-Watson stat	2.0947974	
Prob(F-statistic)	0.000000			

** (***) represents level of significance at 5%(1%) respectively

Source: Constructed from the study data