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Determinants of the real gross domestic
DECLARATION:

This research paper is my original work. Except where acknowledgement is given, the paper is not substantially similar to work that has previously been or is being submitted to any University for fulfillment of an academic requirement.

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DEDICATION:

This paper is dedicated to my father, the late Daniel Maingi Njuguna, who inspired us to Read and acquire knowledge. It is also dedicated to my mother Wangui for her patience and understanding and my brothers -Hosea, Francis, James, and sisters- Eunice, Rose and Beky. Without their support, I would have not been able to mobilize the energy and motivation required to write a paper of this complexity and size.
ACKNOWLEDGEMENT:

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Nevertheless any misrepresentation in this paper remain my responsibility alone.
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Table 1: Kenya's Average Real GDP Growth Rates

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The objective of the study was to identify the factors that determine the rate of economic growth in Kenya. Due to severe economic turmoil in the early 70's, it was necessary to use statistical and econometric methods to analyze the data. The data used was obtained from government and world bank publications for the period 1973 to 1993. Non-stationary data was integrated to make it stationary. Ordinary least squares (OLS) method of estimation using time series programme (TSP) was applied on stationary data. Both linear and log-linear form were used and the one which gave the better results was adopted. Two regression models were estimated, namely the linear and log-linear form. The log-linear form was found to be more appropriate. The regression model was estimated using annual data from 1973 to 1993. The results indicate that there has been significant improvement in the pace of GDP growth in Kenya.
ABSTRACT

The Kenya Government has pursued stabilization and structural adjustment policies for more than ten years in an attempt to restore and sustain the high growth rates experienced in the 1960s and early 1970s. Despite these measures, real GDP in Kenya has continued to be characterized by positive and negative rates of change of real GDP growth rates. The cyclical fluctuations have been more marked, especially after 1973.

The objectives of the study were to identify the factors that determine fluctuations in real gross domestic product (GDP) growth rate in Kenya, measure the relative effect of the factors, and to give policy recommendations. Time-series data were collected from government and world bank publications for the period 1973 to 1997. Data collected were integrated to make it stationary. Ordinary least squares (OLS) method of estimation using time-series programme (TSP) was applied on stationary data. Both linear and log-linear models were run and on the basis of results linear model was adopted. From the linear regression results, growth of capital stock, export growth, financial development, external debt, exchange rate, and real interest rate were found to be significant determinants of real gross domestic product. On the basis of these findings, policy recommendations were then drawn on these variables so as to accelerate the pace of GDP growth rate in Kenya.
CHAPTER ONE

1 INTRODUCTION

1.1 Historical Background

1.1.1 Performance of the economy

Since Kenya’s independence (1963), the growth rate in real Gross Domestic Product (GDP) has been cyclical (Development Plan 1997-2001). The period between 1963-72 was characterized by rapid real GDP growth rate, although with substantial fluctuations. Between 1964 and 1972, real GDP growth rate was 6.4 percent per annum (Economic Survey 1975). However, the oil crisis of 1973 which resulted to sharp price increase, led to a decline in rapid real GDP growth rate experienced in the first decade of independence (Vandermoortele 1985).

To address the above fluctuations in real GDP growth rate, the Kenya Government in Sessional Paper No 4 of 1975 formulated policies to restore and sustain the real GDP growth rate. The policies centered on the objective of restraining both private and public consumption through fiscal and monetary policies. However, these policies achieved very little in terms of real GDP growth which rose from 3.1 per cent in 1975 to 4.2 per cent in 1976 (Economic Surveys 1976, 1977). In 1976 the growth rate in real GDP was 4.2 per cent and increased to 8.9 percent in 1977 (Economic Survey 1978). The 1977 growth rate however dropped to 5.0 percent in 1979 (Economic Surveys, 1984 through 1986).

The decade of the 1980s was difficult for Kenya in terms of economic growth. Kenya suffered slow growth that began in 1974 coupled with macro-economic instability. Since 1973 Kenyan economy has been characterized by fluctuation in real GDP growth rate (appendix i), low export earnings, deteriorating balance of payments, widening fiscal imbalances, high rates of inflation, unemployment and huge external debts (Development Plan 1997-2001).
Plan 1997-2001). It was glaring that a desirable growth in the economy would be unattainable unless the prevailing macro-economic and structural imbalances were urgently redressed. Inevitably, the Structural Adjustment Programmes (SAPs) were introduced in 1986 as a package of macro-economic policies aimed at restoring the ailing economy. Under SAPs, several reform measures were designed to restructure and diversify the productive base of the economy, achieve fiscal and balance of payments viability, intensify the growth potential of the private sector and set the economy on the path of steady GDP growth rate (Mwega 1994).

The major aspects of the reforms were on improvement in financial intermediation through monetary and credit controls and industrial expansion through trade liberalization. Financial intermediation and industrial expansion were considered necessary conditions for stimulating investment, raising productive capacity and fostering economic growth (Policy Framework Paper 1994).
### Table 1: Kenya’s Average Real GDP Growth rates

<table>
<thead>
<tr>
<th>Period</th>
<th>Average % GDP Growth rate</th>
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<tr>
<td>1965-1969</td>
<td>6.8</td>
</tr>
<tr>
<td>1970-1974</td>
<td>4.8</td>
</tr>
<tr>
<td>1975-1979</td>
<td>5.7</td>
</tr>
<tr>
<td>1980-1985</td>
<td>4.1</td>
</tr>
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<td>1986-1991</td>
<td>5.4</td>
</tr>
<tr>
<td>1992-1997</td>
<td>3.1</td>
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</table>


The table above shows fluctuations in real GDP growth rates over the years. For instance, on average, real GDP grew by 6.7 per cent between 1965 and 1969. However, real GDP growth rate decreased since 1969.

The rapid growth during 1965-69 resulted mainly from successful rural development policies that led to increased agricultural output, import-substitution industrialization strategy supported by access to the East African community markets and good macro-economic management. In the case of agriculture, the main source of growth was the expansion of land under cultivation and the introduction of more modern farming techniques. As for the manufacturing sector, growth was largely due to the expanding domestic demand supported by rising agricultural incomes, the encouragement of investment through high levels of protection and investment. The good performance during this period was, however not sustained (Development Plan 1997-2001).
The real GDP growth rate started declining during 1970-74. The decline during this period was triggered by the first international oil price crisis of 1973. Agricultural growth slowed down as the forces which boosted its production during the 1960s weakened. In addition, inappropriate policies turned the internal terms of trade against agriculture. As regards industry, growth declined due to a weak incentive system which favoured production for the domestic market over production for export, and to diminishing opportunities for efficient import substitution. The slight improvement during 1975-79 was as a result of the first coffee boom of 1976 which increased both domestic and foreign demand in the economy.

The collapse in 1977 of the East African community, the traditional market outlet for Kenya’s industry and the growing inefficiency of public industrial investments, the second oil price crisis of 1977, the severe drought of 1984, the structural constraints, high inflation and a deterioration in the balance of payments as a result of the coffee boom led to slow economic growth between 1980-85 (Development plan 1997-2000).

There was a slight improvement on the economic performance between 1986 and 1991 and real GDP growth rate increased to 5.4 per cent. The slight improvement was as a result of structural adjustment programmes that were implemented in agriculture, industry and trade, and the financial sector of the economy. The reform process reduced protection and encouraged manufactured exports (Economic Surveys 1987 Through 1992).

There was a drastic decline in economic performance between 1992-97. The decline was attributed to prolonged drought, high inflation, excessive growth in money supply, massive depreciation of the Kenya shilling, adverse weather conditions, rising input costs, power interruptions, dilapidated infrastructure, pre-election violence, depressed investments, competition from imports arising from a liberalized trade regime,
lack of investor confidence, labour unrest, high interest rate, withholding of foreign aid by donor countries and uncertainty in the financial markets.

Poor weather combined with declining prices of coffee and high input prices for many of the commodities Kenya produce adversely affected agricultural production, particularly in 1992. Poor weather also led to power rationing which reduced manufactured output. The presence of large numbers of refugees from neighbouring countries increased uncertainty and strained the resource base of the economy. The reinstatement of political pluralism and the 1992 general election contributed to uncertainty, and thereby reduced investment, tourism, and manufactured output. Another contributing factor to the country’s slower GDP growth is the sharp reduction of the import surplus in 1991. Kenya’s economy is heavily dependent upon its ability to import. Imported capital goods are needed for investment while manufacturing requires access to key imported intermediate goods. Adverse development in the trade account contributed to reduction in investment and the slower growth rate of real GDP. Kenya’s capacity to import was sharply reduced further by freezing of the balance of payments support in 1991 which therefore contributed significantly to the slowdown in the overall growth in 1992.

There was a reduction in aggregate demand for goods and services. In the real sectors, agricultural and manufacturing production was seriously constrained. The agricultural sector was constrained as a result of the drought which led to large imports of commercial and relief maize. Manufacturing sector was constrained as a consequence of deepening effects of liberalization, dilapidated infrastructure, competition from imported goods, election uncertainties and depressed local demand (Economic Survey 1993 Through 1998).
1.1.2 Policy Measures to Accelerate Real GDP Growth

Kenya has implemented six national development plans since its political independence in 1963. The implementation of the seventh plan is in progress and will end in year 2001. Throughout this period of planning, the prime objective has been to accelerate the rate of economic growth measured in terms of annual percentage change in the GDP. These development plans covered policy areas such as employment generation, improved management of human and financial resources, regional balance, capital stock and the environment.

The government has also implemented a number of policies contained in a number of sessional papers. Sessional paper No 1 of 1986 contained Structural Adjustments Programmes aimed at restoring and sustaining high GDP growth rate. The Structural adjustment policies implemented in mid-1980s and early 1990s covered all the major sectors of the economy. Agricultural adjustment programmes mainly involved raising producer prices to induce farmers to increase production. In the financial sector, the Central Bank’s supervisory role over commercial banks and non-bank financial intermediaries has been enhanced. Industrial sector’s structural adjustments were to help raise its efficiency by increasing its outward orientation. This was to be achieved through trade and foreign exchange liberalization.

Trade reforms implemented were a 10 per cent tariff surcharge imposed on all imports and tariff increases on over 200 items in 1980. These reforms were continued in the following year, with tariff increases ranging from 2 to 90 per cent on about 1400 items. There was also tariff reductions on about 20 items used mainly by export-oriented industries. From 1987 to 1991 the number of tariff categories was reduced from 25 to 11 and the maximum tariff rate was reduced from 170 to 70 per cent.
Trade liberalization policies implemented included: Arbitrary quantitative restriction mechanisms such as import bans and the "no objection" certificate were eliminated in the early 1980s, and import items listed in the less restrictive categories were increased. In mid-1982, for example, 317 items were moved from schedule II to the less restrictive schedule I. Manufactured export subsidy introduced in 1974 rate was increased to 20 per cent from 10 per cent in 1980. However, because of balance of payment problem, the scheme was suspended in June 1982. The scheme was reintroduced in December 1982 at the rate of 10 percent, with a bonus rate of 15 per cent to those exporters who had increased their exports the previous year(s). This bonus rate was abolished in 1985, and the basic rate was raised to 20 per cent. In 1986, the items eligible for export compensation were reduced from 2000 to 700, then restored to 1260. In the 1990 budget, exporters were permitted to process their claims through commercial banks to speed up payments and were given the option of claiming duty exemptions rather than export compensation on imported inputs. In early 1993, the basic rate was again reduced to 10 per cent.

Since 1983, Kenya has utilized a more flexible exchange rate regime. For nearly ten years, the rate was adjusted on daily basis against a composite basket of currencies of the country's main trading partners. Since 1983, the Kenya shilling has been depreciating significantly both in nominal and in real terms. Between 1983 and 1987, there was a 79.6 per cent nominal depreciation of the Kenya shilling against the special drawing rights (SDR) and a 26.5 per cent depreciation of the real trade weighted effective rate. The liberalization of the foreign exchange market was extended in 1992 when foreign exchange bearer certificates (which are issued against capital inflows and entitle the holder to repurchase foreign exchange at the prevailing shilling exchange rate) and
Early in 1993 the government unearthed a series of extraordinary financial scandals that had serious macro-economic consequences. This forced the government to begin to charter a more responsive course in its financial sector discipline by strictly reinforcing and ensuring future accountability. The process of establishing the credibility of the key financial institution responsible for economic management had began at the right moment. The government began to recognize the view that far-reaching changes to economic management and radical structural reforms are essential if Kenya's evident potential for rapid economic growth and financial instability is to be achieved. In order to create an enabling environment for the local and foreign investors, import controls were lifted, exchange controls were relaxed or removed, foreigners were allowed to pay their hotel bills, airline tickets, airport taxes and so on in Kenya; restrictions on domestic borrowing by foreign controlled companies were removed; foreigners were allowed to remit majority of payment, including dividends, profits, and expatriate earnings; exchange rate and interest rate were left to be determined by the forces of demand and supply; exporters were allowed to retain 100 per cent of their export earnings; residents were permitted to borrow from abroad with no limit on the amount to finance investment in Kenya, and finally active foreign exchange market system was promoted. These financial management adjustment reforms now in place allow the investors a wide availability of
both local and foreign resource finance.

In addition to the above, the government has began a civil service reforms aimed at creating a streamlined and motivated service whose hallmarks are integrity and efficiency. Incentives for early retirements are being provided for those who want to retire early and Privatization of non-strategic parastatals has been going on (World Bank 1995).

1.1.3 Factors that Brought About Slow Economic Growth

At independence Kenya inherited a colonial economy which had a weak foundation. On the production (supply) front, not only was the agriculture sector dominant (42 percent of GDP) which itself had a large subsistence portion (25 percent) than the monetary one (17 percent), but the manufacturing sector was small (11 per cent of GDP). On the consumption (demand) side, Kenya’s income per capita, at around $100 per annum was too low to sustain a vibrant competitive manufacturing sector without outside markets. The export sub-sector which, together with the agricultural sector, was supposed to be the "engine of growth," and accounted for 24 percent of GDP, was dominated by primary commodities.

To compound the problem, the primary commodities that Kenya was exporting were historically fraught with supply and demand rigidities. On the supply side, Kenya’s three main exports-coffee, sisal and tea (accounting for 34 per cent, 13 per cent and 13 per cent of total exports in 1964 respectively) were three crops which took a considerable time lag before maturity. Thus, whatever world market price signals were received by farmers were not good at influencing production decisions in the short-run. On the demand side, these commodities main markets were in the developed countries of Europe and north America with stagnant or negative population growth. Further-more, the commodities themselves were relatively demand inelastic. In fact consumption of coffee
and tea in these market has reached saturation points. The implication of these demand rigidities on Kenya’s primary commodity exports was that the long-term prospects of growth were poor.

Contrary to current belief that Kenya’s economic problems started in mid-1980s, danger signals warning of pending economic trouble, started flashing strongly in the first half of 1970s. To be exact, the signals started flashing in 1973 when the downward trend in real GDP growth set-in.

The reform process of 1980 did not bring about improvement in the economic performance (Development Plan 1997-2001). The economy has continued to perform poorly for the last two decades and real GDP growth rate continued to fluctuate. The possible factors behind the economic instability can be traced to excessive expansionary fiscal and monetary policies, adverse exogenous shocks and structural factors especially failure to expand and diversify exports. Major influences on government spending are first, too large recurrent expenditures (wage bills of the civil service and local currency costs of servicing the public debts). Second, political reluctance by the authorities to collect sufficient tax revenues on consistent basis. Third, inadequate control of expenditures and inability to target expenditure to achieve specific policy objectives. Fourth, heavy public debts.

The high rate of saving of early 1970s started to decline in 1980s with pronounced negative effects on GDP growth rates. After moving from the fixed exchange rate system in the early seventies, Kenya’s exchange rate remained fairly stable pegged to the special drawing rights (SDRs). It’s however been established over time that this stability is not sustainable because it has weakened the country’s power of export. A series of major devaluation have taken place since 1980.
Private sector investment declined as a result of the collapse of the East African community and deterioration of Kenya's international terms of trade which reduced domestic demand. The level of investment was also adversely affected by political uncertainties of 1982, the 1984 drought and the introduction of political pluralism in 1990.

Among exogenous factors that contributed substantially to the poor economic performance in recent years were the various negative shocks that the economy experienced, including the two oil shocks of 1973 and 1979, the closure of the border with Tanzania, both of which severely curtailed exports of manufactures; the end of the coffee boom in 1977; the military coup attempt of 1982, which reduced business confidence and caused some capital flight; droughts in 1984, which curtailed agricultural output; and political unrest in 1990s. In addition, the country experienced a serious decline in the term of trade, with the term of trade index declining from 114 in the mid-1970s to 71 in 1990.

The rate of Kenya population growth has been increasing since independence. Total population more than doubled within twenty years from 1969 to 1989. The average annual growth rate of the period was 3.8 per cent. Currently, the rate is estimated at around 3.34 per cent. Given that the 1993 population estimate was about 24 million, even with the lower rate, the base is larger and therefore absolute increments will be higher in future. This call for immediate action to reduce the rate further as the government undertakes to cater for many people. The aim of family planning program, launched in 1967 remain to reduce the population growth rate and promote a healthier population. Currently, this had serious consequences on the GDP growth effort as the first growing needs of the population put strains on the country's resources.
1.2 Statement of the Research Problem

Given a growing population, increase in real GDP is necessary to maintain the standard of living as measured by the average of goods and services per person. The government through its various policy documents has shown its commitment in generating and sustaining a high and positive real GDP growth rate. The Kenya Government has pursued stabilization and structural adjustment policies for more than ten years in an attempt to restore and sustain the high growth rates experienced in the 1960s and early 1970s which averaged 6.6 percent. The main policy measures taken to accelerate the growth rate of real GDP have been, price decontrol, trade liberalization, changes in relative factor prices, domestic credit restrictions, strict control of public expenditures and human development programmes. Despite these measures, real GDP in Kenya has continued to be characterized by positive and negative rates of change of real GDP growth rates. The cyclical fluctuations have been more marked, especially after 1973.

The question then arises as to why Kenya has been experiencing cyclical fluctuations in real GDP growth rate. This calls for attention to find out which factors have continued to determine the growth rate of real GDP in Kenya.

1.3 Objectives of the Study

The objectives of this study may be summarized as follows:

(i). To identify the factors that determine fluctuations in real GDP growth rate in Kenya.

(ii). To measure the relative effect of the factors identified in (i) above.

(iii). To suggest policy recommendations in light of (ii) above.
1.4 Significance of the Study

First, the study will give insights into the factors determining real GDP growth rate in Kenya. Second, the aim of the government in implementing structural adjustment policies was to alleviate macro-economic imbalances and structural rigidities to enhance domestic and external competitiveness in the economy. This was in an attempt to restore and sustain real GDP growth rate. These adjustments have affected the decision of the government policy makers. Therefore, the results of this study are of vital importance to policy makers in guiding them when identifying and implementing macroeconomic policies compatible with better economic growth performance. Third, the study added to the existing knowledge on real GDP growth rate determination and provoke further research in this area.

1.5 Scope of the Study

The focus of the study was on determinants of real aggregate gross domestic product (GDP) growth rate in Kenya. The study took a sample period of 1973-1997. This period is long enough for an economic analysis of factors affecting cyclical fluctuations in real GDP growth rate.
CHAPTER TWO

2 LITERATURE REVIEW

2.1 Introduction

This section reviews literature on the works done on the various aspects of the gross domestic product growth by both individuals and group of individuals. There exists a lot of literature on GDP growth in both developed and developing countries. However, not much literature exists on real GDP growth especially in Kenya. Therefore research reviews theoretical and empirical literature on determinants of real GDP growth in other countries in general and Kenya in particular.

2.2 Theoretical literature

Solow (1957) stated that output growth was determined by demographic factors (the rate of population growth) and the rate of technical progress. Solow developed a growth model based upon the following assumptions: that labour force growth rate is given exogenously; investment and saving are a fixed fraction of output; the production function combines capital and labour; there is continuous full employment; there is perfect competition, and that there is automatic transfer of saving to investment.

Solow (1957) asserted that real GDP growth was determined by: the rate of growth of labour input, gross capital input and total factor productivity changes. On the basis of the above three factors, he developed a real GDP growth model.

Solow’s growth model assumed that the growth of output was exogenously determined by technical progress and population growth. Since population growth and technological change were assumed to be exogenous, the growth model does not explain the mechanism that generates steady growth. Therefore, it did not allow an evaluation of the mechanism through which government policies can influence the growth process. The
model assumed continuous full employment, presence of perfect competition and automatic transformation of saving into investment which was not possible due to financial disintermediation.

Romer (1986) and Rebelo (1991) developed a per capita output growth model. They proposed varieties of channels, such as fiscal and financial, through which steady growth arises endogenously. Endogenous growth theory focused on the role of human capital accumulation and the interaction between economic growth and financial development. Based on the assumption of a constant returns to scale production function and taking all production inputs as some form of reproducible capital including both physical capital and human capital, they formulated a growth model of the form:

\[ g = a s - \delta \]

where \( g \) = The growth rate of per capita input  
\( a \) = The marginal productivity of capital  
\( s \) = The rate of saving  
\( \delta \) = The rate of depreciation

They asserted that the growth rate of per capita income was determined by the rate of saving, marginal productivity of capital, and depreciation rate. This growth theory provides the mechanisms through which government policies could potentially influence the growth process. It proposed a variety of channels through which steady-state growth arose endogenously (growth without bound as a result of government policies). Because of this, our research adopted and modified growth models developed by Romer (1986) and Rebelo (1991).

Pagano (1993) introduced financial factors into the growth model developed by Rebelo (1991). It was assumed that a fraction of saving was lost as a result of financial
disintermediation activities. By assuming equilibrium condition in the goods market and production technology described by constant returns to scale, the growth model was formulated.

\[ g = s \Delta a - \delta \]

where \( g \) = The growth rate of per capita income  
\( s \) = The rate of saving  
\( \Delta \) = The proportion of saving allocated to investment  
\( a \) = The marginal productivity of capital  
\( \delta \) = The depreciation rate

Pagano (1993) concluded that financial development could affect economic growth through three ways. First, financial development might raise the saving rate \( s \). Second, it might raise, the marginal productivity of capital stock \( a \). Third, it might lead to an increase in the proportion of saving allocated to investment \( \Delta \).

However high rate of saving did not mean high GDP growth rate. This was because savings were withdrawn from the national income. Therefore, people might be saving but putting less saving into productive investments. Pagano (1993) asserted that financial development raised the proportion of saving allocated to investment which was not possible in developing countries where the majority of people are poor as manifested in low income.

Harrod (1957) expressed growth as the product of a country’s investment divided by output \( I/Q \) and the productivity of investment \( \Delta Q/I \). The following function was specified:

\[ \frac{\Delta Q}{Q} = \frac{I}{Q} \frac{\Delta Q}{I} = g = sK \]

where \( I \) = Investment
\[ Q = \text{Output} \]
\[ g = \text{The growth rate of national income} \]
\[ s = \text{The ratio of saving to national output} \]
\[ K = \text{Incremental capital output ratio} \]
\[ \Delta = \text{A small change in output} \]

Harrod (1957) further expressed growth of national income as the product of the total labour force (L) and the output per unit of labour (Q/L). Therefore, growth of output was specified as the sum of the rate of growth of the labour force and the rate of growth of output per unit of labour, or labour productivity.

\[
\left[\frac{\Delta(Q/L)}{(Q/L)}\right] = \frac{\Delta Q}{Q} = \frac{\Delta L}{L} + \frac{\Delta (Q/L)}{Q/L}
\]

Chenery (1966) emphasized on the importance of incremental capital-output ratio and labour productivity in the growth process. In developing countries measurement of labour productivity may be hard mostly due to lack of proper records of population actually involved in the production.

Chenery (1966) emphasized on the incremental capital output relationship. It was suggested that the rate of economic growth increases if the ratio of investment to national incomes rises and that an increase in capital imports increases the investment ratio. The assumption was that the value and volume of exports was given as exogenous \((x = X_0)\), while the demand for imports largely depended on the targeted rate of economic growth. Import of capital goods depends on the level of investment, and intermediate goods were a derived demand of the rate of capacity utilization. This domestic inputs were an imperfect for imported intermediate goods, the latter increase/decrease with an increase/decrease in production. The cost of financing such imports in most cases has
exceeded the earnings of foreign by exports. A foreign exchange gap arises, which if not closed by aid resources reduces the targeted economic growth.

2.3 **Empirical literature**

2.3.1 **Empirical literature from Other Countries**

Elias (1992) studied on the causes of real GDP slowdown in seven Latin America economies over the period 1940-85. His objective was to identify the factors that led to decline in variable real GDP growth rates in these countries and to estimate the influence of external factors such as population growth, exchange rate, energy prices, wage rate, and the behavior of the technological changes towards GDP growth. Using ordinary least square method of estimation, the results indicated that quality of labour, capital stock, size of fiscal deficit and foreign trade were significant elements in the diverse rates of growth observed in these countries. Taking a sample period of 1940-85 and using time series data, Elias (1992) regressed reduced form models of both real GDP growth and capital input using ordinary least squares method of estimation. These models included a methodology for explaining the source of input growth. The regression results indicated that the external sector variables (population growth, wage rate, energy prices) were much more relevant for capital input than for the GDP, suggesting that they affected GDP growth through capital accumulation. Elias (1992) used source of growth methodology which assumes that growth was exogenously determined by factors such as technology and population. Also, Elias did not take into consideration the effects of government policies on GDP growth which are taken into account in this study.

Schmidt (1995) examined the causes of slow economic growth in developing countries. The objective was to find out whether macro-economic instability and fiscal adjustment impair growth in developing countries. A cross-country study of 82 developing
countries was carried. Nominal GDP was expressed as a function of base year income, primary, secondary, and higher education enrollments, fiscal deficit, macro-economic instability comprising external debts, exchange rate and inflation, terms of trade shocks, volume of trade, liabilities in the banking sector, and civil liberties.

Using pooled (cross-sectional and time series) data for the period 1970-1990, the following growth model was tested.

\[
g = \beta_0 \text{GDP}_{60} + \beta_1 \text{enpri} + \beta_2 \text{ensec} + \beta_3 \text{enhd} + \beta_4 \text{Fibal} + \beta_5 \text{Mins} + \\
\beta_6 \text{trd} + \beta_7 \text{Tot} + \beta_8 \text{Lib} + \beta_9 \text{Cv} + U
\]

where \( g \) = Growth rate of real GDP,

\( \text{GDP}_{60} \) = Base year income

\( \text{enpri} \) = Primary school enrollment

\( \text{ensec} \) = Secondary school enrollment

\( \text{enhd} \) = Higher school enrollment

\( \text{Fibal} \) = Fiscal balance

\( \text{Mins} \) = Macroeconomic instability

\( \text{trd} \) = Volume of trade

\( \text{Tot} \) = Term of trade shocks

\( \text{Lib} \) = Liabilities of banks

\( \text{Cv} \) = Civil unrest

\( U \) = An error term

\( \beta_i \) = Coefficients

OLS regression results indicated a significant role played by base year income levels and primary and secondary school enrollments. Terms of trade shocks, liabilities of banks and civil liberties were found to be insignificant. Furthermore, while macro-
economic instability was a central and systematic growth determinant, it’s individual components were seldom significant when taken individually. The study was largely cross-country based and is faced with the problem of acquiring comprehensive data that would permit in-depth analysis of government policies.

Ghani (1992) studied the causes of real GDP slowdown in developing countries of sub-saharan Africa such as Morocco, Senegal, Ivory Coast. The objective was to find out what factors determine the rate of GDP growth in developing countries. The hypothesis of a positive relationship between financial development and real GDP growth in developing countries was tested. Real GDP growth was expressed as a function of financial development, human resources, level of real GDP, investment growth rate, labour force growth rate, inflation rate, exchange rate and foreign trade. OLS regression results indicated that the initial level of financial development was significant and positively associated with a country’s subsequent real GDP growth after controlling for the effect of starting the level of human capital and investment. Given the initial level of financial development and human capital, subsequent growth rate was also found to be significantly and negatively related to the initial level of per capita GDP.

This study was based on cross-country analysis and can not be used for in-depth analysis of government financial policies. Nonetheless, the author has demonstrated that a positive relation exists between financial development and economic growth.

Olomola (1994) examined the causes of depression in Nigeria. The objective was to investigate the influence of financial liberalization on economic growth under structural adjustment in Nigeria by investigating the relationship between financial development and growth. Financial control measures prior to the introduction of SAPs were analysed and then compared financial sector development during SAPs (1986-91) and pre-SAPs (1980-
by using two approaches. First, the correlation among the conventional indicators of financial development such as interest rate, financial efficiency and intermediation, and per capita GDP were determined. Correlation coefficients for both the pre-SAPs and SAPs sub-period for comparative purposes were computed. Second, the relationship between each of the indicators and per capita GDP was further examined through regression analysis.

The results indicated that each of the measures of financial size had a negative correlation with per capita GDP but more significantly under SAPs than pre SAPs. The regression results indicated that the only positive relationship was with respect to the private sector credit relative to aggregate credit in the economy. However, the time frame was not adequate for analysis. By dividing the study period into pre-liberalization years and liberalization years led to the few years available for each sub-period. This made the study to apply a regression analysis for each period. The two periods were combined making results not to be indicative of the consequences of financial liberalization.

William (1996) did a study to find out the causes of slow economic growth in sub-Saharan countries over the period 1980-1995. The objective was to find out factors that contributed to economic slowdown in these countries by expressing real GDP as a function of level of education, political stability, financial development, exchange rate premium, and fiscal deficits. Growth equation that was estimated was of the form:

\[ GYP = \beta_I + \beta_M + \beta_Z + U \]

where \( GYP \) = Growth rate of real GDP

\( I \) = Set of base variables such as education and financial development

\( M \) = Policy indicators such as exchange rates

\( Z \) = A set of three variables chosen from a pool of policy indicators such as
fiscal balance, terms of trade and volume of trade

\[ U = \text{An error term} \]

\[ \beta_i = \text{Coefficients that were estimated} \]

OLS regression results indicated that low school attainment, political instability, poor developed financial systems, large black market exchange rate premiums, large government deficits and inadequate infrastructure were associated with slow growth and reduced the likelihood of adopting good policies. This study used cross-country data which was not adequate to allow in-depth analysis.

Hicks (1980) analyzed the causes of poor economic growth in developing countries in Africa and Latin America. The objective was to find out factors which contributed to poor economic growth in developing countries. By taking a sample of 83 developing countries, Hicks (1980) examined a cross-country growth of per capita GDP and two indicators of human resource development-life expectancy and literacy.

The model of the form below was used:

\[ \text{GRYPc} = \beta_1 \text{INVRT}_t + \beta_2 \text{GRIMP}_t + \beta_3 \text{HR}_b + e \]

where, \( \text{GRYPc} = \) Growth rate of per capita real GDP, over time period \( t \)

\( \text{INVRT} = \) Average investment rate over the same period

\( \text{GRIMP} = \) Growth rate of imports

\( \text{HR} = \) Some measure of basic human resources development in the basic period

\( e = \) An error term

\( \beta_i = \) Estimated coefficients

By use of multiple regression techniques and pooled time series data for the period 1960-1977, regression of per capita GDP growth rate against investment, imports and the
level of human resource development was done. The regression results indicated that all
the three factors were significant determinants of per capita GDP growth. This was a
cross-country study and getting comprehensive data for analysis was a problem. Also, the
conclusion reached was not representative of individual countries.

Papanek (1967) conducted a study to establish the causes of slow economic growth
in developing economies of Africa, Latin America and north America. The objective was
to examine the influence of foreign capital factors (financial aid and foreign investment
towards real GDP growth). The relationship between financial aid, foreign investment,
saving and growth were studied. By use of cross section data and a sample of 85
countries, a growth equation of the form below was estimated.

\[ g = b_0 + b_1Sd + b_2a + f_1 + b_4O + e. \]

where \( g \) = Growth rate of real GDP

\( Sd \) = Domestic saving ratio

\( f \) = Private foreign investment,

\( a \) = Financial aid

\( O \) = Other foreign financial inflows such as donations

\( e \) = An error term

OLS regression results indicated that foreign direct investment and financial aid
were significant determinants of real GDP growth rate. Aid flows had the following
potential effects (1) Supplementing domestic savings, hence capital accumulation and (2)
increasing the proportion of income saved. If this was not the case then the aid increased
the capacity for economic growth and was able to lead a country to self-sustaining levels
and subsequently reduce the amount of aid contracted. This had not been the case in most
of the developing countries. Indeed in most cases financial aids had been directed into
personal use or used to develop projects which were not viable for economic growth. Financial aids do necessarily increase economic growth and development in developing country like Kenya due to inefficient administration and misallocation of the funds.

Emery (1978) and Stein (1971) did a study to investigate the growth slowdown in Ethiopia over the period 1953-63. The influences of foreign trade towards nominal GDP growth rate were investigated. By expressing real GDP as a function of export and import growth, a growth equation was formulated as follows: 
\[ g = b_0 + b_1X + b_2M + e \]

where 
- \( b = \) Growth rate of the real GDP 
- \( X = \) Export growth rate 
- \( M = \) Import growth rate 
- \( e = \) An error term 
- \( b_i = \) Estimated coefficients

By use of time series data and ordinary least squares method of estimation the regression results indicated that exports and imports were significant and positively related to real GDP growth. The correlation between imports and growth was slightly higher than exports and growth but both were significant at the 5 percent level.

Meyer, et. al (1979) did a study to investigate the variability of GDP growth in America. The authors investigated the relationship between education and growth. They estimated a growth equation of the form 
\[ g = a_1Pe + a_2Se + a_3He + e \]

Where 
- \( g = \) Growth rate of real output 
- \( Pe = \) Level of primary school education 
- \( Se = \) Level of secondary school education 
- \( He = \) Higher level education

By using OLS method of estimation, they regressed real GDP growth rate against...
primary, secondary and higher education level and found that primary and secondary education were significant in periods 1950-65 and 1965-70 respectively, while higher education was always negative and statistically insignificant at 95 per cent level of significance. It was also found that the effect of secondary education on growth was higher than that of primary education.

2.3.2 Empirical Literature Specific to Kenya

Hazlewood (1979) assessed the influence of inflation on Kenyan economic growth during 1963-1978. Real GDP growth rates were compared in each year with the price. The results indicated that increased use of resources for investment between 1964 and 1977 resulted in impressive real GDP growth rate during this period. He pointed out that growth during most of the period since independence took place at remarkably stable prices. The study asserted that sudden change from a long period of rapid price rise and slow growth which followed the 1973 oil crisis completely prevented the economy from achieving the targets. It was concluded that investment and inflation rate determined real GDP growth rate in Kenya during 1963-78 period. Hazlewood (1979) did not estimate any model to test the significance of inflation and investment as determinant factors of GDP growth. Also, the issue of unemployment was not considered and yet had high impact on economic growth during this study period.

Mwega. et. al (1992) did a study to find out the causes of poor economic performance in sub-Saharan countries since 1970s up to 1994. The study outlined that the per capita growth rate for example declined from 1.7 per cent in 1965-73 to 0.6 per cent in 1978-80 and to -3.1 per cent in 1980-89. The study asserted that one major cause of poor performance was the large macroeconomic imbalances which had characterized these countries. It was stated that many countries started to implement structural adjustment and
stabilization programmes so as to reduce fiscal, saving and foreign exchange gaps. Taking Kenya as a case study, Mwega (1992) investigated whether it was the saving, fiscal or foreign exchange gap which was the binding constraint on capacity growth in Kenya and how these gaps have evolved since the early 1970s. The three-gap framework applied in the study, extended the traditional two-gap model by distinguishing the fiscal constraint as another potential, independent impediment to economic growth. Mwega (1992) estimated a growth function of the form:

\[ g = f(i). \]

where \( g \) = Potential growth of output

\( i \) = Gross investment ratio

Investment consisted of gross fixed capital formation and inventory investment. Total investment was decomposed into private investment and public investment. By use of OLS method of estimation, growth functions of saving, fiscal and foreign gaps were regressed. Growth effects of two functions at a time were then estimated. The results indicated that the foreign exchange gap was the binding constraint to potential growth in Kenya. Mwega (1992) did not bring out clearly how the three gaps evolved in the country.

Nalo. et. al (1991) did a study to investigate what constrained economic growth in Kenya between 1964 and 1990. They examined constraints to growth in the context of two-gap model. The gaps were foreign exchange and saving gaps. By use of time-series data and OLS method of estimation, they regressed both saving and import functions under the two-gap model. The results indicated that saving gap was the binding constraint to economic growth. It was significant at 95 per cent level of significance. It was concluded that high levels of savings and investment rates directly influenced growth rate.
of GDP in Kenya. Nalo (1991) only estimated saving and import functions but did not estimate output growth model. Also, no explanation was given on how the two gaps evolved and their estimation.

A number of growth models have been put forward in order to explain the impact of growth of capital stock on aggregate performance of the economy. In the empirical scenario, these models are used for analytical purpose in this paper. However, the focus of this paper is on the growth model, taking Kenyan data and theory of Royden, Corden, and Powell into consideration. This theory, producing a growth function and examining how growth is determined by the factors of economic system, but not the result of forces that generate fundamental change in the economy theory, a channel through which output growth arises and the role of output growth in explaining government policies can be developed. This can be achieved by some modification of output production function which will be developed in line with Royden, Corden, and Powell model. The developing the production function is dependent on output per immobilized capital and is given by

\[ Y = F(P, H) \]

where \( Y \) stands for output in period \( t \), \( P \) is physical capital, and \( H \) is nonimmobilized capital.

The output function can be explained by nonimmobilized capital \( H \) as an added ordinary input. Therefore, \( P \) has to be expressed in terms of physical capital and nonimmobilized capital \( H \). The output production function can be represented as

\[ Y = F(P, H) \]
3.1 Theoretical Framework

A number of growth models have been put forward in an attempt to show the impact of growth of capital stock on aggregate performance of the economy. The model used for analytical purpose in this paper emphasizes the rate of saving. To develop the growth model, endogenous growth theory of Romer (1986) and Rebelo (1991) is used. This theory postulates that growth depends on human and physical capital accumulation. Endogenous growth theory emphasizes that economic growth is an endogenous outcome of an economic system, but not the result of forces that impinge from outside. From this theory, a channel through which output growth arises endogenously (growth as a result of government policies) can be developed. This can be achieved by: First, formulating an output production function. Second, by developing a capital accumulation equation and finally developing the relationship between capital accumulation and output growth rates.

All production inputs are taken as some form of reproducible capital, including not only physical capital (as emphasized in the basic neoclassical framework), but also human capital and the state of knowledge. The output function is assumed to be linear, homogeneous of degree one. Assuming constant return to scale and no non-rival inputs, then the output function can be specified as:

\[ Y = F(P, H) \]  

(1)

where \( Y \) stands for output in period \( t \), \( P \) is physical capital, and \( H \) denotes human capital. The output function can be simplified by treating physical capital, and human capital like ordinary inputs. Therefore, \( P \) and \( H \) can be aggregated into a single broad measure of capital (\( K \)). The output production function can be represented as:
\[ Y = F(K) \]---------------------------(2)

where \( K \) is a composite measure of the physical and human capital stock. The level of output depends on the aggregate capital stock at the beginning of the production period \( t \). This can be expressed as:

\[ Y_t = aK \]------(3)

where \( a \) denotes marginal productivity of capital \( Y \) and \( K \) are as defined earlier. The capital accumulation equation can be developed by taking total or gross investment at any time to be \( I_t \). The capital stock accumulate according to,

\[ K_{t+1} = K_t + I_t - \delta K_t ; \quad 0 < \delta < 1 \]---------(4)

where \( \delta \) is the rate of depreciation, \( (K_t) \) stands for capital stock at the current period and \( (K_{t+1}) \) is the capital stock at the beginning of the next period \( (t+1) \).

The change in capital stock is given as,

\[ \Delta K = K_{t+1} - K_t = K_t + I_t - \delta K_t - K_t. \]

where \( \Delta \) denotes a change in capital stock

\[ \Delta K = I_t - \delta K_t \]---------------------------------(5)

The change in output depends on changes in capital stock

\[ \Delta Y = a\Delta K \]---------------------------------(6)

Therefore from (5),

\[ \Delta Y = a[I_t - \delta K_t] \]

or \[ \Delta Y = a(I^n) \]--------------------------------------(7)

where \( (I^n) \) is net investment \([I_t - \Delta K_t]\).

If net investment is taken as some given fraction of the saving ratio \( s \) of output \( Y \), \( I^n = sY; \quad 0 < s \)
where (s) is the rate of saving, then the basic output growth relationship can be written as:

$$\Delta Y = a s Y$$ \hspace{1cm} (8)

Dividing equation (8) by output (Y) gives us growth rate of output.

$$\frac{\Delta Y}{Y} = \text{growth rate of } Y = a s$$

or

$$g = a s$$ \hspace{1cm} (9)

Equation (9) indicates that growth is indirectly linked to (K) which is an aggregated value of physical and human capital stocks. The theoretical model can be expressed as:

$$g = f(a, s)$$ \hspace{1cm} (10)

3.2 Model specification

The study postulated a relationship between real GDP growth rate and its determinants. From economic theory and the literature review, the growth of real GDP is determined by, saving rate, marginal productivity of capital, fiscal deficit, financial development, growth of export earnings, private foreign investment, exchange rate, real interest rate, external debt and structural adjustment. A general model of real GDP growth used in this study was a modified version of equation (10). The modification was first necessitated by taking output growth to represent real GDP growth rate. Second, by disaggregating marginal productivity of capital into both human and physical capital stocks. Third, taking Kenya to be a labour surplus country, labour may not be a critical determinant of real GDP growth rate. Finally the model was modified by including other variables.

The modified form of the model was therefore given as:

$$G = f(S, K, Fibal, FD, EDT, DFI, EXR, INT, X, SAPs)$$ \hspace{1cm} (11)

where:
3.3 Estimation Procedure

Both linear and non-linear specifications of the functional relationship in equation (11) were estimated using time series data for the period 1973-97. The research adopted the best specification. Time-series data usually exhibit a non-stationary process (has both time and variable specific effects) and if OLS method is applied directly, the results would be spurious. Because of this, a test for the order of stationarity was done. As a first step, unit root test on both dependent and explanatory variables in the model were conducted to evaluate their time series characteristics. Essentially, these tests were required to ascertain the number of times a variable has to be deferenced to arrive at stationarity. The basic logic here was to avoid the problem of spurious regression that is often encountered when non-stationary series are estimated at their levels, particularly using ordinary least squares (OLS) method of estimation. For this purpose, the Dickey-Fuller (DF) and 'Augmented' Dickey-Fuller (ADF) tests were employed to identify the
order of integration of economic variables of interest. Tests of cointegration between the dependent and some of its explanatory variables was carried out. This was conducted using the Engle-Granger two step method (Engle and Granger, 1987). In addition, a correlation matrix (Appendix iv) was formed before estimation was done to determine the existence of multicollinearity.

The linear model was specified as

\[ G_i = b_0 + b_1K + b_2S - b_3\text{FIBAL} + b_4X + b_5\text{FD} - b_6\text{EDT} + b_7\text{PFI} + b_8\text{XR} - b_9\text{INT} + b_{10}\text{SAPS} + e \]  

(12)

where

\[ b_j's = 0, 1, \ldots 10 \]  

are parameters to be estimated.

\[ e = \text{error term}. \]

The log-linear model was specified as

\[ \ln G = \beta_0 + \beta_1\ln K + \beta_2\ln S - \beta_3\ln\text{FIBAL} + \beta_4\ln X + \beta_5\ln\text{FD} - \beta_6\ln\text{EDT} + \beta_7\ln\text{PFI} + \beta_8\ln\text{XR} - \beta_9\ln\text{INT} + \beta_{10}\ln\text{SAPS} + e \]  

(13)

where \[ \beta_j's = 0, 1\ldots 10 \]  

are elasticities.

### 3.4 Order of Integration

Equations (12) and (13) respectively were differenced 10 times, the highest order of integration of the component series (Appendix ii). For each of the series, an Augmented Dickey Fuller regressions for linear and non-linear specification of the following forms were run: Augmented Dickey Fuller linear model was specified as:

\[ \Delta^{10}G_i = \gamma_0 + \gamma_1\Delta^{10}K + \gamma_2\Delta^{10}S - \gamma_3\Delta^{10}\text{FIBAL} + \gamma_4\Delta^{10}X + \gamma_5\Delta^{10}\text{FD} - \gamma_6\Delta^{10}\text{EDT} + \gamma_7\Delta^{10}\text{PFI} + \gamma_8\Delta^{10}\text{XR} - \gamma_9\Delta^{10}\text{INT} + \gamma_{10}\text{SAPS} + e \]  

(14)

where

\[ \gamma_j's = 0, 1, \ldots 10 \]  

are parameters to be estimated.
Augmented Dickey Fuller log-linear model was specified as:

\[ \alpha \ln_{10} G = \alpha_0 + \alpha_1 \ln_{10} K + \alpha_2 \ln_{10} S - \alpha_3 \ln_{10} \text{FIBAL} + \alpha_4 \ln_{10} X + \alpha_5 \ln_{10} \text{FD} - \alpha_6 \ln_{10} \text{EDT} + \gamma \ln_{10} \text{PFI} + \beta \ln_{10} \text{XR} + \omega \ln_{10} \text{INT} + \tau \ln_{10} \text{SAPS} + e \]  

(15)

where \( \alpha_i \)'s i = 0, 1-------10 are elasticities.

3.5 Definition and Measurement of Variables

The dependent variable is the growth rate of real GDP. The growth rate of real GDP (g). This is the average annual growth rate of output for both the monetary and the traditional economy. It was captured by percentage change of the level of the total output at 1982 prices.

The exogenous Variables are:

1. The rate of saving (S): This is the proportion of GDP that is saved in a year. It was measured by the rate of gross domestic saving.

2. Physical capital stocks (K): This is the growth rate of fixed capital stock (plant and machinery). It was captured by the percentage rate of growth of fixed capital formation by industry.

3. Fiscal balance (FIBAL): This is the difference between central Government's expenditure and revenue (negative for a deficit). It was measured by the difference between current revenue plus capital revenue and current expenditure plus capital expenditure plus net lending.

4. Growth of Export Earnings (X): This is the growth rate of the value of goods and services exported outside the country. It was captured by percentage change in value of domestic exports.

5. Financial Development (FD): Financial development is the improvement of financial
intermediation. It was captured by broader measure of the stock of liquid assets held by
the public ($M_2$)-currency plus demand deposits plus deposits held by non-banking financial
institutions.

6. **External debts (EDT):** This is the amount of money borrowed by the government from
other countries. It was measured by the value of total long-term and short term foreign
debts.

7. **Change in Direct foreign investment (PFD):** This is the amount of financial inflows
from other countries. It was captured by the percentage change in the value of net
foreign assets invested in Kenya.

8. **Exchange rate (XR):** This is the price of a unit of one nation's currency in terms of a
unit of a foreign currency. It was measured by an annual average of the official market
exchange rate in national currency per Us dollar.

9. **Real interest rate (INT):** This is the actual annual percentage change in the purchasing
power of interest income earned on the government treasury bills. It was measured by
real interest rate of government treasury bills.

10. **Structural Adjustment (SAPs):** These are institutional changes in the economy. It
was captured by a dummy: $1 = $ with structural change and $0 = $ with no structural change.

### 3.6 Abbreviation of Variables

- **G** = Gross domestic product (GDP) in Kenya pounds.
- **K** = Capital stock growth in percentage.
- **S** = Rate of gross domestic saving as a percentage of GDP.
- **FIBAL** = Fiscal balance (negative for a deficit) in Kenya pounds.
- **X** = Value of exports in Kenya pounds.
- **FD** = Financial development (demand deposit in Kenya shillings).
**EDT** = External debt in US$.

**DFI** = Direct foreign investment in Kenya pounds.

**XR** = Exchange rate of Kenya shilling against (SDR).

**INT** = Real interest rate on treasury bills.

**SAPS** = Structural adjustment.

### 3.7 Data type

The study utilized time series data extracted from secondary sources (Appendix v). The model required data on: real GDP growth rate, domestic saving rates, physical capital stock growth rates, values of fiscal deficit, export growth rate, financial development, values of external debt, values of direct foreign investment, exchange rate and interest rate. Refinement was done to data given for fiscal years by converting them to calendar years. This was accomplished by adding data for two consecutive fiscal years and dividing by two. GDP was converted to real terms by deflating it using GDP deflator.

### 3.8 Data sources

The sources of the above data were Statistical Abstracts, Economic Surveys, Central Bank of Kenya's Quarterly Economic Reviews and Annual Reports, African Economic and Financial Data, African Development Indicators and World Tables.
CHAPTER FOUR

4 DATA ANALYSIS, EMPIRICAL RESULTS AND INTERPRETATION

4.1 Data Analysis

In this chapter analysis of data using Augmented Dickey Fuller linear regression model was done. Because of the nature of the data log-linear model could not be estimated. The estimated linear model as presented in (Appendix iii) indicates the existence of multicollinearity. It is also manifested by inconsistency of some parameters. Evidence from the correlation analysis (appendix iv) shows that Structural Adjustment Programmes (SAPs) is highly positively correlated with Financial Development (FD) \( r = 0.753 \), External Debt (EDT) \( r = 0.897 \), and Exchange Rate (XR) \( r = 0.743 \). The strong correlation between SAPs and, FD, EDT, and XR within the model makes it suspect of the cause of multicollinearity problem. When SAPs was removed the results improved as shown in table 4.

4.2 Empirical Results

Table 2: Step-wise Linear regression without SAPS

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>t-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.040</td>
<td>6.250</td>
<td>0.639</td>
</tr>
<tr>
<td>K</td>
<td>-0.353</td>
<td>0.072</td>
<td>-4.917*</td>
</tr>
<tr>
<td>S</td>
<td>-0.125</td>
<td>0.106</td>
<td>-1.181</td>
</tr>
<tr>
<td>FIBAL</td>
<td>-0.118</td>
<td>0.350</td>
<td>3.375*</td>
</tr>
<tr>
<td>X</td>
<td>0.849</td>
<td>0.412</td>
<td>2.059*</td>
</tr>
<tr>
<td>FD</td>
<td>1.388</td>
<td>0.439</td>
<td>3.159*</td>
</tr>
<tr>
<td>EDT</td>
<td>-0.834</td>
<td>0.264</td>
<td>-3.161*</td>
</tr>
<tr>
<td>PFI</td>
<td>0.013</td>
<td>0.027</td>
<td>0.480</td>
</tr>
<tr>
<td>XR</td>
<td>0.961</td>
<td>0.309</td>
<td>3.108*</td>
</tr>
<tr>
<td>INT</td>
<td>-0.095</td>
<td>0.097</td>
<td>-2.987*</td>
</tr>
</tbody>
</table>

R-Squared = 0.734; Adjusted R-Squared = 0.534
Table 2 shows the step-wise regression results of the linear model. The explanatory power of the model improves. The Adjusted R-squared of 53 per cent is fairly impressive implying that most of the variation in GDP growth rate is explained by the estimated model. In all cases except one (K), the signs for the coefficients have correct signs. Except (PFI) and (S), the t-ratio for the coefficients of all other variables are statistically significant at 95 per cent level. The absence of first order auto-correlation is indicated by the value of the Durbin-Watson statistic of (2.160). The F-statistics of 3.673 indicates that all variables in the estimated equation as a group have a non-zero effect on GDP growth rate. Also, growth of the value of exports which was previously insignificant at 95 per cent level is now significant. The overall results appear fairly reasonable and provide a firm basis for interpretation. Furthermore, the model presents results readily in terms of propensities for easy interpretation.

4.2 Interpretation of Results.

Interpretation of results is based on the regression results presented in Table 2 for the linear estimated model. From the results, the growth of capital stock (K) is the most significant variable influencing GDP growth rate as shown by a t-ratio of -4.917. The variable has a negative coefficient suggesting that one unit increase in capital stock yields a 0.353 units decrease in real GDP growth. The sign is inconsistent with the theory. Capital input available in the economy at a certain period influence productive potential. The growth of capital stock through investment increases the nation’s productive capacity leading to a higher economic growth. The inconsistency can be attributed to excess
capacity in the economy. During the 1970s, import-substitution took place behind high protective barriers and government encouraged mainly long-scale investments including its own at a cost to the economy. High protection often leads to over-building of industrial plant and may be responsible for the excess capacity in Kenya manufacturing today. However, capital stock is significant. The significance of capital stock is attribute to possibility of higher capital stock growth rate coexisting with fluctuating GDP growth rate.

The coefficient of the rate of saving (S) for that particular period is negative suggesting that a one unit increase in the rate of saving reduces GDP growth by 0.125 units. This is consistent with economic theory. Savings are withdrawals from the circular flow of income. However, this variable is statistically insignificant with a t-ratio of -1.181. The insignificance can be attributed to the fact that savings in the economy are not ploughed back to the circular flow of the income (output) through investment. Public sector savings arises from budgetary surplus while private savings, on the other hand, arise from either corporate sectors retained earnings or household savings. Also domestic savings level has remained low and is inadequate for meaningful economic growth.

The fiscal balance (FIBAL) yields a negative coefficient suggesting that a one unit increase in fiscal balance will reduce the rate of GDP growth by 0.118 units. The long-run effect of fiscal adjustment on growth depends on two channels: The resource contribution to higher domestic investment and the reduction in financial/monetary market distortions and macroeconomic instability. Reducing public deficits involves a combination of lower public investment and higher public saving. The increased savings should increase investment leading to high growth. The second channel by which fiscal adjustment can contribute to growth stems from the shift in financing and improved fiscal
stability derived from lower public deficit. The need for unconventional, distortional, and unstable forms of taxation—mostly the inflation and financial repression taxes—diminishes when conventional, explicit, and more stable forms of taxation are strengthened and public expenditure is cut. This leads to financial deepening, lower relative price variability and a more stable tax system. The resulting improvement in financial intermediation and macroeconomic stability improve resource allocation, raise the quantity and quality of investment leading to growth.

Fiscal balance is significant determinant of GDP growth. The main effects of government expenditure on growth are: First, too large wage bill of the civil service leading to large recurrent expenditure. Second, insufficient tax revenues due to political reluctance by the authority to collect sufficient tax revenues on a consistent basis. Finally, inadequate control of expenditures. Whereas government recurrent revenue as a proportion of GDP has declined, recurrent expenditure has increased. Large budget deficits has been the result giving rise to increased government borrowing, enlarging money supply, and crowding out of credit to the private sector. Large budget deficit has therefore adversely affected GDP growth through crowding out private investors in the economy.

The growth of export earnings (X) has a positive coefficient suggesting that a one unit increase in the export earnings will increase the rate of GDP growth by 0.849 units. This sign is consistent with growth theory. The theory provides some basis for postulating a growth contribution from exports through positive technological externalities stemming from positive exposure to a large market and greater competition. Export growth is statistically significant with a t-ratio of -2.059. After moving from the fixed exchange rate system in the early seventies, Kenya’s exchange rate remained fairly stable pegged to the
This has strengthened the country's power of export. Exports of manufactured goods has continued to perform well accounting for nearly 32.3 per cent of the volume of exports per year. Also, due to far-reaching trade reforms undertaken by the government during the study period, Kenyan products have become more competitive leading to economic growth.

The financial development (FD) has a positive coefficient which is consistent with the hypothesis in the previous chapter. A one unit increase in demand deposit increases the real GDP growth rate by 1.388 units. Financial Development affect economic growth by raising the saving rate, raising marginal productivity of capital and increasing the proportion of saving allocated to investment. The development of financial markets offers households the possibility of diversifying their portfolios and increasing their borrowing options, thereby affecting the saving rate. Financial development also tends to reduce the overall level, and to modify the structure of interest rates, the latter by reducing the spread between the rate paid by borrowers (typically firms) and that paid to lenders (households). A key function of financial intermediaries is the efficient allocation of resources to investment projects that provide the highest marginal return to capital. In the above framework, financial intermediation increases the average productivity of capital and thus the growth rate in two ways: by collecting, processing, and evaluating the relevant information on an alternative investment project; and by inducing entrepreneurs through their risk-sharing function, to invest in riskier but more productive technologies.

The government implemented financial reforms with a view to enhancing the capacity of the financial system to effectively discharge it's role of mobilizing and allocating savings to the various sectors of the economy. These reforms included the development of market oriented instruments of monetary control, in particular, reserve
money management, and an appropriate regulatory framework for effective depositor and investor protection. Growth of money supply and credit was normalized to bring economic growth without exerting undue pressure on both domestic prices and the balance of payments. As a result financial intermediation has improved. This has helped to raise marginal productivity of capital and the proportion of savings allocated to investments leading to economic growth.

The coefficient of external debt (EDT) is negative suggesting that a one unit increase in external debt reduces GDP growth by 0.834 units. The sign of EDT is consistent with the hypothesis in the previous chapter. During the period of the study the government borrowed heavily to finance a high targeted GDP growth rate. The servicing of high debt has created an unsustainable burden on the budget. Interest payments have reached about 5 per cent of GDP at current market price in 1996. To finance the high interest, government has resulted to increased domestic borrowing. As a result there was crowding out of private investors, increased interest rates and reduced level of public savings. High interest has led to less expansion of essential expenditure by the government leading to slow economic growth.

Foreign private investment (PFI) is positively related to real GDP growth rate. This implies that when foreign private investment is increased by 1 unit the rate of growth increases by 0.013 units. This variable is insignificant. This insignificance may be as a result of high protection accorded to foreign investors by the government. This protection has led to a movement of capital and labour into foreign owned companies. This made local export industries and other import-competing industries to become less profitable. The recent established investment Advisory centre has been an important avenue for promoting private foreign investment by the government, particularly in
partnership with domestic investors. The government intended to limit its participation in commercial ventures and instead to encourage wholly private initiative. The government has played its role by providing appropriate incentives, information on opportunities and suitable regulation to protect foreign investors. This means that although the government has tried to promote private foreign investments they have not contribute significantly to the growth of the economy. This is due to high protection accorded to the foreign investors.

The exchange rate (XR) yields a positive coefficient indicating that a unit increase in the exchange rate will yield a 0.961 units increase in the rate of GDP growth. This is consistent with the economic theory. With a flexible instead of a fixed exchange rate system, fiscal policy is likely to have a more predictable effect on output. Flexible exchange rate results in a stable internal prices leading to increased demand in the economy and increased demand lead to economic growth. In order to achieve the country's competitiveness in external markets and to attract foreign direct investment, the government removed foreign exchange controls and in 1995 repealed the exchange control Act. Currently, the exchange rate of the shillings against external currencies is determined largely by market forces. However, to achieve a stable exchange rate, the central bank of Kenya intervenes through buying and selling in the foreign exchange market. This action serves to minimize undesirable fluctuations of the shilling.

Interest rate (INT) has a negative coefficient which is consistent with theory. A unit increase in interest rate will reduce real GDP growth by 0.095 units. In 1991 the central bank of Kenya deregulated interest rates, allowing them to vary with the demand and supply of loanable funds. Also, the government through International Monetary Fund (IMF) and world bank pressure advocated for high interest rate policies. The high interest
rate has several negative effects on the economic growth. One, they act as a powerful break on economic expansion by discouraging private borrowing for investment. Two, high interest rate fuel inflation by raising the cost of borrowing.

5.2 Conclusions

From the presentation and analysis, it can be deduced that a country's growth

...
CHAPTER FIVE

5 SUMMARY, CONCLUSIONS AND POLICY IMPLICATION

5.1 Summary of Findings

Analysis of the data revealed growth rate of capital stock with a t-ratio of -4.917 as the most significant factor in determining the rate of gross domestic product growth in Kenya. In order of importance, other variables that were significant determinants of gross domestic product growth include: fiscal balance, external debt, financial development, exchange rate (t=3.108), interest rate, and export growth.

The study also showed that, export growth, financial development, and exchange rate have significant positive effect on the rate of growth. However, growth of capital stock, external debt, fiscal balance, and interest rate had a negative effect on growth.

5.2 Conclusions

From the results of data analysis, the main factors affecting gross domestic product growth rates are growth of capital stock, fiscal balance, external debt, financial development, exchange rate, interest rate, and growth of the value of exports in that order of importance.

5.3 Policy Implications

(i) If the country is to achieve sustainable levels of growth, the efficiency in the already existing capital stock should be enhanced. Government parastatals should be overhaul to reduce their inefficiency. For sustainable economic growth government should increase it’s production potential by producing or importing more machines tools and plows, and less households and luxury goods.

(ii) Government should reduce further the budget deficit as a proportion of GDP with an ultimate aim of eliminating it. This is necessary to mitigate the undesirable
effects that higher deficits have on domestic prices, interest rates, balance of payments and the exchange rates. Government should provide adequate funds for the operation and maintenance of existing public investment, and encourage and facilitate private sector participation to economic growth by providing economic infrastructure.

The government also should seek to reallocate public expenditure towards its basic functions of maintaining law and order and administering justice, financing broad-based education and health services, supporting agricultural research and extension, and protecting environment.

(iii) Continued government commitment to structural reforms and sound debt management are essential. The government should pursue rigorously the objective of reducing gradually the level of external debts through net retirement. This will ease the crowding out of credit to the private sector, gradually reducing domestic interest cost to the budget, and increasing the level of savings. This will in turn allow more rapid expansion of essential expenditures that foster economic growth.

(iv) To marshal resources for economic growth financial institutions should be put into place to mobilize, intermediate and maintain the flow and management of the necessary financial resources. Thus the Government should regulate the formation of commercial banks, non-banking financial intermediaries, building societies, insurance companies, re-insurance companies, development financial institutions, investment advisory firms, securities and equities brokerage firms, stock exchange markets, hire-purchase companies, pension funds, foreign exchange bureaus, saving and credit co-operatives societies. The Government should strengthen post
office bank as a saving institution. In many respects the post office network seems most suited as a mobilizer of small savings.

(v) Priority should be given to Rural co-operatives. Rural co-operative provide an excellent instrument for saving mobilization, as well as channeling credits to farms. Commercial banks should be encouraged to lower their minimum deposits requirements. More practical ways than moral suasion should also be found to increase commercial banks lending to small farmers and entrepreneurs.

(vi) Exchange rate should be fully market determined. The central bank should only intervene in the foreign market to limit undesirable fluctuations caused by mismatches between the supply and demand of foreign currencies. This will help to increase the volume of exports. Also, flexible exchange rate will have an expansionary effect by switching demand away from imports and making export industry more competitive. Flexible exchange rate policy will also induce domestic industry to use more local instead of imported input.

(vii) Government should ensure a positive real interest rates. This is to be done by developing and improving secondary markets for government securities; maintaining low inflation; promoting public and private domestic savings; encouraging external borrowing by the private sectors; and introducing the Lamard borrowing facility for commercial banks to reduce volatility in interbank lending rates. Positive interest will increase economic growth through several ways. First, they affect spending and savings depending on their sensitivity to these rate. Second, they affect exchange rate when it is free to move, thereby influencing the competitiveness of the country's products with respect to foreign good and services. Through this channel, they can affect demand for country's s output at
home and abroad. Third, change in interest rate affect the market rate of long-term assets such as stock and bonds.

(viii) The government should adopt an outward-oriented growth strategy. This can be done by taking the following trade policies. First the government should remove all quantitative restrictions on exports. Second, the number of items on the free list should be increased. Finally, export subsidies should be used to offset the bias against exports arising from an increase in the items subject to quotas or an accompanying increase in tariffs. These policies will help to raise the share of manufactured exports in the total value of exports. Increased exports will enable the country to achieve sustainable economic growth.

(ix) To create conditions for rapid and sustainable growth, government should ensure a stable macro-economic environment within which the private sector can operate and flourish. The major objective is to spur economic activity, maintain low inflation, create positive real interest rates and stabilize nominal exchange rate. Prudent management of major macro-economic variables is essential for economic growth in Kenya. This should entail among other things, consistency in maintaining price stability and ensuring an enabling environment for the accumulation and efficient utilization of financial resources. These measures are expected to facilitate efficient private sector operations and increase both the level and efficiency of domestic savings and investment.

5.4 Suggested Areas for Further Research

(i) The role of income distribution, production infrastructure, and political stability are also areas that deserve careful consideration. In developing countries, inadequate infrastructure (in particular electricity, water supply the transport
network and telephone services) is often a critical impediment to growth and may account for a substantial part of the low factor productivity that has often been observed. There exist, therefore, a potential for government action through not only the provision of education but also the provision of infrastructure services.

(ii) Also insecurity, corruption, and economic mismanagement are areas that deserve careful consideration. Developing countries Kenya included are prone to insecurity, corruption and mismanagement of the economy and act as impediment to economic growth. Therefore if a solution is to be found investigation should be done in this area.
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Appendix ii: Unit Roots and Order of Integration

$G \sim (10)$

$K \sim I(2)$

$S \sim I(2)$

$FIBAL \sim I(10)$

$K \sim I(8)$

$FD \sim I(10)$

$EDT \sim I(10)$

$PFI \sim I(10)$

$XR \sim I(10)$

$INT \sim I(2)$
### Appendix iii: Regression results for the linear model.

Dependent variable: G

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<th>Independent variable</th>
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<th>Standard error</th>
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R-Squared = 0.738  
Adjusted R-Squared = 0.500  
F-statistic (zero slopes) = 3.106  
Durbin-Watson statistic = 2.152

---

Notes  
* significant at 95 level  
** significant at 90 level
### Appendix iv. Correlation Matrix

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