ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
FACULTY OF BUSINESS AND ECONOMICS

A CONCEPTUAL AND AN EMPIRICAL STUDY ON THE DETERMINANTS AND THE POSSIBILITY OF SUSTAINED GROWTH IN KENYA

A **THESIS** submitted to the school of graduate studies in partial fulfilment of the requirement for the degree of Master of science in Economics (Economic Policy Analysis)

AMOS KIPRONOH CHEPTOO
JUNE, 1996.

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A Conceptual and an Empirical Study on the Determinants and the Possibility of Sustained Growth in Kenya

By
Amos Kipronoh Cheptoo
Faculty of Business and Economics

Approval by Board of Examiners:

Dr. Wolday Amha Advisor	Signature
Professor L. Mureithi Examiner	Signature
Dr. Assefa Admassie Examiner	Signature

DEDICATION

Devoted to my aunt Tabitha and my brother Daniel for undisclosed grounds.

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I pay much honour to the African Economic Research Consortium (AERC) for covering my learning expenses, without which my post graduate studies could have been infeasible. My heart felt feelings goes to my advisor, Dr. Wolday Ahma for his patience and timely assistance. I cannot disregard initial encouragements and scholarly advice from my instructors viz, Mr. John MacKinnon, Dr. Carolyn Jenkins, Dr. Andre Croppenstedt and Dr. James Warner. My colleagues, Samuel Mulenga, Fatima Ahmed, Alimamy Kamara, Elizabeth Woldemarium and Wisdom Akpalu are acknowledged for being too kind and instrumental in not only organising initial drafts but also in providing some technical support. Lastly, I pay homage to Dr. Edward Sambili for the generous and vital support initially extended to me.

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Abstract

This paper is a general empirical study on the determinants and the possibility of sustained growth for Kenya. Some determinants were regressed on investment, agricultural output, growth in the service sector, net capital inflow, and growth in exports. It concludes that financial deepening, outward orientation, foreign capital inflow, human capital development and service sector growth have a strong positive link to better economic performance. Population size, political disruption and adverse terms of trade are lethal to growth. The paper further reveals the substitution between economic prudence and donor funding, held responsible for current economic achievements. This is attributed to donor conditionality and competitive multi-party politics which forced the government to clean up economic mismanagement and built a reputation. This can only be maintained if policies are incessantly consistent without reversal.

CHAPTER ONE

Introduction.

1.1 The Statement of the Problem.

Despite rapid economic growth in some economies, the desire to attain and sustain high rates of economic growth (per capita or overall growth) has been the centre problem of policy making in virtually every country of the world, whether developing or not. Among developing countries, the craving is unmeasurable, Kenya being one of them. As to what policy variables can be targeted to terminate the unpleasant performance of the economy remains a mystery to be unfolded.

Under the influence of powerful donor agencies and nations, reluctant governments led by weakly committed policy makers, have been dragged into a series of adjustments to remedy the economic malaise.

The prescriptions contained in the adjustment package is characterized by the orthodoxy to mimic what is believed to have led to the take-off of the currently industrialized countries, fabricated by findings of research intended to bolster the culprit responsible for low rates of growth. Unfortunately the recipe of growth has not readily applied to most low income countries. Little efforts have been made to come up with policies necessary to stimulate sustainable rates of growth for individual countries (Helleiner, 1994).

There is need to spell the experience of individual economies, in an effort to come up with an understanding that is relevant and peculiar to the amelioration of growth problems

and subsequent policy prescription for specific countries, rather than taking up wrong models.

During the early years of independence, the Kenyan economy grew at a rate comparable to those of the four Tigers of South East Asia (see Table 1.1).

Table 1.1 Growth in Real GDP for Kenya and some countries (1950-1986).

country	1950-59	1960-69	1970-75	1975-80	1980-86
Taiwan	6.7	7.9	9.5	9.5	5.9
S.Korea	3.3	6.9	9.5	9.5	5.1
Kenya	6.1	5.9	10.0	5.9	3.4
SSA	-	4.9[a]	5.6	3.5	0

Source: Adopted from Mosley, (1992).
a:For 1965-1970 only.

Kenya's political leadership and its development strategy in these early years showed remarkable continuity and Kenya seemed to be graduating rapidly from low-income to middle-income status (Mosley, 1992 and Swamy, 1994). The public service and the overall policy fraternity showed recommendable achievement. The initial growth record and commitment on the part of policy makers did not last smoothly through the second decade of independence.

Apart from the period of the coffee boom, the economy seemed to show a gradual decline in its growth potential throughout the late seventies. By 1980s, progress was only significant in few sectors. The economy's momentum of the first decade of independence slowed down considerably. The performance reached its lowest level in 1992 and 1993

when Kenya registered a growth rate in GDP of 0.4% and 0.2% respectively. These have been the lowest rates recorded since independence (see Table 3.2).

Several reforms have been undertaken by the government and the economy seems to have picked up a recovery trend. This has restored optimism domestically and in the international community. What is not clear is the future of the recovery. It seems uncertain bearing in mind the key factors[1] responsible for the reforms and policy reversals characterizing policy making[2].

Categorically, booms and slumps meets elusive reactions particularly from policy makers and political figures, the latter blaming negative events experienced in the global economy such as the oil crisis. This is particularly held responsible for pushing up the inflation rate, the cost of imported inputs and other raw materials. However, some global economies which suffered similar experiences performed much better (Khan *et al*, 1991 and Pack, 1994). The slowdown has also been attributed to unfavourable weather conditions and insufficient donor funding. To the contrary, good performance is credited to government budgetary discipline and improved management. These exegeses show bias to exogenous factors as opposed to poor and inconsistent policies formulated and implemented by the government. Vandemoortele (1985) documents that between 1973 to 1983, the value of non-oil imports was more than twice the country's total oil import bill. It is therefore myopic to attribute poor performance during the period to negative external shocks, leaving economic mismanagement scot-free.

---

[1]A landslide of reforms were effected due to competitive politics and donor conditionality which nearly dried government coffers.

[2]An example is in the field of monetary policy where a total mess occurs just before elections bringing adjustment to level zero.

On the same note, a growth rate of 5% in GDP for 1995, achieved with a mere paltry donor funding due to suspension of development aid, indicates the weakness of the premise. The truth is subject to empirical investigation.

Given that the economy has performed well in some years, more so, in the midst of little foreign aid, it raises curiosity on the part of researchers and policy makers to investigate whether the Kenyan economy is operating on the right production function. Additionally, the premise that macroeconomic environment has been the cause of the intermittently unpleasant performance remains indisputable and requires a more systematic investigation.

Prior studies in this area mainly focused attention on comparative analysis based on pooled cross-country data. Comparative analysis is likely to overlook interesting issues peculiar to an economy such as this one. This is so in the sense that regression coefficients which provide the basis for analysis, only indicate changes in explanatory variables on growth per capita income for an average country. It cannot be valid unless the country of study closely resembles the same (Romer, 1986, and Levine and Zervos, 1993)[3]. On this regard Kenya could be wrongly graded by a comparative study of the economies of Sub-Saharan Africa based on pooled data such as that of Otani *et al* (1990), and Ghura (1995). This is because among other things, Kenya is relatively more developed than the rest with an annual rate of savings averaging 20% of GDP (relatively high) throughout the decades (see Table 1.2). This is almost twice as high as the Sub-Saharan average of only 5% from 1985 to 1990 (Mwega *et al*, 1993 and Adam *et al*, 1992).

---

[3]Romer explains the difficulty of controlling for political and social variance that significantly influence growth across countries.

Table 1.2 Percentage ratios of investment to GDP of some counties between 1970-1990.

Year	Kenya	Ghana	Sudan	Zambia	Sierra	Ethiop	Zaire	Nigeria
1970	24.4	14.2	13.6	28.2	15.7	11.5	14.9	14.8
1971	23.9	14.1	11.8	37.1	11.8	18.4	18.7	19.5
1972	22.3	7.1	9.2	35.3	11.7	12.7	18.6	21.1
1973	25.8	9.0	11.7	29.2	11.7	11.4	16.7	22.4
1974	18.1	13.0	18.4	36.7	15.8	9.9	17.1	17.0
1975	20.2	12.7	17.5	40.6	15.7	10.5	17.8	25.2
1976	23.7	8.9	23.2	23.7	11.3	9.6	14.5	31.5
1977	29.8	11.1	17.1	24.7	13.1	8.9	21.4	31.0
1978	22.3	5.4	14.4	23.9	11.3	7.5	11.9	28.6
1979	29.2	6.5	13.2	14.1	13.4	8.8	12.7	23.4
1980	27.7	5.6	15.1	23.3	16.2	10.0	10.0	23.9
1981	21.8	4.6	14.3	19.5	19.1	10.6	10.5	24.4
1982	20.8	3.4	22.8	16.8	13.4	12.0	8.3	20.6
1983	20.7	3.7	16.0	13.8	14.3	12.7	9.3	14.8
1984	26.0	6.9	13.8	14.7	12.7	16.0	10.5	9.6
1985	21.8	9.6	4.5	14.9	10.0	15.5	12.5	9.0
1986	24.3	9.4	12.8	23.8	11.2	14.3	13.2	15.1
1987	25.0	10.4	10.3	13.4	10.4	15.6	14.2	13.7
1988	24.6	10.9	10	11.4	7.9	15.8	14.4	13.5
1989	23.7	13.5	9.1	9.9	13.4	13.4	14.5	13.9
1990	23.6	15.1	9.3	14.3	14.0	12.2	11.5	14.6

Source: Adopted from Jayarajah et al (1995).

Similarly, recent developments in time series analysis require the examination of time series data to avoid spurious regressions. This has been overlooked by prior studies. This study takes into consideration this aspect in order to remedy the methodological flaw and ensure the generation of results consistent with least square estimators.

Investigating the determinants of growth without commenting on whether growth can be sustained[4] may limit the conclusion of the study. The study attempts this extension.

[4]This term is used in this context to imply continued and more rapid growth to the long-run.

1.2 Objectives and Significance of the Study.

Following current developments in time series econometrics and the availability of reliable data sets which permits time series analysis, the study attempts to undertake the following objectives;

(a) General objectives:

(i) To conduct an empirical investigation on the determinants of growth for Kenya,

(ii) To inquire on the possibility of sustained growth. This directs reference to the macro-environment throwing light to other pertinent issues which will indicate the likelihood of continued growth.

(b) Specific objectives:

(i) What is the empirical importance of factors politically held responsible for good and unpleasing performance.

(ii) Are the determinants of growth concurring with findings from cross-country studies?

(iii) Are omitted variables in prior studies relevant for Kenya? eg, Net capital inflows and growth in main sectors of the economy.

(iv) Which factors are more important for growth? (i.e between external forces and domestic policies).

(v) How far is the economy from the right production function.

The results of the study will help to propose guidelines in designing appropriate policies and in setting priorities. It will also attempt to suggest areas of further research.

1.3 The Hypothesis.

Economic growth in Kenya is more likely to depend on domestic policies (Fiscal, monetary & trade policies, etc). Correct domestic policy involves transparency, cautious financial policy, manageable inflation and budget deficits, and efficient exchange rates. Within the realm of endogenous factors are (i) the establishment of a democratic and transparent political institution which minimizes political disruptions and corrupt practices, (ii) increased savings, hence investment, (iii) export promotion, (iv) low rates of population growth, (v) financial deepening[5], (vi) stimulation of growth in various sectors particularly the service sector and (vii) improvement of human capital. A favourable weather condition is also desirable.

Successful domestic policies requires supportive exogenous factors. These include (i) favourable growth in terms of trade, (ii) foreign investment, (iii) conducive interest rates in the world market and (iv) growth in OECD Countries. If right policies operate domestically, external factors are likely to be right except those beyond the economy's control, leading to favourable growth rates.

The second hypothesis posits that the growth process is unlikely to be sustained. This idea is based on several issues, the most important of all being weak policy making. The current achievement is attributed to donor conditionality and competitive politics. If policy makers were serious, then reforms and prudence could have been initiated without external sanctions. Such policies may not persist.

[5]This term stands for efficacy in the financial sector.

External shocks that have always weakened the economy's growth momentum, such as drought, need not to be carrying the catastrophe that it does, had food policy been of correct foresight. It almost follows that in the event of drought, the economy falls apart. This is followed by a painful recovery, a thing which need not to occur.

Chronic mismanagement in macro policy particularly at the eve of election campaigns, with consequences of inflation among other problems, which sends the economy on leave is unnecessary. Rampant crimes, particularly robberies affecting economic agents including tourists is uncalled for. Terminating them at least once and for all has long been delayed regardless of its cost. These issues mitigate factors responsible for growth leading to instability in the growth process.

Since tourism contributes significantly to foreign exchange earnings, at the moment ranking ahead of coffee and tea, traditionally placed first and second in foreign exchange earnings, then increasing insecurity may decelerate growth.

Similarly, a decline in foreign capital inflows expected to bridge the savings-investment gap as a result of unfulfilled conditions in political reforms and, or rampant corruption which leads to meagre revenues, amongst other factors unattractive to the donor community is tantamount to unsteady and deceleration of growth. The verity that silly mistakes are repeatedly committed in policy making implies that the economy will continue to be marked by the typical ups and downs.

1.4 The Scope and the Limitations of the Study.

The study will attempt to cover the post independence period using time series data for the period between 1967 to 1993.

With immense literature on economic growth, it is not possible to review each and every event, given the time limit. Moreover, the study looks at the determinants of growth in a general sense. This reduces precision. Nevertheless we are not pessimistic about the findings.

1.5 Organization of the Study.

The rest of the paper is organized as follows. Chapter 2 gives a possible summary of the burgeoning literature on economic growth. Chapter 3 provides a background information on the Kenyan economy during the post independence period. Chapter 4 describes the data, the methodology and specifies the models, explaining the rationale of the variables included. Chapter 5 presents time series characteristics and the analysis of the empirical results. Chapter 6 summarizes and concludes with possible policy recommendations.

CHAPTER TWO

Literature Review.

2.1 Growth Theories.

From time immemorial the objective of economies has been to achieve higher rates of growth. Surprisingly, not all have been successful in attaining this goal. The weak performance of Sub-Saharan Africa has from time to time, rekindled concern as to why they have been stagnating. On the other hand, others have been exhibiting excellent performance for the last four decades. No single specific answer has as precisely as possible offered an explanation.

The dynamics of economic growth was a pertinent question amongst the classical economist[6] which is the classical theory of economic growth (Nicholas, 1991).

Harrod (1939) and Domar (1946) attempted to develop a formal theory of determining economic growth. Their model envisaged that an economy wishing to grow at a particular targeted rate satisfactory to its economic requirements ought to commit certain levels of it's national product to savings. The model proved quit unclear since capital-output ratios are not only difficult to measure, but also bear little relationship to marginal capital-output ratios. When this is coupled with unstable savings, it vindicates the weakness of the early growth model.

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[6]Malthus for example viewed that economic growth is constrained by limited resources such as land and if population was not controlled growth would decline.

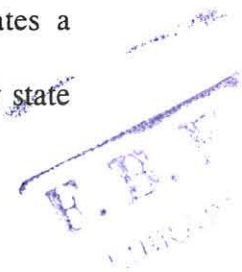
It is however the neo-classical perspective that provides a dominant bench-mark theory exemplified by the Solow-Swan model of 1956. The model focuses on the economy as a whole and predicts an equilibrium steady-state level of per capita income. Technology, rates of savings, population growth and technological progress, are assumed exogenous determinants of the equilibrium steady state of per capita income (Swan, 1956, and Solow, 1956, 1994).

Apart from assuming that similar technological opportunities are available in all economies, attention is focused on capital formation. Aggregate savings are meant to finance additions to the national capital stock. If an economy is characterized by a low capital-output ratio, it's marginal product would be high. Income generated by the new piece of equipment would be saved and gross investment would exceed the amount needed to equip new members of the work force. This implies that as capital per worker rises (assuming constant returns to scale and a fixed technological level), a continuous decline in marginal product of capital results. The decline continues until it eventually becomes only sufficient to replace worn-out machines and equip new members of the work force. At this point the economy enters a steady state with unchanging standards of living and same rate of growth in: output, capital and labour. This is synonymous to the fact that as marginal product of capital approaches zero, falling returns to investment kills the desire to invest over time (Grossman *et al,* 1994).

In the short-run, capital-labour ratios would be changing due to changes in savings. In particular, as technology improves, savings rise too, due to improved returns to investment.

These prescriptions did not pass through quite well due to misgivings of supply-side assumptions, guided by growth in an economy assumed to operate in full capacity. Added to this is the fact that the exogenous growth models failed to explain the endogenous character of the factors of production. Also, policy prescription is difficult. This is because investment is assumed not to affect growth at the equilibrium steady state level of income.

Within the economic growth literature is the convergence controversy[7]. Baumol (1986) used data provided by Maddison (1982) covering the period between 1870 to 1979 for sixteen industrialized nations. He confirmed convergence in labour productivity as given by the negative relationship between initial per capita incomes and growth in real per capita income. The neo-classical notion of a long-run steady state equilibrium level of income among nations tallies with the convergence theory. However, it illustrates a weaker form of convergence in the sense that there is no driving force to the steady state (Barro, 1991).



Akin to the convergence controversy is the diffusion hypothesis proposed and analyzed by; Nelson and Phelps (1966), Nelson and Winter (1974), and Gomulka (1971). To them, growth in technology in any country depended on the technology gap between the specific country and world technological leader. Countries with a very large gap are under the pressure to mimic, but they lack the ability to do so, and hence they have a low technological growth. It is the middle sized gap who have enough pressure to imitate and exploit technology transfer and innovations due to relatively improved infrastructure,

[7]That nations would approach each other in the long-run in their per capita or product per worker due to forces driving the economy to a steady state.

higher levels of education and research capacities. This model suggests a stronger fashion of convergence in the sense that in the long-run countries grow at the same rate as their per capita incomes are tied to that of the world leader. Convergence however, proved quite un-robust based on the biased sample of countries understudied (Delong, 1988) and the fact that countries of the world have not converged to a single rate of growth.

Further evidence of this un-robustness is given by Baumol and Wolff (1988) who used Heston-Summers data to confirm the existence of exclusive convergence clubs, for Less Developed, OECD and Middle Income Countries. This is consistent With Monojit (1993)[8] whose empirical study points the existence of the multiple equilibria. The explanation lies in the fact that countries imitate different models (countries), rather than a single world leader. The study by Ojo *et al* (1995) also confirmed the existence of exclusive convergence clubs after controlling for variations between some African countries. The cross-section study by Barro (1991), however, failed to verify the desired link between per capita income growth rates and initial per capita income.

Several contributions to the sources of growth debate using the sources-of-growth method exist. Elias (1992) outlines that Jan Timbergen examined the national accounts of Germany, United States, France and Great Britain for the period 1870-1914. The analysis focused attention on gross components of labour, and capital inputs. The study equated unexplained growth with the residual between growth in GDP and the weighted average of the rates of growth in gross labour and capital inputs. The same notion is held in the neo-classical growth models.

---

[8] This section benefits a lot from Monojit (1993).

Kaldor (1957), Arrow (1962), Atkinson and Stigltz (1969) postulated the importance of experience as a basis of learning, know referred to as "learning by doing". This became a pivotal aspect of the modern theories of growth. Dennison's contributions of 1962 included elements of input quality and other characteristics of production, advancing the neo-classical work. The characteristics of labour considered included education, age, gender composition, hours of work and unemployment. On the other hand, for capital, changes in stock composition by economic sector, role of foreign trade and increasing returns to scale was taken into account. The extension of his work especially in 1967 and 1985 to include fluctuations in agricultural sector, ecological problems and the role of technological transformation, links his study to what is currently considered as the determinants of GDP growth. Meanwhile, weather-caused fluctuations did not show significance in accounting for the total factor productivity for the United States.

Elias (1992) based his studies on seven Latin American countries using an aggregate economic model to analyze data for the period between 1940 and 1985. His work revealed the importance of the quantity and quality of inputs in the growth process.

The new growth theories introduces a new wave in the theory of economic growth. Its main proponents were Romer (1986) and Lucas (1988). Grossman and Helpman (1991, 1994), Aghion and Howitt (1992), followed among others. Their theses held that economic growth was an endogenous outcome of an economic system or the internal allocation process rather than as a result of forces impinging from outside as held in the neo-classical model.

Profit seeking firms or would-be innovators may invest resources in the hope of discovering something of commercial value (better methods of production or new products). These action becomes an engine of growth particularly in the long-run.

Romer (1990) argued that as a firm makes a breakthrough, it is able to earn monopoly profits. Since there are many firms in any particular industry or economy, the unsuccessful firms do not recant with hands folded on their chests. They do strive by investing in research and development in order to come up with something even better than that of the firms earning profits at the moment. This type of investment is mostly directed towards human capital since it is this form of capital that is assumed to be associated with spill-over effects that increase the level of technology (Romer, 1986 and Lucas, 1988).

The innovator is able to earn rents because of exclusivity of information in the short-run. Given that valuable information is characterized by externalities, discoveries are difficult to patent. Other firms get it from innovators at zero cost because discoveries only account for fixed costs of production.

Aghion and Howitt (1992) showed that each successive innovator begins where its predecessors left as the basis. In this way, the process of economic growth continues as income grows in the long-run due to continuing accumulation of inputs or ideas that have positive externalities. This is evident by the fact that a large proportion of scientific research conducted in OECD is financed by private industries motivated by a desire to earn profits (Pack, 1994).

Domestic investment motivated by research and development is supplemented by international trade. Similarly, savings from patient households and firms augments the imperfect competition and spill-overs in innovations (Grossman *et al*, 1994). Success in research depends on the number of national scientists and other professionals. This is because the character of endogenous human capital accumulation involves the role of teamwork. Skilled manpower is therefore likely to be more productive in developed economies with a large pool of team-mates to consult.

The greatest flaw to the new theory of growth is the absence of empirical confirmation. Empirical work on the theory, paradoxically, focuses on tests of convergence implied by the neo-classical theory rather than efforts to directly test endogenous growth theory itself (Pack, 1994). The theory ignores some factors mitigating growth in developing countries such as the deteriorating terms of trade, debt crisis, misguided exchange rate and weak macroeconomic management. Fischer (1993) demonstrates the significance of macro variables such as inflation and the budget deficit on growth. Even in the newly industrialized countries, externalities arising from designs in domestic machinery do not seem to have been of much significance. This is largely so since a considerable proportion of machinery seems to have been imported during most of the period with little on research and development until in the 1980s (Pack, 1994).

Despite the limitation, the new theory provides crucial insights into the relationship between research and development as well as the aggregate growth theory. The theory also helps to bridge anomalies contained in the neo-classical theory.

2.2 Review of Empirical Analysis.

With an exception of Cross-Country studies, comprehensive empirical work on individual countries has been absent. Wheeler (1984) emphasized the role of external forces in explaining growth in Sub-Saharan African Countries. Kormendi *et al* (1985), confirmed the negative link between growth and inflation. In general their findings attributed weak growth for both developing and developed countries to adverse macroeconomic stability.

Barro (1989) based his study on 98 countries for the period between 1960 to 1985. The cross-sectional study considered the initial per capita GDP level, ratio of government consumption to GDP, measures of political stability and market distortions. Weighted least squares was used to remedy heteroscedasticity with little success. He however concluded that current government expenditure was negatively related to growth. Expenditure on education and infrastructure showed a positive link.

Otani *et al* (1990) endogenised the long-term growth rate of per capita income of 55 developing countries based on the assumption that the rate of labour augmenting technical change depends on human capital. This is consistent with endogenous growth models. Their conclusions identified factors contributing to the growth performance in developing countries. These included domestic saving rate, improvement in human capital and export performance. Other macroeconomic variables such as inflation and imports were excluded. Fosu (1992) also confirmed a strong link between exports, politics and economic growth.

Ojo *et al* (1995) analyzed the determinants of growth in some African countries using panel data between 1970-1991. They deduced that investment, external debt, population

growth, human capital and the macroeconomic environment were main factors influencing long-run growth. The study indicated that initial per capita to GDP, primary and secondary school enrolment ratios, terms of trade, government consumption ratio and political coups were sensitive to estimation techniques. Investment showed more importance in oil exporting countries than in the low and the middle incomed, with an exception of Nigeria and Mauritius. Inflation and external debts, unlike exports and population growth were more important in explaining growth in the low income countries than for the middle and the oil exporting countries. Government consumption ratio was insignificant.

Ghura (1995), using pooled data (time-series and cross-section) for 33 countries in Sub-Saharan Africa for the period between 1970 to 1990, concluded that countries with higher growth rates had higher investment ratios, export volume growth and life expectancy as well as low inflation rates. Countries with more favourable economic growth rates did not necessarily experience better terms of trade or better food production than countries with poor rates of growth. The study excluded the role of imports in growth. Ghura (1995) also tested for convergence and confirmed the negative relationship between initial GDP per capita and growth in real per capita income.

There are some studies done on growth in Kenya although their scope and objectives are slightly different.

Vandemoortele (1985) used a descriptive technique to analyze the causes of economic instability in Kenya for the period between 1964 to 1983. Some of the factors pointed out as influencing economic performance of non-oil producing developing countries included

(i) the deterioration of the international terms of trade, (ii) slowdown of economic growth in the industrial world, (iii) increase in the general level of protection, (iv) changes in the international aid flows (lower levels and harder conditions) and a sharp increase in the real interest rates in the international credit markets, (v) rising budget deficits and (vi) the appreciation of the real effective exchange rate. Vandemoortele concluded that for an open economy like Kenya, the most important factor was the deterioration in the terms of trade and the stagnation in industrial economies which absorbed the lion's share of Kenya's exports. The study did not however rule out the role of endogenous factors particularly in reinforcing exogenous factors.

Mwega *et al* (1994), used a simple analytical framework to investigate the relative importance of saving, fiscal or foreign exchange gap in constraining capacity growth in Kenya. The three-gap framework concluded that foreign exchange is the binding constraint to the growth potential. Their recommendations included the expansion of export promotion, more concessionary capital inflows and the reduction of import compression.

The empirical studies reviewed and those on Kenya provide a good basis for this study. This implies that our study falls under endogenous theory of growth. The study will not test for convergence. This is because convergence controversy has long been resolved. Moreover, the study deals with the determinants of growth in a single economy.

2.3 The No-Growth Debate.

The No-Growth debate maintains that economic growth is not so desirable. This is because most of the problems facing mankind except for poverty are traced to growth.

The most serious being environmental degradation and non-satiated psychic needs. The proponents advocated for anti-natal policies as well as non-production of additional economic goods before assessing their pros and cons (Kennedy, 1984). Critics argue that this is not possible unless population grew at a rate of zero.

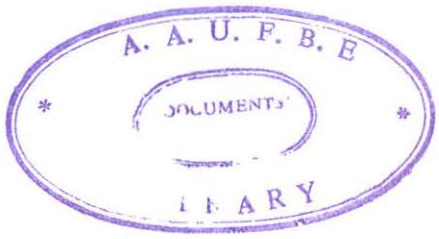
CHAPTER THREE

AN OVERVIEW OF THE KENYAN ECONOMY.

3.1 General Performance.

Kenya is a low income East African open[9] economy heavily dependent on agricultural exports, principally coffee and tea for foreign exchange earnings particularly during its early years of independence. The contribution of agriculture in Gross Domestic Product and foreign exchange earnings has, however, been declining with the emergence of other sectors, notably tourism, which has ranked ahead of coffee and tea in foreign exchange earnings for most years after 1987. Within the agricultural sector, horticulture and ostrich farming is gaining importance.

Table 3.1 gives the percentage share of agriculture (AGRRGDP), manufacturing (MORGDP) and service (SRGDP) sectors to GDP. Generally, the service sector has risen to account for 45% of GDP by 1993. Agriculture has declined in importance contributing 24% of GDP compared to 33% in 1967. The manufacturing sector does not show any significant change.



[9]Mwega *et al* (1994) documents that between 1984-1988 commodity trade ratio, i.e, imports plus exports as a proportion of GDP comprised of 43% from 46.4% between 1964-1968.

Table 3.1 Percentage share of three sectors in GDP for Kenya (1967-1993).

Year	AGRRGDP	MORGDP	SRGDP
1967	33.6364	10.3409	41.1364
1968	31.6443	10.3413	42.2958
1969	30.9021	10.9405	42.5244
1970	30.2183	10.8297	42.4454
1971	28.1890	11.2598	43.3071
1972	32.2259	10.3654	40.6645
1973	31.8725	10.7570	39.3853
1974	31.3060	11.2683	38.8967
1975	30.1713	10.6143	40.2842
1976	33.3333	9.9071	38.2525
1977	37.0261	9.6774	35.3495
1978	32.0566	10.7099	37.3506
1979	30.1931	10.7296	39.7425
1980	27.7871	10.9442	39.6959
1981	27.8781	10.6256	40.5031
1982	28.9433	10.5959	40.5063
1983	29.8393	10.2561	40.4720
1984	29.4342	10.3305	40.9300
1985	28.5161	10.2928	42.4417
1986	28.7709	10.3507	42.1263
1987	27.1708	9.9489	43.0205
1988	26.9727	9.9610	42.3242
1989	26.4759	9.9714	43.3767
1990	24.9719	10.1002	44.3183
1991	23.2994	10.5537	45.7085
1992	23.2336	9.6227	46.4594
1993	24.4918	8.8374	45.3230

Source: Computed from World Tables Data.

The Kenyan economy is marked by distinctive economic episodes since independence. These begins with the first decade (1963-1972), a period of economic excellence characterized by a remarkable degree of growth.

This success was achieved through significant transformation in industry and agriculture. In particular, for agriculture (i) large high potential land was transferred from large to small holder farm-use, (ii) area under cultivation was extended to cover high valued land and (iii) high yielding hybrid seeds were put to use. In industry, growth was attributed to (i) high level of protection, (ii) a liberal attitude towards foreign investment, (iii) an active government role in industrial promotion and investment and (iv) a supportive role from the agricultural sector whose income was rising (Government of Kenya, various issues, World Bank, 1995). These were made possible in an environment with a high degree of political stability and committed public servants.

Gross Domestic Product grew at a rate of 6.5% per annum. Sectorial growth rates indicate that industry grew at 8.2%. The agricultural sector grew by 4.2% in the same period (see Table 3.2).

Table 3.2. Growth rates of real Gross Domestic product in Kenya (1964-1993).

YEAR	AGRICULTURE	MANUFACTURE	TOTAL GDP
1964-71	4.2	8.2	6.5
1972	7.6	7.3	6.8
1973	4.4	14.4	4.1
1974	-0.2	5.9	3.1
1975	4.6	4.0	3.1
1976	3.7	14.0	4.2
1977	9.5	16.0	8.2
1978	8.9	12.5	7.9
1979	-0.3	7.6	5.0
1980	0.9	5.2	3.9
1981	6.1	3.6	6.0
1982	11.2	2.2	4.8
1983	1.6	4.5	2.3
1984	-3.9	4.3	0.8
1985	3.7	4.5	4.8
1986	4.9	5.8	5.5
1987	3.8	5.7	4.9
1988	4.4	6.0	5.1
1989	3.9	5.9	5.0
1990	3.4	5.2	4.3
1991	-1.1	3.8	2.3
1992	-4.2	1.2	0.4
1993			0.2[b]

Source: Development Plan 1994-1996.

b:From Economic Survey, 1995.

It was until the **oil shock of 1973** that a sharp brake was applied to the economy. This led to a fall in growth rates to below 4% per annum. The impact of the shock was felt through an increase in prices of oil which was almost two fold and that of imported raw materials used in agriculture and industry. Agriculture did not do well the following year

because of bad weather. This was aggravated by unsuitable policies in marketing, leading to a further drop in GDP growth and a deterioration in the terms of trade[10].

The disequilibrium was met with programs initiated in 1975 under an International Monetary Fund loan (Mwega *et al*, 1993). These were however abandoned immediately following the unexpected **coffee boom of 1976-7**[11]. Coffee prices rose by 400%. This was amassed by good prices on tea exports. Growth in Gross Domestic Product was pushed up to 8.2%, generating a current account surplus of over 10% of the Gross Domestic Product.

This did not continue throughout the 1970s because of two things. **The collapse of the East African Community** in 1978 heavily undermined the manufacturing sector[12]. **The second oil shock of 1979** (with price of crude oil rising from US $ 13 per barrel in 1978 to US $ 27) adversely affected economic growth. The shocks and the fiscal indiscipline after the boom ushered the economy into the 1980s in a state of disequilibrium, (Mwega *et al*, 1993).

An attempted coup in 1982 which undermined confidence within the business fraternity led to capital flight and depressed investment (see figures 3 and 5). Growth in GDP

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[10]Mwega *et al* (1994) documents a serious decline in terms of trade (TOT), with the TOT index declining from 114 in 1974-78 to 76 in 1989-90.

[11]Following a severe frost in Brazil, a leading world coffee exporter, the prices of coffee rose from Ksh 10.50 in 1975 to Ksh 43.35 per kg in 1977. Similarly, tea prices rose from Ksh 8.75 to Ksh 20.45 in the same period.

[12]The East African Community was formed in 1967. By then, to date, Kenya's economy has been more progressive, compared to that of the other members especially in manufacturing. By 1975 Tanzania accounted for 10 percent of Kenya's exports valued at 20 million Kenyan Pounds. This quickly fell to 1,800 kenyan Pounds in 1978.

decelerated below 5% per annum with a rate less than 1% in 1984 following a serious widespread drought. Agricultural assets and output were severely affected. Food imports were resorted to, which further deteriorated terms of trade.

The economy recovered in 1985 with growth in GDP of 4.8%, and 5.5% the following year. The good performance in 1986 was attributed to the stabilization efforts, good weather and a modest-boom in the coffee sector. Henceforth, growth averaged 5% to 1989.

In the early 1990s things became worse. Rapid decline in major macroeconomic indicators decelerated growth rates to 2.3% in 1991, down to 0.4% in 1992. This was a year of elections with election expenditure in excess of estimates. A growth rate of 0.2% was registered in 1993. The economy was reeling from spiralling inflationary pressures (fuelled by excessive growth in monetary aggregates), half heartedly embraced reforms, external debt servicing, unfavourable weather and ethnic skirmishes. Monetary policy had lost track. Pre-shipment export scheme, overdrafts and rediscounts from the central bank had been abused. This gave birth to the Goldenberg scandal. It is for these imprudence that donors suspended development aid flows.

The election results indicated that the government with their sole candidate benefitted from a divided opposition. A new minister of finance was appointed with the mandate to clean up the system and instil financial discipline. Serious reforms were instituted and growth recovered to 3% and 5% in 1994 and 1995 respectively. This was achieved despite the limited inflow of donor funds. Other outstanding economic accomplishments recorded are impressive. Inflation has been brought to a single digit, money supply has been

successfully curtailed, foreign exchange reserves have almost doubled, the agricultural and the industrial sectors are on the upswing, and the turbulent foreign exchange markets have stabilized. The collapse of the parallel market for currency indicates financial deepening. Liberalization has also been fairly adopted and implemented.

The revival of the East African Community (EAC) is opted to improve trade in the region, where Kenya can increasingly divert its trading attention to, due to unfavourable terms of trade within the European Economic Community.

3.2 Some Socio-Economic Indicators.

The debt situation remained modest during the first post independence decade, however, following negative shocks, major debt indicators have worsened. In 1993 for instance, debt servicing had backslided (see figure 4). This exerted sizable pressure on the pace of growth and it is not clear whether debt will be manageable in future if negative shocks continue to recur without significant transformation within the economy. At the moment, accumulated external debt arrears as of the end of 1993 have been rescheduled over the period 1995-2001.

Basic infrastructure, has changed since independence. Road networks have fairly been linked to major parts of the country. Kenya is also well connected to members of the EAC by road, rail and water. Weakness is however notable in maintenance of the existing structures and connection of others. This is particularly for those of economic potential. Added to these, despite kenyan goods get into horn of Africa (Ethiopia, Eritrea, Djibouti and the Sudan), railway line is absent, while road networks are not efficient.

At the time of independence, government policy was directed to fight disease, poverty, and illiteracy, which were then the key enemies of mankind. By late 1970s and early 1980s, health had improved and mortality rates had reduced. Many children could live beyond infancy. This in turn led to high rates of population growth. This averaged 3.6% per annum by 1984. This rate gradually declined to 3% in 1993 (see figure 2). The current size of over 26 million is likely to hit the 50 million in the next 15 years (Development Plan, 1994-1996). Even though trends in fertility rates indicate a decline from 7.7 in 1984 to 6.7 in 1989, and 5.4 in 1992, the structure which indicates that over 50% are below 19 and that large numbers of women are entering the child bearing years are matters to worry about. This increasingly strains the available resources (World Bank, 1995).

A major social problem is now unemployment which by no means is linked with the upsurge in criminal activities. This problem has been exacerbated by liberalization which has led to the closure of some industries. The textiles and the shoe industry are the worst hit.

The large population also exerts pressure on government ability to provide social services. In education for instance a completely free system is a thing of the past. The cost-sharing program introduced in late 1980s requires Kenyans to pay part of the cost of most public goods[13].

[13]Structural adjustments in general are characterized by the weak social dimension.

The system of education produces school leavers and university graduates most of which are biased towards white-collar jobs. This aggravates the unemployment problems already in place. The impact of the new system of education whose graduates are now at the market is too early to assess.

Agriculture, as indicated earlier, remains the bed-lock of the economy. It contributes 24% of GDP, 60% of export earnings and absorbs about 70% of the country's labour force. Also due to the fact that 70% of industrial establishments are agro-based, supplies of raw materials from the sector is vital. This sector portrays a diversified outlook in terms of food crops and cash crops which has successfully bolstered the economy against fluctuations in world prices. Main problems affecting the sector include, (i) the limited size of arable land, (ii) unexpected weather, (iii) land degradation and (iv) unequal holdings, just to name a few.

The industrial sector has performed fairly well. It's manufactures are supported by domestic demand and markets in the neighbouring countries. The informal industrial sector ("Jua-kali" industries) has experienced the largest growth. It's labour force is estimated to approximately 5% of the population (Economic Survey, 1995). The future contribution of the industry to the economy cannot be ignored.

Kenya's financial sector has fairly developed relative to that of its neighbours. Foreign exchange regulations is an issue of the first. As of December 1995, 40 foreign exchange bureaus had been licensed although only 22 were operational. The parallel market for currency is no longer operational. Interest rates have been set free from repression. Despite the establishment of the Capital Markets Authority in 1990 (CMA) to speed up

financial developments, the financial market is still thin even though the money market is developed. Current efforts of the ministry of finance and the central bank indicates a positive move in financial management which has spurred economic growth. This ensures that institutional insolvency does not recur. At the moment Post Bank Credit Ltd., Trade Bank Ltd. and Exchange bank Ltd. falls under the statutory management of the Deposit Protection Fund[14]. Pan African Bank Ltd. and other non-Bank financial institutions were placed under the statutory management of the Central Bank.

The political trend since the transition to multi-party politics, may be said to be that of great uncertainty. This is marked by the collapse of the peace talks between the clashing groups[15] and the general ethnic inclinations. This feature which characterizes the society is lethal to growth. The possibility of new clashes cannot be ruled out, more so, that the brainchild-culprit was not brought to book. Given that the ruling party benefitted from a divided opposition, it will be difficult to predict the outcome of the next general elections. This will be expected to determine the direction of reforms and the overall performance of the economy.

The rampant corruption characterizing agents in the economy has increased rent seeking activities lowering government revenues. There is no evidence as to whether government officials can be exonerated from the vice. The Kenya Revenue Authority which became operational from July 1995 is expected to improve administration and collection of income tax, VAT, customs and exercise duties. Reduction of corruption also depends on cooperation between the government and the public accounts committee.

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14 This body was established to protect depositors from insolvency.

15 The land clashes of 1991/92 were concentrated in the Rift Valley an area of great agricultural potential.

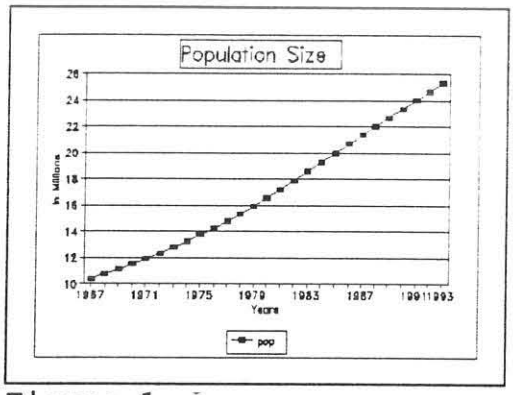

Figure 1

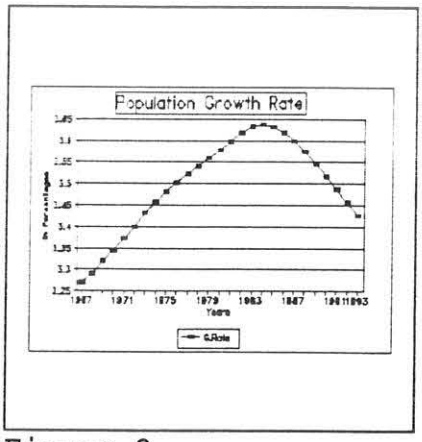

Figure 2

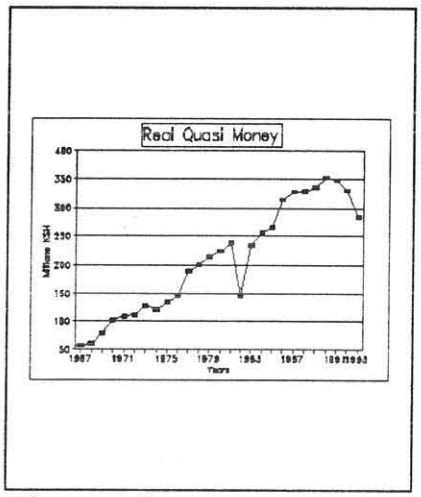

Figure 3

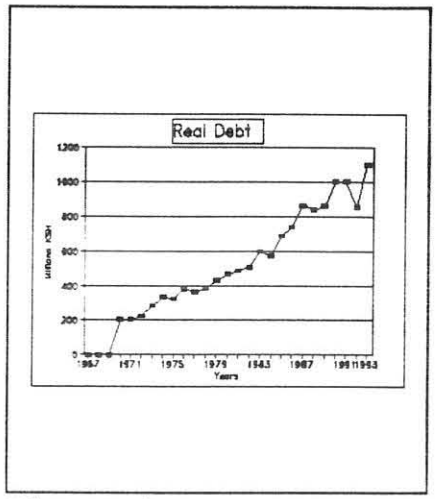

Figure 4

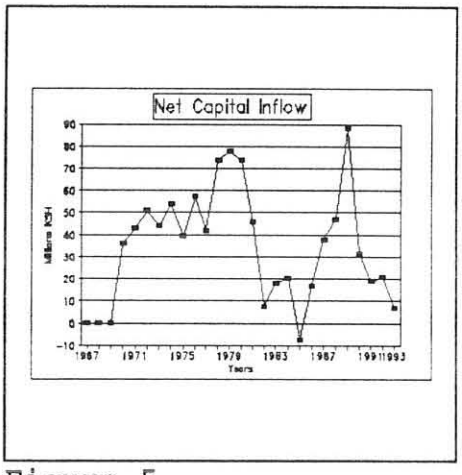

Figure 5

CHAPTER FOUR

Data and Methodology.

4.1 Sources and Nature of Data.

The study mainly utilizes secondary data. The variables required for estimations are specified section 4.3. With an exception of RER from Juyarajah *et al* (1995) and GOECD from *OECD Economic Outlook* (1993), the rest of the data was drawn from the *World Tables*. This is because it availed continuous series of annual data which enabled time series examinations to be undertaken.

Variables whose growth rates were used required computations based on growth formulas, while those involving ratios are generated accordingly and converted into percentages. Data on Total External Debts and Net Long-term Capital inflow is given in US dollars. The nominal exchange rate is used to convert them to local currency because the other variables are given in Kenya shillings. We have also ensured that all values are stated in millions of Kenya shillings to achieve uniformity in the data-set.

The consumer price index (CPI) used to generate real values is also used in the computation of the inflation variable. The GDP-deflator which excludes exports renders it an unsuitable deflator for an open economy like Kenya.

Some variables lack published data. This problem is solved by generating dummies to capture the desired relationship. Periods of favourable weather conditions, political and civil stability were represented by zero. The opposite is represented by the digit one.

4.2 Method of Analysis.

4.2.1 Conceptual Theory.

From the 1980s onwards, econometricians focused their attention and energies to testing for unit roots in modelling time series data (Madalla, 1992). Newbold, Engle, and Granger, among others contributed the development of these method. This very wave of treating time series is, however, not devoid of weaknesses[16], yet it has become mostly inevitable, if not a sheer madness to dodge the development. The hankering premises, lies on the oddball of time series, the most crucial of all being the unguaranteed stationarity (Granger and Newbold, 1977). Added to this, is the fact that these developments, not only allows for short-run forecasts. It also made possible the use of (only) previous values of the series, together with current and previous values of the stochastic term to make inference. This offers the possibility of making accurate forecasts, even when the underlying structural model is unknown. This is because it reduces the structural restrictions needed for sampling, improving forecasts and restrictions determined by data (Griffiths *et al*, 1993).

[16]Time series analysis is accused for too much testing and little estimation. Also cointegration depends on the variables introduced in the model.

An error correction model is estimated using first differences for any model, depending on whether the variables are cointegrated[17], based on stationarity tests[18]. The error correction model gives the short-run relationships in the model.

For nonstationary series, the means are time-dependent, while the variances and the covariances are interminably changing asymptotically. This is because their autocorrelation functions do not drop to zero quickly, making innovations not to vanish (Granger and Newbold, 1977).

Consequent upon these are spurious regressions emerging from regressions involving one trended and other nonstationary series. These reject the null hypothesis of no relationship much too frequently, while accepting significant relationships that are spurious far too often. This is because the standard t-test in the regressions are no longer as the student's t, and therefore incompatible to least square estimators.

The solution given to this problem, suggested by Newbold prescribed estimating relationships in differences, such that,

$$\Delta y_t = \beta_1 + \beta_2 \Delta x_t + v_t \ldots (i)$$

---

17 If y_t and x_t are cointegrated, e_t is I(0) so that their trends cancel out when the residuals are being formed, i.e, in the equation $e_t = y_t - a - bx_t$. b is the cointegrating parameter.

18 A series is said to be stationary, or I(0) if, (i)it has a constant mean, (ii) and variance, which allows it to revert quickly to the mean in the even of innovations.This is referred to as a short memory series.

This does not insinuate that all series become stationary after differencing once. This is because some are integrated of a higher order[19]. Granger *et al* (1977), Granger (1981), and Engle *et al* (1987), identified a circumstance where variables are I(1), but not spurious. This was when variables were cointegrated.

4.2.2 Unit Root Tests.

Following the conceptual understanding outlined above, it becomes imperative and adequate to test the order of integration in our series. To perform this, we will utilize the *Dickey-Fuller*, (DF) and the *augmented Dickey-Fuller*, (ADF) tests (Dickey *et al*, 1979, 1981). The *Dickey-Fuller* examination is based on the regression:

$$\Delta x_t = \beta x_{t-1} + e_t \ldots (ii)$$

The null premise to be examined, posits that x_t is not I(0), vis a vis the alternative that x_t is I(0). It is therefore a simple test for the presence of unit root against a stationary alternative based on one-tailed t-ratio of H0: B = 0 against H1: B < 0. The null is rejected if the computed t-statistic is above the critical.

Inauspiciously, the DF-test presumes white noise, which is not always the case. If it is not, then the autocorrelation in the stochastic term biases the test (Adam, 1993). To overcome this, the *augmented Dickey-Fuller* test is utilized. This is based on the following equation.

[19]A series is said to be integrated of order d if it becomes stationary after differencing d times but not d-1 times. I(1) series are non-stationary except when there is cointegration. Cointegration allow long-run information to be combined with short-run information on their dynamic behaviour within a stationary error correction framework.

$$\Delta X_t = \beta x_{t-1} + \sum_{i=1}^{T} \Delta x_{t-i} + e_t \ldots (iii),$$

where, T is selected so that e_t is white noise. The t-ratio for beta is the ADF statistic, and H0 is rejected if beta is significantly different from zero.

4.2.3 Test for Cointegration.

After confirming nonstationarity of the dependent and the exogenous variables, the estimated residuals are then subjected to unit root tests (DF and ADF) to test for stationarity. If $e_t = y_t - a - b_1x_t \ldots b_2x_n$, is I(0), then y_t and x_is are cointegrated, i.e, for H0: e_t has a unit root, vis a vis H1: for cointegration.

The cumulative sums of recursive residuals (CUSUM) and cumulative sums of recursive residuals squared (CUSUM SQ) tests are used to test for structural breaks. CUSUM and CUSUM SQ measures systematic and certain changes in variables respectively. This will enable us to determine the consistency of estimations. The two tests employs a graphic technique with straight lines assuming a 5% level of significance. Any deviation outside the critical bound indicates structural breaks. The software Microfit 286 (version 3) provide these tests. Elsewhere the OLS results are the key tools of analysis with the guide of theory.

Standardized coefficients are used to evaluate the relative importance of the variables in the basic model. This method is desirable because it adjusts the estimated slope parameters

by the ratio of the deviation of the explanatory variables to the standard deviation of per capita growth.

4.3 Model Specification.

Many variables are taken into consideration and modelling employs the general-to-specific approach. This will avoid omission of important variables. To this effect many estimation results are reported.

As indicated earlier, we adopt models used by Khan *et al* (1992), Ojo *et al* (1995) and Gurushi (1995) with our own modifications. The main model to be estimated is given as follows;

$$RPG=f(GR1, EQRGDP, INF1, TOT, INVRGDP, GRIV, GOVRGDP, PCI, GOECD,$$

$$DEBRGDP, GRSS, RLTI, QMRGDP, LEX, EXR) \ldots (iv)$$

Where, **RPG** = a measure of economic growth proxied by real growth in per capita income.

GR1 = rate of population growth. Population size (**POP**) will be tested in the place of GR1.

EQRGDP = ratio of export value to real gross Domestic product (RGDP) meant to capture outward oriented trade policies.

INF1 = inflation, a proxy for macro economic instability.

TOT = growth in terms of trade to capture the developments of the external sector.

INVRGDP = ratio of Gross Domestic Investment to GDP. We also add the ratio of agricultural output to GDP, **AGRRGDP**, to our model to determine the relationships.

LEX = a measure of the quality of manpower represented by life expectancy.

GOVRGDP = ratio of government consumption to GDP.

PCI = a dummy variable meant to capture political and a civil instability.

GOECD = growth of per capita income in OECD countries.

DEBRGDP = the ratio of external debts to GDP.

RLTI = net long-term capital inflow.

QMRGDP = ratio of quasi-money to real GDP, proxing financial deepening.

GRSS = growth in real service sector output.

RER = real exchange rate.

Epsilon represents the white noise term here and elsewhere below.

4.3.1 The Rationale

A high ratio of investment to GDP is essential for growth. This was evidenced during the first decade of independence when the economy registered a ratio of approximately 20 percent to GDP. Similarly, growth in export items and volumes is expected to show a positive link with economic growth[20]. The collapse of the East African Economic Community in 1977, adversely affected Kenyan manufacturing sector leading to a decline

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[20] The fastest growing economies currently in the world pursued outward oriented policies as exemplified by the South East Asian Countries.A closer example for Kenya is the Mauritius.

of manufactures from 29 percent between 1969-1973 to 10.6 percent between 1979-1983. This also give a good indication (Mwega *et al*, 1993).

The widening savings and investment gap, for example, from about 3.2 percent of GDP between 1965-69 to 6 percent in the 1980s implies an important role played by long-term foreign capital inflow in domestic capital formation (Mwega *et al*, 1994).

Conducive interest rates in the World Market ensures that serious debt problems will not be incurred in financing the development process from foreign loans[21]. Given that a larger proportion of external debt to GDP mitigates the growth process, excessive borrowing especially on non-concessional terms is expected to be negatively related to growth.

The establishment of democratic institutions which minimizes political and civil unrest, bringing credibility to the government, is an engine in the growth process (Perotti *et al*, 1994). Kenya therefore needs a sound and stable political climate to encourage growth through; increased foreign capital inflow, improved tourist influx and the ending of sanctions often tied to political reform as a pre-requisite for Official Development Aid.

The recession which hit global economy in the eighties affected Sub-Saharan African countries more than the low income Asian economics which were characterized by low population growth. Kenya therefore currently needs an extremely low population growth as it fights it out with the needs of the already born, particularly the poor (Khan *et al*, 1992).

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[21] Ibid.

The improvement of human capital through provision of elementary schooling, health facilities and necessary vocational training is also of considerable importance in the growth process. The provision of this requirement should, however, be directed to the needs of the economy. The involvement of the government in the economy in providing valuable public goods such as education, health, infrastructure and property rights is beneficial to overall investment.

Apart from being an origin of tourists, the OECD countries provide the main market for Kenyan exports. Growth in per capita income in these countries could therefore be linked to economic growth in Kenya.

The financial sector is the nerve centre of any market economy. This is because it perfects financial intermediation. It also provides the ground for pricing and trading risks. The ability to put the sector into sound footing is obviously going to spur growth.

Lastly, macroeconomic stability (low inflation and efficient exchange rates) improves the external account and improves financial confidence in the general business community by sending signals to the private sector on government commitment to stabilize the economy.

The following models concerns key sectors of the economy that are sensitive to the overall growth. We estimate these relationships in order to monitor the impact of some variables on their performance in a case to case basis in order to closely monitor some determinants of growth. These strengthens the results obtained in the model above.

The first estimation attempts to seek the relationships between growth in export values (**GREQ**) and some variables as given below.

$$GREQ=\beta_0+\beta_1 PCI+\beta_2 GAGRI+\beta_3 GOECD+\beta_4 GGINV+$$

$$\beta_5 EXR+\beta_6 INF1+\epsilon \ldots (v) .$$

Growth in real agricultural output (**GAGRI**), GOECD, growth in real investment (**GGINV**) and exchange rate are expected to be positively related to GREQ. The rest of the variables in the model are expected to assume a negative sign.

The importance of investment in any economy is unquestionable. To this effect we estimate the following model.

$$RGINV=\beta_0+\beta_1 LEX+\beta_2 RLTI+\beta_3 INF1+\beta_4 POP+$$

$$\beta_5 PCI+\beta_6 RQM+\beta 7\, RDEB+\epsilon \ldots (vi)$$

LEX, RLTI, real quasi-money (RQM) are expected to assume a positive sign. The rest of the variables are posited to assume a negative relationship. The dependent variable RGINV denotes the value of real gross investment.

Similarly given persistent savings-investment gap, the importance of foreign capital inflow is acknowledged. The next model investigates relationships between Net Long-Term

capital inflow (**RLTI**), as the dependent variable on a measure of political instability (**PCI**), real debts (**RDEB**) and a proxy for domestic economic empowerment (**RGDP**).

$$RLTI=\beta_0+\beta_1 PCI+\beta_2 RDEB+\beta_3 RGDP+\epsilon \ldots (vii)$$

PCI measures the impacts of political and civil instability on foreign capital inflow. If periods of riots, land clashes and the attempted coup show negative relationship with foreign capital inflow, then we could conclude that sustained growth will depend on the political atmosphere. If politics are uncertain, then the persistency of growth is uncertain. Real GDP represents the size of the domestic market and is expected to assume a positive sign given that Kenya provides favourable domestic market for foreign investment. Lastly, real debts is expected to be negatively related to RLTI.

The next estimation concerns the service sector output which has been an important source of foreign exchange and a contributor of overall growth. This variable is an important source of growth particularly in foreign exchange earnings and overall GDP. The model is given as follows,

$$GRSS=\alpha_0+\alpha_1 PCI+\alpha_2 GOECD+\alpha_3 RER+\epsilon \ldots (viii)$$

GRSS is the real growth in the service sector output. A measure of civil and political instability (**PCI**) is expected to have a negative coefficient. Real exchange rate (**RER**) is expected to verify whether currency depreciation has made the country a cheap tourist

destination. Favourable growth in per capita of OECD countries implies more tourists coming into the country.

A model to test the relationship between the value of agricultural output (**RAGRIC**), and some variables relevant to our findings is given below. The rationale for this estimation lies in the fact that the sector is a large employer as well as a major foreign exchange earner.

The model is given as follows,

$$RAGRIC=\alpha_0+\alpha_1 PCI+\alpha_2 RER+\alpha_3 REQ+\epsilon \ldots (ix).$$

Real exchange rate is expected to be negatively related to agricultural output. This is because it taxes agriculture through high cost of imported fertilizer. Currency depreciation and shortage of foreign exchange leads to limited application of the crucial input which negatively affects output. Similarly land clashes affected areas of agricultural potential. This should be reflected by a negative coefficient on PCI. Other variables in the model include a proxy for periods of drought (**PEDR**) and the real export value (**REQ**). Favourable weather conditions which is related to exports of agricultural products and the decline in food imports improves the balance of payments providing an impetus to growth.

CHAPTER FIVE

Time Series Examinations, Results and Analysis.

The models and the methods of estimation have been outlined in chapter four. This chapter presents and discusses the results.

5.1 Test for Stationarity.

Table 5.1 gives the Unit Root Tests for the variables in the long-run models. The results reveal that LEX, QMRGDP, EQRGDP, GR1, INVRGDP, GOECD, EXR and RDEB indicate ambiguous results. GRIV, GAGRI and GGINV confirm for stationarity. The rest of the variables unambiguously confirm for unit roots.

Table 5.1 Result from Stationarity Tests.

variable	DF-TEST		ADF-TEST	
	WITHOUT TREND	WITH TREND	WITHOUT TREND	WITH TREND
GRSS	-1.8573 (-2.985)	-2.5441 (-3.6027)	-0.525 (-2.9907)	-1.1343 (-3.6119)
TOT	-0.12439 (-2.9798)	0.44417 (-3.5943)	-0.27078 (-2.985)	0.31294 (-3.6029)
RLTI	-2.493 (-2.9798)	-2.4065 (-3.5943)	-2.5189 (2.985)	-2.4687 (-3.6027)
POP	8.5367 (-2.9798)	-6.3396 (3.5943)	-2.7901 (-2.985)	-4.4042 (-3.6027)
LEX	-4.053 (2.9798)	-4.9755 (-3.5943)	-0.63249 (-2.985)	-4.08907 (-3.6027)
AGRIRGDP	-1.5094 (-2.9798)	-2.5010 (-3.5943)	-1.3657 (2.9850)	2.8172 (-3.6027)
QMRGDP	-0.8425 (-2.9798)	-4.3476 (-3.5943)	-0.6283 (-2.985)	-3.5584 (-3.6027)
EQRGDP	-2.6782 (-2.9798)	-2.6401 (-3.5943)	-3.3968 (-2.985)	-3.2419 (-3.6027)
GR1	-2.6689 (-2.9798)	4.1447 -3.5943	3.84772 (-2.9850)	-1.8461 (-3.60267)
GRIV	-5.6940 (-2.985)	-5.9316 (-3.6027)	-5.0041 (-2.9907)	-5.9596 (-3.6119)
INVRGDP	-3.1581 (-2.9798)	-2.666 (-2.985)	-3.0671 (-3.5943)	-2.4781 (-3.6027)
GOECD	-3.1159 -2.9798	-2.9201 (-3.5943)	-3.8686 (-2.985)	-3.6185 (3.6027)
INF1	-0.26674 (-2.983)	-1.0273 (-3.6027)	-0.091174 (-2.9907)	-0.73554 (-3.6119)
GOVRGDP	-2.3546 (-2.9798)	-1.6653 (-3.5943)	-1.8086 (-2.985)	-0.89242 (-3.6027)
EXR	5.3029 (-2.9798)	4.361 (-3.5943)	1.9247 (-2.985)	2.6813 (-3.60267)
GAGRI	-4.3212 (2.985)	-5.2418 (-3.6027)	-3.1604 (-2.9407)	-4.5977 (-3.6119)
RDEB	-0.2751 (-2.9798)	-3.9595 (-3.5943)	-0.4739 (-2.985)	-2.6842 (-3.6027)
RER	-2.0274 (-2.9798)	-2.3133 (-3.5943)	-1.9214 (-2.985)	2.4788 (-3.6027)
GGINV	-5.8438 (-2.985)	-5.9852 (-3.6027)	-4.8223 (-2.9907)	-5.3424 (-3.6119)
RQM	-1.4162 (-2.9798)	-2.5421 (-3.5943)	-1.4099 (-2.985)	-1.9831 (-3.6027)

Notes: Critical values are given in the parentheses. The rest of the statistics are computed values.

5.2 Test for Structural Break.

The **CUSUMS** and **CUSUM SQ** tests described in chapter four indicated that there was no structural breaks in our estimations. This abated the need of introducing slope dummies.

5.3 Regression Results and Analysis.

Table 5.2 presents the results from the long-run cointegration models where growth in real per capita income (RPG) is regressed on variables, including those capturing the influence of the external sector on growth. The estimations aims at generating an appropriate model with relevant variables to explain growth for Kenya.

The first equation indicates that growth in real service sector output (GRSS), life expectancy (LEX), and net real long-term capital inflow (RLTI) are positive and significantly[22] linked to growth at 1%, 5% and 10% levels of significance. Growth in terms of trade (TOT) and population size (POP) indicate negative relationship and significance at 1% and 5% levels. The ratio of debts to real GDP (DEBRGDP) assumed an unexpected sign and insignificance. The test statistics indicate that 70% of the variations are explained. Even though the DW-statistic is indecisive, the diagnostics do not reveal any major diagnostic problem[23]. The validity of the overall regression is also confirmed by the F-statistic.

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22 As a rule of thumb, a F-statistic of 5 and above is significant at 5% level. All the estimations are done using Microfit 286 (version 3) which gives the critical points upon which our analysis are based.

23 The diagnostic results for this equation and the rest are given in the appendix.

In the place of DEBRGDP, we introduce the ratios of real Quasi-Money to real GDP (QMRGDP), real agricultural output to real GDP (AGRRGDP) and real export values to real GDP (EQRGDP), in the next three regressions interchangeably. The results indicate that the initial variables in the regression maintained their expected signs and significance at 1% and 5%. RLTI is weakly significant at 10%. The additions, despite insignificant, assumed expected signs. The regressions are significant in the sense of the F-statistic, and over 60% of variations are explained. No serious diagnostic problem is notable.

Two changes have been effected in equation (5). Firstly, the EQRGDP has been lagged by one period, and second, POP has been replaced by rate of growth in population (GR1). The results show that EQRGDP(-1) assumes a positive relationship with RPG and significance at 5% level. GR1 is also significant at 5% but with a positive sign which was not expected. This was so elsewhere, unreported. Other changes unbinding as before is change in the sign relating LEX. In particular it assumes a negative sign, inconsistent to our expectation. The DW-statistic indicates the absence of serial correlation.

In equation (6), among the changes made is the re-introduction of POP in place of GR1 and the omission of RLTI. EQRGDI(-1), LEX, POP, GRSS and TOT, are significant at; 1% and 10% levels. The sign relating LEX and RPG has been correctly restored, and as before the estimation is significant with no profound diagnostic problem. The fit explains 71% of the total variations.

Growth in real import values (GRIV) and growth rate in per capita income for OECD Countries (GOECD) are introduced in equation (7) to investigate their relationships with

the growth proxy. GRIV assumes significance at 5% to our expectation. A possible explanation stems from the fact that important items (capital, fuel, intermediate goods) are constituted in the import bill which have positive income effects domestically (see Ndulu, 1994). The third lag of GOECD shows positive relationship with RPG and significance at 10% level. With an exception of RLTI which is insignificant, the rest of the variables are at least significant at 5% with expected signs. The regression is significant with a good fit and specification.

In equation (8) GOECD and GRIV have been omitted while the lagged value of QMRGDP is introduced. This variable assumes a positive sign and significance at 11% level. In the next equation, the ratio of investment to real GDP is introduced (INVRGDP). The result indicate that it assumes a positive sign and insignificance. The significance of LEX and QMRGDP(-1) has been weakened.

By and large, the results reported in the above estimations plus others not reported herein, indicate that POP and TOT are unambiguously significant and negatively influence RPG. On the other hand, GRSS constantly showed a significant positive link with RPG. The rest of the variables depicted ambiguous results. The reasons lie on the fact that possibly, the single equation estimation technique led to collinearity among some of the variables. This seems to influence the signs and significance levels of the collinear variables. Nevertheless, apart from GRSS; QMRGDP(-1), EQRGDP(-1), LEX, RLTI and GOECD are held significant and positively linked to growth in Kenya in the long-run. This model is given in Equation (10). The residuals from this equation were saved as **E23**. Test for cointegration based on DF and ADF tests indicate that the residuals are stationary (see

appendix 2). This confirms for cointegration. We therefore proceed to estimate an error correction model to determine their short-run influence on growth.

The results from the dynamic model in Equation 11 indicate the existence of serial correlation. The Cochrane Orcutt technique was successfully used to eliminate it as given in Equation 12. The results reveal that DQMRGDP(-1), DRLTI, DEGRGDP(-1) and DGRSS strongly influence growth in the short-run at 1% and 5% levels. DRLTI is valid at 11%. Additionally, DTOT2 negatively influence growth with significance at 0% level. GOECD(-3), DLEX and DPOP1 have assumed wrong signs. It therefore follows that investment in human capital, change in population size and growth in OECD Countries do not confirm a short-run link with growth for Kenya. The coefficient of the stochastic term depicts that all innovations are corrected within a given year.

Table 5.2 Dependent Variable: Growth in Real Per Capita Income (RPG).

Long-Run Models						
variable	EQ1[24]	EQ2	EQ3	EQ4	EQ5	EQ6
CON	-302.5294 (-1.8619)	-343.6769 (2.3162)	-352.1655 (-2.2474)	-322.799 (-2.0781)	-88.7209 (-1.6442)	-241.5961 (-1.6545)
DEBRGDP	0.077381 (0.5368)					
GRSS	0.83366 (3.477)*	0.7093 (3.4194)*	0.7683 (3.8504)*	0.80884 (3.459)*	0.97425 (4.8552)*	1.0128 (4.9365)*
TOT	-0.25743 (-3.013)*	-2.2806 (-3.7154)*	-0.2898 (-3.511)	-0.27313 (-3.5109)*	-0.24513 (4.6735)*	-0.2087 (-3.8799)*
RLTI	0.0736 (1.69)***	0.0690 (1.57)***	0.07745 (1.787)***	0.070883 (1.5172)	0.064888 (1.558)	
POP	-5.8515 (-2.20)**	-6.8223 (-2.428)**	-6.0762 (-2.258)**	-5.7795 (-2.0955)**		-4.486 (-1.7514)***
LEX	7.694 (1.931)**	8.7147 (2.3729)**	8.6947 (2.3186)**	8.1211 (2.1024)**	-1.1003 (-1.8234)***	6.1284 (1.6959)***
AGRIRGDP			0.21123 (0.34879)			
QMRGDP		0.4172 (0.74815)				
EQRGDP				0.055805 (0.34879)		
GR1					46.0044 (1.9585)**	
R^2	0.67675	0.68124	0.6737	0.67393	0.74303	0.71397
Adj. R^2	0.57467	0.58057	0.57066	0.57096	0.66188	0.64247
F-STAT	6.6296	6.7675	6.5481	6.545	9.1564	9.9847
DW-STAT	2.4843	2.4486	2.4261	2.4421	2.2291	1.934

Notes.

-The t-ratios are given in brackets. The rest of the values are coefficients. EQ denotes equation. The same format applies elsewhere.

For the cases above and elsewhere in the paper, *, ** and *** denote significance at least at 1%, 5% and 10% respectively. More accurate interpretations are availed in the text.

-The long-run models are the same, except that the general-to-specific approach used enabled insignificant variables to be eliminated which prompted the researcher to report several estimations. This case applies elsewhere.

-Variables in the long-run model are in levels while those in the short-run are in differences.

-Equation 12 is similar to Equation 11. The only difference is that autocorrelation in Equation 11 was eliminated using the Cochrane Orcutt Method and reported in Equation 12.

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24 Equations 1 to 16 are estimations derived from model (iv) in chapter four.

Table 5.2 (continuation).

	Long-Run Models				Short-Run Models	
variable	EQ7	EQ8	EQ9	EQ10	EQ11	EQ12
CON	-347.3928 (-2.5901)	-218.2933 (-1.5518)	-199.2566 (-1.3791)	-264.3838 (-1.8528)	2.8479 (1.2196)	2.7445 (1.5849)
GRSS	1.0105 (5.8246)*	0.94114 (4.6743)*	0.93145 (4.565)*	(0.93482) (4.9008)*	1.119 (6.4055)*	1.2381 (14.54)*
TOT	-0.30662 (-5.1146)*	-0.24862 (-3.643)*	-0.25053 (-3.643)*	-0.27106 (-4.132)*	-0.12702 (-2.404)**	-0.16626 (-6.829)*
RLTI	0.022813 (0.5867)			0.048631 (1.2246)	0.07515 (1.619)***	0.035701 (1.70)***
LEX	8.4623 (2.5892)**	5.6241 (1.617)***	5.0305 (1.396)	6.5752 (1.889)***	-11.6213 (-1.85)***	-11.2717 (-2.646)*
POP	-5.9652 (2.6146)**	-5.2321 (-2.096)**	-4.6485 (1.76)***	-5.7399 (-2.33)***	73.6933 (1.0098)	77.3009 (0.99555)
QMRGDP(-1)		0.80082 (1.663)***	0.68269 (1.3347)	0.7675 (1.772)***	0.84195 (2.440)**	1.0659 (5.214)*
GRIV	0.12715 (2.4798)**					
EQRGDP(-1)	0.47937 (3.6279)*	0.29623 (2.1663)**	0.30543 (2.1999)**	0.38729 (2.7097)**	0.48145 (3.452)*	0.3393 (2.303)**
INVRGDP			0.25223 (0.75742)			
GOECD(-3)	0.85285 (1.821)***			0.44367 (0.90614)	-0.35478 (-0.692)	-0.22581 (-0.6746)
E23(-1)					-1.2224 (-3.7749)*	-1.5738 (-9.305)*
R^2	0.86063	0.75031	0.75802	0.8375	0.89559	0.94388
ADJ.R^2	0.78231	0.67146	0.66269	0.75084	0.82331	0.87529
F	11.5788	9.5155	8.0551	9.6636	12.3903	13.7614
DW	2.1855	2.3882	2.3624	2.5223	1.2743	2.0225

Table 5.3 presents results of relationships between per capita income and the macroeconomic environment proxied by periods of political and civil disruption (PCI), Inflation (INF1), Exchange rate (EXR), and the ratio of government consumption to real GDP (GOVRGDP).

The results in equation (13) indicate that PCI and INF1 are negative and significantly related to economic growth at 5% levels. EXR and GOVRGDP are both insignificant

albeit, respective positive and negative relationship to growth. The goodness of fit explains only 40% of the variations, however, overall significance is infirm.

Equation (14) maintains the two variables that showed significance in equation (13) and the results are valid at 5% and 10% levels. The signs are as expected a priori. The F-statistic reveals the potency of the overall regression, however the fit explains only 30% of the variations.

Equation (15) is estimated without a constant term using the variables in equation (13). INF1 and PCI are significant at 5% with correct signs. GOVRGDP is positively related to growth and significant at 10% level. EXR though weakly insignificant, is positively related to growth. The overall regression is not only significant, but without serious diagnostic problems. The researcher chooses this equation as the long-run model. The residuals saved as **E30**. Test for cointegration based on DF and ADF tests indicate that with an exception of ADF with trend, the residuals are stationary (see Appendix 2). We accept for cointegration. This necessitates the estimation of a dynamic model.

The results from the dynamic model in equation (16), expose that INF1 and PCI are negatively related to growth and significant at least at 5% level. EXR is positively related to growth and significant at 5%. GOVRGDP is insignificant though it assumes a positive sign.

The results in these estimations are very informative and valid. PCI negatively influences growth both in the long-run and the short-run because it does not allow income generating activities to prosper. In fact during civil disruption, there is a loss in both human and

physical capital. INF1 on the other hand also decelerates growth because it leads to lower capital formation and favours current consumption. EXR is positively related to growth in the sense that depreciation represents a real devaluation which encourages income earnings from abroad through exports and tourism amongst other factors. GOVRGDP is only positively related to growth in the long-run as given in equation (15) and not in the short-run. This is because government expenditure is mostly directed to factors with long-term impact on the economy, such as education which consumes about 40% of the annual budget in Kenya.

The negative coefficient of the Stochastic term and its significance not only confirms for cointegration which renders the long-run model non-spurious. It also implies a speed of adjustment of 80%. This means that growth is not totally restored to the right path in case of shocks from changes in the macroeconomic environment.

Table 5.3 Dependent Variable. RPG.

Long-Run Models				Short-Run Model
Variable	EQ(13)	EQ(14)	EQ(15)	EQ(16)
CON	9.5552 (0.55045)	4.4278 (1.95841)		
PCI	-9.7638 (-2.27)**	-9.8392 (-2.31)**	-9.7904 (-2.315)**	-9.149 (-2.485)**
INF1	-51.4691 (2.00)**	-31.0051 (-1.81)***	-53.1403 (-2.11)**	-45.862 (-2.479)**
GOVRGDP	-0.29685 (-0.318)		0.22689 (1.7401)***	0.24786 (0.24796)
EXR	0.17716 (0.91656)		0.22689 (1.3494)	0.61313 (2.40)**
E30(-1)				-0.92238 (-4.203)*
R^2	0.42775	0.38618	0.4195	0.69507
Adj. R^2	0.31875	0.3328	0.34034	0.63088
F	3.924	7.2351	5.2993	10.8276
DW	1.8998	1.9145	1.8706	1.8275

Table 5.4 presents regression results where growth in exports (GREQ) is the dependent variable, vis a vis a proxy for political and civil disruption (PCI), growth in investment (GGINV), growth in agricultural output (GAGRI), Exchange rate (EXR) and inflation (INF1)

In equation (17) EXR and GAGRI are not only positively related to export growth but significant at 5% and 1% levels. PCI is negatively related to growth and significant at 10%. INF1 and GOECD assumes a positive and a negative sign respectively but insignificant. The fit accounts for 60% of the total variations, however the F-statistic for overall significance is less binding.

In equation (18) INF1 is dropped. The result is not quite different from that in the previous equation, even though the overall significance of the estimation holds, with an improvement in the adjusted R^2. Given that GOECD assumes an unexpected sign, we have dropped it in equation (19) and the results obtained are as before except that PCI is weakly significant. This is set aside in equation (20).

The positive relationship between growth in agriculture and exports implies that a negative shock in the sector is likely to decelerate export growth. Similarly, a real depreciation of the nominal exchange rate stimulate exports because it gives more dividends to farmers in terms of local currency. This follows from the fact that major export crops are paid in foreign currency. Finally periods of political disruption is associated with a fall in exports. It therefore ensues that for exports to fully take off, there should be a transformation in the agricultural sector as well as a supportive macroeconomic environment.

The need to estimate a dynamic model for this sector is not deemed necessary because the dependent variable and some regressors are I(0) series making the results by no means consistent to least square estimators.

Table 5.4 Dependent variable: Growth in Exports Values (GREQ).

Long-Run Models				
Variable	EQ17[25]	EQ18	EQ19	EQ20
CON	-4.0689 (-0.4729)	-1.628 (-0.2969)	-8.3812 (-2.098)	-6.1999 (1.7949)
PCI	-11.7717 (-1.73)***	-11.0092 (-1.74)***	-9.6479 (-1.4611)	-12.2473 (-1.985)**
GAGRI	0.72941 (3.594)*	0.77122 (3.668)*	0.5962 (3.106)*	0.61063 (3.177)*
GOECD	-1.8877 (-1.0805)	-2.2906 (1.7068)***		
GGINV	0.14584 (1.1818)	0.16626 (1.5409)	0.11766 (1.0749)	
EXR	0.5225 (2.034)**	0.64003 (3.595)*	0.69325 (3.760)*	0.68872 (3.722)*
INF1	21.57831 (0.3486)			
R^2	0.6387	0.63553	0.5962	0.54567
Adj. R^2	0.50322	0.52834	0.4782	0.47394
F	4.714	5.9287	6.0405	7.606
DW	2.4827	2.4066	2.2738	2.35

Among the variables regressed on real investment (RGINV), in equation (21), life expectancy (LEX) and real net long-term capital inflow (RLTI) assumed positive relationship and strong significance at 1% levels. Inflation (INF1) and population size (POP) showed negative relationships and significance at 10% and 5% levels respectively. The fit explains 75% of the total variations with a significant F-statistic for overall significance. There is absence of profound diagnostic problem.

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25 Equations 17 to 20 correspond to model (v) stated in chapter four.

In equation (22) we introduce a proxy for political and civil stability (PCI) to the variables in equation (21). The results of the initial Variables are as they were in equation (21), except that the new variable, assumes an unexpected sign and insignificant.

PCI is then dropped and the real quasi-money (RQM), proxing financial deepening, is introduced in equation (23). The results still indicates expected signs for life expectancy and real net long-term capital inflow, at 1% and 12% respectively. Inflation has however become insignificant. The fit and overall significance are good in the sense of R^2 and F-statistic.

In place of inflation in equation (24), we introduced real value of total debts as a regressor. This assumes an unexpected sign and insignificance. It is dropped in equation (25) whose estimated residuals are saved as **E9** and tested for cointegration. The results in Appendix 2 indicate that the DF and the ADF tests accept the alternative hypothesis for the stationarity of the residuals. This necessitates the estimation of an error correction model.

Equation (26) is the error correction model. All the explanatory variables are in differences. The lagged value of the saved residuals is included as a variable, consistent with short-run models. With the exception of the real quasi-money which is significant at 5%, the other variables are relatively insignificant. This implies that financial deepening, proxied by the real quasi-money explains investment in the short-run. The magnitude of the coefficient of the stochastic term indicates that innovations are corrected within a year.

In summary, the estimations tells us that for Kenya, population growth is negatively related to investment. This is due to the fact that a larger percentage of resources get devoted to consumption and other services required by people rather than savings. Capital inflows are positively related to investment because they bridge the savings-investment gap. The quality of human capital as proxied by life expectancy, is positively related to investment only in the long-run. This is because the benefits of investing in human capital is only realized in the long-run. Financial deepening not only influences investment in the long-run but also in the short-run. This is because it's role in financial intermediation provides correct prices and trading in risks, as well as the expectations about the future of the economy. Investment decisions are not easily reversible. Kenya has comparatively experienced less serious political problems. The variable does not influence investment to a large extent. A rational investor will however see the value of waiting until uncertainty is resolved. This is so especially during elections when investment pause is common. In case of disturbances, economic agents are known to withdraw money from the banking system as was the case in 1982 (see figure 3).

Table 5.5. Dependent Variable: Real Investment (RGINV).

	Long-Run Models					Short-Run Model
Variable	EQ21[26]	EQ22	EQ23	EQ24	EQ25	EQ26
CON	-1525 (-3.63)	-1541 (-3.619)	-1151.3 (2.571)	-1054.4 (-2.658)	-1103.5 (-2.81)	-7.7144 (-0.174)
LEX	36.97 (3.73)*	37.31 (3.71)*	30.8 (3.08)*	30.113 (3.399)*	29.87 (3.32)*	42.002 (1.01)
RLTI	0.866 (3.263)*	0.814 (2.91)*	0.5092 (1.594)	0.3971 (1.458)	0.4802 (1.87)***	0.2791 (1.07)
INFI	-198.3 (-1.99)**	-180.04 (-1.72)***	-12.25 (-0.0911)			
POP	-16.9 (-2.28)**	-16.67 (-2.26)**	-27.25 (-3.007)*		-27.48 (-4.25)*	-6.2356 (-0.345)
PCI		-14.88 (-.663)				
RQM			0.654 (1.82)***	0.68051 (2.933)*	0.6868 (2.968)*	0.4438 (2.274)**
RDEB				0.0919 (0.949)		
E9(-1)						-1.03 (-4.7)*
R^2	0.759	0.765	0.794	0.828	0.820	0.624
Adj. R^2	0.714	0.706	0.742	0.786	0.787	0.559
F-Stat.	16.589	13.006	15.39	28.122	25.08	7.34
DW	2.236	2.155	2.098	1.932	2.066	1.974

Results for variables regressed on Net Long-Term Capital Inflows are reported in 5.6. Equation (27) reveals that the three variables not only have expected signs but are significant at 1% and 5% levels. The proxy for political and civil disruption is negatively related to capital inflows. This is because private foreign investment and development aid collapses during political crisis. The lagged value of real gross domestic product is positively related to net capital inflow. It implies that foreign capital is attracted by an expanding domestic market. Debts are negatively related to capital inflow because its accumulation brings uncertainty on its sustainability and the appropriateness of measures taken to solve crisis. The fit accounts for 40% of the variations. F-statistic confirms overall significance of the regression, although the DW-statistic reveals autocorrelation.

[26]Equations 20 to 26 correspond to model (vi) specified in chapter four.

In equation (28), the Cochrane Orcutt method has been used successfully to minimize the problem of autocorrelation. The variables maintains their signs as before. The proxy for domestic market RGDP(-1) and PCI assumes significance at 10% levels while RDEB is valid at 1%.

In equation (29), the inclusion of the lagged value of the dependent variable which is significant at 5%, has strengthened the test statistics. This implies that the problem of autocorrelation encountered earlier was a case of omitted variables. The partial adjustment framework reveals that initial capital inflow positively influences current and future inflows. The rest of the variables are significant at 10% levels. The researcher chooses this equation as the long-run model. The residuals are saved as **E13**. The Unit Root tests given in Appendix 2 reveal that with an exception of ADF-test with trend cointegration is validated. We accept cointegration and proceed to estimate an error correction model.

Equation (30) is an error correction model with values in their differences as well as the lagged value of the residuals saved from the preceding equation. The F-statistic for overall significance is inadequate. This weakens the dynamic model. Going by the sign and significance of the lagged residuals, cointegration is ultimately confirmed. Long-run regression results are therefore non-spurious. This justifies our earlier assumption on cointegration. Approximately 70% of the errors seems to be corrected in a given year. This is because it needs more than a year for confidence to be restored before foreign capital flows regularly.

Table 5.6. Dependent Variable: Net Capital Inflows (RLTI).

Long-Run Models				Short-Run Model
Variable	EQ27[27]	EQ28	EQ29	EQ30
CON	-7.2794 (-2.179)**	-16.5892 (-0.3402)	-37.4804 (-1.1108)	3.4923 (0.57478)
PCI	-31.0699 (-2.2776)**	-26.5954 (-1.8885)***	-25.0324 (-1.9267)**	-24.2384 (-1.118)
RDEB	-0.095464 (-3.0315)*	-0.07855 (1.8291)***	-0.058603 (-1.9267)**	-0.20055 (0.45547)
RGDP(-1)	0.17164 (3.4745)*	0.11476 (1.8291)***	0.099707 (-1.746)***	0.031924 (0.35729)
RLTI(-1)			0.39805 (2.117)**	0.10459 (0.26242)
E13(-1)				-0.69157 (-1.6)***
R^2	0.4112	0.49957	0.51476	0.29806
Adj. R^2	0.33091	0.36057	0.42233	0.11334
F	5.1214	3.5939	5.5694	1.6136
DW	1.2014	1.7425	1.9854	1.975

Notes: The problem of autocorrelation in Equation 27 was corrected using the Cochrane Orcutt Method and results were reported in Equation 28.

Table 5.7 reveals the relationships between growth in service sector output (GRSS) and variables expected to influence it. The first equation indicate that the lagged dependent variable {GRSS(-1)} positively influences it's growth at 1% level of significance. GOECD variable has a positive relationship but insignificant. The coefficient of PCI is negative as expected, but insignificant. RER is also insignificant even though it assumes a positive sign. RER is dropped in the next equation where GOECD, PCI and the lagged dependent variable assumed significance and expected signs at 10%, 5% and 1% levels respectively.

[27]Equations 27 to 30 correspond to model (vii) specified in chapter four.

The residuals from Equation 32 were saved as **E24** and tested for Unit Root. The results in Appendix 2 indicate that the existence of a Unit Root is rejected except for ADF-Test with trend.

The error correction model estimated in equation (33) indicates that the influence of PCI and GOECD are negative and positive respectively. GOECD is significant at 5% while PCI is weakly significant. The robustness of the error correction framework is given by it's negative coefficient which is significant at 1% level. This result confirms the efficiency of the long-run model. The rest of the statistics present the validity of the regressions and the absence of profound diagnostic weaknesses.

Table 5.7 Dependent Variable: Growth in the Service Sector (GRSS).

Long-Run Models			Short-Run Model
Variable	EQ31[28]	EQ32	EQ33
CON	-3.6869 (-1.414)	-1.6677 (-0.83168)	0.14376 (0.14406)
PCI	-4.7422 (-1.5155)	-5.9044 (-1.9649)**	-4.3106 (-1.5414)
GOECD	0.8774 (1.5603)***	1.0291 (1.8598)***	1.051 (2.02258)**
GRSS(-1)	0.4814 (2.673)**	0.50768 (2.8114)**	0.20271 (0.70506)
RER	0.03159 (1.1945)		
E24(-1)			-1.0438 (-2.5588)*
R^2	0.55118	0.51916	0.55118
ADJ. R^2	0.46142	0.45047	0.46142
F-STAT	6.1404	7.558	6.1404
DW	2.4802	2.2834	2.4802

28 Equations 31 to 33 correspond to model (viii). The rest of the Equations correspond to model (ix) specified in chapter four.

Equation (34) reveals the relationship between real agricultural output (RAGRIC) as the dependent variable and PCI, the lagged term of real export values {REQ(-1)}, periods of drought (PEDR) and GR1. The result depicts a positive relationship between the lagged values of exports and population growth with agricultural output. This implies that agricultural output is motivated by these factors. RER and PCI assumed their respective signs but were insignificant. The fit explains over 70% of the variations and the overall regression is significant. The results in long-run models show inadequacy in functional forms. This could be attributed to possible problems in data.

The results from equation (35) does not show much deviation from those in the preceding equation despite the omission of one regressor. Albeit, PCI has assumed significance at 12%. When PEDR is dropped from in equation (36) the results are still as before except that PCI has assumed significance at 10% level. The residuals from this equation was saved as **E25**, and having satisfied for cointegration, except for ADF-Test with trend (see Appendix 2), an error correction model was estimated.

The results from the dynamic model indicate weak significance in t-ratios. The coefficient of the stochastic term and it's significance, however, rules out a case of spurious results.

Table 5.8 Agricultural Output and some Macroeconomic factors.

Long-Run Models				Short-Run Model
Variable	EQ34	EQ35	EQ36	EQ37
CON	-7771.6196 (2.8479)	-791.76 (-3.063)	-731.5578 (-2.8907)	
RER	0.056185 (0.33387)			
PCI	-25.4067 (-1.2701)	-28.3784 (1.6187)	-31.0143 (-1.7811)***	-26.2064 (-1.8446)***
REG(-1)	0.14719 (1.676)	0.149 (1.737)	0.15715 (1.8333)***	0.99407 (0.9723)
GR1	288.8688 (3.5187)*	295.6643 (3.76412)*	277.2055 (3.6412)*	-70.7042 (-0.06581)
PEDR	-16.5857 (-1.0971)	-14.9624 (-1.0681)		
E25(-1)				-0.6626 (-3.0426)*
R^2	0.72864	0.72713	0.71231	0.4286
ADJ. R^2	0.6608	0.67307	0.67307	0.3429
F	10.7407	13.9899	10.1567	5.000
DW	1.5611	1.5518	1.4926	1.8634

5.4 Comparative Discussion and further Interpretation of Results.

The Cross-Country findings by Otani *et al* (1990), Ojo *et al* (1995) and Ghura (1995) established a negative and significant relationship between population growth rate and economic growth. The results of this study indicates a positive and significant relationship. This could be due to the fact that population growth rate in Kenya fell from 3.6% in 1984 to 3% in 1993 (see figure 2). Fertility also declined from 7.7 in 1984 to 6.7 in 1988 and 5.4 in 1994 as mentioned earlier. When GR1 is replaced by population size (POP), the coefficient of POP is negative and significant. These implies that the current population problem for Kenya is not that of fertility which is already declining. Rather, it revolves around the size.

A large population biased towards young people with many women entering child bearing age, like in Kenya exerts considerable pressure on resources. Further evidence indicates a negative relationship between POP and investment (see Table 5.6).

Growth in terms of trade has been declining since the 1970s for most low income countries. This has a negative effect on growth as revealed in this study. We mentioned earlier that Mwega *et al* (1994) documented a serious decline in terms of trade index from 114 in 1974-78 to 76 in 1989-90. Ojo *et al* (1995) established a negative coefficient between growth and changes in terms of trade, however, the result was insignificant. The study by Wheeler (1984), also argued that external factors were crucial in explaining economic stagnation among Sub-Saharan Countries. Moreover the strong correlation between terms of trade and economic instability documented by Vandemoortele (1995) is confirmed.

Growth in the service sector output (GRSS), a variable unique to this study is highly significant and positively linked to growth. This is because of the importance of the sector in the Kenya's economy and particularly in tourism. Apart from foreign exchange earnings, tourists purchase works of art and improves income in the hotel and transport industries. Evidence from the study indicate that the sector's output is positively influenced by growth in OECD countries, both in the short-run and in the long-run. A certain jump in the per capita income in OECD Countries improves earnings in the sector especially through tourist influx. Political disruptions depicted a long-run negative impact to the sector. This is because the economy relies much on the service sector (ie, tourism as mentioned earlier), particularly

in foreign exchange earnings and as Kenya prepares to receive over a million visitors annually, a peaceful environment is of suitable importance.

The proxy for outward oriented policies {represented by the ratio of exports to real GDP, EQRGDP(-1)}, shows a strong positive influence to growth. Given that agriculture employs 70% of Kenya's labour force and at the same time contributing 60% of exports, the relationship is not surprising. This supports findings by Fosu (1992), Ojo *et al* (1995), and Ghura (1995). Growth in Kenyan exports (GREQ) is influenced by performance in the agricultural sector and the nominal exchange rate. This is because exports are dominated by tea, coffee and horticultural products originating from the agricultural sector. Similarly payments of proceeds of major export crops in foreign currency motivates farmers. Political disruption showed a negative impact on exports in the short-run and in the long-run.

Financial deepening, proxied by the ratio of Quasi-Money to real GDP, indicates a positive and significant link to growth. Additionally, real Quasi-Money (RQM) revealed a strong positive link with investment both in the short-run and in the long-run. This is because it improves the allocation of resources, accelerating growth. Financial deepening is therefore important for growth in Kenya. This is consistent with Berthelemy *et al* (1995).

The quality of human capital, proxied by LEX indicated significance and positive relationship to growth. Basic education is responsible for reduced fertility, increased child bearing age and adoption of better agricultural techniques. It also improves peoples propensity to undertake meaningful economic activities in a more efficient way. These improves income earnings

across the board. This confirmed Cross-Country studies by Barro (1989), Otani *et al* (1990) and Ghura (1995). Renelt (1991) and Ojo *et al* (1995), however failed to establish this fact. This could be due to the variance in the proxies used in different studies. Elsewhere, this study further established a strong positive connection between LEX and investment. Human capital in Kenya seems to be somewhere around the right place. This is due to the fact that basic education was emphasized since independence and government expenditure on education has been large. Also the presents of a small and a powerful Asian community with business acumen and skills in other areas has an impact that cannot be ignored on the Kenyan economy.

Long-term capital inflow captured by RLTI has a significant link with growth both in the short-run and in the long-run. It augments domestic savings, thus helping in bridging the savings-investment gap. 80% of net capital inflow is official development aid (ODA) for Sub-Saharan Africa. Flows of foreign direct investment (FDI) has been minuscule (Ndulu, 1994). The World Bank documents that flows of FDI to SSA averaged 1% in 1980s, down from 2.3% during 1970-75. That is why a slight knowledge of a possible failure in the disbursement of development funds is quickly translated to an instability in the foreign exchange market. This is because economic agents, with foresight, are careful in avoiding rationed foreign exchange by the government. This variable is therefore an important source of external resources. This variable is positively related to the economic empowerment of the people which is proxied by real GDP. PCI is inversely relates to it. The disbursement of donor funds and other foreign investment ventures are closely tied to political and economic reforms. The variable is however omitted in the literature reviewed.

GOECD assumed a positive sign and significance in equation (8). Elsewhere it was less robust except in equations (31) (32) and (33). This is an important determinant of growth for Kenya because Kenyan (major) exports are destined to these countries while at the same it is the main source of Kenya's tourists. The results by Ghura (1995) did reveal the importance of this variable.

The ratio of investment to real GDP did indicate a positive sign with growth though it was insignificant. There is a possible inefficiency in investment. Barro suggests that the relationship rather runs from growth to investment and not vice versa. This does not concur with Ojo *et al* (1995) and Ghura (1995). There is need to use disaggregated values of investment according to portfolios. This is expected to indicate the investment venture that is more worthy undertaking. Results from Table 5.6 depicts that there is a strong positive link between RLTI, LEX, RQM and investment.

Other results did not confirm prior studies. These includes the failure to establish a negative relationship between ratios of debts and government expenditure to real GDP. These contradicts with the study by Barro (1989), Ojo *et al* (1995) and Ghura (1995). This could be because Kenya fairly has had a good record in debt servicing except at the height of the daunting socio-economic predicaments of 1992/93 when debt servicing backslided (see figure 4). Additionally debt problems in Kenya is not of the magnitude in Latin American economies.

The negative link between inflation and growth confirmed in this study was established in Kormendi *et al* (1985), Ojo *et al* (1995) and Ghura (1995). Inflation has actually been a problem in Kenya especially in election periods.

The positive and significant link between growth and imports is not a surprise for Kenya. Ndulu (1994) points out a strong relationship between incomes and imports, with elasticities well in excess of one for SSA. This is because 75% of imports were related to production (i.e. capital, fuel and intermediates). This is exacerbated by the legacy of import substitution.

5.5 Standardized Coefficients.

Standardized coefficients were computed for Equation 10 and Equation 15. These equations are chosen because they form the main model in the study. The results indicate that Unit changes in inflation, terms of trade and population size strongly decelerate growth as indicated by the size of the coefficients.

Table 5.9 Results from standardized coefficients.

Equation 10		Equation 15	
TOT	-4.18	INF1	-5.848
POP	-3.503	GOVRGDP	0.50
LEX	2.716	PCI	-0.436
GRSS	0.76		
QMRGDP	0.33		
RLTI	0.158		

CHAPTER SIX

Conclusions and Policy Recommendations.

We have used the above regressions to establish the importance of several factors for the entire growth performance of the economy, proxied by growth in real per capita income. Attempts have also been made to estimate the relationships between some macroeconomic variables and specific factors. The outcome indicates that financial deepening, export growth, capital inflows, human capital and an upswing in the service sector are portentous determinants of growth for Kenya. This does not mean that the service sector should be preferred to others. These factors are highly influenced by the policy environment. Population size, deterioration in terms of trade, political disruption and inflationary pressures are lethal to growth. Net Long-Term capital inflow and growth in the service sector omitted in Cross-Country studies assumed their importance. Imports are positively linked to growth due to what it constitutes. This confirms the potency of individual country studies.

The standardized coefficients indicate their order of importance. Test for unit roots assured that results are non-spurious. Further investigation needs to be directed to individual factors in relation to growth to be more comprehensive. Similarly, disaggregated values of investment and government consumption could yield more precision.

The drought proxy (PEDR) did not strongly influence agricultural output. This does not rule out a possible weakness of the proxy. Nevertheless, it weakens factors that politicians attribute poor economic performance. Similarly, excellent performance in the period of

limited donor funding indicates the superiority of economic prudence over donor funding. This further weakens political exegeses.

A proxy for political and civil stability indicated a negative and significant relationship with growth despite the fact that Kenya has had comparatively stable politics compared to some neighbouring countries. These implies that in the event of negative political developments, the economy is likely to be considerably devastated. It is therefore worth noting that a correct macroeconomic environment ranging from political and civil stability to stable prices is of crucial importance.

Generally speaking policies in Kenya ought to be kept right in all sectors of the economy. These includes instituting proper parastatal reform measures. Policies affecting farmers (such as marketing of their produce and liberalization of goods related to their output) needs to be treated carefully. Strict measures on corruption, criminal activities and an overhaul of management in relevant sectors of the economy are pressing problems. These needs to be addressed in order to improve government revenue, capital inflow and tourism influx.

Flows of official development aid has been fairly smooth for Kenya for many years. The utilization was however questionable. This alienated major donors and aid was suspended in the early 1990s. The government was forced to sort out the economic mismanagement, corruption and political repression. Positive effects were realized. This indicates the capability of the Kenyan economy. In our view economic prudence seems to have substituted development aid in these years. If the two were put in their rightful place, *ceteris paribus*,

a growth rate of 10% is unavoidable. The economy therefore lies on the ideal production function. The problem centres on non prudence in policy making. To this effect Kenya can take off to join the precepts of the newly industrialized countries so long as proper and realistic policies are incessantly put in place.

Things are still questionable whether policy reforms will be sustained. The current situation was created by strong restraint from donor conditionality which forced the government to apply a double-barrelled strategy of reforms and discipline. This needs not be the development pillar since serious and committed policy making, with the interest of the country at heart did not, and do not need sanctions to gain senses of prudence and transparency. The ball therefore still remains in those hands.

The very government has already cleaned the economic mess, and has even instituted measures on corruption especially in the customs and exercise departments, the worst hit by the immoral vice. We trust the government of the day as the right alternative at the moment, in terms of the ability to deliver the goods. This is because of the failure in the opposition in showing unity and a clear policy framework. A quiz expected to provide an assessment on government's credibility and goodwill will be their policy conduct-cum-the next general elections scheduled for the next eighteen months. If current reforms are not put in the reverse gear then our optimism will come true. Investment boom will be unavoidable and growth in GDP and per capita income will be remarkable. If not, then we have no choice, but to expect a slump followed by constant and painful recovery lags as in 1993. The possibility of, say clashes cannot be ruled out particularly that the culprits were not brought to book. At the

same time, the nature and direction of fiscal and monetary policy is not easily predicted just as we cannot predict a severe drought like that of 1984. Had it not been for donor conditionality and competitive politics things could probably be worse. We therefore deduce that the sustainability of economic growth for Kenya is largely unforeseeable.

Recommendations.

(i) Problems of infrastructure were highlighted in chapter three. Policy on the sector should be two dimensional. (a) Much needs to done to rehabilitate the existing infrastructure. Inaccessible areas, particularly those with economic potential needs to be urgently connected as soon as funds are available. (b) On the international scene, the liberalization age is here with us and little can be done to stifle the economic wind. Benefits will yield if markets in the neighbourhood are explored more vigorously. The improvement of networks (rail and road) to countries like Ethiopia and the Sudan could be one of the issue in the agenda which can open the horn of Africa for a diversified range of Kenyan goods. Ethiopia, a land locked country can be serviced by the excellent port of Mombasa which currently serves as the gateway to East Africa. This consideration should be speeded up because Kenya's regional relative competitiveness is being challenged by the steep competition from the South.

(ii) Even though the proxy for drought (PEDR) did significantly influence agricultural output, the vagaries of weather on agricultural yield can be remedied by increasing the area under irrigation. An insurance policy for farmers is another issue in the agenda for consideration.

This will compliment the limited size of arable land and shape the country's image by reducing the habit of begging in the event of a severe drought.

(iii) The tourism is a very important industry for Kenya now and in the future. The time to invest in the sector is now.

(iv) Criminal activities are major risks. If personal security is poor then expatriate managers will be expensive to hire and some foreign firms will be unwilling to post staff to the country, Collier (1994). It is therefore the duty of the government to urgently introduce stringent measures to fight possible crime directed to economic agents.

(v) Moi's 1992' campaign slogan was, and i quote "Good politics is good life". This should be adopted by all parties. Current reforms have to be upheld. Corruption, mismanagement and political repression should be minimized.

(vi) Export promotion remains a call to any Economy. This will improve terms of trade. The ability to promote non-traditional export items such as horticultural products which show a large potential in Kenya will significantly affect the growth process.

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Appendices

Appendix 1: Results from Diagnostic Tests

EQ	Diagnostics Tests			
	Serial correlation	Functional form	Normality	Heteroscedasticity
EQ1	1.874 (.188)	.03316 (.858)	.56298 (.755)	.18404 (.893)
EQ2	1.872 (.188)	.014 (.907)	.997 (.607)	.347E-3 (.985)
EQ3	1.575 (.226)	.0054 (.942)	.899 (.686)	.767 (.784)
EQ4	1.656 (.215)	.0495 (.826)	.755 (.686)	.0102 (.92)
EQ5	.562 (.463)	.164 (.69)	1.471 (.479)	3.119 (.09)
EQ6	.917E-3 (976)	.482 (.496)	1.708 (.426)	2.167 (.154)
EQ7	0.1895 (.67)	.0002 (.967)	3.447 (.178)	1.825 (.19)
EQ8	1.433 (.247)	.985 (.334)	1.327 (.515)	1.882 (.183)
EQ9	1.316 (.267)	.8204 (.378)	1.229 (.541)	1.862 (.185)
EQ10	1.955 (.184)	.4117 (.531)	1.169 (.557)	0.592 (.45)
EQ11	15.313 (.002)	1.2405 (.287)	2.009 (.366)	1.1303 (.3)
EQ12	-	-	-	-
EQ13	.005 (.944)	.124 (.728)	.935 (.627)	1.309 (.264)
EQ14	.71E-3 (.979)	2.028 (.168)	1.078 (.584)	.841 (.368)
EQ15	.031 (.862)	.006 (.937)	.67975 (.712)	1.44 (.242)
EQ16	.0059 (.349)	.088 (.607)	.0078 (.709)	.0095 (.457)
EQ17	1.388 (.257)	.009 (.924)	.815 (.665)	1.648 (.213)
EQ18	1.038 (.324)	.001 (.973)	.709 (.701)	1.429 (.245)
EQ19	.446 (.513)	.276 (.606)	.239 (.887)	.694 (.414)
EQ20	.7498 (.398)	.1765 (.679)	.1942 (.907)	.406 (.531)
EQ21	.305 (.587)	.2691-3 (.987)	1.586 (.452)	2.523 (.125)
EQ22	.186 (.671)	.0106 (.919)	1.977 (.372)	2.576 (.122)
EQ23	0555 (.816)	.817 (.377)	2.025 (.363)	.942 (.341)
EQ24	.015 (.904)	2.181 (.155)	1.767 (.413)	1.125 (.299)
EQ25	.026 (.872)	.886 (.357)	1.964 (.375)	1.415 (.245)
EQ26	.010 (.921)	.152 (.701)	2.747 (.253)	.500 (.486)
EQ27	3.648 (.07)	3.381 (.08)	.936 (.626)	.002 (.961)
EQ28	-	-	-	-
EQ29	.002 (.964)	.262 (.614)	463 (.793)	.403 (.532)
EQ30	.3507E-3(.985	.0843 (.985)	.4496 (.799)	1.1469 (.296)
EQ31	6.14 (.023)	4.269 (.053)	1.3082(.52)	.007 (.932)
EQ32	3.2487 (.087)	7.686 (.012)	1.203 (548)	.17749 (.677)
EQ33	1.046 (.32)	.2403E-3 (.988)	2.088 (.352)	1.145 (.296)
EQ34	.645 (.432)	.441 (.515)	5.20 (.074)	.356 (.556)
EQ35	.654 (.428)	.614 (.442)	6.038 (.049)	.293 (.593)
EQ36	1.053 (.317)	.500 (.487)	5.944 (.051)	.359 (.555)
EQ37	.546 (.342)	.414 (415)	.365 (.565)	.008 (.901)

Notes: Probabilities are given in parentheses. The other values are coefficients.

Appendix 2: Results from Cointegration Tests.

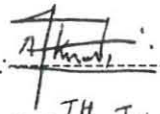
Variable	DF-TEST		ADF-TEST	
	WITHOUT TREND	WITH TREND	WITHOUT TREND	WITH TREND
E23	-6.1208 (-2.997)	-5.971 (-3.6219)	-5.0775 (-3.0039)	-4.9393 (-3.6331)
E30	-4.1208 (2.98)	-4.7221 (-3.6027)	-3.1014 (-2.9907)	-3.1792 (-3.6119)
E9	-5.0779 (-2.985)	-4.9715 (-3.594)	-4.72026 (-2.9907)	-4.6456 (-3.6119)
E13	-4.8919 (-2.9907)	-4.8296 (-3.027)	-3.2026 (-2.9907)	-3.2948 (-3.6119)
E24	-5.8921 (-2.9907)	-5.9092 (-3.6119)	-3.5817 (-2.9907)	-3.5126 (-3.6119)
E25	-4.2172 (-2.985)	-4.1277 (-3.027)	-3.5817 (-2.9907)	-3.5126 (-3.6119)

NOTES: Critical values are given in the Parentheses. The rest are calculated values.

DECLARATION

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university. All sources of material used for this thesis have been fully acknowledged.

Name: AMOS KIPRONOH CHEPTOO

Signature: 

Date: 25TH JUNE, 1996.

Place: ADDIS ABABA, ETHIOPIA