

h DETERMINANTS OF PRIVATE INVESTMENT
IN
KENYA 9

BY

PETER ONSERIO MAGERO

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An opportunity for advancing education towards higher echelons is a challenging one and to me I see it as a continuum having a start and an end between which one really undergoes a struggle that is itself a test of life. At the end of it all, one realizes that its achievement is through concerted effort from the individual and other people as well. It is on this basis therefore that I am indebted to thank the following whose assistance proved a great asset to me.

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DECLARATION

This research paper is my original work and has not been presented for a degree at any other university.

Signature.....
PETER ONSERIO MAGERO

This research paper has been submitted for examination with our approval as university supervisors.

Signature.....
PROF. L. MUREITHI

Signature.....
for DR K. SINGH

Department of Economics

University of Nairobi

P.O. Box 30197

NAIROBI

DEDICATION

To my family and to the memory of my beloved brother Naphtal Onserio.

ABSTRACT

This study undertakes to examine private investment in Kenya. Its major objectives are geared towards the factors that determine private investment.

The study was based on data drawn from National Accounts, aid and trade statistics for the country. These sources provided annual observations for the period 1970-2003. The factors that affect private investment were broadly investigated through socio-economic explanatory variables.

The factors that featured in the study include; savings, income, aid, concessional loans, foreign exchange availability, interest rates, output price and the variability of returns to investment.

A specified simple model was estimated in logs by OLS method. Stationarity of the variables was investigated using Durbin Watson statistic and the augmented Dickey Fuller Statistic. Where data was non-stationary, cointegration of the variables was investigated by Engle – Granger and Johansen's Procedure.

The study found out that domestic funds, aid and concessional loans do affect the growth of investment, but these are not the only factors. Variables reflecting the rate of return to investment are also important. That the demand – side factors are significant suggests that some investors are able to borrow on international capital markets. In particular, the rate of growth of

investment can be impaired by an increase in the variability of capital goods prices.

The study gives some recommendations to be adopted in the face of declining private investment in the country, which include among others, review of the banking act, reduction of government borrowing from the domestic market and increased government investment on physical infrastructure.

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CHAPTER ONE

1.0 GENERAL INTRODUCTION TO THE PROBLEM

1.1 Definition

In national income analysis, to invest simply means the use of money to bring profit or earn interest. This can be done through purchase of property, shares etc. Investment, therefore, is the value of that part of the economy's output for any time period that takes the form of new structures, new producer's durable equipment, and change in inventories.

In practice, apart from the change in inventories, the value of output is measured by the amount of expenditure on these items.

Investment can be viewed in either gross or net terms. If we deduct from gross investment expenditures an allowance for the amount of the existing structures and producers' durable equipment used up in producing the period's output, we have net investment.

1.2 Fixed and non-fixed gross investment

The amount of gross investment that is made up of new structures and new producer's durable equipment is called gross fixed investment. This may be divided into non-residential investment, which is essentially business fixed investment, and residential investment, the largest component of which is

single-unit houses. The balance of gross investment – the non-fixed component is the change in business inventories.

1.3 Investment as a flow variable

When narrowly defined to specifically refer to business expenditures for plant and equipment, investment is a flow variable. Its counterpart stock variable is capital, which should here be understood to mean the accumulated stock of plant and equipment held by business.

If for the economy as a whole, gross investment in any period equals the amount of capital used up during that period, there is neither net investment nor disinvestments – and consequently no change in the stock of capital. If gross investment exceeds replacement requirements, the difference equals positive net investment, which represents an increase in the stock of capital. If gross investment is less than replacement requirement, the difference is negative net investment, or disinvestments, which represents a decrease in the stock of capital.

Therefore, by definition, net investment is an addition to the stock of capital. All else being equal, an addition to the stock of capital increases the productive capacity of the economy. This must be the result when a larger physical stock of capital is available for use with an existing labour force, natural resources and technology.

In the same way, an increase in productive capacity must result when the labour force increases with no change in the stock of capital, natural resources, or technology or when there is an improvement in technology with no change in the stock of capital, labour force or natural resources.

As suggested by the "law of diminishing returns", the only plausible exception to this rule is the case in which the variable factor is so plentiful relative to the fixed factors that its marginal productivity falls to zero. In Kenya, labour is abundant and capital scarce with the resultant high levels of unemployment.

1.4 Background to Government's Private Investment

Policies and Programmes

At independence, the main challenge for the government was to open up opportunities for indigenous Africans to participate fully in the modern economy. The government's agenda for post independence economic and social transformation was initially articulated in the Sessional Paper No.1 of 1965 on African Socialism and its Application to Planning in Kenya. It also set the stage for the government to pursue its political and social objectives that embraced reinstatement of the African's economic and political rights, social justice, human dignity and freedom from want.

The government attempted to pursue investment promotion policies as an integral part of the national agenda for rapid and sustained economic growth.

It was perceived that rapid economic growth would open up more investment opportunities, which would in turn contribute to eradication of poverty. Some of the measures it adopted sought to increase levels of aggregate saving and raise per capita GDP.

However, in real terms, the Kenya government lacks a comprehensive and realistic investment policy. The so-called policy is gathered from the utterances of Ministers and senior government officials in public gatherings. Even then, there have been numerous structural problems that have affected the growth of the private sector and the economy at large. Some of the structures established to promote and support private sector investment have not lived to the challenge. The key players in the private investment scene include the Investment promotion Centre, the Export Processing Zones Authority and the Export Promotion Centre.

The Kenya government needs to lay more emphasis on capital accumulation and stress the need to raise the level of investment for development. Capital accumulation or investment growth over time may enlarge the country's capacity to produce goods and services.

Best practices elsewhere, especially in the developed world, have shown governments striving more to implement reforms geared to attracting investors including the following:

- Abolishing export and import licences completely.

- Rationalizing all export duties.
- Freeing of the exchange rate completely to be determined by the market.
- Allowing residents and non-residents to open foreign currency accounts.
- Removing restrictions on domestic borrowing by foreign owned companies.
- Liberalization of the capital markets.
- Removing price controls on all goods and services
- Removing of foreign exchange restrictions.

In the absence of clear and consistent policy guidelines, the investment climate is bound to be unstable and uncertain, making planning and forecasting difficult. This has tended to reduce business confidence and has scared away investors. For Kenya to achieve the desired sustainable high economic growth rate, consistent and serious implementation of sound economic policies will be crucial.

There is need for increased investment in Kenya in order to have a long-term sustainable solution to the deteriorating economic performance. The implementation of appropriate fiscal and monetary policies to attract investment is necessary.

This study undertook to review and evaluate the factors that determine private investment in Kenya. These factors were broadly investigated through Socio-economic explanatory variables. The factors that featured in the study

include: savings, income, aid, concessional loans, foreign exchange availability, interest rates, output price and the variability of returns to investments.

1.5 Statement of the problem

The level of per capita income is an issue of great concern in all economies of the world. Low levels of private investment in Kenya could be contributing immensely to low productivity, low income and generally, low levels of social economic development as reflected in the continued decline in the country's gross domestic product. A low rate of per capita income resulting from, among other factors, low investments and/or poor investment decisions increases the risk of poverty, corruption and other forms of crime leading to the deterioration of the country's public image.

Poor investment decisions should be a worry to any country given that a lot of time and money is wasted in trying to re-adjust resources. This has the effect of demotivating investors and credit providers.

Numerous stalled investment projects in the country indicate that investment decisions are haphazard whereby resources end up being wasted or are underutilized. This has led to low levels of income as a result of low

productivity. It was, therefore, imperative that the country's private investment system be investigated with a view of streamlining it.

1.6 Objectives of the Study

Broadly, the major objective of the study was to institute a periodic review of the determinants of private investment in Kenya.

1.6.1 Specific Objectives

The objectives of the study were:-

- (i) To identify factors determining private investment in Kenya
- (ii) To determine the impact and relative significance of the identified factors on private investment
- (iii) To outline policy recommendations based on the study findings

1.7 Hypothesis tested

H_0 : Both conventional and non-conventional factors do not influence Private Investment in Kenya.

H_1 : Both conventional and non-conventional factors influence Private Investment in Kenya.

1.8 Justification for the Study

Private Investment in Kenya had reached a crucial juncture. The elegance of early research on private investment stood alongside stark empirical failure to explain many, if not most, aspects of behaviour that sustained the poor rate of private investment. A search for alternative theories had to be put in process and much attention should be focused on incorporation of non-conventional factors.

A sizable number of factors needed to be addressed in order to ensure that the country's objective of widespread, efficient and effective investment ventures were realized. This study analyzed all these factors with the hope that necessary adjustments could be made.

Levels of investment needed to improve so as to be in touch with the competitiveness of the modern world. The launching of the investments promotion commission and the establishment of the export promotion zones demonstrated government commitment. But the question remained why there was still poor local investment, low foreign direct investments, widespread unemployment and poverty.

A proper understanding of the determinants of private investment was expected to enhance the capacity of policy makers to create a business friendly environment in order to attract and promote more and higher quality investments, investment with strong links to the domestic economy, export

orientation, advanced technology and skill or spill over effects. Identifying the relative importance of determinants was important for designing effective policy and therefore worth of investigation.

In reviewing the role of the private investor and re-focusing its activities on core investment ventures, deployment of resources with priorities and high rates of investment return had to be guaranteed by policy. Otherwise, problems of duplication of resources, overlaps of investments, uncoordinated, bureaucratic and red tape procedures could not be overcome.

1.9 Significance of the Study

The outcome of this research should be an efficient private investment process to be facilitated effectively and automatically through formulation and implementation of policy priorities of the country.

Private investment activities, based on sound information, ought to be carried out more effectively to directly benefit the investors and the general public in form of increased general productivity. As such, the sector shall have to play its rightful role in socio-economic development of the country.

The recommendations of this study should be adopted accordingly to be able to play this critical role. This is so given that the focus of every government everywhere in the world is to create an enabling environment for investors to

increase profits. In the process, higher levels of development will be achieved and the resulting improvement in the overall welfare status.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Theoretical literature

According to P. Collier and D. Bevan (1993), two factors are likely to determine the rate of growth of percapita income in an economy, that is, the rate of physical capital accumulation and the extent to which factors of production are allocated efficiently. Of these, it is the latter that has received most attention in development economics literature in recent years, with many articles analyzing the anatomy of various forms of price liberalization and the measurement of relative rates of returns to different economic activities.

W.H. Branson (1992) introduces investment demand as a simple function of the interest rate, offering as a rationale the present value (PV) criterion of investment decisions. He presents a simple function exposing and manipulating the basic interconnections between the product, money and labour markets. According to Branson, the $i = i(r)$ function is not a good representation of the complex determinants of investment in the "real world". It is only in the past twenty years or so that empirical investigators have been able to obtain even barely reasonable empirical explanations of investment

demand. He stresses on the role of profits and liquidity as partial determinants of investment demand through the interest rate and user cost. Consequently, the response of investment to changes in output and the cost of capital is such that the marginal propensity to spend – the sum of $\partial i/\partial y$ and the marginal propensity to consume out of Gross National Product (GNP) – is less than unity. As such, the IS curve is negatively sloped.

Edward Shapiro (1988) takes investment through stages. Firstly, investment is merely assumed to be some fixed – dollar amount in a given period and assumed to change by some fixed – dollar amount from one period to the next without benefit of any explanation.

Secondly, he shows investment as a function of the interest rate. However, the decision to invest needs to be determined. The businesspersons' decision as to whether to undertake a given investment project depends on the relationships among the expected income flow from the project, the cost of the project and the market interest rate. The various mechanics of these relationships lead to the very important concept of the marginal efficiency of capital.

"Investment leads to capital accumulation and this may add new resources or upgrade the quality of existing resources. The essential feature of all investment decisions is that there is a tradeoff between present and future consumption." This is according to Todaro (1985). He asserts that

investment augments future input and income. New factories, machinery, equipment and materials increase the physical "capital stock" of a nation. These directly productive investments complemented by investments in social and economic infrastructure such as roads, electricity, water and sanitation, communications, etc have a direct bearing on private investments demand. For example, he says, investment by a farmer in a new tractor, combine harvester and other farm inputs may increase the total output of the vegetables and other farm produce. However, without adequate transport facilities to get the extra produce to the markets (local commercial markets), his investment may not add value to either the micro economy or the macro economy and he will most likely make a different investment decision.

Todaro (1985) re-examines the traditional theory that unequal incomes will best promote savings and thus investment and general growth using the variable factor proportions model and ended up concluding that rates of return plus relative and absolute shares of income going to labour and capital depend on the relative growth rates of labour and producers may be expected to adopt capital/labour ratio (K/L) which maximizes the profit per unit of capital employed (π/K). This presumably could maximize "business saving" and "re-investment" thus increasing potential output over time. However, Jhingan's paper (1975) points out that the use of savings for purposes of investment in capital goods will depend upon enterprise.

Increasing savings to the level desirable for channeling through credit and financial institutions for capital formation has not been easy in developing countries, Kenya inclusive. If voluntary savings are not forthcoming, the government has the option of resorting to forced savings. Forced savings curtail consumption and thereby releases resources to be utilized for capital formation. The government uses tax revenues, deficit financing, borrowing and profits earned by Public Corporations for capital formation. Jhingan distinguishes between differences in motivation between state investment and private investment. The state looks at social marginal productivity, social and economic overheads, equity depending on broad social and economic objectives of the country. Private investments on the other hand, are motivated by the notion of profit maximization.

However, for both, the choice of production techniques influences the amount and pattern of investment. Whether to invest in capital – intensive or labour - intensive techniques of production depends on a number of factors such as on the market demand and economies of scale.

Various economists have advocated capital-output ratio as an investment criterion. While making a choice among investment opportunities and in determining priorities, capital-output ratios of different projects should be compared. Investment should be confined to those projects that lower the capital output ratio. The investor will be better off by concentrating on

projects with lower capital-output ratios. The underlying assumption here is that the projects in which investment is to be made are perfect substitutes. Todaro (1975) cautions that while choosing among investment projects one should compare their contribution in terms of income over time and not just capital-output ratios.

It is believed that the investment potential of an individual or organization is limited by its capacity to absorb capital. The capacity to absorb capital, on the other hand, is limited by the lack of mobility of the factors, including technology. Rational investment criteria, therefore, require that the supply of other co-operant factors should be increased along with capital until these difficulties are overcome.

However, the question still remains whether there is a single, precise, simple and objective investment demand factor.

2.2 Empirical Literature

It has been observed that monetary, fiscal and exchange rate policies for correcting unsustainable macroeconomic imbalances are bound to affect private investment (Serven and Solimano 1992).

There are two ways by which restrictive monetary and credit policies included in stabilization packages affect investment. These are the rise in the real cost of bank credit and the opportunity cost of retained earnings from higher

interest rates. The user cost of capital is increased by both mechanisms, leading to a reduction in investment. These effects have been pointed out by, for example, de Melo and Tybont (1986), Greene and Villanueva (1987) and Solimano (1989). Van Wijnbergen (1982), Blejer and Khan (1984b), Lim (1987), and Dailami (1990) differ, however, noting that credit policy affects investment directly, because credit is allocated to firms with access to preferential interest rates rather than through the indirect interest rate channel. Thus the effect of monetary and credit policy on investment and the means of transmission depend on the institutional structure of the financial markets.

✓ In the case of fiscal policy, Van Wijnbergen showed that a reduction of the public deficit during macro-economic adjustments allows private investment to expand. How the public deficit is corrected, however, will have different impacts on investment. Serven and Salimano (1992) indicated that if the reduction of the public deficit involves cutting back public investment in components of infrastructure such as roads, ports and communication networks, which may be complementary with private investment, there would be a decline in private investment.

Studies that have used multicountry panel data to shed light on this are Blejer and Khan (1984b), Greene and Villanueva (1991) and Serven and Solimano (1991).

According to some studies in developing countries, changes in output are the most important determinants of private investment. Blejer and Khan (1984b), Faini and de Melo (1990), Greene and Villanueva (1991) and Serven and Solimano (1991) arrived at results that supported the importance of changes in output in determining private investment. This has been taken as a puzzle, however, since a substantial amount of fluctuation in output appears to be transitory and therefore should not affect investment (Serven and Solimano, 1992).

Adjustment programmes rely on a combination of policies that cut back on expenditures and switch spending toward domestic goods in order to reduce external imbalance. Real exchange rate devaluation is among the expenditure switching policies that have significant consequences for investment. Devaluation affects investment through its impact on profitability, as well as its effect of devaluation on the real value of foreign currency liabilities stems from the debt crisis of the 1980s. For firms with foreign debts, devaluation automatically raises the burden of debt, reducing the net worth of firms producing home goods (Serven and Solimano, 1992). In imperfect credit markets – a characteristic of developing countries – firms may face credit constraints on higher financing costs as creditors raise interest rates to compensate for the increased risk of default. Reduced investments will be the outcome of the financial pressures.

An indirect way in which the increase in real value of firms' foreign debt affects investment is the tightening of credit markets. As the net worth of firms falls, the quality of the portfolios of the domestic creditors also falls. Banks and financial intermediaries may be forced to reduce their exposure by cutting their loans, and hence squeezing investment. Some empirical studies done on the financial effects of devaluation and its impact on investment are Easterly (1990) and Rosenweig and Taylor (1990).

Devaluation may also reduce investment by depressing aggregate demand. Serven (1990) points out that if investment has a significant import content, the expansion of output is likely to be a necessary (but not sufficient) condition for expanding investment.

An anticipated devaluation can have a substantial effect on the timing of investment through its effect on interest rates and the future price of imported capital goods. Expectations of devaluation represent a transitory disincentive to invest. Pending the depreciation, the real interest rate is high and investment low. Once devaluation has taken place, the disincentive is eliminated and investment rises. The effect on interest rates, however, depends on capital mobility. When capital is relatively immobile, and investment requires a high proportion of imported goods, an anticipated depreciation occurs (Serven and Salimano, 1992). A formal framework for studying private investment in developing countries was developed by Blejer

and Khan (1984b). This framework was an extension of previous work in the theoretical literature on investment that yielded a well-defined class of models of the flexible accelerator type associated with Jorgenson (1967, 1971) and Hall (1977).

✓ Sundararajan and Thakur (1980) and Tun Wai Wong (1982) incorporated features of the neoclassical model into investment models for developing countries. Their approaches take into account the relevant data problems and structural features that caused a gap between the modern theory of investment and the models that were specified for developing countries.

Blejer and Khan (1984b) focused on the role of government policy and derived an explicit functional relationship between the principal policy instruments and private capital formation using the model they were able to assess the extent of any "crowding out". The second extension that Blejer and Khan did was to make a distinction between government investment that is related to the development of infrastructure and government investment of other kinds.

✓ Blejer and Khan (1984a) found a positive relationship between the share of private investment in total investment and the ratio of total investment to income. They also found that the larger the share of private investment, the higher the average growth rate of the economy. These patterns indicate the importance of private investment behaviour in developing countries and call

for the testing of formal models of private capital formation in individual countries.

Two principal conclusions emerged from Blejer and Khan's (1984b) tests of formal models for 24 developing countries. The first was the possibility of identifying well-behaved empirical function for private investment in developing countries. This challenged the traditional view that standard investment theory is not relevant for developing countries. The second major conclusion was the establishment for a direct empirical link between government policy variables and private capital formation.

Asante (1993) estimated a private investment equation that tried to assess the determinants of private investment in Ghana. Among the independent variables were the incremental capital output ratio, the lending rate, the exchange rate, credit to the private sector and public investment. His preliminary results showed among other things a "crowding out" effect of public investment.

Ariyo and Raheem's (1991) country estimation of the determinants of investment consisted of public investment, rate of growth of GDP, domestic credit to the private sector and interest rate as arguments in the private investment function. Their results show that all the variables were statistically significant and evidence of the existence of "crowding in" was arrived at. Martin and Wasow (1992) modelled private investment in Kenya with the real

exchange rate, foreign exchange reserves, credit, public investment and income as arguments. The results showed significance of all co-efficient except interest rate and income.

Most recently, investment theories have focused on uncertainty and investment irreversibility as factors that can be seriously harmful to fixed investment decisions. Investment literature concerned with the analysis of those links has shown that if investment is costly or impossible to reverse, investors have an incentive to postpone commitment and wait for new information in order to avoid costly mistakes (Serven, 1996, Dexit and Pindck, 1994). It has also been suggested in the literature that the economic and political instability suffered by many African countries can pose a formidable obstacle to the take off of private investment (Serven, 1996; Elbadawi, 1995). Moshi and Kilindo (1999) adapted elements of modern investment theory to certain special features of the Tanzanian economy. A simple model of private investment was estimated by OLS. The study was able to establish a direct empirical link between government policy and private capital formation. The evidence indicates that public investment "crowds out" private investment, but the effect depends on the way in which public investment is introduced into the model. When a distinction is made between infrastructural investment and non-infrastructural investment, the complementarities between infrastructural investment and private investment is evident.

The results show the significance of flow of credit to the private sector. Monetary policy that directs credit to the private sector is expected to encourage private investment. This emphasises the changing environment in the financial sector whereby market forces and interest rate policy rather than the pre-reform repressive financial measures are likely to determine credit allocation.

The supply of foreign exchange to the country is another important issue effecting private investment. A smooth flow of foreign exchange to finance imports requires appropriate exchange rate and interest rate policies.

The fiscal stance also requires serious re-examination. The reduction of public sector investment in socio-economic infrastructure may constrain private sector investment. It is therefore advisable to increase rather than to reduce public investment in infrastructure. Given the limited resources available to government, this can be achieved by reducing government's non-infrastructural investment by encouraging private sector participation in that sector, while government concentrates on infrastructural investment.

Popular empirical models of investment in development literature therefore fall into a number of categories, some of which have been mentioned. Papers such as Root and Ahmed (1979), Schneider and Frey (1985) and Guillaumont (1988) present the results of cross-country regressions, where the rate of investment or direct foreign investment is explained by variables which are

meant to capture factors affecting both the expected rate of return to investment e.g. measures of political stability and factors which may constrain the supply of funds for investment such as the availability of foreign exchange, often proxied by export earnings. Seldom is any thought given to the structure of the equations estimated, or to the instrumenting of explanatory variables which are unlikely to be independent.

There are articles that use time series analysis to examine links between gross domestic investment and gross domestic savings. The methodology of these papers is derived from the study of developed countries by Fieldstein and Horioka (1980). Investment, usually expressed as a fraction of GDP, is regressed on savings. A coefficient not significantly different from unity is taken to mean that the economy is financially "closed" meaning that it has no access to international capital markets, so that domestic investment is constrained to equal domestic savings.

In Africa, where financial repression is the norm, this would mean that investment is determined by the amount domestic agents were willing to save at the prevailing real interest rates.

However, the above approach has a number of limitations. It is possible that savings and investment will be highly correlated even when there is perfect integration into international capital markets.

CHAPTER THREE

3.0 FRAMEWORK AND METHODOLOGY

3.1 The model

A comprehensive model of investment should take into account the possible links between saving and investment and should also allow for other variables to enter into the model. The structure should be in such a way that it provides an account of how the economy moves from a short run in which the long run zero capital account condition does not bind, to a long run in which it does.

The model will embody a long run relationship between savings and investment reflecting this identity:

$$1. \quad I = I^* = S + AID$$

Where

I = gross investment

I^* = long run equilibrium level

S = savings

AID = foreign aid inflows

With financial repression, 'I' will be the dependent variable with respect to the loans market (although this does not entail that S will be an independent variable in the estimated equations). That this relationship holds is to be tested empirically.

Modification is done when there exists a possibility of foreign exchange rationing in the domestic economy (Just as it was in Kenya before liberalisation in the 1990s). If foreign exchange is rationed, then some domestic investors may not have access to the currency necessary to buy imported capital equipment.

Those investors who are not forex constrained will face a financial constraint $S + AID$ less investment by forex constrained investors, which amount to a constraint on total investment of $I = S + AID$. However, this assumes that there is perfect capital market within the domestic economy, so that net saving in forex - constrained sectors can finance net borrowing in unconstrained sectors. Otherwise, the long run constraint will involve a savings and forex term.

2. $I = I^* (S + AID, FOREX)$

Ideally, the $(S + AID)$ term would represent funds available to just those investors who are not rationed in forex exchange, whilst FOREX would represent the foreign exchange holdings just of those investors who are so rationed.

In the model below, total savings, aid and forex are used to proxy the ideal measures. The accuracy of this proxy will depend on the extent to which savings and forex in each sector remain proportional to aggregate savings and forex.

To built such constraint into a dynamic model of investment requires that if the investment, saving and forex series are integrated to order 1, then the appropriate dependent variable in the investment function will need to be expressed as a first difference, in order to ensure stationarity. In a log-linear model, the dependent variable would be $\Delta \log I(t)$. In this case, the long run constraint can be built in as an "error correction" term in an equation of the form.

$$3. \quad \Delta \log I(t) = -a (\text{Log}I(t-1) - \text{Log} I^* t-1) + \dots$$

The coefficient a measures the speed with which investment converges on its long run equilibrium level, I^* . Other terms on the RHS of the equation will reflect the determinants of investment in the short run, which may include (S + AID) and FOREX, but need not do so.

In constructing a short run investment model, attention is given to the determination of private investment formation. In Kenya, private investment makes up roughly 75% of the total investments in the country.

Variables to be included in the short run model will reflect the possible ways in which investment might be determined. With no forex rationing and a completely financially closed economy, the only variable needed will be $\Delta \log (S + AID) (t)$, which ought to have a coefficient of unity, since investment must always equal savings plus aid. However, in a completely financially open economy, the coefficient should be zero, since there is no short run

savings/investment constraint. With perfect capital markets, the short run determinants of investment will be those determining its rate of return and, with uncertain returns, the accompanying risk.

The simplest way of relating the level of investment to its rate of return is to consider a risk-neutral, profit maximising firm facing an infinitely elastic supply of loanable funds, which has the problem.

$$4. \quad \text{Max } \int (P(t) Q(t) K(t) - P_I(t) I(t) \exp(-it) dt$$

$$\text{Subject to: } k(t) = I(t) - hK(t)$$

Where $P(t)$ is the expected output price at t , $P_I(t)$ the expected capital goods price, $Q(t)$ output, I , the interest rate, $K(t)$ the capital stock, h its rate of depreciation and $k(t)$ the rate of net investment. Solving this problem for $k(t) = \dot{\mu}(t) = 0$, where $\mu(t)$ is the rate of change of the Lagrangian multiplier, yields an equilibrium investment function:

$$5. \quad I(t) = f[(P(t), \dots, P(T), P_I(t), \dots, P_I(T), i, I(t-1)]$$

Variable factor input prices (including wages) are suppressed in this equation: such prices may not be recorded in the sample period. However, movement of variable factors between capital intensive and non-capital intensive activities may affect the return to investment. If, for example, Labour is shifted away from a highly capital-intensive sector and into one that uses negligible capital, because of a relative output price change, then the aggregate marginal physical product of capital will fall, which may reduce

investment. In this case, it will not be simply the aggregate output price that matters, but the price of capital-intensive output relative to that of other output.

However, the equation above does not typically have a tractable functional form. Empirical estimation will require the imposition of some a priori restrictions of $f(\cdot)$, especially if the data to be used are quite small. Imposing constant elasticities on the arguments of $f(\cdot)$ will do. With more data, the validity of this restriction could be tested. There is also the problem of providing on account of how expectations of future prices are formed. With rational expectations, we would assume that expected prices would equal actual prices plus a random error term, and include actual future prices in the regression.

With adaptive expectations, expectations will be based on lagged prices and present plus lagged prices will appear in the regression. Given the high degree of uncertainty and high information costs that are likely to face a Kenyan investor, the latter approach is taken in the model below. Again, with more data, this is an assumption that could be tested.

The model above assumes that investment activities are risk-free. In this case, we also introduce the possibility of a relationship between the uncertainty of returns to capital and investment. Two choices are to be made: (i) to select the variable on which the measure of risk is to be based

and (ii) having selected this variable, to choose an appropriate transformation which measures its volatility.

Below is the model for private investment in a completely financially open economy not constrained by forex shortages:

$$\begin{aligned}
 6. \quad \Delta \log I_p(t) = & \beta_0 + \beta_1 \Delta \log I_p(t-1) + \sum \gamma_i \Delta \log P(t-i) + \\
 & \sum \delta_i \Delta \log P_i(t-i) + \sum \zeta_i \Delta i(t-1) + \\
 & \sum \eta_i VAR(t-i) + \sum \lambda_i \Delta \log I_G(t-i) - \\
 & a [\text{Log}(I_p(t-1) + I_G(t-1)) - \text{Log} I^*(t-1)]
 \end{aligned}$$

Where VAR(t) is the chosen measure of risk, in this case, $I^*(t) = (S + AID)(t)$. In an economy that is neither completely financially open nor completely financially closed, both domestic savings and rate of return variables will be significant.

The size of the coefficient on the savings term reflects the degree of openness where a smaller coefficient implies a more open economy. If forex was to be rationed, $I^*(.)$ will need to be modified and include $\Delta \log \text{FOREX}(t)$ as an explanatory variable.

$$\begin{aligned}
 7. \quad \Delta \log I_p(t) = & \beta_0 + \beta_1 \Delta \log I_p(t-1) + \sum \gamma_i \Delta \log P(t-i) + \\
 & \sum \delta_i \Delta \log P_i(t-i) + \sum \zeta_i \Delta i(t-i) + \sum \eta_i \\
 & VAR(t-i) + \sum \theta_i \Delta \log (S + AID)(t-i) + \\
 & \sum \kappa_i \Delta \log \text{FOREX}(t-i) + \sum \lambda_i \Delta \log I_G \\
 & (t-i) - a [\log(I_p + I_G)(t) - \log I^*(t)] + e
 \end{aligned}$$

Where in this case, $I^*(t) = I^*(S + AID, FOREX)(t)$.

The model above can be extended to test whether the volume of concessional loans has any impact on domestic investment. Concessional loans make up an important part of foreign investment finance for many developing countries. These are loans tied to particular investment projects made at low interest rates, as part of the foreign aid packages of donor countries. If such loans dominate investment finance, including concessional loans in the model will render insignificant any variable reflecting the rate of return to investment. If this scenario is incorrect, the coefficient on the concessional loans term will be insignificant. In immediate cases, where some investment activity is constrained by such loans but some investors do genuinely have access to international capital markets, both will be significant explanatory variables.

Equation 7 treats savings as an independent variable hence it is inadequate. We also need a model of savings in order to ensure that there is no collinearity involving the savings terms.

The success of error correction models of developed countries suggests that a similar model of savings might be applied to the Kenyan situation. After all, it had emerged from Blejer and Khan's (1984) tests of formal model for 24 developing countries that there existed the possibility of identifying well-behaved empirical function for private investment. The form of such a model

is guided by the restriction that in the stationary state, people will be consuming and saving constant fractions of their income. We therefore have:

$$8. \quad S = nINC$$

Which is strictly a model of private savings behaviour. For our investment model, we need a model of aggregate savings, since this is the variable that is used to capture the magnitude of financial openness of the domestic economy. If private agents do offset some of the current budget deficit/surplus, perceiving a long run budget balancing constraints, then the model of private savings will work reasonably well as a model of aggregate savings.

We need to relax equation (9) to allow the marginal propensity to save to vary.

$$9. \quad S = nINC^\sigma$$

If savings are disturbed from their long run equilibrium level, then the adjustment back to equilibrium is described by:

$$10. \quad S(t) = S(t-1)^{\bar{i}} [nNNC^\sigma]^{(1-\bar{i})}$$

If $\bar{i} = 0$, then people attain their long-run equilibrium immediately; otherwise adjustment takes sometime and savings converge logarithmically to their equilibrium level. If income is a way from its long run equilibrium level, then the time path of savings is described by:

$$11. \quad S(t) = nS(t-1)^{\bar{i}} [n [INC(t)^\mu INC(t-1)^{(1-\mu)}]^\sigma]^{(1-\bar{i})}$$

is approach endows consumers with some degree of myopia: savings depending on just past and present income, regardless of where long run equilibrium is. Equation (11) can be transformed into:

$$2. \log S(t) = \bar{i} \log S(t-1) + (1-\bar{i}) \sigma [\mu \log INC(t) + (1-\mu) \log INC(t-1)] + (1-\bar{i}) \log n$$

Which, if savings are integrated I (1), can be estimated as:

$$13. \Delta \log S(t) = (1-\bar{i}) \sigma \mu \Delta \log INC(t) - (1-\bar{i}) [\log S(t-1) - \sigma \log INC(t-1) - \log n]$$

Another assumption that needs to be relaxed is that savings do not depend on the real interest rate. It is possible that n will depend on the real rate of return to domestic savings, r_d . The general functional form:

$$14. n = n_0 (1 + r_d)^n$$

And then equilibrium

$$15. S = n_0 (1 + r_d)^n INC^\sigma$$

Extending equation [11]

$$16. S(t) = S(t-1)^{\bar{i}} [n_0 [(1 + r_d(t))^{\Omega} (1 + r_d)] (t-1)^{(1-\Omega)}]^n (INC(t)^\mu INC(t-1)^{(1-\mu)})^{\bar{i}}$$

The equation can be estimated as:

$$17. \Delta \log S(t) = (1-\bar{i}) n \Omega \Delta \log (1 + r_d(t)) + (1-\bar{i}) \sigma \mu \Delta \log INC(t) - (1-\bar{i}) [\log S(t-1) - n \log (1 + r_d(t-1)) - \sigma \log INC(t-1) - \log n_0] + e$$

is possible also that lags of $\Delta \log (1 + r_d)$ and $\Delta \log INC$ will be empirically important, if there is some lag in the decision making process. Clearly, the error correction term in the savings equation is complex, and that although stationarity requires that $\tilde{\alpha} < 1$, there is no other restriction which need be placed on the adjustment coefficient. A positive $\tilde{\alpha}$, implying monotonic adjustment to equilibrium, is not essential. It may be the case that there is non-monotonic adjustment ($\tilde{\alpha} < 0$). For example, if agents discover that savings that period are too high, then they may reduce savings next period below their long run equilibrium level; otherwise, agents will be left with a long run path of the asset stock which is higher than without the original error.

A further extension of the savings equation is to allow foreign aid to have an impact. Foreign aid is typically tied to investment activities. It is a gift that is given on the condition that it is not consumed. If aid increases, an optimizing response on the part of recipients is to save less out of current income and consume more. This way, savings may be a negative function of aid.

In the equations above, the rate of inflation and nominal interest rate have been combined into one variable, the real interest rate even though the two might not have identical elasticities.

Equations (7) and (17) form the model to be estimated for this study.

Equation (17) provides an estimate of $\Delta \log S(t)$, and so $S(t)$, given an initial

of savings in period 1 of the sample. This estimate is used in the investment equation, equation (7).

2 Data Types And Sources

The data for this study was drawn from National Accounts, aid and trade statistics for the country, as reported in World Bank (1998,2001), IMF (2000), ECD (1970-99), UNECA (1973, 1980, 1987, 1996, 2000), UNCTAD (1979-2001), BCEAO (1987, 1990, 1999) and the Kenya Central Bureau of Statistics (1970-2003).

Other government publications used for this study were the Annual Statistical Abstracts, Economic Surveys, Budget Estimates and the Central Bank statistics. These sources provided up to date annual observations for 1970 – 2003 in Kenya.

3.3 Estimation Method

The specified simple model was estimated in logs by OLS method. In order to estimate the savings and investment functions efficiently, there was need to first ascertain the order of integration of the series of interest. Stationarity of the variables was investigated using Durbin Watson statistic (in testing against a null of stationarity) and the (augmented) Dickey Fuller statistic (in testing against a null of non-stationarity). Where data was non-stationary,

Integration of the variables was investigated by Engel – Granger and Johansen's procedure and on the basis of the cointegration results, Vector/Error Correction Models (ECM) have been constructed.

The variables chosen were as follows:

i) Investment

National Accounts Statistics Reported real and nominal gross domestic investment and fixed capital formation. Real and nominal capital formation figures were used to derive a capital price series, P_1 . These statistics disaggregate capital formation by public and private sector, providing series for I_G and I_P . Since we needed a real capital good price, then P_1 was capital formation deflator expressed as a fraction of the GDP deflator.

(ii) Savings

Nominal gross domestic savings were reported in National Accounts Statistics. An appropriate deflator needed to be found to express savings in real terms. Here, there was a conflict between the deflator which was appropriate when considering the impact of saving on investment in this case, it was appropriate to use a capital price series, measuring the real value of savings in terms of the capital goods they could be used to buy and that which would be appropriate when constructing a behavioural model of savings. The value of the savings

to savers is the opportunity cost of the consumption forgone, so a consumer price deflator was to be used. They differ to the extent that;

- Capital goods prices vary relative to the price of output, and
- Consumer prices vary relative to output prices (i.e. to the extent that indirect taxes vary over time).

A compromise approach was to use an output price series. In the equations, the GDP deflator was used as a proxy for aggregate output prices.

(iii) Income

National Accounts Statistics reported real GDP and terms of trade adjustment figures (an improvement in the terms of trade results in an increase in income for a given GDP). The sum of these components constitutes real domestic income.

(iv) Aid

OECD tables reported total annual grants to Kenya from multilateral and bilateral sources, in US\$. This was the source of AID series used in the model. The World Bank exchange conversion factor was used to convert this into domestic currency units. This figure was deflated in the same way as savings series.

Concessional loans

UNCTAD defines a concessional loan as one where there is a grant element of at least 25 per cent. The grant element is derived by calculating the financial value of the loan (The value of the principal plus interest payments at a "competitive" rate of interest, taken to be 10 per cent) and subtracting the total discounted value of the actual required repayments. The loans so defined are not "commercial", and could not be acquired on competitive international markets. UNCTAD tables reported the US\$ value of concessional loans, which were converted into real domestic currency value in the same way as AID.

(vi) Foreign exchange availability

IMF tables reported the US\$ value of foreign exchange holdings in Kenya, which was converted into real domestic currency values in the same way as AID.

(vii) Interest rates

There are two relevant interest rates, the one that appears in the savings function, and the one that appears in the investment function. In the savings function, we needed a measure of the real return to savings. This was determined by the nominal rate and the rate of inflation. The available proxy for the nominal rate of return being the bank deposit interest rate, r , and π are included separately in the

savings equations. The consumer price index was used for the calculation of interest rates in trying to capture opportunity cost of deferred consumption. Since USA predominates in capital flows to Kenya, the US interest rate (i) for the investment function was used (as reported in IMF tables).

(viii) Output price

The proxies for output price used were: industrial, manufacturing production deflators and also (the inverse of) the terms of trade. Exports, in this country, are dominated by agricultural commodities and imports by manufacturing commodities. If agricultural activities happen to be less capital intensive than manufacturing activities, then the negative relationship between the terms of trade and investment can be interpreted as a relative price effect.

(ix) The variability of returns to investment

In so far as the output price, the price of capital goods and the interest which firms face all influence the returns to investment, the variability of any one of them might affect investment. The significance of the transformations of P and i series were tested through calculations of moving variance and standard deviation of each series. Also used was the polynomial lag of the absolute value of the first difference of every series.

4 Scope and Limitations of the study

Only secondary data was used hence the study experienced problems of data availability and quality. Some important factors such as real wages, tax legislations and trade policies were not quite accurately captured in this part of the world. Testing the impact of such factors became extremely difficult. Attempts were made to adjust the data and stick to the most consistent, authentic and reliable sources.

A major problem in carrying out a study such as this arose from definition of the important concepts such as investment and capital. In popular usage, the two words have many meanings. The study was restricted to national income analysis definitions.

UNCTAD defines a concessional loan as one where there is a grant element of at least 25 per cent and 10 per cent rate of interest. This definition is arbitrary in so far as the figures of 25 per cent and 10 per cent are arbitrary. If it were these loans plus savings plus aid, which determine domestic investment, then one would not be justified in claiming that the domestic economy has access to international capital markets.

The proxy for nominal rate of return was the bank deposit interest rate. This is not a perfect measure of the average return of all savings (not all savings consist of bank deposits), the coefficient on the nominal interest rate term

ed not be the same as on the inflation term, even without the surprise
flation effect.

choosing an international interest rate (i) for the investment function has its
own problems. Capital flows are sometimes not disaggregated by country of
origin. Indeed, some flows were from multinational agencies, and they do not
have (or show) a country of origin. Consequently, it was difficult to construct
a weighted average of foreign national lending rates.

CHAPTER FOUR

ESTIMATED EQUATIONS

order to estimate the savings and investment functions efficiently, it was important to first ascertain the order of integration of the series of interest. The dependent variables in the estimated equations ought to have been stationary (Engle and Granger, 1987).

The two standard tests of stationarity used were the Durbin Watson statistics (testing against a null stationarity) and the (augmented) Dickey Fuller statistic (testing against a null of non-stationarity).

However, the sample sizes here were very small so significant results could not be produced for most of the variables in the data set. Nevertheless, it was possible to use the DW as a descriptive statistic. Where the DW for the first difference of a time series was close to two, but the statistic for the series itself was much lower, it suggested that the series was integrated to order 1. Table 1 shows the DW statistics for the variables of interest and their differences. It shows that the large drop in the statistic between $\Delta x(t)$ and $x(t)$ occurs for all the variables except VAR. This indicates that it would be sensible to treat the variables (excluding VAR) as $I(1)$, although it is to be stressed that this choice is not based on a formal statistical test, due to the inadequacy of the data.

that the dependent variables were I(1) the modelling procedure described above could be implemented. First of all, it was necessary to derive longrun relationship between investment, savings and forex, and between savings, income and interest rates. This was done by regressing $\log I_p(t)$ and $\log S(t)$ on explanatory variables, and using the coefficients of the static equations to these equations as a description of the long run equilibriums. The long run equilibria were then used to construct error correction terms. Thus, having estimated the longrun relationship, $\log I = \log I^* (S + AID, FOREX)$, an error correction term $[I(t) - I^*(t)]$ (denoted $ecm^*(t)$) was created.

Similarly, long run relationships of the form, $\log S = \log S^* (INC, r, \Pi, AID)$ yielded error correction terms of the form, $[\log S(t) - \log S^*(t)]$ [denoted $ecm(t)$].

These error correction terms were then incorporated in equations for $\Delta \log I_p(t)$ and $\Delta \log S(t)$. The results are reported in tables 2 and 3, and are discussed below.

Table 1:***Durbin – Watson Stationarity Tests***

log I_p	1.138
Δ log I_p	2.215(3.9)
log S	0.273
Δ log S	2.073(5.9)
log INC	0.077
Δ log INC	1.798(4.4)
log (1 + Π)	1.616
Δ log (1 + Π)	2.908(0.2)
log (1 + r)	0.078
Δ log (1 + r)	0.905(0.3)
log P_I	0.140
Δ log P_I	2.082(2.6)
log P	1.356
Δ log P	2.771(0.8)
VAR	1.996(7.6)
Δ VAR	2.581
log FOREX	1.361
Δ log FOREX	1.997(3.8)

Table 2:**Savings Function**

$$\text{Solved Static Longrun Equation: } LS = 1.084 \text{ LINC} + 0.199 \text{ L}(1+r) - 2.203$$

(0.059) (0.038) (0.152)

$$\text{WALD Test } \chi^2(3) = 42562.882$$

Tests on the Significance of each variable:

Variable	F[Num, Denom]	= Value	Probability	Unit Root t- test
LS	F[2, 12]	21.357	0.000	-12.245
LINC	F[3, 12]	46.481	0.000	9.717
L(1+r)	F[3, 12]	14.095	0.000	5.152
Constant	F[1, 12]	82.423	0.000	-9.079

Modelling ΔLS by OLS: Sample 1969 to 2000

Variable	Coefficient	Std Error	HCSE	E-value	Partial r^2
ΔLS 1	-1.5032181	0.16801	0.17304	-8.94732	0.8792
ΔLS 2	0.3471263	0.14391	0.11936	2.41216	0.3460
$\Delta LINC$	1.4266629	0.25163	0.20056	5.66958	0.7450
$\Delta LINC$ 1	2.2096405	0.24048	0.19167	9.18841	0.8847
$\Delta L(1+r)$ 1	-0.2178956	0.07814	0.07432	-2.78870	0.4142
$\Delta L(1+\Pi)$	0.7604462	0.16719	0.13122	4.54853	0.6529
$\Delta L(1+\Pi)$ 1	0.6183084	0.22394	0.18692	2.76107	0.4093
ecms 2	-2.3153555	0.26627	0.31501	-8.69560	0.8730
Constant	-0.0373668	0.01913	0.01831	-1.95362	0.2576

$$R^2 = 0.9840843 \quad \sigma = 0.0341140 \quad F(8,11) = 85.02 (0.0000) \quad DW = 2.542$$

RSS = 0.0128014040 for 9 variables and 20 observations

R^2 Relative to Difference + Seasonals = 99233

LM Serial correlation: $F(1,10) = 2.06 (0.1818)$

LM ARCH Test: $F(1,9) = 0.01 (0.9342)$

χ^2 Test for Normality: $\chi^2(2) = 1.118$

Chow Test: $F(4,7) = 0.41 [0.7963]$

The savings function is reported in Table 2. The long run equilibrium is derived from an AD (2,2) model of the log S on log INC and log $(1+r)$. Neither Π nor AID enter significantly into the long run relationship as it has been estimated.

The coefficient on log INC is not significantly different from unity: savings are proportional to income. The low standard errors on the static solution, and the test statistics reported suggest that the static solution represents a stable equilibrium relationship.

The equation for $\Delta \log S(t)$ is the result of omitting insignificant variables from an AD (2,2) + *ecm* model. Note that the short run income elasticity is significantly higher than the longrun elasticity of unity. The result accords with consumption functions estimated for OECD countries, where the short run income elasticity of consumption is less than unity.

The explanation of these results is that consumers take time to adjust consumption levels in response to a change in income, and so in the short run, the change in consumption following a change in income is less than proportional. There are positive short run coefficients on the inflation terms, $\Delta \log (1 + \Pi) (t)$ and $\Delta \log (1 + \Pi) (t-1)$, and this also accords with existing models of consumption.

The savings series fitted in table 2 is used to model investment. This model is reported in Table 3. The long run equilibrium is derived as the static solution

to an AD (1,1) model of $\log I_p$ on $\log (S + AID)$ and in $\log FOREX$. Since I_p is approximately equal to both $(S+ AID)$ and $FOREX$ over the sample period, the estimated elasticities on the latter (0.2 and 0.3 respectively) can also be interpreted as the marginal change in investment for a change in savings/forex. The low long run savings coefficient reflects the fact that it is not true of all investors that the long run binding constraint is savings: for some, the binding constraint is foreign exchange availability.

It is possible to arrive at a measure of the cost of the forex constraint by comparing the actual equilibrium level of investment (based on the

Table 3:**Investment Function**

Solved Static Long Run Equation: $LI_p = 0.205 L(S+AID) + 0.303 L FOREX + 1.457$
 (0.090) (0.119) (0.182)

WALD Test $x^2(3) = 4369.929$

Tests on the significance of each variable:

Variable	F[Num,Demon] =	Value	Probability	Unit Root t-test
LI_p	F[1,16]	0.390	0.541	-5.390
L(S+AID)	F[2,16]	4.146	0.035	1.889
L FOREX	F[2,16]	8.897	0.003	2.685
Constant	F[1,16]	23.002	0.000	4.796

Modelling ΔLI_p by OLS: Sample 1968 – 2000

Variable	Coefficient	Std Error	HCSE	t-value	Partial r^2
Constant	0.0630873	0.04228	0.05227	1.49218	0.1462
ecm* 1	-0.8882447	0.13416	0.13260	-6.62061	0.7713
$\Delta L(S+A)1$	1.1043379	0.15191	0.19586	7.26980	0.8026
ΔLI_p	-0.4414059	0.10497	0.12566	-4.20515	0.5763
ΔL_p	1.1598589	0.18671	0.25604	6.21197	0.7480
$\Delta L_p 1$	1.0873778	0.20300	0.26762	5.35660	0.6882
VAR 1	-2.0807781	0.50905	0.60089	-4.08757	0.5624
$\Delta L CONC 1$	0.6190909	0.17160	0.29849	3.60780	0.5003

$R^2 = 0.9486149$ $\sigma = 0.0656220$ $F[7,13] = 34.28[0.0000]$ $DW = 1.456$
 RSS = 0.0559812688 for 8 variables and 21 observations
 R^2 Relative to Difference + Seasonals = 0.97676
 LM Serial Correlation: $F[1,12] = 0.69 [0.4230]$
 LM ARCH Test: $F[1, 11] = 0.05 [0.8354]$
 X^2 Test for Normality: $X^2(2) = 0.475$
 Chow Test: $F(4,9) = 1.08 [0.4224]$

reported equation) with the hypothetical equilibrium level, based on a long run solution with $I_p = S + AID - I_G$. Since S , FOREX and I_G are evolving over time, the actual and hypothetical equilibrium levels of investment are also evolving over time. The ratio of the actual to hypothetical equilibrium investment is:

1972	82%
1976	71%
1980	79%
1984	55%
1988	53%
1992	51%
1996	51%
2000	48%

That is, the costs in terms of total private investment are substantial, and have increased with time.

The estimated long run solution was used as a basis for the error correction term reported in the equation for $\Delta \log I_p(t)$ which appears in table 3. In this equation, insignificant variables have been omitted from an AD (1,1) + *ecm* model of $\Delta \log I_p$ on $\Delta \log (S + AID)$, $\Delta \log CONC$, $\Delta \log FOREX$, $\Delta \log P_t$, $\Delta \log P$, $\Delta \log (1 + i)$, and VAR. The significant explanatory variables are: $\Delta \log (S + AID)$, $\Delta \log CONC$, $\Delta \log FOREX$, $\Delta \log P$, VAR and *ecm**.

The coefficient on the error correction term is not significantly different from unity: the economy adjusts very quickly to its long run equilibrium level. The coefficient on the savings term is not significantly differently from unity, either. That is, arise in savings will, *Ceteris paribus*, lead to a proportional rise in investment in the shortrun. Investment is not independent of savings, and therefore the hypothesis of perfect financial market integration is rejected. However, investment does not depend entirely on domestic funds. Investment is influenced both by variables affecting the demand for investment goods (P and VAR) – suggesting that some agents have access to foreign financial markets - and by concessional out flows. The picture of Kenya is very mixed: some investors depend on domestic funds, or on foreign concessional loans. However, others appear to have access to foreign capital markets.

Of particular interest is the magnitude of the impact of the uncertainty term, VAR, on investment. The average value of VAR is 0.076. The co-efficient on VAR is 2.00. This implies an average value of $I_p(t)/I_p(t-1)$ which is 86% of the level which it would have been with zero VAR. The maximum value of VAR is 0.179, and the minimum 0.020, implying maximal and minimal values of $I_p(t)/I_p(t-1)$ equal to 70% and 96% of their hypothetical level with zero VAR.

CHAPTER FIVE

5.0 SUMMARY OF MAJOR FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This study on the determinants of private Investment in Kenya was designed to look into the factors that can explain private investment. These factors were broadly investigated through socio-economic explanatory variables. Since a few researches have been carried out here and there on the same topic, the study depended entirely on secondary data.

The study utilized a specified simple model, which was estimated in logs by OLS method. This was used to test the association between private investment as the dependent variable against such explanatory variables as savings, income, aid, concessional loans, foreign exchange availability, interest rates, output price and the variability of returns to investment.

5.2 Summary of Major findings

The composition of this research paper is such that it has 5 chapters. Chapter 1, gives an overview of the Research topic. Here, definitions and background to governments private investment policies and programmes are given. Also, the chapter highlights the problem statement objectives, the motivation and usefulness of the study. The purpose of the chapter is to give the reader an

insight of the socio cultural and socio-economic background of the research topic to be able to make reference to it and acknowledge the discussed factors that are assumed to determine private investment.

Chapter 2 makes reference to the existing literatures touching on private investment. From the reviewed literatures, one learns that the problem of low levels of private investment is a worry to many countries in the world and more especially to developing countries. The major points of departure from the existing literatures and which form the basis of this study have also been addressed. Most of the approaches do not appreciate the fact that savings and investments could possibly be highly correlated even when there exists perfect integration into international capital markets.

Chapter 3 gives the detailed view of the framework and methodology for the study. It asserts that a comprehensive model of investment should take into account the possible links between saving and investment and should also allow for other variables to enter into the model. Data sources include international organizations and local publications. The specified simple model was estimated in logs by OLS method. The chapter also gives the variables chosen for analysis. It also points out the limitations of the study.

Chapter 4 forms the core of the study. It deals with estimated equations to enable us realize the objectives of the study which is trying to come up with the factors that determine private investment in Kenya.

Based on the results of the analysis done in Chapter 4 the major findings of the study are discussed below.

The long run savings equilibrium is derived from an AD(2,2) model of the log S on log INC and log $(1+r)$. Neither \dot{r} nor AID enters significantly into the long run relationship. The coefficient on log INC is not significantly different from unity: savings are proportional to income. The low standard errors on the static solution, and the test statistics reported suggest that the static solution represents a stable equilibrium relationship. The equation for $\Delta \log S(t)$ is the result of omitting insignificant variables from an AD(2,2) + *ecm* model. The short run income elasticity is significantly higher than the longrun elasticity of unity.

The explanation of these results is that consumers take time to adjust consumption levels in response to a change in income, and so in the short run, the change in consumption following a change in income is less than proportional. There are positive short run coefficients on the inflation terms, $\Delta \log (1 + \Pi) (t)$ and $\Delta \log (1 + \Pi) (t-1)$.

The long run investment equilibrium is derived as the static solution to an AD(1,1) model of log I_p on log $(S + AID)$ and in log FOREX. Since I_p is approximately equal to both $(S+ AID)$ and FOREX over the sample period, the estimated elasticities on the latter (0.2 and 0.3 respectively) can also be

interpreted as the marginal change in investment for a change in savings/forex. The low long run savings coefficient reflects the fact that it is not true of all investors that the long run binding constraint is savings: for some, the binding constraint is foreign exchange availability.

It is possible to arrive at a measure of the cost of the forex constraint by comparing the actual equilibrium level of investment (based on the reported equation) with the hypothetical equilibrium level, based on a long run solution with $I_p = S + AID - I_G$. Since S , FOREX and I_G are evolving over time, the actual and hypothetical equilibrium levels of investment are also evolving over time. The costs in terms of total private investment are substantial, and have increased with time.

The estimated long run solution was used as a basis for the error correction term reported in the equation for $\Delta \log I_p(t)$ which appears in table 3. In this equation, insignificant variables have been omitted from an $AD(1,1) + ecm$ model of $\Delta \log I_p$ on $\Delta \log (S + AID)$, $\Delta \log CONC$, $\Delta \log FOREX$, $\Delta \log P_i$, $\Delta \log P$, $\Delta \log (1 + i)$, and VAR. The significant explanatory variables are: $\Delta \log (S + AID)$, $\Delta \log CONC$, $\Delta \log FOREX$, $\Delta \log P$, VAR and ecm^* .

The coefficient on the error correction term is not significantly different from unity: the economy adjusts very quickly to its long run equilibrium level. The coefficient on the savings term is not significantly differently from unity, either. That is, arise in savings will, *Ceteris paribus*, lead to a proportional

rise in investment in the short run. Investment is not independent of savings, and therefore the hypothesis of perfect financial market integration is rejected. However, investment does not depend entirely on domestic funds. Investment is influenced both by variables affecting the demand for investment goods (P and VAR) – suggesting that some agents have access to foreign financial markets - and by concessional out flows. The picture of Kenya is very mixed: some investors depend on domestic funds, or on foreign concessional loans. However, others appear to have access to foreign capital markets.

Of particular interest is the magnitude of the impact of the uncertainty term, VAR, on investment. The average value of VAR is 0.076. The coefficient on VAR is 2.00. This implies an average value of $I_p(t)/I_p(t-1)$ which is 86% of the level which it would have been with zero VAR. The maximum value of VAR is 0.179, and the minimum 0.020, implying maximal and minimal values of $I_p(t)/I_p(t-1)$ equal to 70% and 96% of their hypothetical level with zero VAR.

5.3 Conclusion

It has been possible to construct an economic model, which explains the evolution of private investment in Kenya over the last 30 years. The results strongly reject the extreme hypotheses of completely open and completely

closed domestic capital markets; domestic funds, aid and concessional loans do affect the growth of investment, but these are not the only factors. Variables reflecting the rate of return to investment are also important.

That these demand – side factors are significant suggests that some investors are able to borrow on international capital markets. In particular, the rate of growth of investment can be impaired by an increase in the variability of capital goods prices.

5.4 Recommendations

An efficient private investment process needs to be facilitated effectively and automatically through formulation and implementation of policy priorities so as to sustain its contribution to the Gross Domestic product. In Kenya, the private sectors' share contribution has been on the decline.

Based on the above contention, the following recommendations have been suggested for implementation.

The cost of money in Kenya, currently at an average bank rate of 20 % is unaffordable. The persistent high interest rates are a disincentive and discourage investment. Industries and businesses have been affected adversely by the existing lending arrangements whereby companies pay high bank penalties, charges and interest rates. It is recommended that:

- Banking Act be reviewed with a view of making it friendly for industry to borrow.
- There exists a direct link between government policy and private investment. The evidence indicates that public investment “crowds out” private investment. As such, government borrowing should be checked to ensure that funds are available to the private sector at affordable rates.
- Tax collection department should collect all due taxes.
- The government should support establishment of micro finance institutions or complex commercial banks, to lend a certain proportion to small and medium enterprises.
- To promote the local small-scale industry and agriculture sector, there is need for sectoral financing requirements. The banking Act should make this compulsory.
- The concept of EXIM (Export Import) bank is very essential for fast developing economies, which is not prevailing in Kenya.

The investment environment is not conducive particularly for small private investors, which are facing stiff competition especially from foreigners undertaking similar activities. Other issues affecting investment are multiplicity of licensing, imbalance in ownership and management of business, access to credit and liberalization. It is recommended that:

- Committees be set up between the government and the private sector to review investment incentives.
- The Immigration Department must be strict in issuing entry permits particularly when no new investments are injected into the economy.
- Some investment areas should be undertaken.

The effect of public investment on private investment depends on the way the former is introduced into our model.

- There is need to consider intensifying the rural access road programme as the programme is labour intensive with good workmanship.
- A critical review is needed to evaluate the utilization of public funds in the provision of cheap housing schemes. This will activate the building/construction industry, which will in return increase wage employment and the resulting GDP from the sector.
- The cost of borrowing will have acted negatively to investors in the building industry. Therefore, deliberate efforts are needed to manage the economy's fiscal policy.
- Currently, it is quite costly to invest in transportation sector due to poor state of roads. Road maintenance mechanisms are needed to ensure that Kenyan roads are kept to the required standard.

- Matatu is a popular road transport system. There is a need to arrive at a mutual understanding between matatu operators and law enforcement units. Local authorities also need to improve facilities at bus parks.
- With the persistent power shortages and rationing, it is important that other sources of power be explored. This can be done for example, by ensuring that the solar system provides maximum efficiency and also by formulating a deliberate policy to encourage use of renewable energy and cost saving power generation.

Low budgetary allocations to investment promotion and bureaucracy are among the key hindrances to growing Private Foreign Direct Investment (PFDI). In order to spur PFDIs the following steps are recommended.

- Provision of investment guidelines and enactment of privatization and enactment of privatization bill
- Further liberalization of trade

5.5 Recommendations for Further Research

In order to address more effectively the issues raised in this study and particularly the aspect of variability of returns to investment, it is recommended that a number of policy issues be addressed to pave way for further research. It is recommended that research be carried out to

determine the link between private investment and the investors' attitude pertaining to the following aspects.

- Rule of law
- Adoption of Information Technology (IT) services
- Existence of an enabling environment and
- General level of development of government machinery in as far as support of social analysis, assessment of investment priorities, identification of targets and financing key poverty reducing investments are concerned.

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APPENDICES

Appendix I

Trends in Major Macroeconomic Variables, 1970 - 2002

Year	Annual change in GDP (1970 prices)	Annual changes in money supply	Inflation NCPI	Exchange Rate Kshs/US\$	Lending Rate %	Deposit Rate %
1970	6.9	23.3	2.4	7.1	6	3.9
1971	5.7	8.9	6.3	7.5	5.5	4
1972	3.5	12.4	1.9	7.1	6	4
1973	3.9	14.3	16.0	6.9	7	4.5
1974	2.2	11.9	9.3	7.1	8	5.9
1975	3.3	17.1	8.0	8.2	8	5.9
1976	2.2	24.1	10.7	8.3	9	5.9
1977	4.9	46.8	12.3	7.9	10	5.9
1978	2.9	13.7	8.4	7.4	-	5.9
1979	1.6	16.1	12.8	7.3	-	5
1980	-0.4	-1.1	11.1	7.5	11	6
1981	1.4	13.3	10.9	10.2	14	10
1982	-0.4	16.1	22.3	12.7	16	12.5
1983	0.1	90.6	14.5	13.7	15	12.5
1984	-2.8	167.0	9.1	15.8	14	
1985	1.4	91.8	10.7	16.3	14	
1986	1.9	163.4	5.7	16.0		
1987	1.2	48.5	7.1	16.5		
1988	1.6	7.1	10.7	18.6		
1989	1.4	75.7	10.5	21.6		
1990	1.0	74.9	15.8	24.1		
1991	-1.2	78.9	19.6	28.1		
1992	-2.8	73.8	27.3	36.2		
1993	0.2	23.5	46.0	68.2		
1994	0.1	50.5	28.8	44.8	0.9	
1995	1.9	15.2	1.9	55.9	33.1	
1996	1.8	47.1	9.1	55.0	34.6	
1997	-0.3	18.7	11.2	62.6	30.4	
1998	-0.6	-67.4	6.6	61.8	26.2	
1999	1.4	52.2	3.5	72.9	25.2	
2000	0.2	-12.8	6.2	78.0	19.6	
2001	1.2	-41.9	5.8	78.6	19.5	
2002	1.2	33.0	2.0	77.1	18.3	

Source: Republic of Kenya, selected statistical series

Appendix II

Total Net Foreign Exchange Holdings, 1970-2002

Year	K £ '000
1970	51232
1971	54723
1972	64487
1973	73562
1974	66723
1975	70141
1976	113198
1977	207377
1978	131908
1979	232710
1980	183206
1981	122498
1982	136088
1983	269393
1984	307404
1985	320875
1986	338727
1987	214891
1988	254910
1989	311190
1990	276130
1991	227178
1992	272248
1993	644500
1994	1348300
1995	1332100
1996	2311600
1997	2170900
1998	2224350
1999	2254200
2000	2421650
2001	3367800
2002	3455550

Source: Republic of Kenya, *Statistical Abstracts & Economic Survey Series*.

Appendix III

Capital Formation by Public and Private Sector, 1970-2002, (K £.millions)

Year	At Constant Prices (1982)			At Current Prices		
	Public sector	Private Sector	Total capital formation	Public sector	Private Sector	Total capital formation
1970	25.06	68.99	95.52	34.20	78.50	112.71
1971	26.52	73.66	110.17	55.55	88.65	144.20
1972	63.86	102.16	166.02	60.89	99.48	160.37
1973	72.86	90.27	163.13	73.85	101.34	175.19
1974	66.26	85.04	151.30	92.04	111.62	203.65
1975	60.25	82.75	143.00	100.87	133.90	234.77
1976	61.72	83.28	145.00	122.50	167.93	290.43
1977	151.13	200.83	351.96	164.99	225.02	390.01
1978	158.59	252.60	411.19	193.68	320.33	514.01
1979	177.77	206.97	384.74	248.74	291.71	540.45
1980	180.43	214.73	395.16	281.56	340.97	622.53
1981	189.56	221.36	410.92	322.46	402.95	725.41
1982	168.55	168.82	337.37	326.53	360.43	686.96
1983	228.37	347.60	757.97	274.16	443.31	717.47
1984	248.93	345.63	593.56	336.69	470.46	807.15
1985	233.86	363.30	597.19	343.52	536.86	880.38
1986	280.74	387.34	668.08	475.51	677.70	1,153.21
1987	261.82	446.13	707.95	467.49	819.24	1,286.73
1988	321.10	448.19	769.29	614.74	876.88	1,491.62
1989	325.75	455.59	781.34	694.30	1,017.81	1,712.11
1990	386.35	398.77	785.12	956.19	842.84	1,799.03
1991	363.84	398.49	762.33	957.50	1,176.06	2,133.56
1992	332.79	385.28	718.07	972.87	1,215.97	2,188.84
1993	311.94	391.39	703.33	1,219.36	1,605.90	2,825.26
1994	382.24	417.82	800.06	1,805.19	1,975.73	3,780.92
1995	345.31	578.07	923.38	1,832.98	3,141.88	4,974.86
1996	355.84	597.56	953.40	1,981.79	3,241.69	5,223.48
1997	383.43	590.68	974.11	2,093.20	3,608.59	5,484.61
1998	363.26	587.82	951.08	2,083.35	3,591.11	5,693.94
1999	344.92	562.13	907.05	2,056.95	3,612.76	5,648.06
2000	349.19	536.48	885.66	2,205.67	3,900.52	5,818.43
2001	342.29	551.48	893.77	2,253.42	4,048.06	6,153.94
2002	337.29	550.17	887.46	2,300.00	3,391.35	6,357.06

Source: Republic of Kenya, Statistical Abstracts & Economic Survey Series

Appendix IV
Foreign Aid to Kenya, 1970-2002

Year	K£ '000		
	Concessional Loans	Grants	Total Foreign Aid
1970	11238	509	11747
1971	10941	201	11142
1972	11489	1040	12529
1973	24661	292	24953
1974	13999	3226	17225
1975	22003	6290	28293
1976	96455	7008	103463
1977	54773	10519	15292
1978	110173	9049	119222
1979	11810	28659	129469
1980	83580	19148	102728
1981	130187	19604	149791
1982	159605	19792	179397
1983	165394	23152	188546
1984	199800	40532	240332
1985	278115	57088	335203
1986	103076	18572	121648
1987	202470	101575	304045
1988	275261	196955	472216
1989	267749	256652	524401
1990	597750	208250	806000
1991	371550	231850	603400
1992	269878	440400	710278
1993	961950	458540	1420490
1994	691434	278733	970167
1995	474423	270979	745402
1996	909815	264823	1174638
1997	442934	326718	769652
1998	861836	749544	1611380
1999	560278	274484	834762
2000	915763	390113	1305876
2001	1531113	539542	2070655
2002	1217831	300561	1518392

Source: OECD, UNCTAD Tables and Republic of Kenya, Statistical Abstracts & Economic Survey Series.

Appendix V

Price Indices and Quantity Index of manufacturing Products, 1970 - 2002

Year	Imports (1982=100)	Exports (1982=100)	Terms of Trade (1982=100)	Quantity Index of Manufact.. products (1976=100)
1970	11	13	103	59
1971	19	21	105	67
1972	29	28	99	72
1973	33	31	98	77
1974	39	34	87	89
1975	41	37	92	91
1976	47	41	90	100
1977	49	55	120	121.3
1978	52	60	107	133.4
1979	55	53	97	140.4
1980	68	83	122	147.8
1981	87	91	105	155.3
1982	100	100	100	156.5
1983	128	120	94	163.6
1984	131	144	110	170.3
1985	155	142	92	178.2
1986	147	152	103	188.7
1987	149	126	85	199.4
1988	164	145	88	211.3
1989	225	152	78	226.7
1990	238	169	71	231.1
1991	265	216	82	237.6
1992	308	244	79	241.3
1993	496	438	90	249.9
1994	445	450	101	254.6
1995	513	644	96	263.9
1996	560	519	93	272.9
1997	598	608	102	278.1
1998	614	615	100	282.2
1999	667	576	86	285.6
2000	739	620	84	281.4
2001	807	637	79	283.6
2002	847	657	78	287.0

Source: Republic of Kenya, Statistical Abstracts & Economic Survey Series.