

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

THE EFFECTS OF MACROECONOMIC FACTORS
ON PRIVATE INVESTMENT IN ETHIOPIA

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“The Effects of Macroeconomic Factors on
Private Investment in Ethiopia.”

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List of Abbreviations

ADF	Augmented Dicky Fuller
AIC	Akaike Information Criteria
CPI	Consumer Price Index
EIA	Ethiopian Investment Authority
ECM	Error-Correction Model
GCF	Gross Capital Formation
GDP	Gross Domestic Product
GDS	Gross Domestic Saving
HIPC	Heavily Indebted Poor Country
HQ	Hannan-Quina Statistics
IEG	Imperial Ethiopian Government
IMF	International Monetary Fund
LR	Log Likely
MDGs	Millennium Development Goals
MoFED	Ministry Of Finance and Economic Development
NBE	National Bank of Ethiopia
OLS	Ordinary Least Squares
PRSP	Poverty Reduction Strategy Paper
SBC	Shwartz Bayesian Criteria
SSA	Sub-Sahara Africa
VAR	Vector Auto Regressive
VECM	Vector Error-Correction

Abstract

Private investment plays indispensable role in fostering economic growth, alleviating poverty and in upgrading social capital and services. Understanding the different factors affecting private investment in developing countries in general and in Ethiopia in particular, has a paramount importance.

This study tries to model some of the macroeconomic factors that affect private investment in Ethiopia during the period 1964/65-2004/05 based on the argument that private investment in developing countries is externally constrained apart from being affected by risk and uncertainty variables. The study employs the vector auto regression (VAR) methodology that account for spurious regression and exogeneity bias. This methodology also provides suitable tool for policy analysis by distinguishing the long and short-run impacts of the explanatory variables.

The result indicates that over the last four decades (1964/65-2004/05), economic growth, foreign exchange availability and trade flows stimulate private investment both in the long and short-runs. The positive effect of foreign exchange availability is found to be relatively strong supporting the argument that private investment in developing countries is externally constrained.

The study also suggests that public investment on economic and social infrastructure has a crowding-in effect and this effect is observed only in the long-run. Furthermore, domestic inflation rate appears to stimulate private investment in the short-run.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The role of capital formation has been the central tenet in explaining economic growth in growth theories. In fact, the underlying presumption about capital formation/ investment can characterize these theories. Harrod (1939) in his earlier growth theory argue that, given a fixed capital-output ratio, increasing the rate of investment result in higher growth in output. According to Solow(1957), rich countries are rich because they have larger physical capital stock per person, but increasing the rate of investment(saving) only has a short-term effect on growth.

The new growth theory (the endogenous growth theory) that broaden the concept of capital formation to include human capital, skill and technology, also argue that, investment in new machinery can enhance learning by doing with a multiplier effect on other firms implying a long term relationship between investment and growth in per capita income(Romer,1986).

Based on the literatures on growth, different empirical studies were undertaken to examine the relationship between investment and growth. These studies consistently showed that the rate of accumulation of physical capital or investment is an important determinant of economic growth. According to IMF (1988), high among the reasons for the pronounced slowdown in economic growth in developing countries has been a decline in investment.

A number of cross-country studies also confirmed that difference in growth rate performance among countries is caused by difference in investment rate (Collier and Gunning, 1999; Ghura and Hadjmichael, 1995). Herandez (2000) also shows that the problem of less investment is central to the explanation of less growth in Sub-Saharan African countries.

In fact, it is acknowledged that capital formation is not the sole determinant of a country's growth and development. Nevertheless, it is felt that society can only sustain acceptable levels of long-run growth by maintaining reasonable level of investment (Anderson, 1985). However, most of these studies make no distinction between the public and the private component of investment.

As public sector investment in most of the developing countries is effectively a policy variable, economists have focused on private sector investment, as being more susceptible to extensive economic analysis. Contributing to the interest in private sector activities, empirical studies on developing countries suggest that private investment has been more directly related to economic growth than public sector investment (Khan & Rehart 1990; Serven and Solimano, 1990).

Since 1990s, there has been a growing recognition among African leaders, faced with new realism and pragmatism, that the private sector could play a significant role in promoting growth, reducing poverty and helping people improve their life. The focus in the long-term of structural adjustment programs, and sectoral reform adopted by these countries is on creating more appropriate incentive and framework for private sector development as the bases for achieving sustainable economic growth. In addition, multilateral and bilateral institutions have developed new initiatives with priorities for private sector development.

Despite two decades of strenuous effort to undertake the adjustment program, the response in private investment (especially in SSA countries) has been dismal. Private investment in SSA was at 13.8 percent of the GDP in 1998 (highest in the 1990s) compared with 16 percent of the GDP in Latin America, and 16.5 percent of the GDP in East Asian countries (Herandez, 2000).

The failure of the macroeconomic adjustment to revive private investment rate, the very thing that was hoped to sustain growth in developing countries, led to an increased interest in the study of determinants of private investment in developing countries (Serven & Solimano, 1992; Fitzgerald *et al.*, 1992).

Ethiopia, being one of the least developed countries, has been unable to enhance private investment to a level that can take the country out of the deep rooted poverty over the last four decades. However, since the adoption of the structural adjustment program in 1992/93, emphasis has been given to private sector development. The government effort is to focus on creating the enabling environment for the private sector and market force to operate. This has not however been an easy task as the economy has started from a very low level of private investment.

1.2 Statement of the Problem

Being part of the Sub Sahara African countries, Ethiopia has been characterized by low and fluctuating private investment performance which resulted in a very low advancement in the economy. The political process and the regime shifts that the county experienced in the last four decades largely attributed to the low and irregular performance of the private sector.

During the imperial era (1960/61-1973/74), private investment in percent of GDP at market price averaged about 10.5 percent and growing by about 6 percent per annum. The reasons for the relatively good performance of private investment in this period includes, the existence of free trade policy, market oriented financial sector policies, developing share market, free market where prices were determined purely on supply and demand (Alemayehu and Befekadu,2002).

However, this promising trend was reversed due to the socialist ideology persuaded by the military government that ousted the monarchy in 1974. Thus, the period 1974/75-1990/91 witnessed centralized economic system, where the state is given a significant role in all spheres of the economy. In this period, the ratio of private investment in percent of GDP declined to 4.5 percent. This ratio is far below the SSA countries where the average rate of private investment to GDP was 10.6 percent (IMF, 1995).

After the downfall of the *Derg* regime in 1991, the country adopted the market oriented economic policy, placing great emphasis on the role of the private sector in its development efforts. In line with policy, new investment code was promulgated and successively amended with the aim of expansion of the private investment. To this effect, the share of the private investment to the GDP has registered encouraging improvement. Between the periods 1992/93-2004/05 the share of private investment rose to around 8 percent of GDP. Despite the encouraging improvement in the development of the private sector, after twelve years of adjustment efforts which directed towards making the private sector take the lead in initiating economic growth and development, share of private investment to GDP (8%) is still well below the average share (12.5 %)of SSA countries (IMF,2006).

It is a fact that private investment play indispensable role in reducing poverty by creating jobs and increasing purchasing power of the poor. Hence, the rate by which private investment grew highly determines the attainment of the Millennium Development Goals (MDGs) of the country, in 2015 which target a 7 percent annual GDP growth (PRSP, 2002). Therefore, if the goal of macro policy is to stimulate investment in short and long term, sustainability and credibility of the policy options adopted have paramount importance.

Hence, identifying some of the macroeconomic factors that were responsible for the slow growth rate of private investment in the country for the past four decades (1964/65-2004/05) is the center of this study.

1.3 Objectives of the Study

The General objective of the study is to examine some of the macroeconomic factors that affect private investment in Ethiopia during 1964/65-2004/05 and specific objectives of the study are:

- To examine the effects of public infrastructural investment, foreign exchange availability, trade flows, real output growth and macroeconomic uncertainty on private investment;
- To analyze the effect of policy reform on private investment growth;
- To draw policy implications that may be useful for policy makers.



1.4 Significance of the Study

Most of the studies on the determinants of private investment in developing countries have been undertaken based on cross-country regression. Since cross-country regression is an approach in which each country is treated as a sample point assuming the impact of each variable is constant across countries, it is hardly possible to conclude about the investment behavior in specific country. Moreover, the inconsistency between the findings of individual country regression and the cross country regression suggest that studies must be undertaken on individual case (Oshikoya, 1993). Nevertheless, there are little empirical studies on the determinants of private investment in Ethiopia.

Workie(1996) tried to investigate the determinants of private investment for the period 1975-1994. However, the empirical results of this study are not reliable due to short time series data used and poor estimation techniques. Recently, Mulubrihan(2006) undertook a study on the macroeconomic determinants of private investment for the period 1970-2004 using Vector Auto regression (VAR).

However, none of these studies has taken into account the effect of foreign exchange constraint on private investment which is found to be the important factor affecting the rate of investment in developing countries by determining their import capacity (Fitzgerald *et al.*, 1992; Martin and Warso, 1992; Seyoum, 2002; Ndukimana, 2000; Mlambo and Oshikoya, 2001)

Furthermore, these studies focused on aggregate public investment, ignoring the important question of public investment heterogeneity. This heterogeneity implies that different types of public investment likely have opposing effects on private sector activities. Hence, to study the

relationship between public investment and private capital formation, separating the infrastructural component of government investment has a paramount importance (Agenor *et al.*, 2005). Such distinction is essential in economies like Ethiopia where state owned enterprises are largely involved in activities that basically replicate the activities of the private firms and the capital expenditure of these enterprises usually counted as public investment.

This study therefore, extends the above previous works on macroeconomic determinates of private investment in two directions. First, the study investigate the impact of foreign exchange availability and trade flows on private investment which recently have attracted the attention of many researchers in developing countries in general and in Sub-Saharan Africa countries in particular.

Second, the study attempt to decompose aggregate public investment into infrastructural and non infrastructural components and investigate the explicit impact of infrastructural investment on the rate of private capital formation by extending the periods of analysis to a relatively longer period of more than four decades (1964/65- 2004/05).Moreover, the study also tries to assess the investment policies pursued by the different regimes and the response of the private sector to these policies over the last four decades in general, and after the reform(1991),in particular.

Thus, the outcome of this study can be used to fill the gap through analyzing the impact of the above mentioned policy variables on private investment. The empirical findings of this study are also believed to have insightful implication for policy makers and for further researches.

1.5 Working Hypothesis

The validity of the following hypotheses will be tested empirically;

1. Private investment is positively related to growth of real output.
2. Public investment on infrastructure has a crowding-in effect on private investment.
3. Foreign exchange availability and trade flows positively affect private investment.
4. Macroeconomic instability (measured by domestic inflation and external debt service) deter private investment.

1.6 Scope and Limitations of the Study

The study attempts to explore some of the factors that affect the rate of private investment in the country during the period 1964/65-2004/05. The choice of the period of analysis is based on the availability of published annual data for all the variables incorporated in the model.

The result of the econometric analysis of this study could be limited by the quality of the data series available. Due to the difficulty in obtaining consistent and reliable data series from one source, some times more than one source is employed to get the data. It is worth noting to mention that remarkable discrepancies are witnessed in the data series reported by different institutions. Even different publication from the same institution shows different figures for the same year. This problem is found to be serious especially in external debt related figures. Debt figures of the National Bank of Ethiopia are not the same as that of Ministry of Finance and Economic Development (MoFED) and the World Bank's world debt table.

Furthermore, some important variables were missing and found to be difficult to get these variables either from domestic or international sources. With this regard, there is no data

available for national consumer price index (CPI) for the entire period under consideration, which can be used to calculate inflation rate. The Addis Ababa CPI, used as a proxy for the national CPI. The Addis Ababa CPI, however, has one problem that there are two series with two different base years (1963 and 2000).

1.7 Organization of the Paper

The remainder of the paper is organized as follows. Chapter two reviews investment theories; private investment model and macroeconomic determinates of private investment in developing countries as well as empirical evidences on the determinants of private investment in these countries. Chapter three is devoted to a review of economic growth, saving-investment trends as well as the historical development of private investment policies and the responses of private investment to these policies since the imperial era. Chapter four deals with model specification, methodology employed, and the data source and description. Chapter five investigate the macroeconomic factors that affect the performance of private investment in Ethiopian for the period 1964/65-2004/05 using the Vector Auto Regression (VAR) approach and discusses the estimation results. The last chapter wraps up the study by offering conclusion and policy recommendations based on the analysis.

CHAPTER TWO

LITERATURE REVIEW

This chapter discusses the existing basic theories of investment which are developed to explain private investment behavior especially in developed countries and the major factors that determine the rate of private investment in developing countries as well as the empirical studies on the determinants of private investment in developing countries .

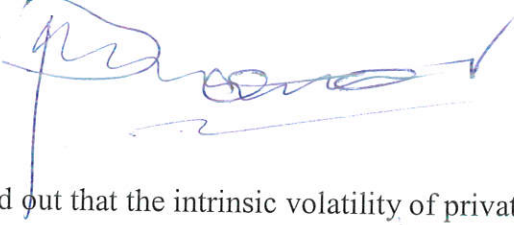
2.1 Theoretical Literature

The decision to invest is the central subject in the analysis of economic behavior mainly because it determines the accumulation of production capacity and hence the future growth path of an economy. Earlier observation also shows that investment is one of the most volatile components of the economy adding interest and challenge for theories that attempt to explain investment behavior.

2.1.1 Theories of Investment

2.1.1.1 The Keynesian Theory of Investment

The origin of the more recent theoretical literature on (independent) investment function can be traced to Keynes. In his General theory (1936), he observed that investment depends on the marginal efficiency of capital or on the rate of return on investment and the interest rate; with the latter is a function of liquidity preference and the stock of money.



Furthermore, he pointed out that the intrinsic volatility of private investment, due to the fact that any forecast of the return on investment accruing in the future will be necessary incomplete and uncertain. According to Keynes, in such environment investors would be left to their “animal sprite” in making their investment decision, rather than to a rational calculation of an inherently uncertain distance future.

2.1.1.2 The Accelerator Theory of Investment

Following Keynes, the evolution of investment theory was linked to simple growth models in the Harrod-Domar tradition. This gave rise to the accelerator theory which is also known as “acceleration principle”, which gained popularity in the 1950s and 1960s. According to this theory, investment is a linear proportion of change in output. A key implication of accelerator theory is that, the level of output or the change in aggregate demand determines investment or the change in capital stock. The theory is limited in explaining the investment behavior due to restrictive assumptions such as a constant ratio of desired capital stock to the actual.

Notwithstanding the obvious critics on its neglect of the cost of capital, expectation, and issues of profitability, it receives much popularity due to its extreme simplicity (Serven and Solimano, 1989; Sachs and Larrain, 1993).

2.1.1.3 The Neoclassical Theory of Investment

The underlying restrictive assumption of the accelerator theory initiates Jorgenson (1967) and Hall and Jorgenson (1971) to suggest the neoclassical theory of business fixed investment in which net investment is proportional to the gap between actual and desired capital stock. This

model combines the user cost of capital and the accelerator effect to explain investment behavior.

According to the neoclassical theory, lags in decision making and delivery, create a gap between the current and desired capital stocks, giving rise to a net investment function/ equation.

This can be represented by:

$$I_t = K_t - K_{t-1} = a (K^* - K_{t-1})$$

Where: I_t - Net investment.

K_t - Existing capital stock at the end of the current period.

K_{t-1} - Capital at the end of the preceding period.

K^* - Desired capital stock.

a - Measures the fraction of the gap between the actual and the desired level of capital stock that is closed each period.

In this formulation the desired capital stock depends on the level of output and the user cost of capital – which in turn depends on the real rate of interest, expected rate of inflation, depreciation rate and investment tax credit. Hence, private investment will also be affected by these factors. This theory has been criticized due to the assumptions of perfect competition, exogenously given output, static expectation about future prices, output and interest rate (Serven and Solimano, 1992).

2.1.1.4 Tobin's 'Q' Theory of Investment

An alternative formulation of the investment function is the 'Q' theory of investment developed by Tobin (1969). In this theory investment decision is mainly determined by the ratio of the market value of the firm (installation of additional unit of capital) with its replacement cost. This ratio is termed in the literature as the marginal Q.

Tobin (1969) postulated that when the increase in the market value of the additional unit exceeds (or is less than) the replacement cost, firms will want to increase (or decrease) their existing capital stock. Tobin argues that, the marginal "Q" may differ from unity because of delivery lags and adjustment or installation cost. However, due to the difficulty in measuring marginal Q and the ratio of the market value of the entire existing capital stock to its replacement cost, instead of marginal Q, the average Q ratio is used (Serven, 1989; Sacks and Larrain, 1993).

Nevertheless, this theory is criticized on grounds that if firms enjoy economics of scale or market power or if they cannot sell all they want, marginal and average 'Q' will systematically differ. Moreover, the assumption of increasing installation cost is dubious. The cost of additions to an individual firm's capital stock is likely to be proportional or even less than proportional to the volume of investment, because of the lumpy investment nature of many investment projects. More importantly, disinvestment, if feasible is more costly than positive investment; capital goods often are time-specific and have a low resale value (Serven and Solimano, 1992). Furthermore, this theory is not applicable in developing countries due to non existence or poor development of the capital market.

2.1.1.5 Disequilibrium Models of Investment

In the 1980s, the disequilibrium model is developed by Malinvud(1980) and Sneeses(1982). This model is based on the idea that investment is a function of both profitability and output.

According to Malinvud(1982), investment decision are separated in two stages: the first is the decision to expand the level of production capacity, which depends on the level of capacity utilization in the economy as an indicator of demand condition. The second is relating to the capacity intensity of the additional capacity which is a function of the cost of capital and labor.

In the words of Serven and Solimano (1992), “the distinction between both decisions is necessary due to the assumption of putty-clay technology, so that factor proportions are flexible ex-ante and rigid ex-post”. Thus, the proportion to which inputs are combined before investment is variable but fixed after that.

Sneesses(1987), theoritize that net investment is positively related to the gap between actual and long-run equilibrium capacity. This gap is a difference between actual and equilibrium rates of capacity utilization (sales and constrain) and between equilibrium and mark up rates (profitability). It is this situation of disequilibrium that influence investment behaviors. Nevertheless, the model is based on simplistic assumptions about expectations, it doesn't explain why prices are rigid. This has been the basis of the criticism for the disequilibrium model.

Initiated by the pitfalls of the disequilibrium model, Rama(1987)¹ developed a model that improved up on the disequilibrium models of investment by augmenting the sales constraint and

¹ Cited in Serven and Solimano, 1992

profitability with credit constraints. The model is applicable in developing countries where finance is one of the major constraints of investment. With credit rationing, firms might not be able to undertake their desired level of investment.

As a result of the poor performance of the flexible accelerator models and the Tobin Q theory, recent works on investment focus on the relationship between investment, irreversibility and uncertainty.

2.1.1.6 Irreversibility, Uncertainty, and Investment

In recent year, uncertainty gained considerable attention in the investment literature. Pindyck(1991) introduced uncertainty element into investment theory due to irreversible nature of investment. It suggests that the installed capital cannot put into productive use in a different sector or in economic activities at least not with out incurring a substantial cost. In this context private investors (foreign and local) will be reluctant to commit large expenditure on fixed investments while they are uncertain about future political, social, and economic environments. Changes in uncertainty usually associated with unpredictability. Instability of the incentive structure and lack of sustainability as well as imperfect credibility of macroeconomic policy reforms can have a very significant impact on private investment.

2.2 Investment Models for Developing Countries

The theoretical models lighted above have been applied to study the determinants of private investment in developed countries with a fair degree of success. Nevertheless, the difficulties associated with testing their implications in the context of developing countries are well known. It is often noted that certain institutional and structural peculiarities of developing countries

make the empirical testing of these theoretical models in the context of developing economics rather difficult.

The absence of well functioning financial market, the relatively larger role of the government in capital formation, distortion created by foreign exchange constraints and other market imperfections are contrary to the key assumption of the standard model. Furthermore, data on key variables such as capital stock, the labor force, wages, real financial rates for debt and equity are not readily available for most developing countries (Rama, 1990; Martin and Wasow, 1992; Mlambo and Oshikoya, 2001). Therefore, due to the lack of full-fledged theoretical model applicable to their context, empirical studies in developing countries have tended to use the modified version of the basic accelerator model to investigate the factors that affect private investment with some degree of success.

The models are focusing mainly on testing several variables /hypothesis that are expected to reflect the institutional and structural characteristics of developing countries (often on ad-hoc basis) and advanced to explain variation in private investment in these economies. The inclusion of such variables has often resulted in eclectic and ad-hoc equations, constructed for econometric convenience, with out strong theoretical basis (Seyoum, 2002). These efforts however, have not yet produce a full –fledged model of macroeconomic determinants of private investment in developing countries.

Ø **2.2.1 Macroeconomic Determinants of Private Investment**

Theoretical consideration and empirical findings asserted that macroeconomic policies such as monetary, fiscal and exchange rate as well as trade policies aimed at correcting the unsustainable macro imbalances are bound to affect private investment in developing countries

and the extent to which these policies affect private investment depend on the special characteristics of the countries.

A good number of empirical studies confirmed that macroeconomic factors such as economic growth /per capita income, public investment, availability of foreign exchange, trade flows, credit to the private sector, interest rate, parallel exchange rate, external debt, and macroeconomic uncertainty (such as volatilities of Terms of trade, Exchange rate and inflation.) are the major variables that play decisive role in explaining private investment behavior in developing countries. The theoretical bases for the inclusion of these variables in the investment models of developing countries are discussed below.

2.2.1.1 Growth Rate of Real Output and Private Investment

Neoclassical investments theory suggests that growth rate of real output is positively related to investment because it indicates changes in aggregate demand for output that investors seek to meet. In the same vein, private investment has been hypothesized as a positive function of the income per capital. Since countries with higher per capita income can devote more resources to domestic savings, which could be used to finance investment projects (Greene and Villanueva, 1991).

2.2.1.2 Public Investment and Private Investment

The extent of government involvement in the economy and the government's ability to create an environment conducive to private sector development has received considerable attention in development literatures. Since public investment in developing countries assume relatively large

role than in industrial countries, it becomes important to take into account of its complementarity and substitutability with private investment.

At the theoretical level, crowding- in and crowding -out effect can occur simultaneously. As a result priori, the net effect is indeterminate. In developing countries, however, the crowding-out effect may not be caused by increased tax or high interest rates as in industrial countries, rather it is likely to take one or all of the following forms.

First, limited market size in many developing countries implies public investment in productive sectors may displace private investors from profitable project opportunities, causing what we call a *real crowding-out*. Second, financing public investment from domestic sources may result in financial crowding-out as both agents (public & private) run for the same and often limited credit pool. And finally, financing public investment by monetary expansion and /or foreign borrowing could crowd out private investment through its effect on inflation and debt accumulation which render the business environment uncertain (Fitzgerald et al., 1992).

Crowding-in effect of public investment in developing countries may also not appear through the accelerator channel as in developed countries but rather through the long-run efficiency (profitability) effects of its infrastructure component on private investment (ibid).

Public investment on economic infrastructures such as transport, power, telecommunication etc. and social infrastructure such as education and health enhance the marginal productivities of private inputs (both labor and capital) and reduce the costs of information. For instance, a better road network may reduce expenses associated with the construction of a new factory or the transportation of heavy equipment. Therefore, by lowering production costs and raising the

expected rate of return, public investment on infrastructure may have a strong impact on private capital formation (Agenor *et. al*, 2005). Particularly, the effect is believed to be large in countries like Ethiopia where the stocks are low and basic infrastructure services are lacking or at low level of development.

2.2.1.3 The Foreign Exchange Availability and Private Investment

Access of the economy to international capital market is another key important determinant of private investment in developing countries. It is reasonable to suppose that least developed countries are subject to foreign exchange constrains. Indeed, this is the origin of the debt crises and the central focus of adjustment policies. In consequence, there is a real limit on import capacity, made up of inelastic export supply, exogenous export prices, external credit rationing by international financial institutions, and exogenous interest rates on outstanding debt. Therefore, to the extent that the high import content of private investment in developing countries, foreign exchange constraints affect the capacity to import.

Hence, the availability of foreign exchange will have a positive impact on the private investment by facilitating intermediate and raw material imports (Rama, 1990; Fitzgerald et al., 1992; Martin and Warso, 1992).

2.2.1.4 Trade Flows and Private Investment

Trade flows (usually measured as import plus export) are another important variable that affects the rate of investment in developing countries. An economy highly integrated to the world is expected to attract investment in tradable sectors in order to increase productivity and competitiveness. The volume of trade positively affects domestic investment both through

exports and imports. An increase in export causes an increase in foreign exchange necessary for the purchase of imported capital goods and also expands the market for domestic products. An increase in imports can stimulate investment if it implies greater access to investment goods in the international markets. However, an abrupt increase in exposure to external competition in certain sectors can make these sectors less attractive as a destination for new capital flows. Trade can also negatively affect domestic investment if imports predominantly consist of consumer goods, which may discourage domestic production (Ndikumana, 2000; Costa & Loza, 2005). Trade flows better channel resources and allocates investment outlays to productive sectors. It also affects return to investment (and thereby the investment rate) by altering the cost of new capital.

2.2.1.5 The Availability of Finance and Private Investment

Changes in the volume of bank credits are suggested to have a positive impact on private investment activity among developing countries. Unlike the well-established firms in developing countries, whose investment activities tend to depend more on retained earnings and equity financing, bank credit remains the most important source of investment financing among private enterprise in developing countries. In these countries where financial markets generally repressed, credit policy affects investment directly through the stock of credit available to firms that have access to preferential interest rates rather than through the indirect interest rate channel. In most developing countries, the rate of interest by lending institutes do not change as other rates change, so they do not represent the cost of credit to the private sector. Moreover, the period of loan given by banking institutes are usually short-term. Hence, it seems more relevant to take into account the availability of finance represented by the proportion of credit



disbursed to private investors, as a determinants of the rate of private investment than the controlled interest rate(Harvey, 1985).

2.2.1.6 The Real Interest Rate and Private Investment

The neoclassical model of investment hypothesizes a negative relationship between interest rate and investment. Because according to this theory, higher interest rates increase the user cost of capital and thus reduce investment. Harvey (1985), however, argues that the cost of money to investor is not more important than any other cost such as the cost of labor and capital. Moreover, empirical studies in developing countries supporting the negative relationship are very limited. Because, in these economies where interest rates are administratively controlled, the quantity of credit is more important than the users cost of capital (Seyoum, 2002).

2.2.1.7 Real exchange Rate and Parallel Exchange Rate and Private Investment

Given the high import content of intermediate and capital goods in developing countries as well as the universality of devaluation in adjustment programs, the real exchange rate appeared to be one of the factors that affect private investment. Theoretically devaluation may have different effect on private investment in the short-run and in the long-run.

In the long-run, real devaluation/depreciation increase profitability in export oriented/traded sectors and therefore promotes investment in these sectors. Conversely, in the short-run, depreciation of the exchange rate increases the cost of imported capital goods and thus depresses investment in import dependent production sectors. The net effect on aggregate investment is therefore, uncertain (Agenor and Montel, 1996; Chibber and Shafik, 1992).

Sever trade deficits combines with ill advised monetary and exchange policies, have created a shortage of foreign exchange in SSA countries. This and other factors have caused black market activities to flourish in these countries. To this effect, recent literature on the determinants of private investment in developing countries particularly in Sub Saharan African (SSA) countries take into account the effect of black market premia on the rate of private investment.

High black market premia tend to induce domestic investors to substitute foreign currency hoarding for investment in physical capital. In addition, black market premia may simply be a symptom of overvaluation of national currencies. This by itself depresses investment by reducing foreign demand for domestic products. Black market premia can also be a sign of pervasive price distortions in the economy that adversely affect investment (Serven, 1998; Ndikumana, 2000). A rising premia has a negative impact on official export and foreign trade taxes as well as a positive effect on capital flight (Elbadawi, 1994). Hence it adversely affects private investment.

2.2.1.8 External Debt and Private Investment

The external debt position is one of the crucial variables influencing private investment in developing countries. High external debt depresses investment in various channels.

First, high debt implies that a higher proportion of domestic output is used to meet debt obligation. This phenomena, referred to as *debt overhang*, discourage domestic investment as investors anticipate confiscatory taxes to finance debt service in the future, hence making the expected return to investment to reduce and by raising the risks of investment projects to raise (Borensztein, 1990; Greene and Villanueva, 1991; Serven and Solimano, 1992).

Second, high debt obligations adversely affect the credit worthiness of the country and may restrict its access to future foreign credit to finance investment or trade .i.e. import capacity of the country become less certain. This can even cause credit rationing (Fitzgerald et al., 1992). The credit rationing effect can be important, especially for Sub-Saharan African countries given their low domestic saving rates that force them to depend on foreign funds for investment. Credit rationing thus amplifies the debt overhang effect in reducing domestic investment (Ndikumana, 2000).

Third, high levels of external debt also depress investment by making macro economic environment uncertain. It also increases the vulnerability of least developed economies to exogenous shock, such as fluctuations in exchange rate, and commodity prices, which can reduce the country's ability to honor their debt obligation. The existence of debt overhang would influence the nature of investment mix, with a bias to wards short term investment projects with faster return that are less productive (Were ,2001).

2.2.1.9 Domestic Inflation Rate and Private Investment

Inflation rate is considered as an indicator of uncertainty in macroeconomic environment. However, the relation between inflation rate and investment and hence growth is still inconclusive both in theoretical and empirical literatures. Tobin (1965) predicts positive relationship between the rate of inflation and capital accumulation. He argues that since money and capital are substitutable, an increase in the rate of inflation increase capital accumulation by shifting portfolio from money to capital and thereby, stimulating a higher rate of economic growth. Conversely, it is argued that inflation restricts economic growth largely by reducing the

efficiency of investment rather than its level (Fischer and Modigliani, 1978 cited in Ahmed and Mortaze, 2005).

Different studies consistently show that high and unpredictable inflation rate can have an adverse impact on private investment by distorting the information content of relative prices. Thus, it increases the riskness of longer-term investment. The presence of high and variable inflation rates would also be expected to lower the credibility of the authorities' vis-à-vis the private sector and reduce the returns on private savings and investment, thereby lowering these aggregates (Greene and Villanueva, 1991; Malmbo and Oshikoya, 2001; Mallik and Chowdhury, 2001). However, it has been argued that some (moderate) level of inflation is inevitable for economic growth at least in the short-run. Moderate inflation encourages investment by raising the nominal rate of return on investment by reducing the real rate of interest. This occurs because businesses buy more plant and equipments are more intensively used. What has remained a controversial issue is that, what is the tolerable level of inflation could possibly be (Ikindi, 2003; Ahmed and Mortaze, 2005).

The studies by Fielding (1995) for Cameroon and Were (2001) for Kenya and Oshikoya (1993) for Morocco, Mauritius, Cameroon and Tunisia, report the positive relationship between inflation rate and investment.

2.2.1.10 Terms of Trade Volatility and Private Investment

Terms of trade are one of the most important indicators of external shocks to the economy. Adverse movement in the terms of trade will increase the cost of imports relative to income and also reduce the purchasing power of exports. Severe terms of trade therefore, may worsen the

ratio of current account deficit to GDP – an indicator of external balance and macroeconomic stability; with adverse consequences on private investment (see Oshikoya, 1993 for a detailed discussion).

2.3 Survey of Empirical Literature

The empirical studies conducted in various developing countries using the macroeconomic factors discussed above have produced mixed result depending on the macroeconomic setting of the countries and the econometric methodology employed.

Blejer & Khan (1984) estimated an investment equation to examine the impact of government policy on private investment in 24 countries². They attempted to capture the crowding-in effect of infrastructural component of public investment by its time trend and the crowding-out effect by the deviation from this trend. They found that the level of private investment activity was positively affected by the change in real GDP, the availability of finance to private investment and negatively by excess production capacity. The study also found that the infrastructural component of public investment has a crowding-in effect while the non-infrastructural component crowd out private investment in these countries.

Greene and Villanueva (1991) estimated empirically the effect of different macroeconomic variable on private investment in 23 developing countries during the post 1974 period. In this study domestic inflation rate, external debt burden and real interest rate appear to have had a negative impact on private investment while public investment and per capita income have had a positive effect.

² In the discussion of empirical studies only significant variables are considered.

Prefferman and Madarassy (1993) studied the determinants of private investment in developing countries by classifying the determinants in to positive and discouraging factors. They have found that availability of finance i.e. increase of credit to private sector and growth of domestic demand to be the positive factors whereas external debt, fiscal deficit, volatility of inflation and exchange rate to be discouraging factors. The study has also pointed out that the effect of public investment and real interest rate as uncertain factors.

Cardoson(1993)conducted regression analysis to examine private investment in six Latin America countries(Argentina, Brazil, Chile, Colombia ,Mexico and Venezuela) using quadrennial panel data. He found that public investment had significant positive effect on private investment.

In their cross-country studies of determinants of private investment in four developing countries (Malaysia, Greece, Thailand, Mexico,Korea) using a modified version of the flexible accelerator theory of investment, Wai and Wong (1982), estimated separate equation for each country using the Ordinary Least Sequence (OLS.) The result shows that the coefficients of change in bank credits to the private sector, public investment, private sector output and net capital inflow to private sector appeared to be statistically significant and have the expects positive sign. Moreover when each explanatory variable was treated as the only explanatory variable in the equation, public investment, private sector output and change in bank credit to the private sector were significant for all country except one (Malaysia).

Oshikoya (1993) studied the macroeconomic determinants of domestic private investment in Africa by taking a sample of seven countries (Morocco, Mauritius, Tunisia, Cameroon, Malawi, Tanzania and Kenya) for the period 1970-88. He estimated a private investment

equation on separate pooled data for four middle- income countries(Morocco, Mauritius, Cameroon and Tunisia) and three low income countries(Malawi, Kenya and Tanzania) using ordinary least square method. The estimated result asserted that increases in real output (GDP) growth rate have a positive impact on private investment particularly for low income countries. Public investment is found to be positively related to private investment in both low and middle income countries. The effect of real exchange rate has found to be positive and significant on private investment activities in middle income countries while its effect is negative and insignificant in the low-income countries.

Inflation rates had a strong negative impact on private investment rates in the low income countries. In contrast, its impact on the behavior of private investment in middle income countries is positive. In this study, the adverse effect of the movement of terms of trade on private investment is found to be weak in all countries.

Fitzgerald *et al.* (1992), criticized the private investment models estimated by the above mentioned studies such as by Green and Villanueva (1991) on the ground that these models are derived from theoretical models formulated for firms in developing countries and the underlying assumption are not applicable for developing country. Furthermore, the models ignore import capacity or any variable that takes in to account foreign exchange constraint in developing countries. The models also treat external debt variables as exogenous while there has been a close interaction between external finance and domestic public sector balance in reality.

To this effect, Fitzgerald *et al.* (1992), developed externally constrained private investment model and incorporated such variable in their study of external determinants of private investment in 22 developing countries. They found that economic growth (GDP), lagged value

of private investment, foreign capital inflows and export growth positively and significantly determine the rate of private investment in developing countries.

Recently, macroeconomic factors affecting the rate of private investment in Sub Sahara African countries (SSA) have attracted a considerable attention in investment literature.

A comprehensive cross country study by Seyoum (2002) is one of these studies. It is comprehensive in the sense that, unlike other studies, it incorporated socio-political instability as a determinants of private investment in addition to the usual macroeconomic factors in a relatively large sample of exclusively SSA countries (33 countries) for the period 1970 to 1998.

The paper specified three regression models and estimated these models using the random effect method. And the study under scored that the lagged level of real per capital GDP and its annual growth rate and credit to the private sector, export growth have a significant positive relationship with private investment.

The study also confirmed the complementarity's between public and private investment in SSA. Since the occurrence of complementary does not ruled out substitutability, the study found that government borrowing from the domestic banking system undermines private investment in the region indicating the existence of financial crowding-out. The magnitude of the crowding-out effect is however less than the crowding-in effect of public investment.

Ndikumana (2000) investigated the effects of financial development on domestic investment in a sample of 30 Sub-Sahara Africa countries. The study provided evidence on the negative effect of external debt, inflation, domestic borrowing on investment while per capital GDP growth, and international trade flows (openness) have positive effects on private investment. Unlike

other cross country studies in SSA, this study considered the effect of black market premia on the rate of private investment and found that black market premia adversely affect private investment in these countries.

Similarly, Mlambo and Oshikoya (2001) analyzed the response of private investment to macroeconomic variable in eight (18) African countries using quadrennial panel data regressions covering the period 1970-96. The results proved that, real GDP growth, public investment, credit to the private sector, export growth and trade flows play a significant role in boosting private investment, whereas, fiscal deficit, inflation and exchange rate uncertainty depressed private investment in these countries.

The inconsistency in the findings of different cross – country studies and the peculiar characteristics of developing countries initiated country-specific studies on the determinants of private investment. Most of the studies on individual country are based on the investment function developed in the cross-country regressions.

The study on Turkey by Chibber and Wijnbergen(1988) and the study on Kenya by Matin and Wasow(1992) were among the earlier individual developing country studies. Chhibber and Wijnbergen (1988) have found a strong evidence that non infrastructural investment, the real cost of capital had slow down the rate of private investment while, credit to the private sector and output measured by GNP accelerate the rate of private investment in Turkey during the period 1970-1986. Matin and Wasow(1992),confirmed that government investment on infrastructure, credit to the private sector and foreign exchange availability significantly and positively affect private in Kenya for the period 1968-1988.

Jenkins (1998) analyzed the determinants of private investment in Zimbabwe using a two – step English-Granger approach to deal with non-stationery variables. In the short –run dynamic model, he found that changes in the availability of foreign exchange lagged one period, positively related to change in private investment. In the long-run, investment is constrained by the availability of finance, and it has been deterred by the external debt.

✓ Moshi and Kilindo(1999), studied the impact of macroeconomic variables on private investment in Tanzania for the period 1970-96.They confirmed that, public investment especially on infrastructures and foreign exchange availability, exert positive and significant effect on private investment.

A study by Asante(2000), investigated the macroeconomic factors affecting the rate of private investment in Ghana by decomposing government capital expenditure into infrastructural and non infrastructural components for the period 1970-96 . The study suggested that, public investment on infrastructure promoted private investment while the non infrastructural component depressed it. The study confirmed that, the positive externality of infrastructural investment outweighed the negative effect of non- infrastructural investment. It also revealed that black market premium-one of the measures of macroeconomic instability, is the major hindrance to private investment in Ghana.

Riberto (2001) analyzed determinants of private investment for Brazil. The study revealed that during the period 1956-96, private investment in this country was positively influenced by output, public investment and credit to the private sector and negatively by exchange rate.

Similar study by Badawi (2004) for Sudan, showed that real output (demand), and real credit to the private sector have a significant direct long-run effect on private investment where as government investment, real exchange rate and real interest rate appears to have a significant negative effect.

Amin (1998), had the same argument as Badawi(2004) on his study “Cameroon’s fiscal policy and economic growth accounting model for the period1961-1994 using to-stage least square estimation. The paper pointed out that per capita GDP had positive and highly significant impact while public investment, real exchange and external debt had negative effect on private investment.

/ Acosta and Loza (2004), studied the long and short-run determinants of private investment in Argentina. And he found that public investment, trade flows, and credit to the private sector, promote private investment while external debt discourage it.

Amore recent study by Ndikumana (2005) on the effect of macroeconomic policy on private investment in south Africa, growth in real GDP and public investment, appears to boost private investment while macroeconomic instability as measured by inflation and exchange rate variability depress private investment.

It is important to note that most of the empirical literatures discussed above employed single investment equation framework to estimate private investment. This approach is trouble some in the sense that it doesn’t account non-stationarity and endogneity problem that often taint investment analysis.

The Case of Ethiopia

As can be understood from the above discussion, the findings of the cross-country and country specific regressions are inconsistent suggesting that studies must be undertaken on individual case. Empirical studies on the determinants of private investment in Ethiopia are found to be limited. Getnet (1992),workie(1996) and Mulubirhan(2006) attempted to investigate macroeconomic determinants of private investment in the case of Ethiopia.

Getnet(1992)³,studied the determinants of private investment using annual data for the period 1970-1989. He found that public investment had a “weak” negative externality /crowding-out effect on private investment. In a reduced form equation, the effect of public investment became insignificant. In this study, the growth of real GNP had a negative sign which is inconsistent with the theoretical underpinning.

Workie(1996), modeled private investment in his masters thesis for the period 1975-1994 based on the works of Greene and Villanueva(1991) and Oshikoya(1993).The study included nine explanatory variables such as public investment, lagged percentage change in real GDP per capita, the ratio of lagged debt-service to export, domestic inflation rate, credit to the private sector, the stock of external debt, real exchange rate, and terms of trade as well as a dummy variable to capture the policy change. He estimated six equations using the Ordinary Least Square (OLS) methods and found that, stock of external debt and external debt-servicing negatively and significantly affected private investment whereas, credit to the private sector, real exchange rate index and policy change positively affected the rate of private investment .In this study, public investment, lagged percentage change in real GDP per capita, real interest rate, and

³ Cited in Workie,(1996)

change in terms of trade did not affect private investment in the period under consideration. Given the short period of time used and the inefficient estimation techniques employed (OLS) to examine the time series property of the data; the result of the study could not be reliable.

More recently, Mulubrihan(2006) undertook a study on the macroeconomic determinants of private investment in his masters thesis for the period 1970-2004 using Vector Auto regression (VAR) model. The variables included in the study were: real output, real public investment, real effective exchange rate, real interest rate, bank credit to the private sector and macroeconomic uncertainty proxied by volatilities in terms of trade and general inflation.

The study suggested that, public investment had a crowding-in effect both in short and long-run models. Real banking sector credit to the private sector, real GDP growth, and change in real exchange rate promoted private investment while real interest rate depressed private. According to this study, variability in inflation rate and terms of trade (indicators of macroeconomic instability) have no effect on private investment in the period under consideration.

However, none of these studies has included the import capacity or any other variable reflecting foreign exchange constraint of the country which is found to be the important factor affecting the rate of investment in developing countries (Fitzgerald et al., 1992; Martin and Warso, 1992, Seyoum, 2002; Mlambo and Oshikoya, 2001)

Furthermore, these studies focused on aggregate public investment, ignoring the important question of public investment heterogeneity. This heterogeneity implies that different types of public investment likely have opposing effects on private sector activities. Hence, to study the relationship between public investment and private capital formation, separating the

infrastructural component of government investment has a paramount importance. Such distinction is essential in economies like Ethiopia where state owned enterprises are largely involved in activities that basically replicate the activities of the private firms.

CHAPTER THREE

ECONOMIC GROWTH, SAVING, INVESTMENT AND INVESTMENT POLICIES IN ETHIOPIA

In this chapter an attempt has been made to explain growth in real output and its sectoral growth trends, saving – investment trends as well as the historical development of investment policies and the response of the private sector to the policy environment over the last four decades, 1964/65-2004/05 in general and after the reform(1991) in particular.

The period 1942(end of Italian occupation) to 1974(the overthrow of the monarchy), may be referred as the imperial era, followed by military dictatorship of the *Derg*⁴ era (1975-1991).The third period marks the post 1991 years and may be referred to as the period of EPRDF.

3.1 Real GDP and Sectoral Growth Trend

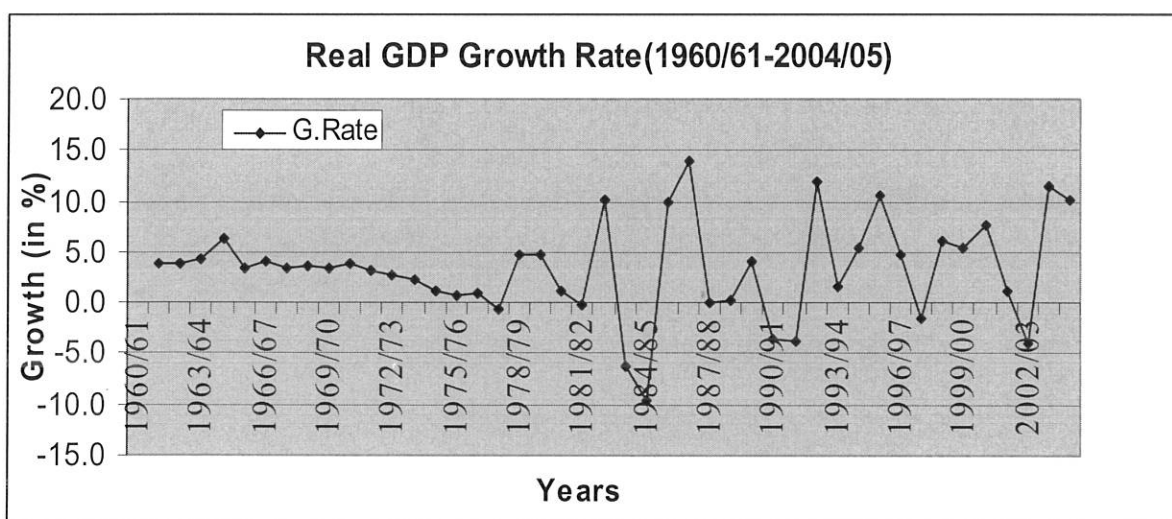
The Ethiopian economy has passed through different growth episodes during the period, 1960/61-2004/05. These three different growth episodes are characterized by the three regimes past and current in the country. According to the survey of Bethelmy and Soderling(2001), the Ethiopian economic history had recorded a sustained and strong growth experience in the period 1960/61-1974/75. This was during the Imperial regime when the three-five-years development plans were designed and implemented. In this period, the economy was growing by an annual average growth rate of 3.7 %(NBE).

⁴ Derg is an Amharic word for military group. Throughout this study, the term Derg ,socialist and military regime/government used interchangeably

Many scholars invariably noted that the 1960s vibrant economic growth performance was somewhat short lived mainly because of the outbreak of the February, 1974 Ethiopian Revolution which is said to have seeded political unrest and economic stagnation in the country. The *Derg* that overthrew the monarchy government in 1973/74 promulgated and implemented centrally planned socialist economic management system. Thus, the centralized economic administration of the then military government that lasted seventeen years experienced a dismal macroeconomic performance.

During the *Derg* period, 1974/75-1990/91, the growth performance became gloomy and experienced tremendous fluctuation to the extent that negative growth rates started to be apparent(see fig.3.1). The crusts were usually recoveries from recessions rather than actual booms. As a result, the crusts and deep troughs offset giving a result of a mere 1.9 percent economic growth during the entire period. This rate as not capable of catching with the estimated average population growth of 2.8%, the per capita GDP declined by about 0.7 percent for the period.

Figure 3.1



Source: NBE

This dismal performance is reflected in all sectors of the economy. During the period 1960/61-1973/74, agriculture, industry and distributive service⁵ sectors had been growing by rates of 2.1, 6.9 and 8.0 percent, respectively (see Table 3.1). However, the growth rates of these sectors exhibited a significant decline between the periods 1974/75-1990/91. The average growth rate of agricultural production declined to 1.6 percent while, the industrial and distributive service sectors dropped sharply to 1.4 and 1.0 percent in that order. The ‘other’ service⁶ sector for which the public administration and defense sub sectors account the major share, had relatively the highest growth rate .i.e. 4.9 percent (see table3.1).

The poor performance of the economy during these periods can be partly attributed to the state of political and economic policies that had been adopted in addition to the exogenous shocks that the country had experienced.

Table 3.1 Growth Rate in Real GDP and Sectoral Growth Trend

Period	Growth rate of RGDP	Agriculture		Industry		Distributive Service		Other Services	
		As % of GDP	Growth rate	As % of GDP	Growth rate	As % of GDP	Growth rate	As % of GDP	Growth rate
1960/61-1973/74	3.7	68.1	2.1	9.2	6.9	11.6	8.0	11.1	7.2
1974/75-1990/91	1.9	55.6	1.6	11.4	1.4	14.3	1.0	18.7	4.9
1991/92-2004/05	4.8	47.3	3.3	10.7	6.0	14.5	6.6	27.6	6.8
1960/61-2004/05	3.3	56.9	2.3	10.5	4.5	13.5	4.9	19.1	6.2

Source: NBE

⁵ Distributive service includes trade, hotel and restaurants, transport and telecommunication sub sectors.

⁶ The ‘other’ service includes public administration, defense, health and education sub sectors.

After the downfall of the *Derg* regime in 1991, the Ethiopian Peoples' Revolutionary Democratic Front (EPRDF) introduced the economic reform programs in 1992/93. These reforms, combined with peace and favorable weather conditions for most of the period in post 1991 have resulted in a relatively good economic performance. In this period, 1991/92-2004/05, the growth rate in real output has been positive except in 1997/98 and 2002/03 in which the economy registered a negative growth rate of 1.4 and 3.8, respectively, due to the severe drought that hit the agriculture sector. Despite of this, on average, the economy has been growing at about 4.8 percent per annum between the periods 1991/92-2004/05.

The recovery in economic performance has been witnessed in all sectors. The agricultural sector expanded with a real growth rate of 3.3 percent per annum, compared with 1.6 percent in the *Derg* regime. The growth performances of Industry, Distributive service and 'Other' service sectors also rose in this period to 6.0, 6.6 and 6.8 percent from 1.4, 1.0, and 4.9 percent in the previous government, respectively (see table 3.1). Nevertheless, except for the 'other' service sector, the economy doesn't show major structural change post 1991 and/or over the last four decades. Agriculture remains to be the main stay of the economy accounting 47.3 percent of GDP after the economic reform (post1991). Notwithstanding the growth upsurge in total output, in post 1991 period, real per capita GDP grew by a mere 1.5 percent per annum which is far below the required rate of at least 5 percent (Real GDP of 7%) to halve poverty by 2015(IMF, 2006).

3.2 Trend in Saving

Economic growth is largely related to the rate of investment which in turn depends on savings. Gross domestic saving (GDS)⁷ as a percent of GDP was steady and over time reaching 13 percent in the last day of the Imperial regime. After the downfall of the monarchy, the socialist state was supposed to increase saving by increasing taxes on luxury commodities and introducing mechanism to increase saving from working people. In actual, however, the reverse was observed, the rate of saving was quite low. Moreover, there was a tremendous fluctuation in saving, ranging from 2.8 percent in 1984/85 to a 12.5 percent in 1987/88. After 1987/88 the rate exhibited a declining trend and in the last day of the Derg regime it reached 3.4 percent (MoFED).

On average, GDS as percentage of GDP during the *Derg* regime was 6.2 percent. One of the reasons for the low performance of saving was the imposed capital ceiling which became a serious disincentive to the saving and further encourages conspicuous consumption.

It is worth noting to mention that even after the overthrow of the military government, the performance of GDS to GDP has not exhibited a remarkable improvement. It rather experienced a considerable fluctuation ranging from a high of 7.7 percent, and a low of 0.9 percent in 1997/98 and 1999/2000, respectively.

In recent years, the performance seems to be disappointing. For instance, GDS as a ratio of GDP averaged only 2.4 percent between the periods 2000/01- 2003/04 which is far below the SSA average of 18.7 percent in the same period (IMF, 2006).

⁷ It is given as a sum of private savings and public savings and measured as residual between GDP at current market prices and consumption expenditure.

3.3 Trend in Investment

The long standing low level of investment has been a major constraint to the country's economic growth. In 1960s total investment⁸ was growing at an average growth rate of 6.5 percent and in 1970s it declined to 5.9 percent. The average annual growth rate revived again and reached 10 percent in the 1980s. In the last days of the *Derg* regime, however it registered a negative growth rate of 4.3 percent due to the misguided economic policy prevailed in the entire period and the high political crises and the devastating civil war of the period.

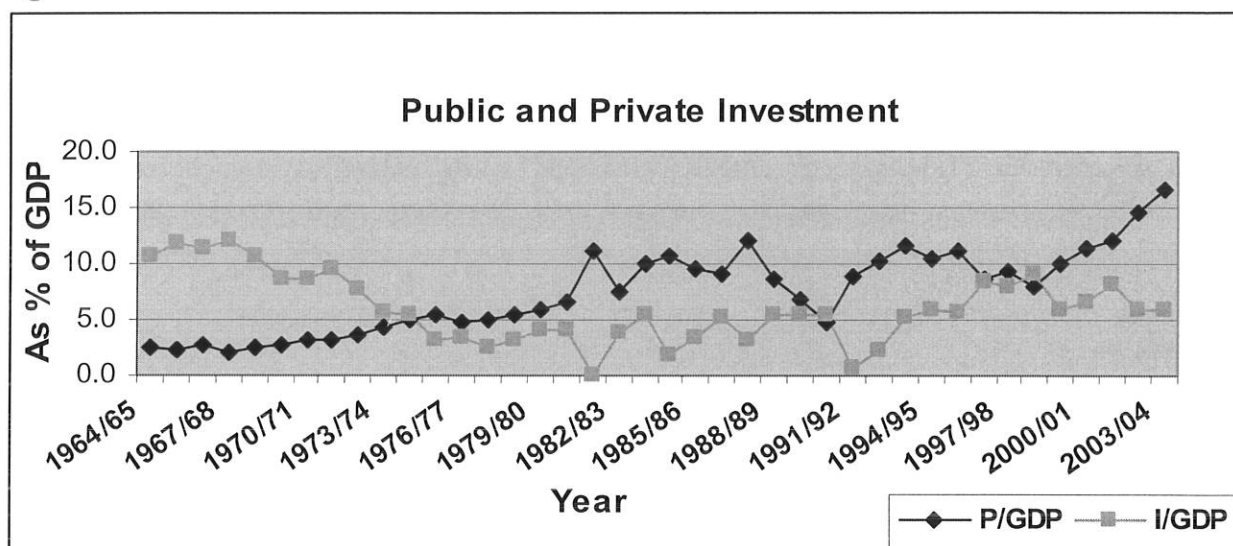
After the socialist government was ousted, total investment has exhibiting a sign of recovery due to a relatively conducive investment environment and stability. Between the periods 1992/93-1999/00, the annual growth rate averaged 12.4 percent. If the year 1999/2000 excluded, the rate became 14.1 percent.⁹ The ratio of total investment to GDP has also shown a remarkable improvement after 1991. During the period 1993/94 – 1999/2000, the ratio increased to 16.2 percent from 14 percent average of the last eleven years of the socialist regime.

Total investment in terms of GDP picked up to historically high level of 19.3 percent between the period 2000/01 – 2003/04 which is above the Sub-Saharan African countries average of 18 percent in the same period (IMF, 2006). Nevertheless, disaggregate figure of total investment gives different picture about the trend of public and private investment.

⁸ Total/aggregate investment is the sum of public and private investments

⁹ In 1999/2000 the country was in boarder conflict with Eritrea and also hit by a natural disaster.

Figure 3.2



Source: MoFED

As depicted in fig.3.2, between the period 1964/65 – 1973/74, Private investment as a percent of GDP (I/GDP) averaged about 10 percent while public investment averaged only 2.6 percent of the GDP (P/GDP) indicating that during the imperial era private investment had greater share of GDP than public investment due to the economic policy that favored the private sector.

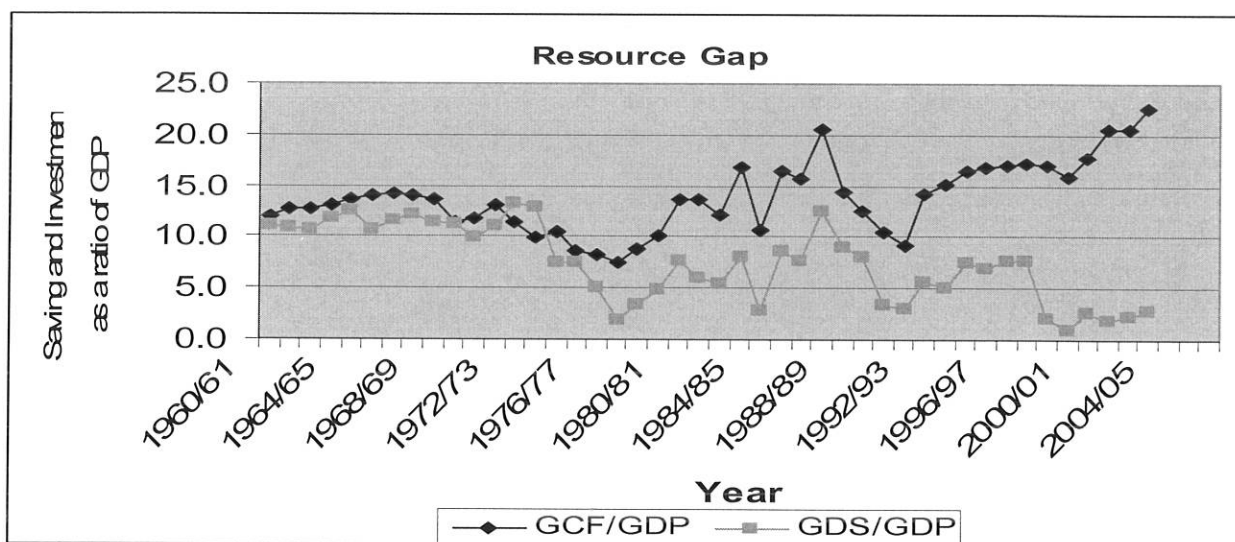
However, this situation was changed following the socialist ideology of the military government, which favors the public economy in the expense of the private sector. As a result public investment steadily increased and when the civil war intensified in 1988/89, it reached 12.3 percent of the GDP. Conversely, the ratio of private investment to GDP slide down and reached 3. 2 percent in the same year. The performance deteriorated and hit the lowest percentage point of 0.6 percent in the last day of the regime. The economic policy of the socialist government that deliberately depressed the private sector is largely attributed to the dismal performance of the private investment.

Following the downfall of the socialist government in 1991, private investment has been showing an increasing trend due to the relatively conducive environment. Consequently, the ratio of private investment to GDP increased progressively and reached 9 percent in 1998/99. It declined during the boarder conflict with Eritrea and recorded 6.5 percent in 2000/01. Between the periods 1992/93-2003/04 the share of private investment reached 8 percent of the GDP. The ratio of public investment has also increased progressively since 1999/00 and attained a high historical level of 16.6 percent in 2003/04.

3.4 Saving and Investment

Throughout the last four decades, the ratio of investment to GDP was higher than the saving to GDP ratio with the exception of 1972/73 and 1973/74 (see fig.3.3 below)

Figure 3.3



Source: MoFED

The difference between domestic saving and domestic investment, commonly called resource gap, was 1.3 percent of GDP per annum in the 1960s, 2.2 percent in 1970s and 7.1 percent in 1980s. As not much improvement has been observed even in the post reform period, the gap magnified and reached about 11.1 percent of the GDP between 1992/93-1999/2000. In recent years, the gap widened significantly and registered an average of 20.3 percent of the GDP during the period 2000/01-20004/05.

To bridge this gap, the country heavily depends on foreign resources. As a result, on average about 67.4 percent and 88.3 percent of the resource gap in the country was financed from foreign source during the period 1993/94-1999/2000, and 2000/01- 2003/04, respectively.

As the resource gap expanded, the external debt was also accumulating reaching a maximum level of 105 percent of the GDP in 2002/03. Even after receiving some partial debt relief under the Heavily Indebted Poor Country (HIPC) initiative in the last few years, the average external debt as ratio of GDP for the last five years stood at 98 percent (NBE, 2005). And due to the huge size of the debt, the financing of this high level of debt is also high. For instance, in 1991/92 the debt-service to export ratio reached a maximum of around 83 percent leaving a very small amount of foreign exchange from the export earning for the domestic investment purpose and hence limit import capacity. Given the high import content of investment in the country, foreign exchange constraint can be one of the factors affecting the rate of private investment in the country.

3.5 Historical Development of Investment Policies in Ethiopia

3.5.1 The Imperial Era (1942-1974)

Investment policies in Ethiopia have experienced a series of changes beginning from the imperial era. Thus, it must be looked at in conjunction with the overall policy of the imperial era.

Following the ejection of the fascist Italian forces of occupation in 1942, the imperial government of Ethiopia devoted the first decade of the post 1942 years to reconstruction of the country. The need to change the static subsistence economy of the post-war period into a dynamic economy needs the declaration of development objective and the channeling of all efforts and resources in activities that would have quick pay-off towards realizing the declared objectives. The first of such declaration was the ten year development program of 1945. To realize the industrialization program a succession of three five-year development plans were implemented with the first in 1957. The achievement of the plan required a planned investment of Birr 673.6 million (1st five- year development plan, 1957).

Due to the low saving capacity and the non existence of the entrepreneurial class, foreign capital was believed to have an important roll in the financing of the planned investment. To this end, the imperial government started creating the necessary mechanism through and by which the foreign investors could be attracted to invest in the country. The first such legal document was the statement of policy for the encouragement of foreign investment in Ethiopia. (Imperial Ethiopian Government-IEG, 1950), which provided a five years tax holiday, duty free importation of machineries and remittance of profit. Interesting point in the policy statement

were the fact that there was no mention of minimum size of investment that would make it eligible for the benefits and the line of investment that could be termed as beneficial. Furthermore, it did not mention the government body responsible for its implementation.

Two year later after the legal notice of 1950, proclamation No.137/1953 was proclaimed related to the marine industry. Under this proclamation merchant ships registered under Ethiopian law were exempted from payment of all taxes and some duties free and charges. The proclamation also exempted marine industrial enterprises from all kinds of taxes and duties for a period of five years, provided they invested in the country not less than Birr 500,000.

The government, with the objective of enhancing the expansion of agricultural and industrial investment; legislated the agricultural and Industrial Expansion Proclamation in 1954. This proclamation had a wider coverage than the legal notice of 1950. Since it covered both industrial and agricultural investments and exempted imports of any and all machinery and implemented from all duties and taxes (IEG, 1954).

The other investment legislation was the income tax proclamation No.173/1961. This proclamation exempted enterprises engaged in industry, transport and mining activities from income tax for a period of up to 5 years if the investment was Birr 200,000 or more and, for three years if Birr 500,000 is invested in extension of an already existing enterprise provided the extension is operated as a separate technical unit with separate accounts.

Thus, between 1950 and the end of the first five years plan period in 1961, four different pieces of legislation were enacted to encourage foreign investors. Due to lack of information on the size of the actual inflow of foreign capital, the effect of these legislations can not be measured.

However, since the inflow of foreign capital was not as much as expected especially towards the beginning of the planned period, the plan failed to achieve its target (2nd five-years development plan, 1962).

In 1963 , the government launched its second five year development plan with a total investment of Birr 2.7 billion, with the objective of shifting the structure of the economy from agriculture to industry , which was expected to result in an annual GDP growth rate of 4.3 percent and a per capital growth rate of 2.8 percent. Since the required expenditure could not be covered by domestic sources, the plan envisaged an inflow of foreign capital to the tune of Birr 639 million(2nd five-years development plan, 1962).To ensure an adequate inflow of foreign resources, the government proposed to intensify mobilization of foreign resource by expanding the range of existing benefits, privileges and exemptions. As a result, the government legislated an investment decree in 1963 and established an implementing office.

The “investment Decree” (IEG, 1963) (Which became enacted as proclamation in 1966), consolidated the hitherto scattered investment policies and broadened their coverage. At the same time, it created the “investment committee” composed of the Ministers of Commerce and Industry as a chair person, Finance, Agriculture, the governor of National Bank of Ethiopia and General Secretary of the planning Commission as members.

In this proclamation investors were offered the following benefits:-

- Income tax relief for five years if the investment is new and is valued at no less than Birr 200,000 or three years if the investment is an extension of an existing enterprise,

operated independently of the established plant and the investment is valued at no less than Birr 400,000.

- Import duty relief: imports related to the investment were to be free of import duty.
- Remittance in foreign exchange to be provided by the Central Bank.
- Export duty relief: outputs of the investment were to be exempted from export tax.
- Protection was to be provided in the form of tariff and /or quantitative restrictions where this was thought necessary.

At the end of the plan period, the inflow of foreign capital was more than anticipated. Gross Domestic Product registered a growth of 4.6 percent as compared to the planned 4.3 percent per annum. Actual investment exceeded planned investment by more than 10 percent. Both the total domestic and foreign resources were higher than the planned and so proved the success of the policy (3rd five year development plan, 1968).

The government was launched the third five years plan in 1969 and completed in 1974. Again, in this plan foreign resources were expected to play a crucial role. The plan envisaged a total investment of Birr 3,450 million birr of which Birr 3,000 million was monetary investment. Of the total monetary investment, 46 percent was to be covered by the private sector and the balance was that of the central government and autonomous agencies. The public sector was intended to concentrate on the development of infrastructure such as transport, health, and education while the private sector was expected to invest in directly productive activities (3rd five year plan, 1968). At the end of the third –five years plan, the government sought to follow it up with the fourth for which the draft was completed and new investment policy proposed

(Befekadu, 1992). However, this intention was not carried through because of the revolution in 1974.

The investment law of the Imperial era has criticized on the ground that it rather opened the way for penetration and domination of foreign capital. It is agreed that, the feudal economic system which encouraged aristocratic consumption style rather than saving and the liberal investment climate that called for foreign capital to fill the void were among the reasons for such domination (Gulilat, 1994).

In spite of this however, the investment proclamation of the imperial era might, had the flavor of its openness and certainly indicated that the direction of the experiment was towards a liberalized market-based economy. As mentions above, the investment pattern envisaged for the third five year plan, where the state was to concentrate on infrastructure building and the private sector in direct productive activities, was also additional evidence of this fact.

3.5.2 The Derg Period (1975-1991)

The economic policy of the government that ousted the imperial regime was one that limited the role of foreign and domestic private direct and indirect investment and favored to public economy. The government assumed the burden of developing the country using resources mobilized by and through it. To achieve this goal, the military government Proclaimed Proclamation No. 26/1975 that provided ownership and control by the government of means of production and hence, the government nationalized land, industries, commercial farms, financial institutions, houses etc and curtailed the market and resources. At about the same time as the nationalization proclamation, the *Derg*, issued proclamation No. 76/1975 that restricted private operation to a few lines of activities and imposed ceiling on them (Capital ceiling of Birr

500,000). Only industrial business were allowed (with out branch) and where private business are organized in the form of partnership, membership was restricted to 5 persons. Thus, the activities of the private sector in the country were suppressed and restricted in micro and small scale enterprises.

As a matter of policy, the government did not explicitly rule out the participation of foreign investment in the economy. The economic policy issued early in 1975 specified the activities in which foreign capital was to join up with that of the government. In particular, the government expected foreign investment in the extraction (with the exception of precious metals as radioactive materials) and heavy industries. However the conflicting attitude between policy and action and the ideological shift conspired to deny the country any foreign investment (Befekadu, 1992).

In 1983, the government promulgated the joint venture proclamation (proclamation No 235/1983), specifying the conditions and areas in which foreign capital could be invested in the country. According to this proclamation the government must have the majority (A minimum of 51 %) share and the managers of such enterprises were to be Ethiopian. The proclamation also established institutes called “The National Revolutionary Development Campaign” and “Central Planning Supreme Council (Supreme council)” for its implementation. However, due to the above restrictions and the other conditions, the proclamation was found to be unattractive to potential investors and nothing comes out of it except the establishments of six joint ventures between 1983 and 1988. Of which two were liquidated.¹⁰

¹⁰ Melak Tefera, 1989. Report on the amendment of Proclamations No.235/1983. April 8, 1989. Amharic version.

In 1989, the government declared Special Decree No. 11/1989, which amended proclamation No. 235/1983. The decree, to some extent liberalized investment possibilities. It permitted domestic private capital participation in joint ventures and lifted the restriction on the duration of joint venture agreement (which was 25 years) and the provision for majority share holding of the government. To implement the special decree an office called Office of Investment and Joint venture was established in July 1990. The function of the office was to serve as a secretariat for the investment committee headed by the Deputy Prime Minister. Nevertheless, given the other constraining policies of the socialist government, again nothing much seems to have come from the decree either. As a result, the average share of private investment to GDP during the period 1974/75-1990/91 was only 4.5%.

In the last days of the regime (1990), half hearted reforms attempt were instituted when the government chose to pursue the “mixed economy” approach to development. Following this economic policy shift, Special Decree No. 17/1990 was issued in May 1991, which removed most of the restrictions imposed on domestic private business and foreign investment in previous legislations (Teshome, 1996; cited in workie, 1996). However, the special decree was not put in to force since the government failed to get the chance to implement it.

3.5.3 After 1991(The Period of EPRDF)

After the down fall of the military government on May 1991, the Transitional Government of Ethiopia (TGE) issued the economic policy of the transition period. In cognizant of the constraints that were imposed on the private sector development, the Transitional Economic Policy stressed the need for the change of policy to promote private capital participation.

The policy stated that in order to encourage private capital participation the state will;

- Create enabling environments for the participation of both domestic and foreign capital in economic activities with out any capital limitation.
- Remove all existing bureaucratic procedures and red taps and introduce new laws and regulations and enforce them to enhance democratic and foreign capital participation.
- Provide incentives and encouragement to promote domestic capital participation and encourage a wider participation of private capital.

It was also mentioned in the economic policy document that a comprehensive package of incentives for domestic and foreign private capital participation will be worked out by the State.¹¹

Based on this background, the TGE issued investment proclamation No. 15/1992 in May 1992. In order to materialize the policy of encouraging private sector development, the proclamation was a major departure from the previous regime's investment Special Decrees (Decree 17/1990 and the joint venture special decree No. 11/1989.) It permitted few areas of investment, particularly for domestic investors, such as air transport, electricity production and distribution, banking and insurance. Under this code, areas eligible for investment incentives were restricted to broad sectorized categories such as agricultural development and agro processing, manufacturing, large scale capital intensive road and building construction; the development, protection and preservation of natural resource as well as rural transportation.

¹¹ Ethiopian's economic policy during the transition period Nov. 1991.

The incentive provided were 100% duty exemption for imported capital goods and equipment including spare parts worth up to 15% of the value of the capital goods imported and exemption from the payment of income tax for periods ranging from 3-8 years depending on the type and location of investment.

The proclamation created an investment office called Investment Office of Ethiopia at a central level and Regional Investment Offices at regional levels. The proclamation was in force for duration of four years (July 1992- June 1996). During this period, a total of 2,600 projects with a combined investment capital of about Birr 19.5 billion were issued with investment permits. Of which, 24 projects with an estimated capital of Birr 1.6 billion were of foreign origin. In spite of this however, in the course of exercising investment proclamation No. 15/1992 a number of short comings had came to light.

The most import shortcomings were the following:-

- Lack of clarity of projects eligible for investment incentives and the exclusion of education, health, tourism and construction contracting below grade 1 from the incentive scheme;
- Lack of clarity with respect to the areas reserved for the government, Ethiopian nationals and domestic investors as well as areas open four foreign investors;
- The indiscriminate minimum capital threshold requirements of US \$500.000 per project for foreign investors (i.e. for wholly foreign owned , joint ventures and engineering and technical consultancy projects);
- The exclusion of Small –Scale Investment activities (each with an investment capital of less than birr 250,000) from the incentives scheme.



To amend these weak points, investment proclamation No. 37/1996 was promulgated in June 1996. The new proclamation differs from proclamation No 15/1992 in the following respects;

- Areas eligible for incentives were clearly specified and classified into two categories (pioneer and promoted activities) reflecting their importance to the development of the national economy.
- Areas reserved for Ethiopians, domestic investors, foreign investors , joint venture investment between foreign and domestic capital and for governments were clearly indicates and some areas of investment that were reserved for government were allowed for the participation of private investors (e.g. large – scale hydropower generation above 25 MW for all private investors).
- The minimum capital required of a foreign investor investing jointly with domestic investor(s) was reduced from US\$ 500,000 to US\$300,000 and the minimum investment capital required of a foreign Investor investing in engineering or other technical consultancy service was lowered to US\$100,000.
- Small- scale domestic investor with an investment capital of less than Birr 250,000 was exempted form the payment of import customs duty on capital goods.
- The incentive scheme were extended to include activities such as education, health, tourism, engineering and technical consultancy as well as construction contracting below grade 1.
- The requirement for foreign investor to deposit in a blocked account of US \$ 125,000 was removed.

On top of the above improvements, proclamation No. 37/1996 attempted to direct investment to priority areas by granting income tax exemption of different duration for different types of projects. Projects labeled as pioneer are exempted from income tax for longer period than projects labeled as promoted activities. For the administration of private investment in the country, proclamation No. 37/1996 has established the Federal Investment Board and replaces the Ethiopian Investment Office by the Ethiopia Investment Authority (EIA).

During the period of enforcement of proclamation No. 37/1996 (June 1996- Feb. 2001), a total of 4008 investment projects with a total capital of about birr 104.4 billion were granted investment license. Of these 249 (1.6%) with a capital of about 10.0 billion were foreign investments.

Again, proclamation No. 37/1996 was amended in January 2002 by proclamation No. 280/2002 in order mainly to redefine domestic investor so as to include foreign nationals who were Ethiopian by birth, and to allow private investors to invest jointly with the government in defense industries and telecommunication service.

The proclamation permitted specification of areas of investment exclusively reserved for Ethiopian national as other domestic investors. To widen the scope of participation of foreign investors, it reduced the minimum capital required of a foreign investor(s) from US \$ 300,000 to US \$ 60,000, and the minimum investment capital requires of a foreign investor investing in engineering, architectural or other technical consultancy services to US \$ 50,000 from US\$ 100,000.

Measures that have been taken in recent years to improve the investment climate include gradual removal of administrative and other bottlenecks. In light of this, Proclamation No. 280/2002

was slightly amended in October 2003 by investment proclamation No. 373/2003 mainly with the aim of making the system of administration of investment transparent and efficient. As a result, proclamation No. 375/2003 is a proclamation to amend the re – enactment of proclamation No. 280/2002.

The Ethiopian Investment Authority, which has been reestablished under proclamation No. 37/1996, is renamed as the Ethiopian Investment Commission, in proclamation No. 375/2003. Proclamation No. 375/2003 extended the areas of investment that are exclusively reserved for the government in proclamation No. 280/2002 by adding air transport services using aircraft with a seating capacity of more than 20 passengers under the areas of investment reserved for government. Under this proclamation, the issuance, renewal and cancellation of investment permits for air transport services and for generation or transmission or supply of electrical energy are carried out by the Ethiopian Civil Aviation Authority and by the Ethiopian Electric Agency, respectively, representing the Ethiopian Investment Commission.

Following proclamations No. 280/2002 and No. 375/2003 regulation No. 48/2003 was issued. The regulation specified the investment incentives provided and investment areas reserved for domestic investors. The incentives aim at encouraging investors who are engaged in producing of export commodities and invest in relatively remote areas. The incentives among others include;

Exemption from income tax:-

- An investor engaged in manufacturing or Agro–industrial activities or the production of agricultural produces determined by the Investment Board, and who exports at least 50 percent of his product or supplies at least 75 percent of his product to an exporter as a

production input ; is eligible for income tax exemption for 5 years. (The investment Board may under special circumstances grant income tax exemption for a period not longer than 7 years)

- An investors engaged in the above mentioned activities and export less than 50 percent of his products or supplies his products only to the domestic market is eligible for income tax exemption for 2 years.
- When the investment is in relatively underdeveloped regions such as Gambella, Benishangul and Gumuz, South Omo, and in Afar Zones the investor is eligible for income tax exemption for an addition of 1 year's period.

The incentives are also extended for expansion or upgrading of an existing enterprise. An investor engaged in the activities mentioned above who exports at least 50 percent of his products and increases, in value, his production by 25 percent is eligible for income tax exemption for 2 years.

Exemption from the payment of custom Duty:

- An investor is allowed to import duty- free capital goods and construction materials necessary for the establishment of a new enterprise or for the expansion or upgrading of an existing enterprise,
- In addition, an investor granted with a customs duty exemption privilege, allowed importing duty-free capital goods necessary for his enterprise.

Notwithstanding, the above privileges, the Board may, by its directive, bar the duty –free importation of capital goods and construction materials where it finds that they are locally produced with competitive price, quality and quantity.

An investor pursuant to the regulation is also given the same privilege for spare–parts whose value is not greater than 15 percent of the total value of the capital goods to be imported. Regulation No. 48/2003 also specified areas of investment not eligible for customs duty. Some of these areas include: - hotels (excluding star-designated hotels), motels, restaurants which do not have international standards, whole sale, retail and import trade; real estate development, radio and television broad casting services.

This regulation also outlined areas that are exclusively reserved for domestic investors. Some of these areas among others include, banking and insurance services and air transportation less than twenty (20) seats.

Between the period July 2002/03 (the enforcement of proclamation No. 280/2002) to July 2004/05, 6564 projects with capital of about 88.9 billion Birr granted investment permit. Out of these, 1039(16%) projects with a total capital of about 26.1 billion Birr are foreign investment while the balance is domestic.

It is plausible to suggest from the above analysis that performance of private investment in the country has been highly responsive to investment policies that emanated from the over all economic policy pursued by the regimes. Specially, after 1991 both domestic and foreign investors have been positively responding to the policy and regulatory measures taken in the country.

Despite the remarkable improvement in the participation of the private sector in the country's development endeavors, the implementation rate of the licensed investment projects is very dismal. Out of the total 13154 licensed investment projects between 1992/93-2004/05, only 21% became operational while 68 % and 11% are pre-implementation and under-implementation stages, respectively (EIA, 2005). Therefore, in order to enhance the role of private investment in the poverty reduction effort, the root causes for the poor implementation rate of these projects should be identified and addressed.

Similarly, though the inflow of foreign direct investment (FDI) has been exhibiting encouraging improvement following the subsequent amendment of the investment code, FDI is still found to be very low in light with the development needs of the country. Over the last fourteen years (1992/93-2004/05), FDI constitutes only 9.9 % of the overall projects that granted investment license. This suggests the need to exert much effort to attract FDI into the country.

It is worth noting to mention that 51% of the licensed projects are located in Addis Ababa. The concentration of investment activities in and around Addis Ababa is partly attributed to the existence of relatively developed infrastructural facilities.

CHAPETR FOUR

MODEL SPECIFICATION AND METHODOLOGY

4.1 Model Specification

The model of private investment in this study is an eclectic version of the basic accelerator model. The specification is based on the existing theoretical and empirical literature on developing countries and it is basically a combination of the specification followed by Greene and Villanueva(1991) ,FitzGerald *et.al*,(1992) and Ndikumana, (2000).The model is specified in such a way that it captures the effects of different macroeconomic factors such as real output, public investment on infrastructure, trade flows, external financial constraint(foreign exchange availability), as well as domestic and international risk variables(domestic inflation and external debt service) on the private investment. Therefore, the regression equation is specified as:

$$PRI_t = f (RGDP_t, INFR_t, TF_t, FEA_t, DSX_t, DINF_t) \dots\dots\dots 4.1$$

Where:

PRI_t = Private investment at time t

RGDP = Real Gross Domestic Product (to capture the accelerator effect) (+)

INFR = Public investment on Infrastructure (reflects the crowding-in effect) (+)

FEA = Foreign Exchange Availability (+)

TF = Trade Flows (+)

DSX = External Debt Service to Export ratio (reflects the crowding-out effect) (-)

DINF = Domestic inflation rate (reflects macroeconomic instability) (-)

In all the econometric analysis carried out use was made of the natural logarithm of the time series of each variable except domestic inflation in equation (4.1). This is because series expressed in logarithms present roughly constant variances, while the variance of a level series tends to increase with the size of the sample. It also helps the regression directly yield elasticity coefficients of investment with respect to explanatory variables making it readily possible to evaluate the economic importance of the relationships.

Therefore, by expressing equation (4.1) in the natural logarithmic form, the study attempted to look at the relative contributions (elasticity) of each variable to the private capital formation.

Hence, the model to be estimated is specified as:

$$LPRI_t = \beta_0 + \beta_1 LRGDP + \beta_2 LINFR + \beta_3 LTF + \beta_4 LFEA + \beta_5 LDSX + \beta_6 DINF + \varepsilon \dots\dots\dots 4.2$$

In this equation:

LRPI_t = the Natural Logarithm of Private Investment at time t.

LRGDP = the Natural Logarithm of real GDP (+)

LINFR = the Natural Logarithm of Public Infrastructural Investment (+)

LFEA = the Natural Logarithm of Foreign Exchange Availability (+)

LTF = the Natural Logarithm of Trade Flows (+)

LDSX = the Natural Logarithm of External Debt Service to Export ratio (-)

DINF = Domestic Inflation rate (-)

The β 's are coefficients of elasticities and ϵ_t is the random disturbance term. The expected sign of each explanatory variable is indicated in the bracket. The sign shown is based on the theoretical underpinning of each variable discussed under section 2.2.1.

4.2 Data, Sources and Description

Since the reliability of any econometric analysis depends among other things, on the availability and quality of the data employed, it is essential to discuss the nature and sources of the data used for the study.

The study employs secondary data from domestic sources. The former Ministry of Economic Development and Corporation (MEDaC) now Ministry of Finance and Economic Development (MoFED) and National Bank of Ethiopia (NBE) are the principal source of the data. The choice of the period of analysis is based on the availability of published annual data for all the variables incorporated in the model.

The macroeconomic/ national account data of MoFED don't report the capital formed by the private sector separately. As a result, private investment series is calculated as the difference between Gross Capital Formation (GCF) and public investment by taking government capital expenditure as a proxy for public investment.

Public
Public investment on infrastructure includes both economic and social infrastructure. Hence, infrastructural investment in this study refers to government capital expenditures on road, telecommunication, power, water supply, education and health. The data are extracted from the government finance statistics reported by MoFED.

Real Gross Domestic Product (RGDP) is secured from the NBE while CPI is obtained from Central Statistical Agency (CSA) and inflation rates were derived as percentage change in CPI for each period.

Trade flows are measured as the sum of export and imports and the data are taken from the national account reported by MoFED.

Foreign exchange availability is crudely measured as the sum of export and in flow of capital in the forms of foreign loan and credit net of debt servicing. The debt services data are taken from NBE and MoFED.

4.3 Methodology

Most of the literatures on the determinants of private investment in developing countries employ single investment equation model for estimation. This approach however is not reliable in the sense that it doesn't account the problem of exogeneity and non stationarity. Interaction and interdependence of economic policy variables make it necessary that investment models incorporate a set of equations. Each equation in the system describes the behavior of certain variables which appears in the other equation as an explanatory variable. To control for simultaneous interactions between these variables, Sims (1980) advocated the use of a vector autoregressive (VAR) model.

A VAR is a 'k' equation: 'k' – variables linear model in which each variable is in turn explained by its own lagged values and the lagged values of the remaining k-1 variables.

This approach provides a systematic way to capture the evolution and the interdependence between multiple time series variables. It also provides a coherent and credible approach to data description, forecasting, statistical inference and policy analysis (Sims, 1980).

The VAR model offers a number of advantages over the specification and estimation of a single equation model.

First, in developing countries in general it has been proved difficult to estimate robust structural model of private investment (Agnor, 2004) and hence, it offers a way of analyzing the dynamic relationship between variables without having to fully specify a structural model of private investment. The lumpy nature of infrastructural investment (in roads or telecommunication) may be felt only after several years; VAR models allow us to take into account delayed responses with a parsimonious lag structure.

Second, VAR approach doesn't impose any causal links between the variables a priori. Rather, the models allow testing whether the causal relationship implied by single structural equations is valid or whether there are feed back effects from output to the input.

Third, unlike the single structural equation approach, the VAR approach allows for direct link between the variables in the model. Finally, the cointegrated VAR model helps account for spurious correlations and exogeneity bias as it is designated for non-stationarity time series, and it assumes all variables in the system are potentially endogenous (Harris, 1995).

Despite the fact that VAR approach has the above advantage over the single equation estimation procedure, it is not without problem. The approach is criticized on the grounds of

data mining, some times leading to generation of results which though statistically sound, are at variance or incompatible with economic theory. It is therefore, necessary to always invoke economic theory for guidance on model specification, estimation, reduction and/ or identification and interpretation.

Taking into account the above advantages of VAR model this study employs a simple (VAR) model.

4.4 Stationary and Non-Stationary Series

Econometric modeling of time series between economic variables requires time series data on the variables. However, such time series data usually create several problems in an attempt to construct an econometric model for the following reasons. First, empirical works based on time series data assume that the underlying time series is stationary. Second, in regressing a time series variable on another time series variable(s), one often obtains a higher R^2 even though there is no meaningful relationship between the two. This situation exemplifies the problem of spurious or non sense regression (Gujarati, 2004).

The classical regression technique, the ordinary least square (OLS) assumes that the variables under consideration are stationary. Stationary time series have time independent value, a finite variance, transitory innovation from the mean and a tendency to return to its mean value. This means in simple words, their mean, variance and covariance are time invariant. As a result, shocks to a stationary series are temporary and over time will dissipate. However, almost all macroeconomic variables are non- stationary in perception that the mean and variance depend on time and thus there are no tendencies for them to hold back to a given values and hence

shocks have permanent effects. Non stationarity can be due to evolution of the economy, legislation change, technological change, and political turmoil *inter alia*. Unfortunately, regression carried out with such non stationary series give spurious and inconsistent result particularly when the variable involved exhibit consistent trend, either upward or down wards, over time (see Thomas, 1993 for detailed discussion). So, in order to avoid spurious regression problem, stationarity of the time series econometric variables used in estimation need to be tested. In this paper, Dickey – Fuller (DF), Augmented Dickey Fuller (ADF) as well as Phillips Pherson (PP) statistical tests are utilized to test for stationarity.

For two or more time series non-stationary variables there may exists linear combinations which are stationary. This phenomenon is called cointegration and plays a dominant role in modern empirical macroeconomic research. In testing for cointegration, the Engle-Granger two –step procedure and the Johansen’s maximum likelihood estimation procedure are often used.

4.5 Testing for Unit Roots

In time series econometric analysis, if a variable contains a unit roots then it is non-stationary and unless it combines with other non-stationary series to form a stationary cointegration relationship, the regression involving the series can falsely imply the existence of meaning full economic relationships. Hence, to avoid the problem of spurious regression testing for the presence of unit roots before carrying out estimation has a paramount importance.

The Dickey-Fuller test (DF) and Augmented Dickey-Fuller test (ADF) are the most widely used unit root tests in applied works. The ADF test is a modification of the DF test and involves augmenting the DF equation by lagged values of the dependent variable. This is done

to ensure that the error process in the estimated equation is residually uncorrelated but also captures the possibility that the dependent variable is characterized by a higher order autoregressive process.

This study employ ADF test allowing for both constant and trend terms which is given by:

$$\Delta y_t = \mu + \gamma T + \beta y_{t-1} + \sum_{i=1}^k \lambda_i \Delta y_{t-i} + \varepsilon_t \dots \dots \dots (4.3)$$

Where y_t is the variable under consideration, Δ first difference operator, T a time trend, k is the lag length and ε_t is a random variable assumed to be “white noise”. Therefore, equation (4.3) is applied to variables in equation (4.2) to test for the null hypothesis of non stationary against the alternative hypothesis of stationary and hence the order of integration. ADF is criticized on the ground that it is unable to discriminate well between stationary and non-stationary series with a high degree of autocorrelation. To take care of this problem the ADF test is also supplemented by the Phillips - Perron test (PP). PP test has an advantage over the ADF test as it gives robust estimates when the series has serial correlation, heteroscedasticity, and there is structural break (Harris, 1995)

4.6 Cointegration Analysis

As discussed above the classical regression assumes that both the dependent and independent variables to be stationary over time. However, most of economic variables exhibit long-run trend movement and only become stationary after they are differenced. As mentioned above,

applying the classical regression techniques to the levels variables leads to a spurious correlation.

To take care of the non-stationarity of the variables and confirm whether there exists a long-run equilibrium relationship the concept of cointegration is used. This concept basically refers to the condition that even if individual series are non-stationary (i.e. Are $I(1)$ series), if there exists a linear combination of these ($I(1)$) series in the regression equation and is non-stationary, then the regression is not spurious regression.

The economic interpretation of cointegration is that if two (or more) series are linked to form equilibrium relationship spanning the long-run, then even though the series themselves may contain stochastic trends (i.e. non stationary), they will nevertheless move closely overtime and the difference between them will be stable (i.e. stationary). Thus the concept of cointegration mimics the existence of a long-run equilibrium to which an economic system converges over time, and the residual obtained from the linear combination of the series could be interpreted as disequilibrium error (i.e. the distance that the system is away from equilibrium at time t) (Harris, 1995).

A main feature of cointegrating variables is that their time paths are influenced by extent of any deviation from the long-run equilibrium. If the system is to return to the long-run equilibrium the movement of at least some of the variables must be respond to the magnitude of the disequilibrium. The disequilibrium state where adjustment to the equilibrium is occurring is referred to as the short run dynamics.

The short-run dynamics is influenced by the deviation from the long-run relationship. The dynamic model implied here is an error correction. In an error correction model (ECM), the short-run dynamic of the variables in the system are influenced by the deviation from equilibrium (Enders, 1995).

As stated above, there are two major approaches of testing the existence of cointegration between the variables of interest and estimating the cointegrated vector. The Engel-Granger (EG) and the Johansen approach.

Engle and Granger two-stage approach enables determination of whether a long-run relationship exist among two or more non-stationary variables, by examining the stability deviations from the relationship using the coefficients estimated by fitting the static model using OLS (ignoring any dynamic adjustment that may be present in a complete model).

The first step in this approach is to determine the order of integration of the variables through unit root test to ensure that the necessary condition for cointegration is satisfied. According to this technique, once it is established that both variables say x and y , are integrated of the same order, one has to test the order of integration of the residuals in the OLS regression. If both x and y are integrated of order one i.e. $I(1)$ and the residuals are integrated of order zero ($I(0)$), we conclude that x and y reach a long-run equilibrium.

The second step is to estimate the error correction model (ECM) by combing the error term with the first difference of the variables (short-run indicators). This formulation (ECM) helps to show the deviation from the equilibrium position and how an adjustment towards the

equilibrium is made by combining both the long-run and short-run version of the model in one regression (Enders, 1995; Patterson, 2002).

Despite the EG procedure is relatively simple to implement, the approach suffers from a number of weaknesses. In particular, when we have more than two variables, the residual-based technique no longer has a unique vector. In fact, if there is k variables in the system there must be at most $k-1$ possible vectors (Enders, 1995). Secondly unless one has a clear theory, the interpretation of the out comes vector in this residual-based method is problematic. Furthermore one has to make a strong assumption about a unique cointegration vector in the analysis. These shortcomings of the EG approach have led to the popularity of the Johansen approach, which handles multivariate systems in a better way.

Johansen's cointegration testing approach is based on maximum likelihood estimation and likelihood ratio testing of Vector Error Correction Model (VECM). The use of error correction modeling provides an additional channel through which causality in the Granger sense may be assessed. The standard Granger test may provide invalid causality information due to the omission of error correction terms from the tests. If the error correction term is excluded from causality tests when the series are cointegrated, no causation may be detected when it exists, i.e., when the coefficients of the error correction term is statistically significant. The Johansen procedure doesn't require a priori endogenous-exogenous distinction among variables and it can also identify multiple cointegration vectors.¹²

¹² The method considers all variables in level as endogenous and lags of the variables as exogenous.

Under this procedure, the variables of the model are represented by defining vector of potentially endogenous variables X_t which is modeled as an unrestricted vector auto regressive (VAR) involving up to p -lags represented by:

$$X_t = A_1 X_{t-1} + A_2 X_{t-2} + \dots + A_p X_{t-p} + \Phi D_t + \xi_t \quad (t=1 \dots T) \dots \dots \dots 4.4$$

Where: $X_t \equiv [X_{1t} \dots X_{kt}]$ is a $k \times 1$ vector containing k variables in the system. In the case of this study the variables are: Private investment (PRI), real output (RGDP), Infrastructural investment (INFR), Trade flows (TF), Foreign exchange availability (FEA), External debt service to export ratio (DSX), and Domestic inflation rate (DINF). ΦD_t is a vector holding deterministic terms (intercept, trend , dummy and so forth..) which in this study hold the dummy variable(DV) included to capture the effect of policy change. And ξ_t is a k - dimensional vector with zero mean and covariance matrix.

This model serves to estimate dynamic relationships among jointly endogenous variables without imposing strong a priory restriction (such as particular structural relationships and/or the exogeneity of some of the variables).The system is in reduced form with each variable in X_t regressed on only lagged values of both it self and all the variables in the system (Harris, 1995).

The VAR model in equation (4.4) can be reformulated in to the vector error correction model (VECM) as:

$$\Delta X_t = \Pi X_{t-1} + \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + \dots + \Gamma_{p-1} \Delta X_{t-p+1} + \Phi D_t + \varepsilon_t \dots \dots \dots (4.5)$$

Where: $\Pi = -I + \sum_{i=1}^p A_i$ and $\Gamma_i = -I + \sum_{j=1}^{p-1} A_j$, Π and Γ_i represent a $k \times k$ matrix of coefficients

The above VECM specification shows how the long-run impacts of elements of X are incorporated in short-run dynamics. Hence, it contains information on both the short and long-run adjustment to change in X_t , through the estimates of Γ and Π , respectively. The Johansen procedure is based on the examination of the long-run matrix Π . This decomposed in to matrix β and α so that $\Pi = \alpha \beta'$, where α hold the speed of adjustment to disequilibrium, while β contains long run coefficients or elasticities such that the term $\beta' X_{t-1}$ embedded in equation (4.5) represent up to $(k-1)$ cointegration relationships in the multivariate model which ensure that the X_t converge to their long-run steady-state solutions¹³. Therefore, in the case of this study rewriting equation 4.5 in full gives;

$$\begin{pmatrix} \Delta LPRI_t \\ \Delta LRGDP_t \\ \Delta LINFR_t \\ \Delta LTF_t \\ \Delta LFEA_t \\ \Delta LDSX_t \\ \Delta DINF_t \end{pmatrix} = \Gamma_i \begin{pmatrix} \Delta LPRI_{t-i} \\ \Delta LRGDP_{t-i} \\ \Delta LINFR_{t-i} \\ \Delta LTF_{t-i} \\ \Delta LFEA_{t-i} \\ \Delta LDSX_{t-i} \\ \Delta DINF_{t-i} \end{pmatrix} + \alpha \beta' \begin{pmatrix} LPRI_{t-1} \\ LRGDP_{t-1} \\ LINFR_{t-1} \\ LTF_{t-1} \\ LFEA_{t-1} \\ LDSX_{t-1} \\ DINF_{t-1} \end{pmatrix} \dots \dots \dots 4.6$$

¹³ See Harris, 1995 for detail discussion on cointegration.

The analysis of the long-run relationship in the above model is based on the rank of the matrix Π ¹⁴. If this matrix has a full rank (i.e. there are $r = k$ linearly independent columns), then the vector process X_t is stationary. If the rank (Π) = 0, the matrix is null matrix and the equation in (4.5) remains a traditional VAR where the variables are not cointegrated and hence have no long-run relationship. The other possibility is when $0 < \text{rank}(\Pi) = r < k$. In this case the rank is termed as reduced rank and implies that there are multiple cointegrating vectors. This entails that testing for cointegration requires finding the rank of (Π). Johansen suggested two alternative tests statistics in the multivariate frame work for the test of the rank of a matrix Π .

The first is the Trace test - the name comes from the fact that the test statistic involved is the trace (= the sum of the diagonal elements) of a diagonal matrix of generalized eigen values and it is given by:

$$\lambda_{\text{trace}}(r) = -T \sum_{i=r+1}^k \ln(1 - \hat{\lambda}_i) \dots\dots\dots 4.7$$

Where: $\hat{\lambda}_i$ are estimated values of the characteristic root (also called eigen values) obtained from the estimated matrix Π . T is the sample size

λ_{trace} tests the null hypothesis that the number of distinct cointegrating vectors is $\leq r$ against a general alternative ($> r$).

¹⁴ the rank of the matrix is equal to the number of its non zero eigen values)

The second test statistics is Lambda-max (λ_{\max}) test - the name comes from the fact that the test statistic involved is a maximum generalized eigen value and is given by:

$$\lambda_{\max}(r, r+1) = -T \text{In} \left(1 - \hat{\lambda}_i \right) \dots \dots \dots 4.8$$

λ_{\max} tests the null that the number of cointegrating vector is r against the alternative $r+1$ cointegrating vectors(Enders, 1995 ; Patterson, 2002).

When the appropriate values of r are clear, these statistics are simply referred to as λ_{trace} and λ_{\max} .

Johansen approach is presently the most popular technique in empirical macroeconomic cointegration research and this study also adopts the Johansen procedure to analyze the cointegration relationship between the variables under consideration.

CHAPTER FIVE

ECONOMETRIC ANALYSIS AND DISCUSSION OF RESULTS

5.1 Econometric analysis

5.1.1 Unit Root Test Results

The first step in econometric analysis of time series is to examine the integration property of the data series. To carry out the unit root test ADF test statistics indicated in equation (4.3) is employed. The null hypothesis is that the variable under investigation has a unit root/ non stationary, against the alternative that it doesn't (stationary). To obtain reliable results, the Phillips- Perron(PP) non parametric unit root test was also conducted for all the series that the ADF test showed to be non stationary.

The result of the unit root test of the variables is presented in table 5.1. Both the ADF and the PP test result show that, except domestic inflation rate (DINF) which is stationary in level at 1% level of significance, during the sample period under consideration, private investment (LPRI), real output (LRGDP), public investment on infrastructure (LINFI), trade flows (LTF) foreign exchange availability (LFEA), and external debt service to export ratio (LDSX) are non stationary in level. However, when these variables are differenced once and subjected to the ADF and PP tests, it is found that the test statistics exceed the critical values (in absolute terms) and hence reject the null hypothesis of unit root. This leads to the conclusion that these variables are stationary in the first difference. That is the variables are integrated of order one (I(1)). Thus, variables can be cointegrated.

Table5.1 Unit Root Test Results

With Constant and Trend					
Variable	Lag(k) ¹⁵	DF and/ or ADF Test Critical value 5%=-3.5266 1%=-4.2050		Phillips- Perron Test Critical value:5%=-3.5297 1%=-4.2118	
		Level	1 st Difference	Level	1 st Difference
LPRI	1	-1.4791	-12.6599**	-3.3399	-5.4209**
LRGDP	0	-1.4785	-6.6609**	-1.4511	-6.6550**
LINFR	0	-1.8301	-5.2287**	-1.8892	-5.8874**
LTF	1	-1.7440	-4.3679**	-1.3412	-4.3421**
LFEA	0	-1.8159	-5.8205**	-1.8896	-6.3482**
LDSX	0	-0.6849	-6.0295**	-1.0413	-6.1077**
DINF	0	-5.8813**	-	-5.8810**	-

** and * imply refute the null hypothesis of non stationarity at 1% and 5% levels of significance, respectively. All the variables except inflation rate are in logarithm form (L).

5.1.2 Cointegration Test Result

After identifying the variables that are non stationary and their level of integration, the next task is to determine the cointegrating vectors that span the variables in the analysis (equation4.2).The data congruency of the VAR is examined by adopting a general-to- specific procedure. Based on the AIC, SBC and HQ statistics, the first order VAR (i.e. VAR (1)) is selected as an appropriate specification. As mentioned above, in testing for cointegration and

¹⁵ The optimal lag length is select base on Akaike information criteria(AIC);Shwartz Bayesian criteria(SBC) and Hannan-Quinn statistics (HQ)

determining the long-run parameters of equation 4.2, the Johansen maximum likelihood procedure is adopted. The result of the test is presented in table 5.2¹⁶ below.

Table 5.2 Test Results for the Number of Cointegrating vectors

Ho: rank=p	λ_{max}	Remiers	95%	λ_{trace}	Remiers	95%
P=0	52.12**	44.33*	36.4	117.6**	99.93**	82.5
P≤ 1	26.11	22.19	30.0	65.45*	55.60	59.5
P≤ 2	19.98	16.99	23.8	39.35	33.40	39.9
P≤ 3	11.08	9.415	17.9	19.36	16.46	24.3
P≤ 4	5.998	5.098	11.4	8.255	7.042	12.5
P≤ 5	2.287	1.944	3.8	2.287	1.944	3.8

** and * imply refute the null hypothesis at 1% and 5% levels of significance, respectively

As indicated in table 5.2 the λ_{max} statistics refute the hypothesis of zero (no cointegrating vectors) at 1 % significance level and accept the existence of one cointegrating vector while the λ_{trace} statistics rejected the null hypothesis of zero at 1% level and one cointegrating vector at 5% level of significance in support of two. However, the number of cointegrating vectors reduced to one at 1% significance level when both of the statistics are adjusted for the degree of freedom from T to T-nm.¹⁷ Thus, there is precisely one cointegrating vector spanning the variables under consideration. The standardized estimate for one cointegrating vector β (normalized with respect to private investment) and its feedback adjustment coefficients (α s) are reported in table 5.3 (see appendix I for the matrix of β and α coefficients).

¹⁶ All the econometric result except the unit root test, for which Eviews 5.0 is also employed, are obtained using the computer programs FIML 9.10(Full Information Maximum Likelihood)

¹⁷ In the case of small sample, the Johansen procedure over reject the null when it is true. To solve this problem Remiers(1992) suggest to make adjustment on the degree of freedom by replacing T by T-nm. Where T is the sample size ,n is the number of variables in the model and m is the number of lag-length (Remiers,1992; cited in Harris,1995)

Table 5.3 Standardized eigenvector β' and Standardized Alpha (α) Coefficients

Standardized eigenvector β'					
LPRI	LRGDP	LINFR	LTF	LFEA	LDSX
1.0000	-0.2026	-0.47943	-0.58301	-0.78733	-0.34637
Standardized alpha(α) Coefficients					
LPRI	0.75419				
LRGDP	0.10995				
LINFR	0.02926				
LTF	0.08653				
LFEA	0.14432				
LDSX	0.02740				

The cointegrated long run relationships with adjustment coefficients (α) in the above table corresponds to the term (ΠX_{t-1}) or $(\alpha\beta'X_{t-1})$ in equation (4.5). This term embodies the error correction term $(\beta'X_{t-1})$, the term to enter in the short run error correction model (VECM). As indicated in table 5.3 all the long run coefficients (β coefficients) except the coefficient for external debt hold the expected sign.

Once the cointegration rank is determined, a rank of restriction can be imposed on the cointegration space. This restriction is a zero restriction imposed on Betas(β s) and Alphas(α s) coefficients. Restriction on β , called exclusion test, help determine which variables are relevant or statistically significant in the cointegrating vector while restriction on α , called test of weak exogeneity, help determine which variable is exogenous to the system. Therefore, in order private investment (LPRI) to be written as a function of the other five explanatory variables such as real domestic product (RGDP), public investment on infrastructure (LINFR), trade flows (LTF) foreign exchange availability (LFEA), and external debt service to export ratio

(LDSX) and fulfill the classical linear regression assumptions, the explanatory variables need to be weakly exogenous. The test for zero restriction on β and weak exogeneity tests are conducted based on the log likely ratio (LR) test with asymptotic Chi (χ^2) distribution. The result of the zero restriction on β and weak exogeneity tests (zero restriction on α) are presented in the table 5.4 and table 5.5, respectively.

Table 5.4 Test for zero restriction on β - coefficients

Variable	H ₀ : The coefficient β is zero($\beta_i=0$)	
	Coefficient	LR- test $\chi^2(1)$
LRGDP	-0.20260	4.1291[0.0022]*
LINFR	-0.47943	11.869[0.0006]**
LTF	-0.58301	15.972[0.0001]**
LFEA	-0.78733	17.724[0.0000]**
LDSX	-0.34637	3.9655[0.0255]

** and * imply reject the null hypothesis at 1% and 5% level of significance ,respectively.

Figures in square brackets are p-values. All variables are in logarithm (L).

Table 5.5 Test for weak exogeneity

Ho: variable is weakly exogenous to the system($\alpha_i = 0$)		
Variable	Coefficient	LR- test $\chi^2(1)$
LPRI	0.75419	13.997[0.0002]**
LGDP	0.10995	0.8355[0.3607]
LINFR	0.02926	0.067072[0.7956]
LTF	0.08653	0.01585[0.8998]
LFEA	0.14432	2.1942[0.0739]
LDSX	0.027402	0.055432[0.8139]

** and * imply reject the null hypothesis at 1% and 5% level of significance ,respectively.

Figures in square brackets are p-values. All variables are in logarithm (L).

The test for zero restriction on β coefficients (table 5.4) which provide the long-run result, suggested that all the explanatory variables in the system except external debt service to export ratio (LDSX) rejected the zero restriction. Real Domestic Product(RGDP) rejects the null at 5 % significance level while infrastructural investment (INFR), trade flows(TF) and foreign exchange availability (FEA) reject the null at 1% level of significant and hence they are statistically different from zero implying that they constitute the cointegrating relationship. Therefore, they are significant in explaining the long-run private investment model. Furthermore, all the variables except external debt service, which is turned out to be positive, hold the a priori expected sign. The insignificance of external debt service to export ratio is unexpected to heavily indebt country like Ethiopia.

The test for weak exogeneity (table5.5) reveals that all the variables except LPRI don't reject the null hypothesis of weak exogeneity. This suggest that all the variables are weakly exogenous to the system while LPRI is endogenous. In fact, this is the requirement for private investment (LPRI) to be the dependent variable. Hence, the single equation long-run relationship, with estimates of the long-run coefficients (elasticities) normalized with respect to private investment (LPRI) is given by:

$$\text{Log(PRI)} = 0.20260 \log(\text{RGDP}) + 0.47943 \log(\text{LINFR}) + 0.58301 \log(\text{LTF}) + 0.78733 \log(\text{LFEA}) \dots \dots \dots (4.8)$$

The above long- run model shows that real output, infrastructure development, volume of trade flows and availability of foreign exchange have determined the level of private investment in the country over the last four decades (1964/65-2004/05).

Once the long-run relationship between private investment and the variables of interest has determined, the next step is to determine the short –term relationships among the variables that have important policy implication.

5.1.3 The Short-Run Dynamics

The information provided by the long-run test can now be used to generate a set of error correction models that capture both the short and long-run relationships. The changes in the relevant variables represent short-run changes, while the coefficient of the error correction term represent the speed of adjustment back to the long-run relation relationship among the variables. These relationships are represented in the short-run error correction model. In this error correction model, the disequilibrium are estimated by the first difference (Δ) of the variables that are integrated of order one (I(1)), the domestic inflation rate(DINF) whose series proved to be stationary in level and the error correction mechanism (VECM).

The procedure adopted for estimation is the general to specific modeling; where a large model is estimated by including as many variables and their lags as much as possible and then all the insignificant variables are sequentially dropped to arrive at a preferred specification in terms of significance, economic interpretation and diagnostic validity. Since the explanatory variables are found to be weakly exogenous, the short-run dynamics (the error correction model) is estimated using the Ordinary Least Squares(OLS) estimation techniques and the result is summarized in table 5.6 given below.

Table 5. 6 Error-Correction Model (VECM) Estimation Result

Variable	Coefficient	St.Error	t-value	t-probability
$\Delta LPRI_{-1}$	0.29513	0.16019	1.842	0.0753
$\Delta LR GDP_{-1}$	0.73230	0.27414	2.671 *	0.0121
$\Delta LINFR_{-1}$	0.00391	0.23997	0.016	0.9871
$\Delta LDSX_{-1}$	0.00216	0.046152	0.047	0.9629
ΔLTF_{-1}	1.82370	0.79007	2.308*	0.0281
$\Delta LFEA_{-1}$	2.2714	0.73916	3.073**	0.0045
$\Delta DINF$	0.17357	0.053737	3.230**	0.0030
DV	0.21023	0.14292	1.471	0.1517
ECT_{-1}	-0.46078	0.24580	-1.975*	0.0706
Vector Portmanteau lag 5=5.8248 Vector AR 1-2F(72, 81) = 1.2498[0.0572] Vector Normality Chi ² (12) =1.5788[0.4542]				

The result of the VECM, after the necessary reduction to reach to the parsimonious model is fairly acceptable. It doesn't detects any problem of serial residual correlation or autocorrelation (AR), and vector non normality (Normality CH² test).

As depicted on table 5.6, lagged change in private investment ($\Delta LPRI_{-1}$), lagged change in infrastructural investment ($\Delta LINFR_{-1}$) and the lagged change in external debt service to export ratio ($\Delta LDSX_{-1}$) appear to be insignificant at the convention significance levels (1 % and 5%) whereas lagged changes in real output ($\Delta LR GDP_{-1}$), and trade flows (ΔLTF_{-1}) as well as the lagged error correction term (ECT_{-1}) are significant at 5% level and lagged change in foreign

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lagged error correction term (ECT₋₁) are significant at 5% level and lagged change in foreign exchange availability(Δ LFEA₋₁) and change in domestic inflation rate(Δ DINF) found to be significant at 1% level.

The short-run dynamic model (Error -Correction Model) is therefore given by:

$$\Delta \text{LPRI} = 0.7323 \Delta \log \text{GDP}_{-1} + 1.8237 \Delta \log \text{TF}_{-1} + 2.2714 \Delta \log \text{FEA}_{-1} + 0.1735 \Delta \text{DINF} - 0.46078 \text{ECT}_{-1} \dots \dots \dots 4.9$$

5.2 Discussion on the Long and Short Run Results

The results of both the long and short-run models suggested that real GDP (in the long-run) and its past growth rate (from the VECM), has a positive and significant impact on private investment during the period under analysis. As indicated in the long-run model in equation 4.8, the coefficient (0.2020) is positive and significant at 5% level. This suggests that ceteris paribus, a 10 (ten) percentage points increase in real GDP leads to about 2 percentage points increase in private investment in the long-run. The coefficient (0.7323) for the lagged change in real output (Δ LGDP₋₁) in the short-run dynamic (equation 4.9) is also significant at 5% level. This shows that past growth rate of real output, also stimulate private investment in the country.

The positive impact of output on private investment is line with the accelerator principle which proposes the positive relationship between private investment and output. Therefore, it can be argued that expansion of the production capacity of the economy will stimulate private

investment and in the long-run, this can be magnified by exploitation of the economies of scale in the productive sector of the economy.

This finding is similar with recent findings on SSA countries (Mlambo and Oshikoya, 2001; Ndikumna, 2002; Seyoum, 2002) and Badawi (2004) for Sudan and Mulubrihan(2006) for Ethiopia.

The long-run coefficient of 0.4794 for public investment on infrastructure (LINFR) is positive and significant at 1% level. This implies that in the long-run, public investment on infrastructure (LINFR) promotes private capital formation supporting the crowding-in hypothesis. The coefficient suggests that, holding other variables constant, a 10 percentage point increase in infrastructural investment result in about a 5% percentage points increase in private investment. However, its short-run impact is found to be insignificant as shown in table 5.6. This entails that the crowding-in effect of the government infrastructural investment on private capital formation is only observed in the long-run. This is because in developing countries, the crowding-in effect of public investment appears through the long-run efficiency (profitability) of its infrastructural component on private investment (Firtzgerald *et al.*, 1992).

This finding is consistent with the findings of Blejer and Khan (1984) and Greene and Villanueva (1991) for developing countries; Agnor *et al.* (2005) for the Middle East and North African countries and Asent(2000) for Ghana.

The result also shows that, trade flows promote private capital formation over the last four decades. This variable carries the second highest (next to foreign exchange availability) coefficient/ elasticity as compared to the other explanatory variables in the model. The



coefficients of this variable in the long and short-run model are 0.583 and 1.8237, respectively. The long-run coefficient shows that private investment in the country has been responsive to the volume of trade flows. The coefficient (1.8) of the lagged change of trade flow (ΔLTF_{-1}) in the short-run dynamic also suggests that past growth in the volume of trade flows promote private investment. Although economic growth of the country is so slow, the positive relationship between trade flows and private investment is line with the literature on trade and growth which suggests that countries that are more open to the rest of the world are better able to absorb the rapid technological advancement of leading nations and thus tend to grow faster (Harrison, 1996).

This finding is consistent with the findings of Harrison (1996) for developing countries; Ndikumana (2000); Mlambo and Oshikoya (2001) for SSA countries, as well as Seruvatu and Jayraman(2001) for Fiji.

The regression result also suggested that foreign exchange availability (LFEA) has exerted a strong positive effect on private capital formation both in the long and short-run models. This is evidenced by the highest coefficient (elasticity) associated with this variables in the long and short-run models. The long and short-run coefficients for this variable are about 0.8 and 2.3, respectively and significant at 1% level. As compared to the coefficients of the other variables that explain the private investment model, this variable has the highest coefficients. The long-run elasticity coefficient suggests that keeping other variables constant, for each percentage point increase in foreign exchange availability (FEA), private investment goes up by about 0.8 percentage point in the long-run. The short-run dynamic (equation 4.9) also shows that change in the rate of private investment ($\Delta LPRI$) is positively related to past growth in foreign exchange

availability ($\Delta LFEA_{-1}$). This indicates that during the last four decades (1964/65-2004/05) private investment has been highly responsive to the availability of foreign exchange suggesting that foreign exchange availability is one of the crucial liquidity constraints on private investment in Ethiopia. This is due to the fact that investment activities in developing countries in general and in Ethiopia in particular, are characterized by high import content. For instance 87 % of the raw material demand of manufacturing industries in the country is met from import (NBE, 2004). Hence, availability of foreign exchange promotes private investment by facilitating intermediate and raw material imports.

It is therefore, plausible to suggest that the short-run coefficient might indicate the role of foreign exchange availability in facilitating the availability of intermediate imports, while the long-run coefficient might imply its role in capacity creation.

This finding supports the findings of Fitzgerald *et al.* (1992) for developing countries; Mlambo and Oshikoya (2001) and Seyoum (2002) for SSA countries; Martin and Warso, (1992) for Kenya; Jenkins, (1998) for Zimbabwe.

The result of the short-run model shows that domestic inflation stimulates private investment. As indicated in equation 4.9, the coefficient for the change in domestic inflation rate ($\Delta DINF$) is positive and significant at 5% level. It has been argued that inflation may stimulate investment and hence growth at low and containable levels in the short-run. What has remained a controversial issue is what this tolerable level of inflation could possibly be (Ikindi, 2003). In Ethiopia, the inflation had been relatively low for the last four decades as compared to SSA countries. Between the period 1967/68-1997/98 and 2001/02-2004/05 the average inflation rate

was 7.1% and 6%, respectively, which is well below the average rate of 19% and 11.7% for SSA countries in the same periods (Habtamu, 2002; IMF,2006).

This finding is similar with the finding of Fielding, (1995) for Cameroon, and Oshikoya,(1993) for Morocco, Mauritius, Cameroon and Tunisia..

The positive sign of the dummy variable indicates the importance of permissible policies to the private sector.

The lagged Error-Correction Term (ECT-1) included in the model to capture the long-run dynamics between the cointegrated series. It reflects attempts to correct deviations from the long-run equilibrium path and its coefficient can be interpreted as the speed of adjustment. As shown in the short-run model the lagged ECT is significant and correctly signed (negative). This confirms the existence and extent of adjustment of any short-run equilibrium. Accordingly, 46 % of the disequilibrium in the previous period is corrected/ adjusted in the current period.

CHAPTER SIX

CONCLUSION AND POLICY IMPLICATIONS

6.1 Conclusion

Although private investment is believed to be the engine for growth and poverty reduction, Ethiopia has been unable to enhance private investment to a level that takes its people out of the deep rooted poverty over the last four decades (1964/65-2004/05). The political and the regimes shift that the country experienced in this periods largely attributed to the very dismal performance of the private sector.

This study attempted to access the investment policies and the response of the private sector to these policies and also empirically identifies some of the macroeconomic factors that determine the rate of private investment in Ethiopia.

The analysis of the policy environment revealed that despite the fact that private investment (both domestic and foreign) has been responding positively to the policy reform and the regulatory measures taken after 1991, only 21% of the total investment projects that granted investment license over the last fourteen years (1992/93-2004/5) become operational. Besides, the in flow of foreign direct investment (FDI) constitutes only about 10 % of the total licensed investment projects after the reform.

The empirical findings indicate that during the period under consideration (1964/65-2004/05), foreign exchange availability, trade flows, real output growth appear to exert positive effect on

private capital formation both in the long and short-runs. It is also asserted that foreign exchange availability has a strong effect on private investment. This may suggest that in addition to the domestic factors, private investment in Ethiopia is highly determined by the open economy/external factors i.e. private investment is externally constrained.

The study also confirmed that public investment on infrastructures such as road, power, telecommunication, water supply, education and health have positive externalities on private investment. These positive externalities are observed only in the long-run.

The study included domestic inflation rate and external debt service as a measure of macroeconomic instability. Domestic inflation rate appears to stimulate private investment in short-run or for a short period of time. The crowding-out effect of external debt service is found to be insignificant both in the long and in the short-run.

6.2 Policy Implications

The following important policy implications can be drawn from the study findings.

Private investment in the country has been responsive to investment policies that emanated from the over all economic policy pursued by the regimes. Specially, after 1991 both domestic and foreign investors have been positively responding to the policy and regulatory measures taken in the country. Taking into account this responsiveness of the private sector and its indispensable role in ensuring sustainable development, investment policies should be more attractive and open for discussion and revision.

It is a fact that the rate at which private investment grew determines the achievement of MDGs. Hence, it is essential to identify the root causes for the very low implementation rate (21%) of licensed projects and take corrective measures timely. This requires the commitment of the government and the private sector to work closely. Therefore, the government has to take the leading role to work closely with the private sector and design mechanisms that enable close follow up of the status of the licensed projects.

Although the inflow of foreign direct investment (FDI) has been exhibiting encouraging improvement in recent years, it constituted only about 10% of the total investment projects that granted investment license during the last fourteen years (1991/92-2004/05). This figure is insignificant in light with the development need and the widening resource gap of the country. Therefore, the government has to exert much effort in designing investment promotion strategy and creating more conducive environment to attract FDI in to the country.

The empirical finding shows that the accelerator principle works in the case of Ethiopia both in the long and short-run. Therefore, government policies should be geared to wards encouraging the growth rate of real output so that private investment can be stimulated. This will require not only maintaining the macroeconomic stability but also implementing the necessary policy reform that will stimulate the production capacity of the economy.

The econometric result also suggested that public investment on infrastructure utilities has positive externalities. This implies that government's capital expenditure needs to be restructured in such away that it gives priority for financing infrastructural projects such as roads, power, telecommunication, water supply, education and health. Furthermore attention should be given for the geographical distribution of these utilities in order to attract investors to

exploit the untapped resource in relatively remote areas partly due to the non existence and/or underdevelopment of these utilities. In addition, the government has to create conducive environment so as the private sector participate in the construction of infrastructural facilities.

The indispensable role of foreign currency availability and trade flows for the enhancement of private investment in the country are also asserted by this study. This also suggests, the importance of policies that primary target to the growth of export and active participation of the private sector in the international trade fairs on one hand, and effective utilization of the scarce foreign currency (i.e. the scarce foreign currency should be allocated to import capital goods, raw materials etc., instead of luxurious consumption goods which have no economic growth implication) on the other. Doing so requires a host of interrelated and reinforcing measures.

Some of these measures include:

- Exerting extraneous effort to wards the diversification of export along with increasing the volume and improving the quality of the existing export items
- Expanding the provision of export promotion service, technical assistance and financial credit to the private sector.
- Promoting import- substituting investment activities.

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APPENDICES

Appendix I

Matrix of eigenvectors and alpha coefficients

---- PcFiml 9.10 session started at 05:11:03 on Thursday 04 January 2007

Standardized \beta' eigenvector

LPRI	LRGDP	LINFR	LDSX	LTF	LFEA
1.0000	-0.20260	-0.47943	-0.34637	-0.58301	-0.78733
0.64555	1.0000	2.5537	-0.60617	3.5559	-6.0416
-0.66639	0.56415	1.0000	-0.071272	3.1354	-4.3547
0.23620	0.20855	0.52517	1.0000	-1.8845	1.0156
-0.20169	0.30564	0.80636	0.64715	1.0000	-0.11263
-0.0093504	0.80956	0.036477	0.019743	-0.094650	1.0000

Standardized \alpha coefficients

LPRI	0.75419	0.042719	0.36369	-0.081641	0.072182
LFEA	0.10995	0.010201	-0.079838	0.081450	0.11796
LINFR	0.029268	0.038775	-0.11348	0.0055393	0.14234
LDSX	0.027402	0.010863	0.0081469	-0.27703	0.012150
LTF	0.086537	0.039183	-0.027841	0.045470	0.0016363
LRGDP	0.14432	0.038528	0.042969	0.080191	0.036427

Appendix II

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Short run dynamics

URF Equation 1 for DLPRI

Variable	Coefficient	Std.Error	t-value	t-prob
DLPRI_1	0.29442	0.15688	1.877	0.0700
DLGDP_1	0.73107	0.26844	2.723	0.0105
DLINFR_1	0.058882	0.23242	0.025	0.9800
DLTF_1	1.8301	0.76535	2.391	0.0230
DLFEA_1	2.2726	0.72668	3.127	0.0038
DINF	0.17343	0.052785	3.286	0.0025
DM	0.21365	0.12088	1.768	0.0870
ECT1_1	-0.46176	0.23380	-1.975	0.0646

URF Equation 2 for DLGDP,nbe

Variable	Coefficient	Std.Error	t-value	t-prob
DLPRI_1	0.029701	0.16033	0.185	0.8542
DLGDP_1	-0.064577	0.27435	-0.235	0.8155
DLINFRS_1	0.11931	0.23754	0.502	0.6190
DLTF_1	0.28368	0.78221	0.363	0.7193
DLFEA_1	0.049153	0.74268	0.066	0.9477
DINF	-0.019980	0.053947	-0.370	0.7136
DM	0.073949	0.12354	0.599	0.5538
ECT1_1	0.076141	0.24624	0.309	0.7592

URF Equation 3 for DLINFRS

Variable	Coefficient	Std.Error	t-value	t-prob
DLPRI_1	0.098630	0.12479	0.790	0.4353
DLGDP_1	0.35781	0.21354	1.676	0.1039
DLINFRS_1	-0.046151	0.18489	-0.250	0.8045
DLTF_1	0.25422	0.60882	0.418	0.6791
DLFEA_1	-0.12091	0.57805	-0.209	0.8357
DINF	0.063575	0.041989	1.514	0.1401
DM	0.13699	0.096154	1.425	0.1642
ECT1_1	0.055779	0.19166	0.291	0.7730

URF Equation 4 for DLTF

Variable	Coefficient	Std.Error	t-value	t-prob
DLPRI_1	-0.013927	0.052285	-0.266	0.7917
DLGDP_1	0.10106	0.089469	1.130	0.2673
DLINFRS_1	0.083868	0.077465	1.083	0.2873
DLTF_1	-0.057358	0.25509	-0.225	0.8236
DLFEA_1	0.31075	0.24220	1.283	0.2090
DINF	0.017923	0.017593	1.019	0.3162
DM	0.11149	0.040287	2.767	0.0094
ECT1_1	0.12300	0.080302	1.532	0.1357

URF Equation 5 for DLFEA

Variable	Coefficient	Std.Erro	t-value	t-prob
DLPRI_1	-0.064102	0.073822	-0.868	0.3919
DLGDP_1	0.18658	0.12632	1.477	0.1498

DLINFRS_1	0.056478	0.10937	0.516	0.6093
DLTF_1	0.13053	0.36016	0.362	0.7195
DLFEA_1	0.20858	0.34196	0.610	0.5463
DINF	0.013621	0.024839	0.548	0.5874
DM	0.085731	0.056881	1.507	0.1419
ECT1_1	0.31890	0.11338	2.813	0.0084

URF Equation 6 for DINF

Variable	Coefficient	Std.Error	t-value	t-prob
DLPRI_1	-0.22495	0.62712	-0.359	0.7223
DLGDP_1	2.1569	1.0731	2.010	0.0532
DLINFRS_1	-0.082810	0.92913	-0.089	0.9296
DLTF_1	-3.3383	3.0596	-1.091	0.2836
DLFEA_1	1.6297	2.9049	0.561	0.5788
DINF	-0.22379	0.21101	-1.061	0.2971
DM	-0.0016811	0.48321	-0.003	0.9972
ECT1_1	1.9890	0.96316	2.065	0.0474

DLINFRS_1	0.056478	0.10937	0.516	0.6093
DLTF_1	0.13053	0.36016	0.362	0.7195
DLFEA_1	0.20858	0.34196	0.610	0.5463
DINF	0.013621	0.024839	0.548	0.5874
DM	0.085731	0.056881	1.507	0.1419
ECT1_1	0.31890	0.11338	2.813	0.0084

URF Equation 6 for DINF

Variable	Coefficient	Std.Error	t-value	t-prob
DLPRI_1	-0.22495	0.62712	-0.359	0.7223
DLGDP_1	2.1569	1.0731	2.010	0.0532
DLINFRS_1	-0.082810	0.92913	-0.089	0.9296
DLTF_1	-3.3383	3.0596	-1.091	0.2836
DLFEA_1	1.6297	2.9049	0.561	0.5788
DINF	-0.22379	0.21101	-1.061	0.2971
DM	-0.0016811	0.48321	-0.003	0.9972
ECT1_1	1.9890	0.96316	2.065	0.0474

DECLARATION

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

Declared by:

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