

**ADDIS ABABA UNIVERSITY**

**SCHOOL OF GRADUATE STUDIES**

**THE FINANCIAL DETERMINANTS OF PRIVATE SECTOR  
INVESTMENT: THE CASE OF ETHIOPIA.**

**BY: BRHANE TEKLAY**

JUNE 2016

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**BY: BRHANE TEKLAY**

**A project submitted to the School of Graduate Studies of Addis Ababa University in  
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**This is to certify that the paper prepared by Brhane Teklay entitled The Financial Determinants of Private Sector Investment: The Case of Ethiopia, and submitted in partial fulfillment of the requirement of the Degree of Masters of Art in Applied Economic Modeling and Forecasting complies with the regulations of the University and meets the accepted standards with respect to originality and quality.**

**BY: BRHANE TEKLAY**

**Approved By**

**Signature**

**Fantu Guta (PHD)**

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**ADDIS ABABA**

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## **DECLARATION**

**I, the undersigned, declare that this is my original work and has not been presented for a degree in any other university and that all sources of materials used for the project have been duly acknowledged.**

**Declared by**

**Name: Brhane Teklay**

**Signature: \_\_\_\_\_**

**Date: 03-June - 2016**

**Confirmed by Advisor**

**Name: Fantu Guta**

**Signature: \_\_\_\_\_**

**Date: 03 -June - 2016**

## ***Abstract***

*This study mainly emphasized on the financial determinants of private sector investment in Ethiopia using annual time series data from 1975-2015. Using Johansen co integration test they have a significant relationship among variables and OLS regression analysis was undertaken to estimate long run model and ECM has been used to find out the short run dynamics. In both long run and short run model the financial determinants variable like broad money supply, bank credit and availability of foreign exchange were positive relation with the private investment. The other macro variable taken was the capital expenditure, which is negatively affect in the long run and positively affect private investment in the short run. The researchers conclude based on past literature result's capital expenditure is positively association with private investment. The short run dynamics of estimated coefficient ECM which suggests a relatively quick speed of adjustment back to the long-run equilibrium. The findings of the study provide evidence that private investment in Ethiopia, like in other developing countries is affected by important financial and macroeconomic variables. The empirical evidence however has certain important policy implications, and in view of that recommendations have also been provided, in an attempt to help increase and stimulate private investment in Ethiopia.*

***Key words:*** Ethiopia, private investment, financially determinants, Johansen co-integration.

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## List of Acronyms and Abbreviations

ADF = Augmented Dickey Fuller

AFE= Availability Foreign Exchange

BC= Bank credit to private sectors

BG = Breusch-Godfrey

CE=capital expenditure

CPI= consumer price index

DW=Durbin Watson

*ECM=Error Correction Model*

GCF= gross capital formation

GDP=Gross Domestic Production

GDPG= Gross Domestic Production Growth

LM =Lagrange Multiplier

LDC= least developing countries

MoFED = Ministry of Finance and Economic

Development

NBE =National Bank of Ethiopia

*OLS*= Ordinal Least Squares

SDG =sustainable development goals

SIC =Schwarz info criterion

TI =total investment

UN=United Nation

VAR =Vector Auto Regression

# CHAPTER ONE

## 1 Introduction

### 1.1 Background of the study

Private sector development involve the improvement of the investment climate which is crucial for sustaining and expanding businesses, stimulating economic growth, and has been the backbone of most developed and developing economies. The private sector is recognized as a critical stakeholder and partner in economic development, by helping people escape poverty through the provision of jobs and income, as well as the availability of necessary goods and services needed to enhance people's standard of living (International Finance Corporation, 2011). Private investment is thus a powerful catalyst for economic growth and innovation as well as a poverty reduction facilitator and hence its role is important both in terms of its contribution to GDP and its ability to allocate and employ resources efficiently.

Although it is widely accepted that expansion of private investment is the main catalyst for generating long-run growth in developing countries, the response of private investment in various financial sector policies has received little attention in the analysis of investment behavior. An understanding of the way financial sector policies impact on private investment is important given that a number of developing countries have undergone significant financial sector reforms over the last few decades, leading to a widely observed increase in the degree of financial globalization.

According to UN world investment report (2014) the role of the public sector is fundamental and pivotal. At the same time the contribution of the private sector is essential. Given the

broad scope of the prospective sustainable development goals (SDG), private sector contributions can take many forms. Some will primarily place behavioral demands on firms and investors.

The investment needs associated with the SDGs will require a step-change in the levels of both public and private investment in all countries, and especially in least developing countries (LDCs) and other vulnerable economies. Public finances, though central and fundamental to investment in SDGs, cannot alone meet SDG-implied demands for financing.

UN world investment report (2014)

Private investment is a major driver of economic growth. In LDCs, increasing the growth rate of private investment would be a desirable target to achieve post 2015 development agenda. For this purpose policymakers need to find the right balance between creating a climate conducive to investment and removing barriers to investment. They need to find mechanisms to attract private investors (UN, 2014a and UN, 2014b).

The study related to several strands of literature , one has explored determinants of private investment in Zimbabwe (2009-2011 Innocent Bayai and Davis Nyangar ), Determinants of private investment in Fiji (Elenoa Seruvatut k jayaraman 2001), An investigation of macroeconomic determinants of domestic private investment: evidence from east Africa (Esubalew T. 2014), determinants of private investment in Nigeria( Osmond Chigozie Agu 2015), Determinants of private investment (muhdin Muhammedhussen Batu 2016). However, unlike theirs, my focus is to investigate or to asses only the financial determinants of private investment in Ethiopia. This paper aims to complement the above studies, and enrich the literature by providing further evidence on how financial sector policies affect the evolution of private sector investment,

For developing countries like Ethiopia the basic question in their economy is increase the production and hence improve the standard of living of their people so that there will be dramatic change in their economic, political and social conditions. Investment promotion is one key instrument and primary engine of economic growth (Mustefa, 2014). As a result due attention has been given to development of private sector in developing countries to help improve economic growth (Ouattara, 2004). Reliable and continuous increase in domestic private investment also helps in reduction of poverty.

Ethiopia is an investment friendly country with a stable macro-economic environment. Its monetary policy have played a significant role in creating an enabling climate to addressing the need of the public, assisting the economic activity and attractive to investors. Ethiopia has been taking suitable measures in improving the investment policy of the country with aim of promoting sustainable economic development.

This study is aimed at filling this research and knowledge gap in Ethiopia by assessing the effects of some selected financial development indicators on private investment in Ethiopia. Whilst controlling for the effect of non-financial factors, the findings would provide empirical information on how effectively the financial sector deregulation and its accompanying reforms have influenced private investment in Ethiopia. In this study public investment also includes as one of the explanatory variable to see whether crowding in or crowding out private investment other than financial factor.

Using annual time series data from 1975 to 2015, the model will be estimated using the Error Correction Model (ECM) where the short run and long run effects were established. The study

use the variable private investment as dependent variable and variables like credit to private sector, broad money supply, interest rate, inflation rate, availability of foreign exchange GDP growth and capital expenditure (as proxy of public investment) as explanatory variable. Many literatures also use these variables to explain the financial determinants of private investment.

## **1.2 Statement of Problem**

In the region of East Africa almost 70 % of labor force is engaged in agriculture and low investment rate keeps large population to live in under poverty. Needs required to transform agrarian based to industrialized led economy and coordination of every sector of the economy, creating forward and backward linkages of sectors of the economy are desirable. In the given dimension, the private sector plays a fundamental role to equip economy with employment, technology transfer, innovating, inventing and able to use the resources efficiently and less prone to corruption.

Economic growth is achieved through capital accumulation, thus to accumulate capital it needs investment in capital assets. In doing this, it needs favorable investment climates, which promotes investment further and expand the expected outcomes through re-investment opportunity, and encourages firms to invest, simple assessing financial credit. But many developing countries lack this favorable environment for investments, discouraging private firms from investing in further economic opportunity, thus this constraint remains a problem in many developing countries (Fiestas and Sinha 2011).

The Ethiopian economy is manifested by different economic reforms and structural changes in respective regimes. For instance, following the revolution a number of reforms have been undertaken. Accordingly, the government brought large scale agricultural farms, industries,

financial institutions etc under its direct control. In such a way the central bank controls monetary policy variables on behalf of the government. Moreover, the proclamation issued in 1975 was aimed at to insist the people to invest on enterprise larger than cottage industries. But, it is not hidden for everyone that the contribution of the private investment was insignificant.

Since the start of economic reform of 1991, Ethiopia has embarked on policies that aim to rebalance the role of public and private sector in the economy and thus emphasize private sector development. This is a major departure from the socialist policies of Dergue period that relied heavily on public sector institutions (Demilie Basha Hailu, Fikru Debele, 2015).

In Ethiopia, both fiscal and monetary policies seem to be ineffective during the respective regimes. For example, during the command economy, as shown in the study of Mongbay (2010), in the 1980s the government adopted a conservative fiscal management as well as price control and officially over valuing of birr to curb inflation but inflation was averaging 7.1% annually which is turned up during 1990 due to war expenditure. Moreover, currently monetary policy seems aimed at increasing the amount of cash available at banks lending.

For instance, Davison (2012) shows that the national bank of Ethiopia cut the minimum ratio of deposit to be held in reserve to 5% from 10%, and also the amount of liquid asset to be held as a proportion of deposits was also reduced to 20% from 25%. However, lending to exporters and other business declined after the central bank issued a directive ordering to force banks to buy government securities equivalent to 27% of their total loans to fund infrastructure projects in each month (Davison, 2012).

Following the McKinnon (1973) and Shaw (1973) paradigm, financial liberalization has been high on the agenda of developing countries. The financial repression school argues that government intervention in the finance sector, in particular through subsidized interest rates and (favoured) credit allocation, not only distorts the financial market but also depresses savings and leads to inefficient investment. The policy prescription that follows is liberalization. This has been endorsed by the international financial and development institutions, such as the World Bank and the International Monetary Fund (IMF), and was high on the agenda of the reform packages prescribed for most developing countries called Structural Adjustment Programmes (SAPs). (Geda, Alemayehu, 2006)

This paper is concerned with conducting an empirical analysis of the effects of financial sector on private investment in Ethiopia. The paper is important for improve upon previous empirical research by using a broad and more comprehensive data set on financial sector reforms. This is done by developing an index of the reforms, which takes into account the initial conditions at start of the reforms, and characterizes the sequencing of various reform measures. This index is then included in private investment equations to determine the effect of financial reforms on private investment and because we make use of this index of financial reforms, the results will provide a more robust analysis of the impact of financial reforms on private investment than earlier studies have done.

### **1.3 General objectives of the study**

The main objective of this study has focused on identifying the financial determinant of private sector investment in Ethiopia.

## 1.4 Specific object of the study

- To examine the trends of private sector investment across different time periods in Ethiopia.
- To point out which factor are significantly determines private sector investment activities in Ethiopia.
- To figure out the response of private sector investment when the expected explanatory variables changes.
- Investigate the direction and magnitude of the impact of financial determinants on private sector investment both in the short run and long run.
- To know did public investment crowd in or crowd out private investment in Ethiopia.

## 1.5 Hypotheses of the study

The null hypotheses of this study are stated as:-

**H<sub>0</sub>**:- There is no significant relationship between money supply and private sector investment in Ethiopia.

**H<sub>0</sub>**:- There is no significant relationship between bank credit and private sector investment in Ethiopia.

**H<sub>0</sub>**:- There is no significant relationship between availability of foreign exchange and private sector investment in Ethiopia.

**H<sub>0</sub>**:- There is no significant relationship between capital expenditure and private investment in Ethiopia.

## **1.6 Scope of the Study**

The scope of this study is limited to descriptive and empirical analysis of the financial determinates on the private sector investment between 1975 and 2015. The major focus is on the financial determinants of private investment like the variable credit to private sector, broad money supply, interest rate, inflation rate, availability foreign exchange, GDP growth and public investment. The choice of this study period is based on the availability of data.

## **1.7 Significant of the Study**

The main significant of this study is to identify the financial determinates on private sector investment. This study may have also uses for monetary policy decision making, conclusion and recommendation as input for the study in private sector investment.

## **1.8 Organization of the Study**

The paper is organized the first section is all about the introduction part, chapter two reviews literature related with the study both theoretical and empirical literatures, Following literature review, in chapter three all about methodology part and model specification then in chapter four data is described and analyzed so that it covers the interpreting the econometric result and Finally, chapter five describe conclusion and recommendations are forwarded based on the result of the study.

## **1.9 Limitation of the Study**

Like most research studies, this paper is also not free from limitation. Lack of time series private investment data is the first challenge face the researcher. To solve this problem the researcher

used the proxy calculated private investment. And multicollinearity come because of one of the independent variables is the calculated one for the dependant variable. It is better taken into account and caution should be taken when using the result of this research paper for policy input (like supporting the outcome of this research with other research papers outcome).

Finally, time shortage is also one possible factor that diminishes the quality of the paper, it would have been better if enough time were available.

## **CHAPTER TWO**

### **2 Literature Review**

#### **2.1 Theoretical Literature Review**

There are different models that are used to frame and shape the theoretical frameworks of the study. Many scholars used different types of models and fit the argument with the realization of these theoretical baselines about investment. These models are simple accelerator model, Tobin Q theory and flexible accelerator/ neoclassical model and attempt is made to address explicit detail below.

The existence of an independent investment function in an economy was stated by Keynes (1936) with the basic features of saving and investment are equivalent in the ex-post situation while decisions are taken by different bodies and equality of ex-ant saving and investment activities lacks real justification. Next to this, the accelerator theory of investment states that investment is a linear function of output change in the economy. This theory has not given emphasis to the cost of capital goods, expectation and profit in its model. With disregarding the role of input costs in the investment function Keynesians have favored this model.

##### **2.1.1 Simple accelerator model**

The basic idea of accelerator theory states that investment responds to the changing demand conditions, thus net investment is given by the change in the desired output: As demand (income) increase, investment made by firms also increases. Thus, when output is expected to increase, capital stock increases consistent with the given level of output. Investment is a function of the difference between the existing and desired capital stock and replacement capital needed to replace worn out of the existing capital stock.

During these relationships aiming at the role of demand in the formulating investment function, K- Y ratio is nearly constant (Clark 1917).

$$Investment_t = [K_t - K_{t-1}] = K [Y_t - Y_{t-1}]$$

Where  $Y_t$  is demand (aggregate),  $K_t$  capital stock at time  $t$ , and  $K_{t-1}$  capital at a previous period (t-1) and  $k = k/Y$ . It leads the role of demand in the investment function.

### 2.1.2 Neoclassical model/ flexible accelerator model

In a comprehensive way, the accelerator theory of investment is reformed to the flexible accelerator model which favors the larger gap between the existing and the desired capital stock reveals the more investment rates. Moreover, the increment of the desired capital doesn't occur instantly, it depends on the adjustment coefficient where it is influenced by different factors such as operational capacity in the production process. In light of this, in the neoclassical model, as Jorgenson (1967) explains total investment is a function of the expansion and replacement investment at a time  $t$ .

$$Investment_t = I^{Expan}_t + I^{Repl}_t \dots \dots \dots (1)$$

Replacement investment proportional to capital stock with a speed of adjustment

$$I_t^{repl} = \phi k_t \text{ and investment in the new project becomes:}$$

$$Investment_t = W(L)(K_t^* - K_{t-1}) + \phi k_t \dots \dots \dots (2)$$

This description accounts distributed lags in the delay of the adjustment process of capital stock.

Finally, in the flexible accelerator model the investment function takes the form:

$$Investment_t = K_t - K_{t-1} = \phi(K^*_t - K_{t-1}) \dots \dots \dots (3)$$

Where **Kt** is actual capital at time t; **Kt-1** at previous period capital stock; K\* is the desired one; and **It** investment at time t,  $\phi$  denotes adjustment coefficient. This illustrate that investment is a function of the gap between the desired and the existing capital stock. The rate of investment activity rises when the gap between the desired and the existing capital stock increases (Goodwin 1951) and this is a version of neoclassical model explained by of Jorgenson (1967).

Desired capital stock (K\*) is the amount of capital that the sector would like to have in the future and the existing capital is accumulated value at the time (t-1). The desired capital ( $K^*_t$ ) negatively associated with the rental cost and positively with the level of output growth. The increment rate between the desired and the existing capital stock is given by the flexible accelerator model  $I_t = \phi(K^*_t - K_{t-1})$ . Thus, parameters that affect the desired capital level tend to influence the investment level. Hence, real interest rate declines and output growth create positive rewards to the investment rates. Differently, as (McKinnon 1973; Shaw 1973) stated when the interest rate rises stimulates saving rate and increases the amount of resources that can be available for investment purpose and encourages investment. Thus, the growth of output and real interest rates are determinants of private investments.

Thus, in the model of flexible accelerator theory variables that are included, what determines the desired capital stock (Kt\*) are output growth, availability of domestic credit, and cost of external financing. To overcome the limitation of data for investigating empirical findings, scholars used a flexible accelerator model where the adjustment coefficient is given by observable

characteristics such as public investment rates, domestic credit, exchange rate movement, level in terms of trade, inflation, the presence of external debt the among the listed variables through hypothesis setting and empirical justifications are made (Frey1989).

According to the flexible accelerator model by Koyck (1954) and Chenery (1952), the rate of investment by firms is determined by the size of the gap between the existing capital stock and the desired stock needed to raise output to the desired level required to meet a demand shock. Thus the larger the gap between the existing capital stock and the desired capital stock, the greater will be a firm's rate of investment.

In the Q theory of investment associated with Tobin (1969), he reasoned that if the market value of physical capital of a firm exceeded its replacement cost, then capital has more value in the firm than outside the firm. Tobin's Q, formally defined as the ratio of the market value of the existing capital stock to its replacement cost is the main driving force of investment. According to Tobin, firms accumulate more capital when  $Q > 1$  and should draw down their capital stock when  $Q < 1$ . If  $Q = 1$ , then the market value equals the replacement cost and hence there would be no change in the capital stock. Thus net investment in physical capital should depend on where Q is in relation to one.

### **2.1.3 Financial sector reform and private investment**

Broadly speaking, financial liberalization encompasses those policies aimed at freeing financially "repressed" economies from the effects of such growth-retarding financial policies as noted above. Liberalization tends to reverse such policies, through interest rate deregulation, direct credit abolishment, bank restructuring and privatization, enhanced prudential regulation, and deepened supervision. With financial liberalization, it is expected that savings will become

more attractive and increase, thereby making more credit available, and this will promote greater investment. It is also expected that reducing reserve requirements makes more loan-able funds available at banks, and consequently, rate and level of investment can increase. Furthermore, the granting of more banking licenses and the subsequent increase in competition will encourage banks to be more predisposed to providing better services, and this will attract more customers and investors. The removal of credit restrictions under financial liberalization policies will also increase the lending capabilities of banks.

Criticisms of the financial liberalization theory include the neo-structuralists (vanWijnbergen, 1983; Taylor, 1983) who noted that financial liberalization can cause a decline in investment efficiency if it causes a shifting of resources from the formal to the informal financial sector. Informal financial markets are more efficient in allocating credit because they, unlike formal intermediaries, are not subject to reserve requirements which reduce the amount of credit provided by banks. This may mean they (informal intermediaries) can allocate credit more efficiently. Lensink (1996) notes that in SSA countries informal financial intermediaries do virtually all financing of investment projects and so liberalizing the formal financial markets will not really enhance credit allocation. On the contrary, it could cause a shifting of resources from the informal to formal markets and result in a fall in both the quantity and quality of investment.

Many scholars have pointed out that determinates of private investments could be looking at through macro dimension and micro (firm level) aspects: from the macroeconomic perspective scholars' used time series and panel data set depending on the nature of the investigation. Thus, credit to the private sector, real GDP growth, real exchange rates, real interest rate, inflation rate, terms of trade, trade openness (openness facilitates integration among countries and diffusion of

technology), external debt stock, money supply, government investment and FDI are among the determining factors of private investments that are considerably listed in the literatures. (Esubalew T.2014)

## **2.2 Empirical Literature Review**

Previous empirical works have also sought to explain the relationship between selected macroeconomic and financial variables and their effect on private investment. Ndikumana (2000) investigated the effects of financial development on domestic investment in a sample of 30 sub-Saharan African countries based on panel data econometric techniques. The study was based on a dynamic serial-correlation investment model which included various indicators of financial development, and nonfinancial factors of investment. The positive relationship between financial development and investment was documented using four indicators, credit to the private sector, total liquid liabilities of the financial system, credit provided by banks, and an index combining these three indicators. Thus higher financial development led to higher future levels of investment in the long run. The study also provided evidence on the negative effects of external debt, inflation, interest rate and government domestic borrowing on investment.

Fowowe,(2011) conducted a similar study on financial sector reforms and private sector investment in some sub-Saharan African countries using panel data over the period 1980 to2006. Constructing a financial reforms index and including other variables on the basis of the accelerator theory and uncertainty variables, the results of the econometric estimations showed that private investment had a positive relationship with the financial sector reforms in the selected sub-Saharan African countries confirming the financial liberalization hypothesis which advocated financial reforms to boost private investment. From the results also private and public

investment, rather than being complements were substitutes in the selected sub-Saharan countries. The accelerator theory was supported with the finding of a positive coefficient for output growth and also, the effect of macroeconomic uncertainty and inflation on private investment was found to be negative.

Nair (2004), using a Vector Auto Regression (VAR) model, examined the major determinants of manufacturing investment in India for the period 1973 – 2002. The results indicated that the estimated coefficient for the level of output was positive and significant in all the specifications. The coefficient of profit was also positive and statistically significant in all models indicating that even after the introduction of the financial sector liberalization policy, firms still depended on profit for investment. The financial liberalization coefficient however had a negative impact on corporate investment. Nair attributed this to the fact that liquidity constraints existed and this prevented the efficient mobilization and channelization of resources even after the financial sector liberalization.

As Pfeffermann and Madarassy (1993) summarizes what determines private investments in developing countries and it is stimulated by the growth of demand in the economy. Likewise, credit obtained from banks, which helps to finance investment projects are directed to public and private firms and when the public sector needs highest proportion, it leaves negative impact on the amount required by the private sector investments. Moreover, fiscal deficit adversely affects the availability of finance to the private sector firms. Similarly, exchange rate movements and the existence of inflation affect private investments negatively as of distorting effects on the relative prices of items. High inflation in the economy associated with the devaluation of

currency leads to increase the price of imported goods and items and affects the private sector investment negatively. Ghura and Goodwin (2000) confirmed that private investment in LDCs has positively associated with real GDP growth, investment activity by government and improvement of financial intermediation.

A high rate of inflation will tend to discourage private savings and investment. This calls for prudent fiscal policies, which will avoid unsustainable fiscal deficits, as well as disciplined monetary policies including self-denial in resorting to domestic borrowing from monetary authorities (Fairbairn 1992). Export competitiveness requires proactive real exchange rate policies (Fischer & Khan 1998; Herandez 2000). This will prevent domestic resources from being overvalued and ensure that domestic investors are discouraged from investing overseas while overseas investors are encouraged to make new commitments (Siwatibau 1993).

Oshikoya (1992) investigated how interest rate deregulation has affected investment in Kenya over the period 1970-1989. The dependent variable is the private investment ratio, while explanatory variables are: the real economic growth rate, real deposit rate of interest, changes in terms of trade, public investment ratio, inflation rate, and the lagged debt service ratio. The author found that the real rate of interest is significantly positively related to the private investment rate thus offering support to the financial liberalization hypothesis. The other variables inflation rate, terms of trade and external debt service payments have negative and significant coefficients. The coefficient on the public investment ratio is positive and significant, thus implying that public investment is complementary to private investment.

Dailami and Walton (1992) examined the behavior of private investment in Zimbabwe over the period 1970 to 1987. The dependent variable is private investment and the explanatory variables are: GNP growth, relative price of capital goods, the real interest rate, the real effective exchange rate, real wage, the lagged dependent variable, and the real UK government bond yield. The results showed that private investment is positively related to GNP growth, real interest rate, real effective exchange rate, and the lagged dependent variable, and negatively related to the government bond yield, relative price of capital goods, and real wage. These results support the financial liberalization hypothesis.

Seck and El Nil (1993) examined how financial liberalization has affected investment in Africa using data for twenty one countries over the period 1974 to 1989. The dependent variable is the ratio of gross investment to GDP. Explanatory variables are real deposit rate of interest, nominal deposit rate, inflation rate, current account ratio, and growth in the M2 ratio. The effect of the real rate of interest and growth in the M2 ratio are positive and significant thus implying that financial liberalization has improved investment in these African countries.

Oshikoya (1994) examined the determinants of private investment in eight African countries for the period 1970-1988. The results show that the growth rate of real GDP, the public investment ratio, and the availability of credit all have a positive impact on private investment. The debt service ratio has a negative effect on private investment.

Matsheka (1998) estimated an investment function for Botswana for the period 1976-1995. The dependent variable is the real level of domestic investment. Explanatory variables are the real

deposit interest rate, real private sector credit, the lagged accelerator (past level of demand), a dummy variable for 1987/88 that captures the effect of the decline in investment. The results showed a positive and significant coefficient for private sector credit and the lagged accelerator, while other variables are insignificant.

Among different determinants of private investments, government investment in the area of infrastructure investments has considered to be positive and significant effects. Hence, infrastructure and allied activity stimulates private sector investors and it has a complementary effect on increasing returns of the private outputs in the long run, however in the short run it has some 'crowding-out' effects (Blejer and Khan 1984). From this finding in 24 developing countries; real GDP growth and credit given to the private sector has a positive effect on the private investment activities.

Moshi and Kilindo (1999) conducted an empirical study on the role of government policy on private investment in Tanzania using data over the period 1970-1992. The results of regression estimates showed a positive and significant relationship between private investment and GDP growth, private sector credit, and public investment. The authors used another specification where public investment was split into central government investment and parastatal sector investment. The estimated results showed that all the variables were positive and statistically significant with the exception of central government investment which was significantly negative, thus providing evidence of crowding-out.

Asante's (2000) study sought to examine the determinants of private investment in Ghana over the period 1970-1992. The results showed that the variables that had a significant positive relationship with investment are: lagged investment, public investment, private sector credit, real

interest rate, and real exchange rate. Trade, political instability, macroeconomic instability, and the growth rate of real GDP have had a negative relationship with private investment.

Furthermore, in the area of input-output relationship of public and private sector investments also mentioned as complementarities when the output of the public sectors used as input for the private sector investments. On the contrary, the output product of the two investment sectors may compete with each other and ‘crowds-out’ the private one (Khan and Kumar 1997). In another channel, when public investment run under budget constraints and financed by imposing high tax rates leaves undesirable impact on private investments since it raises the cost of inputs and causes to decline expected output growth. Likewise, when it is financed by market borrowing, it imposes restrictions on resources allocated to the private sectors and affect private investments negatively.

Seruvatu and Jayaraman (2001) wrote that, the policy related variables have to take into account government consumption spending which affects availability of savings for the private sector. The “crowding out” effects of government expenditure are reflected in credit availability for the private sector. Zerfu’s study on the determinants of private investment in Ethiopia suggests that, public investment on infrastructure projects has a positive externality on private investment. This implies the complementarity nature of private investment and the availability of infrastructure, at least in the long run. Thus, the government can stimulate private investment by investing on infrastructure projects.

Looney and Fredriken (1997) studied the possibility whether public investment induced or crowded out private investment. From the analysis of data it is seen that private investment showed a rapid positive trend. Pablo et al (n.d) quoting Everhart and Sumlinski (2000), wrote

that, changes in the economic environment usually affect in a different way the investment decisions for both companies and workers that move in markets with different regulation types, or for several government levels whose decisions are taken in normative environments outside of the market mechanisms. Here, the public investment can also have differential impacts, and one of the following effects is expected to arise: the "crowding out" effect, where the state displaces the private sector when the public investment increases in a country, as competes for the appropriation of scarce (physical and financial) resources; and the "crowding in" effect that emphasizes the positive externalities (as investments in infrastructure, and cyclical policies, public goods provision) and the complementarity that the public investment has by inducing more levels of private investment.

## CHAPTER THREE

### 3 Research Design and Methodology

#### 3.1 Data Sources and coverage

The study uses secondary time annual series data from 1975 to 2015, and its main source is from the National Bank of Ethiopia and Ministry of Financial and Economic Corporation. The variable Private investment would be used as dependent variable, and credit to private sector, broad money supply, inflation rate, availability of foreign exchange, Capital expenditure (as proxy of public investment) and GDP growth as independent variables. EVIEW'S software is for estimation and evaluation of the model.

#### 3.2 Model Specification

To determine the effect financial determinants of private sector investment in Ethiopia, the multiple regression analysis and co-integration methods are used to estimate the parameters of the model. The Regression Coefficient is estimated using Ordinal Least Squares. The private investment function has been specified using the following Econometric Model. In the next chapter the researcher will carry out all the necessary tests of like stationary test, co-integration test, long run and short run model specification and Model Fitness and Diagnostic Checking. The main variables under consideration are taken from theoretical setups and empirical evidences in different countries. The dependent variable of study is specified as:-

$$PI_t = f(M2_t, BC_t, AFE, CPI, CE, GDPG, ) \dots \dots \dots 1$$

Where  $t=1, 2, 3, \dots, 41$  (time period ranging from 1975 to 2015)

PI= private investment in time t.

M2= Broad Money Supply

CE=Capital expenditure

BC = Bank credit availability

AFE= availability of foreign exchange

GDPG = Gross Domestic Product Growth.

CPI= consumer price index

Equation (1) can be rewritten for estimation purpose as follows:-

$$lPI_t = \partial_0 + \partial_1 lM2_t + \partial_2 lBC_t + \partial_3 lAFE_t + \partial_4 lCPI + \partial_5 GDPG_t + \partial_6 lCE_t + \varepsilon_t \dots\dots\dots 2$$

Where  $\partial_0$  is the intercept and  $\partial_1, \partial_2, \partial_3, \partial_4, \partial_5, \partial_6$ , are the coefficients of M2, BC, AFE, CPI, GDPG and CE respectively.  $\varepsilon_t$  is error term.

All variables are in natural logarithm except GDPG. Log transformation can reduce the problem of heteroscedasticity because it compresses the scale in which the variables are measured, thereby reducing a tenfold difference between two values to a twofold difference (Gujarati,1995). It is important to note that the model is a multiplicative one where all parameter coefficients represent constant elasticities.

### **3.3 Variables selection and Theoretical assumption**

#### **3.3.1 Dependent variable**

**Private investment:** - is used as the dependent variable. In many cases, this refers to a private business that has a limited number of share holders the utilization in national territory of capital, capital equipment and other assets, in specific economic projects, or the utilization of funds assigned for the setting up of new companies, association or other forms of corporate representation of private domestic or foreign companies, as well as the acquisition of the whole or part of existing companies incorporated under the country law, with a view to the

implementation or continuity of a specific economic activity in accordance with their corporate purposes. Because of unavailability of time series data of private investment the researcher used the proxy for private investment as the following formula.

$$TI = CE + PI \text{ And } GCF = CE + PI \quad \text{then } PI = GCF - CE$$

Where TI =total investment, and GCF= gross capital formation CE=capital expenditure

### **3.3.2 Independent variable**

**Broad Money:-**The ratio of broad money supply to GDP is conventionally used as a measure of financial sector deepening (Nnanna, 2006). It gauges the increased provision of financial services to the financial sector based on how liquid money is. An increase in the money supply will ease the financing conditions of households and firms, which is reflected in lower lending rates and ultimately enhanced availability of credit to private investors which spurs investment. Thus a priori, the coefficient of broad money supply in private investment equation is expected to have a positively sign ( $\partial_1 > 0$ ).

**Bank credit to private sectors:** - An increase in real interest rates encourages deposits and, hence, increases the availability of funds to the private sector to finance investment projects while discourage low-yield projects. In contrast, the theory emphasizing the role of asymmetric information in financial markets predicts that an increase in interest rates causes credit rationing because the lenders expected profitability is not monotonically increasing in interest rates. At higher rates, lenders may experience a decrease in profits due to adverse selection, moral hazard, and monitoring costs. Therefore, lenders are not willing to lend at a rate higher than that which maximizes their expected profits, even though there are agents willing to borrow at that higher rate. Increasing credit by the banking sector to the private sector is likely to boost private sector investment. Thus the effect of credit to the private sector is expected to be positive ( $\partial_2 > 0$ ).

**Availability Foreign Exchange (FEA):-** is one of the crucial determinants of financial sector variables in determining the economy's capacity to import machineries and equipment for the private sector investment. As a result the researcher expects positive affect on the dependant variable.(  $\partial_3 > 0$ )

**Inflation Rate:-** macroeconomic uncertainty is important role in investment decisions and has been highlighted in the early works of Keynes (1936), who argues that private investment is subject to volatility since return on investment is always uncertain. If investments are irreversible, firms are more prone to delay or abandon investment projects in an uncertain economic environment (Arrow, 1968). Postponing investment until the future becomes more certain may generate opportunity costs, whereas forgoing an investment project results in a loss of initial outlays. Furthermore, in an uncertain economic environment, firms will be encouraged to maintain a highly liquid asset position. Productive activities requiring commitments to long-term fixed investment will be discouraged. As such, less capital accumulation will occur in a highly uncertain economic environment. The irreversible nature of investment and its relationship with macroeconomic uncertainty has attracted considerable attention in the literature in recent years (Aizenmann and Marion, 1993; Serven, 1997, 1998). Because investment is irreversible, investors watch out for signs of uncertainty in the macroeconomic environment and if they perceive that the economy is too volatile or dangerous for investment, they will desist from investment. Inflation volatility is included to take account of macroeconomic uncertainty. High rates of inflation send out a signal that the government is unable to manage the economy properly and is a sign of instability. There is also the possibility that the actions of the government in attempting to control inflation through

contractionary policies might depress demand and this would result in a fall in investment. High and unpredictable inflation rates can be portrayed by investors as a sign that the government is losing control of the economy and thus discourage investor confidence. In this way, the researcher expects a negative link between investment and macro economic uncertainty is established. ( $\partial_4 < 0$ )

**Gross Domestic Price:-** Real GDP is used to capture the aggregate demand conditions in the economy and it is expected to exert a positive effect on private investment. In addition to the determinants mentioned above, private investment spending depends on output, economic reform policy, and on its own lagged values. Since the early study of Clark (1917), the change in output is considered as a determinant of investment spending. This effect is the well known “accelerator effect”. Output also plays an important role in the neoclassical approach of investment introduced by Jorgenson (1963), although the central feature of this theory is to evaluate the effects of relative prices on the demand for capital. Output affects investment decisions due to its effect on firms’ profitability and also by means of the output-saving-aggregate investment channel. Consequently, the study expects the coefficient of real GDP to be positive ( $\partial_4 > 0$ ).

**Public Investment:-** is included in our model and it highlights the importance of the government providing a conducive environment for investment to take place. The relationship between private and public investment is theoretically ambiguous. An increase in public investment can have either a positive or negative effect on private investment. On the one hand, public investment can raise private investment in a situation where resources are not fully employed. In such a case, income would increase following an increase in public investment and this increased income would send positive signals to private investors that they can increase their profit

margins by investing more. On the other hand, however, public investment will be a substitute for private investment if it is financed through inflation or debt issues. Public investment can also be detrimental to private investment if the goods produced by the public sector compete directly with private sector produced goods. Thus, this crowding out of private investment by public investment makes them substitutes. The exact relationship between private and public investment can only be ascertained empirically.

### **3.4 Unit Root Test**

Augmented Dickey-Fuller unit root test proposed by Dickey and Fuller (1979, 1981) is widely used in economic literature to investigate the stationarity of a time series data. Dickey and Fuller (1979, 1981) on the basis of Monte-Carlo simulation and under the null-hypothesis of the existence of unit root in time series have tabulated critical values which are called ‘ $\tau$  (tau) statistics’. Philips (1986) points out that if we treat the non stationary series with Ordinary Least Squares (OLS), the results will be misleading for economic analysis. The model can lead to the problem of spurious regressions with very high R-squared (approximating unity) and significant t and F-statistics (Granger and Newbold, 1974).

The reason for starting with the Augmented Dickey-Fuller test is that there is no uniformly better test. This should not be understood as a motive for not performing other types of unit root tests. Comparing different results from different test methods is a good way of testing the sensitivity of your conclusions

If the variables in the regression model are not stationary, then it can be proved that the standard assumptions for asymptotic analysis will not be valid. In other words, the usual “t-ratios” will not follow at distribution, so we cannot validly undertake hypothesis tests about the regression parameters. Due to this reason the researcher will undertake the stationary test using ADF.

### 3.5 Testing for Co-Integration

In the case of co- integration recognizing the fact that most macroeconomic data are non stationary. Co-integration is a popular econometric technique which is used to find long run relationship between variables. A regression involving non-stationary variables (variables with unit roots) is meaningful if the variables are co-integrated, i.e. have long run relationship. According to time series econometrics, if the residuals from a regression involving non-stationary variables are stationary then the variables are said to be co- integrated. This is because even if the variables are individually non stationary their linear combinations are stationary which is despite by the stationarity of the residuals. The analysis is preceding using Johansen co-integration test

### 3.6 Long Run Model Specification

The purpose of OLS estimation in level is to detect the spurious regression. If the results found spurious, they will not be able to further processing or use. Such results if used to apply wrong things will guide to formulate policies in the economy. Long Run OLS estimation result shows in model private investment determined by how many percent of R-squared by the independent variables as well as by what percentage of Adjusted R- Squared (coefficient of determination) measures the proportion or percentage of the total variation in dependent variable explained by the regression model. The specification of the model can be written as follow:-

$$IPI_t = \partial_0 + \partial_1 IM2_t + \partial_2 IBC_t + \partial_3 IAFE_t + \partial_4 ICPI + \partial_5 GDPg_t + \partial_6 ICE_t + \varepsilon_t \dots \dots \dots 3$$

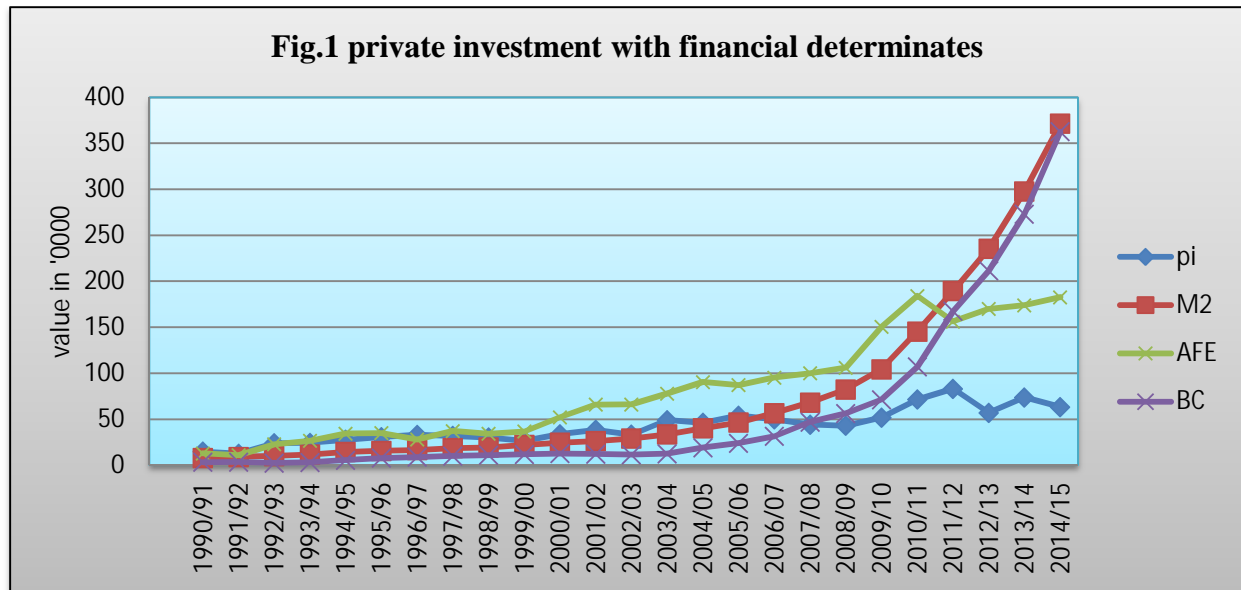


# CHAPTER FOUR

## 4 Result and Discussion

### 4.1 Descriptive Statistics

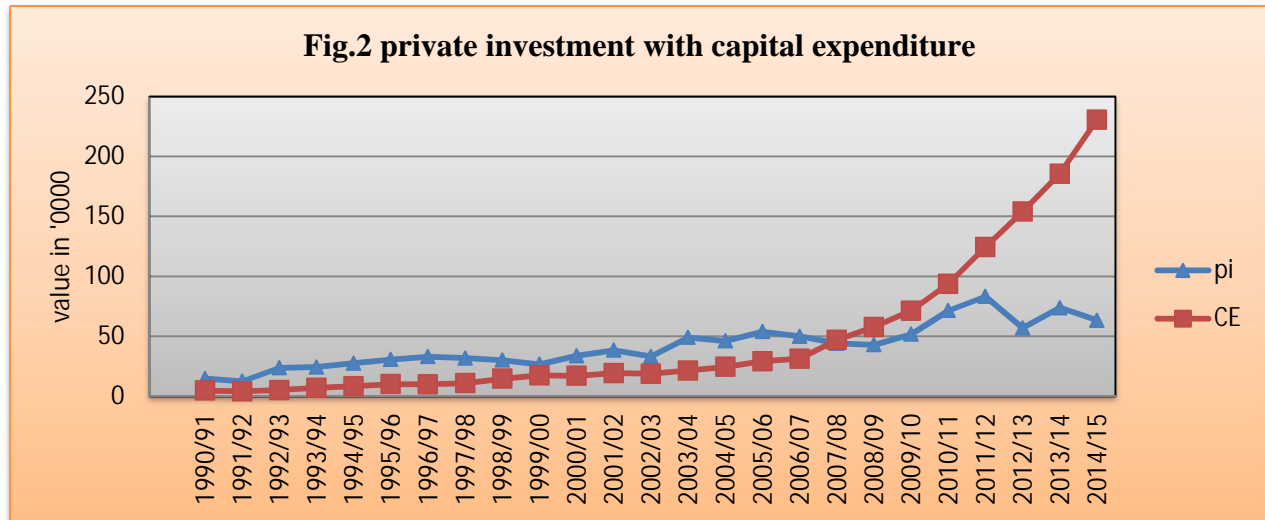
#### 1. Trend of private investment with financial determinates



Source NBE and MoFEC

The above fig.1 indicates the trend of private investment with respect to their financial determinants like broad money, availability of foreign exchange, and bank credit to private sector. As indicated in the above fig 1 until 2010/11 the trend in availability of foreign exchange was positive and stable increasing with the private investment, but at the period of 2011/12 while private investment fell and availability of foreign exchange start to rise. Therefore as indicated from the above figure private investment and availability of foreign exchange is positive relation.

## 2. Trend of private investment with capital expenditure.



Source NBE and MoFEC

The above fig.2 indicates the trend of private investment along with capital expenditure taken as a proxy of government investment to indicate whether have been crowded in or crowded out in private investment. And as indicated in the fig. until the period of 2007/08 both trends was stable increment but in 2008 public investment was above private investment increasing. As indicated private investment declined in 2011/12 where as public investment strictly increasing throughout the period under investigation, this might be crowded out in private investment after 2012.

## 4.2 Unit root test result

**Table 1 result of unit root test**

	ADF Test at level		ADF Test at 1st difference	
	Constant	Constant +Trend	Constant	Constant +Trend
	Actual value (t-cal)	Actual value (t-cal)	Actual value (t-cal)	Actual value (t-cal)
LPI	0.64	-3.87**	-5.03*	-4.66*
LCE	1.64	-0.20	-5.56*	-5.94*
LBC	-1.79	-3.33	-7.22*	-7.16*
LM <sub>2</sub>	-1.99	0.96	-3.35**	-3.93**
LAFE	0.05	-2.02	-6.81*	-6.87*
LCPI	0.23	-1.09	-5.71*	-5.77*

**Note**

- ✓ **t critical without trend at 1%=-3.61 and 5%=-2.93 with trend and intercept at 1%=-4.21 and at 5%=-3.52**
- ✓ **\* represents significant level at 1%. And \*\* represent significant level at 5%.**

The above table indicates the unit root test result of the variable using Schwarz info criterion (SIC) type. For this test Schwarz Info Criterion test was used to select the maximum lag length.

All variables are stationary at first difference with trend and without trend at 1% level of significance except LPI which is stationary at level at 5% level of significance.

### 4.3 Testing for Co-Integration

In order to check for the existence of long run relationship, co integration, in the model a Johansen co integration test was used to check whether have a long run relation among the variable's or not. There may be more than one co-integrating relationship among co-integrated variables. Johansen test provides estimates of all such co integrating equations and provides a test statistic for the number of co integrating equations.

**Table 2 co -integration test (Trace)**

<b>Unrestricted Co integration Rank Test (Trace)</b>				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.745110	134.5428	95.75366	0.0000
At most 1 *	0.680902	82.59970	69.81889	0.0034
At most 2	0.374130	39.19389	47.85613	0.2526
At most 3	0.249930	21.38661	29.79707	0.3340
At most 4	0.169665	10.45822	15.49471	0.2471
At most 5	0.085420	3.393038	3.841466	0.0655

Trace test indicates 2 co integrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

**Table3 co -integration test (Maximum Eigen value)**

<b>Unrestricted Co integration Rank Test (Maximum Eigen value)</b>				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.745110	51.94306	40.07757	0.0015
At most 1 *	0.680902	43.40581	33.87687	0.0027
At most 2	0.374130	17.80728	27.58434	0.5112
At most 3	0.249930	10.92839	21.13162	0.6545
At most 4	0.169665	7.065178	14.26460	0.4815
At most 5	0.085420	3.393038	3.841466	0.0655

Max-eigen value test indicates 2 co integrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

The result from the above table 2 and 3 indicated in trace test have 2 co integration equation at 1% level of significance and in Max-eigen value test have also 2 co integration equation at the 1 % level of significance. There for variables in the long run model has a meaning full economic relationship.

## 4.4 Long Run Model

The long run OLS EVIEWS estimation result of output can be rewrite as follow:-

$$LPI_t = \partial_0 + 0.35*LM2_t + 0.09*LBC_t + 0.45*LAFE_t - 0.41*LCPI_t + 0.01*GDPg_t - 0.16*LCE_t$$

**Table 4 LR OLS Estimation Result**

Dependent Variable: LPI				
Method: Least Squares				
Date: 05/22/16 Time: 10:29				
Sample (adjusted): 1975 2014				
Included observations: 40 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LM2	0.351482	0.165002	2.130161	0.0407
LBC	0.095530	0.056362	1.694944	0.0995
LAFE	0.450790	0.105873	4.257837	0.0002
LCPI	-0.411115	0.180578	-2.276666	0.0294
GDPG	-0.011729	0.005337	-2.197662	0.0351
LCE	-0.164161	0.206821	-0.793731	0.4330
C	4.183863	0.582297	7.185097	0.0000
R-squared	0.919724	Mean dependent var		10.24848
Adjusted R-squared	0.905128	S.D. dependent var		0.523129
S.E. of regression	0.161130	Akaike info criterion		-0.655579
Sum squared resid	0.856778	Schwarz criterion		-0.360025
Log likelihood	20.11157	Hannan-Quinn criter.		-0.548716
F-statistic	63.01351	Durbin-Watson stat		1.547545
Prob(F-statistic)	0.000000			

The above table 3 OLS long run regression result indicates the coefficient of parameters variables are describes as follow. As expected in the above  $M_2$  in both long run and short run is positive and significantly in the long run only affect private investment. As stated in the above theoretical expectation as  $M_2$  increases private investment also increase by 53% in the long run. This is interpreting as  $M_2$  increase by one unit private investment also increase by 53%.

The other variable that describes the main variable is BC. In the long run model as expected there is positive and significant at 10% level of significance relation with private investment but in the short run even is it positively relation it is not a significant value. Interpret as bank credit increase by one unite private investment also increase by 9% (0.09), so bank credit is improves private sectored investment.

As expected in the theoretically literature availability of foreign exchange also has positive and significant relation with private investment in long run and short run model. And interpreted around 45% is affecting private investment in the long run.

The coefficient of CPI is negative and significant value as expected in the theoretical assumption in both models. The coefficient in the long run -0.41 measures change in the private investment when other things remain constant, and the negative value interprets as CPI change by one unit price private investment decrease by 41%.

CE also take as independent variable measure for the private investment and in both long run and short run model output is it not significant with coefficient negatively and positive respectively.

As the researcher conclude based on past literature result capital expenditure is positively association with private investment, therefore privates investment is affected by 41 % in the short run and the positive value shows capital expenditure is crowed in private investment, This result also concludes different scholars. Accordingly, Serven (1998), He argued that an increase in public infrastructure on the road, telecommunication and electric city raises the long run private capital stock by reducing the cost of capital to the private sector.

GDPG in the long run and in the short run is positive significant relation with the main variable. As stated in the above theoretical expectation as GDPG increases private investment also increase by 1% in the long run. To estimate the long run as well as the short run model the growth of GDP was used and that why is the number very small effecting private investment.

## 4.5 Short Run Dynamics

ECM has been used to find out the short run dynamics. The results of short run dynamics of the variables are reported in table-4.

**Table 5 short run model out put**

Dependent Variable: DLPI				
Method: Least Squares				
Date: 05/22/16 Time: 11:52				
Sample (adjusted): 1976 2014				
Included observations: 39 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLM2	0.274099	0.501513	0.546544	0.5886
DLBC(1)	0.016918	0.068538	0.246840	0.8067
DLAFE	0.333589	0.138504	2.408515	0.0222
DLCPI	-0.557878	0.239700	-2.327396	0.0266
DGDPG	0.015740	0.003674	-4.284634	0.0002
DLCE(1)	0.419931	0.211833	1.982367	0.0564
ECM(-1)	-0.808264	0.176208	-4.586979	0.0001
C	-0.032791	0.064055	-0.511915	0.6123
R-squared	0.720709	Mean dependent var		0.035982
Adjusted R-squared	0.657644	S.D. dependent var		0.263194
S.E. of regression	0.153998	Akaike info criterion		-0.723071
Sum squared resid	0.735178	Schwarz criterion		-0.381828
Log likelihood	22.09989	Hannan-Quinn criter.		-0.600636
F-statistic	11.42793	Durbin-Watson stat		2.118594
Prob(F-statistic)	0.000000			

The above EVIEWS result of short run output can be rewrite as follow:-

$$DLPI = 0.27 * M_2 + 0.01 * DLBC + 0.33 * DLAFE - 0.55 * DLCPI + 0.01 * DGDP + 0.41 * DLCE(1) - 0.80 * ECM(-1) \dots\dots\dots 5$$

From the above results, the broad money supply with an elasticity coefficient of 0.27 was not significant. The sign was the same to what was obtained in the long run case. The result implies that in the short-run, a percentage increase in the ratio of broad money supply will increase a 27 percent in private investment. Bank credit in the short run also insignificant however its sign is as expected and the same to the long run model result

In the short run model the variable AFE and GDPG are significantly affect private investment and the sign also positively as expected in the theoretically literature .the result also the same to what was obtained in the long run.

Consistent with the long-run finding, the elasticity coefficient of inflation was found to be negative and significant at the 1 percent level in the short-run. Inflation, which is a sign of macroeconomic instability, has the potential of driving down private investment by 55 percent. Thus in both the short-run and long-run, inflation has the potential of deterring private sector investment.

CE also take as independent variable measure for the private investment and in both long run and short run model output is it not significant with coefficient negatively and positive respectively. As the researcher conclude based on past literature result capital expenditure is positively association with private investment, therefore privates investment is affected by 41 % in the

short run and the positive value shows capital expenditure is crowded in private investment, This result also concludes different scholars. Accordingly, Serven (1998), He argued that an increase in public infrastructure on the road, telecommunication and electric city raises the long run private capital stock by reducing the cost of capital to the private sector.

The ECM represents the speed of adjustment to restore equilibrium in the dynamic model following a disturbance. The estimated coefficient of the ECM which equals (-0.80) suggests a relatively quick speed of adjustment back to the long-run equilibrium. The coefficient is highly significant at the 1 percent significance level and appropriately signed. According to Verma (2007), a highly significant error correction term is further proof of the existence of a stable long-run relationship. The result suggests that about 80 percent of the deviation between the actual and the long-run equilibrium value of private investment is corrected each year. That is approximately more than 80 percent of the disequilibria from the previous year's shock converge back to the long-run equilibrium in the current year.

#### **4.6 Model Fitness and Diagnostic Checking**

R-Squared (coefficient of determination) measures the proportion of the variation in the dependent variable accounted for by the explanatory variables and interpreted as the dependant variable private investment was explained or predicate by 72% of the independent variable. Adjusted R- Squared measures the percentage of variation explained by only those independent variables that in reality affect the dependent variable. The value 0.65 depicts that 65 percent explained the dependant variable by the independent variables. Which is the most commonly used measure of the goodness of fit of a regression. (Gujarati)

The value of Durbin Watson Statistics is the most celebrated test for detecting the existence of serial correlation. To use the DW test, we have to assume these assumption (i) the regression model contains an intercept, (ii) the error process is AR1 (the test says nothing about higher order autocorrelation), (iii) the error term is normally distributed, (iv) there is no lagged dependent variable, and (v) there are no missing observations in the data.

The second test for serial correlation is the Breusch-Godfrey (BG) or Lagrange Multiplier (LM) Test. The BG test is useful in that it allows for (i) lagged dependent variables, (ii) higher order autoregressive processes as well as single or higher order moving average processes. The basic idea is to regress the residuals from the OLS regression on all of the independent variables and on the lagged values of the residuals.

The hypothesis test for the serial correlation is as follow:-

$H_0$  = There is no problem of serial correlation and the alternative hypothesis

$H_1$  = At least one has a problem of serial correlation.

The researcher applied all the necessary diagnostic tests on the model like normality, serial correlation, multicollinearity, heteroscedasticity and model specification. The results, reported in appendices advocate that the model is normality, no problem of serial correlation and there is no problem of heteroscedastiy. And the model also checking the specification using Ramsey's RESET test. The ARCH test also negates or cancels out the presence of autoregressive conditional heteroscedasticity.

## CHAPTER FIVE

### 5 Conclusion and Recommendation

This paper investigated the financial determinants of private investment in Ethiopia by specifying a private investment model. The objective of the paper was to determine whether the financial determinants have contributed to improve private investment in Ethiopia. Using annual time series data from 1975 to 2015, an Error Correction Model (ECM) was estimated. The study concluded that the result of the analysis confirmed the basic findings of some earlier studies that the actual impact of government expenditure on private sector investment varies depending on the type of government expenditure under consideration.

Stationarity of variables of time series was checked by using Augmented Dickey-Fuller (ADF) unit root test. The results from the model show the existence of long run relationship among the variables. In order to check for the existence of long run relationship Johannes's co integration was applied.

The coefficient of ECM represents the speed of adjustment to restore equilibrium in the dynamic model following a disturbance. The estimated coefficient of the ECM which equals (-0.80) suggests a relatively quick speed of adjustment back to the long-run equilibrium. The coefficient is highly significant at the 1 percent significance level and appropriately signed.

The findings of the study provide evidence that private investment in Ethiopia, like in other developing countries is affected by important financial and macroeconomic variables. The empirical evidence however has certain important policy implications, and in view of that

recommendations have also been provided, in an attempt to help increase and stimulate private investment in Ethiopia.

In both long run and short run model the financial determinants variable like broad money supply, bank credit and availability of foreign exchange were positive relation with the private investment.

The other macro variable taken as independent variable was the capital expenditure, which is negatively affect private investment in the long run and positively affect private investment in the short run. The researchers conclude based on past literature result's capital expenditure is positively association with private investment. This result also conclude different scholars like Serven (1998), He argued that an increase in public infrastructure on the road, telecommunication and electric city raises the long run private capital stock by reducing the cost of capital to the private sector.

Based on empirical results of the study the researcher recommended to those policy makers especially on monetary policy to provided that broad money supply, bank credit and availability of foreign exchange have positive effect on the private investment sector, as a result the monetary policy or these financially institution be muscularly apprehension on these private sector investors by boosting credit and available of foreign exchange for those investor require imported raw materials.

The other very crucial point is Ethiopia is the fastest economic growth with huge population size however, still we don't have capital market for easy financing those who have an idea and they don't afford on the private sector investment. Finally encouraging the expansion in private sector

investment towards the government capital investment rising in public expenditures on the provision of infrastructure for rural areas will also be helpful for finest private investment.

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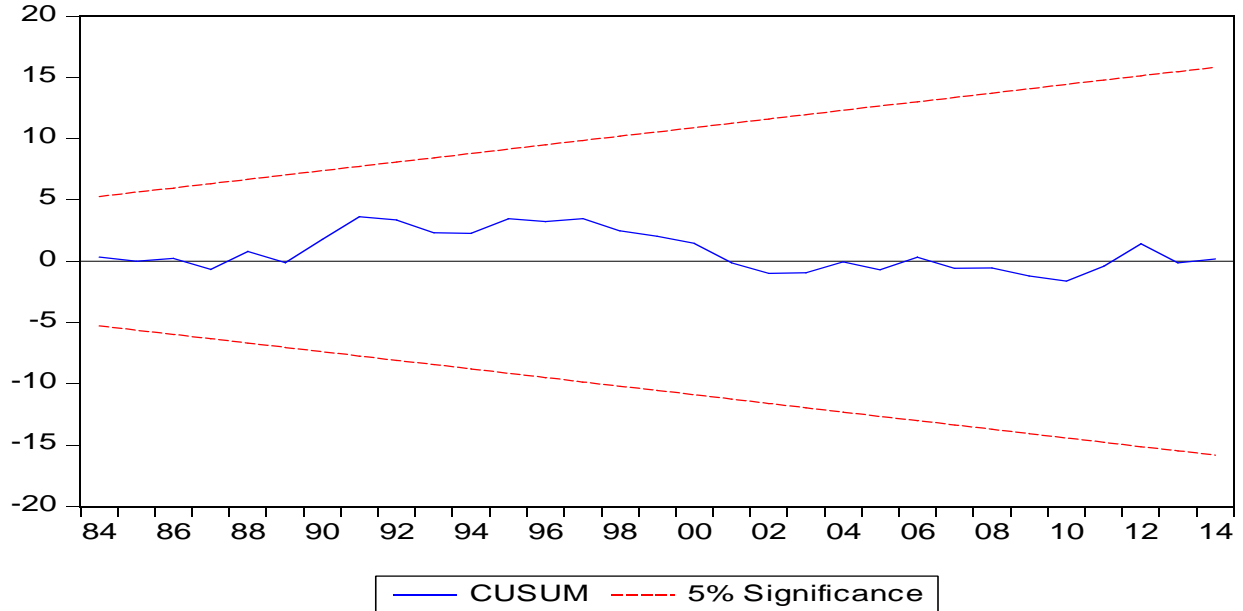
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## Appendices

**Fig. A1. Stability test using CUSUM test**



**Table A1. Diagnostic checking**

Test statistics		$\chi^2$ -statistic and F-statistic	Probability
Normality:	$\chi^2$ -statistic		
Jarque-Bera statistic		3.90	0.14
Serial Correlation:	F-statistic	0.90	0.41
Breusch-Godfrey Serial	Obs*R-squared	2.29	0.31
AR Cond.	F-statistic	0.03	0.85
Heteroskedasticity	Obs*R-squared	0.04	0.84
ARCH LM test			
Heteroskedasticity:	F-statistic	2.20	0.28
White Heteroskedasticity	Obs*R-squared	37.50	0.35
test			
Specification Error:	F-statistic	0.13	0.71
Ramsey RESET test	Likelihood ratio	0.18	0.67

**TableA2.Variance Inflation Factors**

Variance Inflation Factors				
Date: 06/02/16 Time: 13:08				
Sample: 1975 2015				
Included observations: 39				
Variable	Coefficient Variance	Uncentered VIF	Centered VIF	
DLM2	0.251515	2.502923	1.635824	
DLBC(1)	0.004697	1.673979	1.332866	
DLAFE	0.019183	1.403431	1.285517	
DLCPI	0.057456	2.036989	1.316069	
DGDPG	1.35E-05	1.129614	1.128450	
DLCE(1)	0.044873	2.610791	1.262077	