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The Determinants of Private Investment in Ethiopia

By: Woldemariam Fujaw

Advisor: Alem Hagos (PhD)

**A thesis Submitted to the Department of Accounting and Finance for
the Partial Fulfillment of the Requirement for the Degree of Masters
Science in Accounting and Finance**

Addis Ababa, Ethiopia

February, 2018

**Addis Ababa University College of Business and
Economics Department of Accounting and Finance**

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Statement of Declaration

I, woldemariam Fujaw, have carried out independently a research work entitled "The determinants of Private Investment in Ethiopia, in partial fulfillment of the requirement of the M.Sc. program in Accounting and Finance with the guidance and support of Dr. Alem Hagos, research advisor. I do hereby declare that this thesis is my original work and that it has not been submitted by any other person for an award of degree in this or any other university/institution. All references in the thesis have been duly acknowledged and cited in the reference list.

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Approval

The undersigned certify that they have read and hereby recommend to Addis Ababa University to accept the Thesis submitted by Woldemariam Fujaw entitled "The Determinants of Private Investment in Ethiopia", in partial fulfilment of the requirements for the award of a M.SC Degree in Accounting and Finance.

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ABSTRACT

Private investment is viewed as a powerful tool for maintaining and expanding the capital formation and production capacity of an economy. Hence, this study was conducted with the main objective of investigating and analyzing factors that determine private investment in Ethiopia. 21-years secondary data(i.e. from 1996 to 2016) was collected from various national and international institutions. Then, OLS regressions model was applied after the data sets were transformed to natural log form. The regression results show that public investment, real GDP, external debt servicing , and access to bank credit have significant positive effect on private investment, while lending interest rate and foreign direct investment have significant negative effect on performance of private investment under the study period. Hence, to promote the performance of private sector in the country, it is essential to take measures that can improve real income of people, and make public investment (Social and Physical) and institutions that are crucial to attract private investment. Besides, strengthen financial institutions to provide sufficient financial resource to private investors.

Key words: *Determinants, Private investment , Ethiopia*

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Acronyms and Abbreviations

ADF: Augmented Dickey-Fuller

AR: Auto Regressive

ARDL: Autoregressive-Distributed Lag

EDS: External Debt Servicing

EIC: Ethiopia Investment Commission

FDI: Foreign Direct Investment

FDRE: The Federal Democratic Republic of Ethiopia

GDP: Gross Domestic Product

GTP: Growth and Transformation Plan

IMF: International Monetary Fund

IR: Lending Interest Rate

MOFED: FDRE Ministry of Finance and Economic Development

NBE: National Bank of Ethiopia

NPC: FDRE National Plan Commission

NR: National Reserve

OECD: The Organisation for Economic Co-operation and Development

OLS: Ordinary Least Square

PP: Phillips-Perron

PI: Private Investment

Pui: Public Investment

RGDP: Real Gross Domestic Product

SSA: Sub-Saharan Africa Countries

UNCTAD: United Nations Conference on Trade and Development

WB: World Bank

WEF: World Economic Forum

WDR: World Development Report

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Investment is, without doubt, one of the primary engines of growth in all economies (Khan, 2005). However, its effectiveness rests on strong complementarities with other elements in the growth process, most notably technological progress, skills acquisition and the development of innovative capability. These elements make investment a natural point of departure for Governments seeking to formulate a robust development strategy. The link between investment and these other determinants of growth, however, is not an automatic process. It requires among other things a favourable macro policy environment and specific policies and institutions aimed at encouraging savings and attracting and directing investment to key sectors in the economy thereby enhancing the contributions of investment to skills formation, technological change, competitiveness and economic growth (Workie, 1997).

The role of investment in the economic growth of nations has been one of the most crucial issues for development related discussion among policy makers, researcher, donors, scholars as well as various economic and financial institutions in developing as well as developed nations. This view originates mainly from the fact that investment plays a central role in economic development in every country. Investment is taken as one of crucial determinants of the rate of physical accumulation and productive capacity of an economy by raising the productivity of factors of production through the use of new techniques of production and promotion of technological progress. It is argued that investment is the major foundation of enhancement in the level of literacy, improvement in technology and increase in the capital stock (Blejer and Khan,1984). Gross domestic investment boosts economic growth by increasing physical capital directly and indirectly through technological spill over (Khan & Reinhart, 1990). The investment sector has the significant contribution to the economic growth through creating an employment opportunities, enhancing technical progress and introducing new techniques of production. In developing countries during the year 1980s, decline in economic progress of countries was directly linked with the decline in gross capital formation (Greene and Villanueva ,1991).

In the process of investigating the economic performance or growth of a country, one of the key determinants that need to be considered is investment (Augustine, 2014). Countries that are

developed are those that have invested much in their economies whereas countries that are investing slowly, are not only developing slowly but also still remaining poor (Solow, 1956).

Alemayehu and Befekadu (2005) have explored the role of investment as one of the long-run determinants of Ethiopia's growth rate. With regard to the relative contribution of public investment and private investment to economic growth, they confirmed that private investment is a greater contributor than public investment to the country's economic growth; a 10% increase in private investment leads to an approximately 1.5% increase in output, while a similar increase in government investment leads to a 0.95% increase. Recently, economists have developed a common opinion about the constructive effect of sustainable investment on economic growth. Moreover, the sustainability of investment depends on the investment sector (World Investment Report 2014).

A good investment climate provides opportunities and incentives for investors to invest profitably, create jobs, and expand national output thereby increasing private investment and economic growth (World Bank, 2004). This Report note that improvements in the investment climate in developing countries are key to increasing the flow of investments and, consequently, a higher level of economic growth and development. However, in the poorest developing countries, such as Ethiopia, businesses frequently operate in investment climates that undermine their incentive to invest and grow, thus undermining the performance of trade (UN, 2005). In line with this environment, Ethiopian investors complain about poor infrastructure, particularly power shortages; poor transport; poor telecom connectivity of business locations and lack of efficient tax administration (Mima and David, 2012; World Bank, 2004). Ethiopia ranked 124th out of 148 countries interims of the infrastructure in the 2013/14 global competitiveness report (WEF, 2013).

As quoted by Saker (1993), behaviour of private investment is quite different in developed and developing economies. Credit availability and government investment appear to be strong boosters of private investment in case of developing economies. He concludes that private investment is positively correlated with output growth, private sector credit availability and government infrastructural investment. Private investment functions for various middle-income and low-income African countries for the period 1971-1988. He finds that real output growth, real exchange rate, credit availability and government infrastructural investment are positively related to domestic private investment in studied African countries. Inflation and external debt

servicing add to macroeconomic uncertainty and are, therefore negatively related to private investment (Saker,1993).

The transitional Government of Ethiopia, which took power from the socialist regime, had led the country for about four years with the principle of market - based economy. In order to materialize the intention of putting the private sector at fore front in the economy, the Transitional Government promulgated investment proclamation No. 15/1992. The newly promulgated investment proclamation has created good investment environment particularly for domestic investors, which lifted the majority of restrictions to the private investors. After exercising for some years this proclamation, two successive amendments have been made with the objective to enhance the participation of both domestic and foreign investments. Particularly, the last proclamations No.37/1996 have made remarkable progress with regard to the participation of foreign investments aimed at attracting substantial foreign capital. With regard to the institution to implement investment policy and incentives, “Investment office of Ethiopia,” which then renamed “Ethiopia investment Authority (EIA),” was established. The authority is accountable for investment Board that is chaired by prime minister. Along with this office, Regional Investment Bureaus were established to implement investment policy and incentives as the country have pursued decentralization of political power to regional states. Regional states have the power to formulate and have their own respective investment policy and incentives within the environment of the federal investment policy and incentives (Ethiopia Investment Guide, 2010).

In Ethiopia Private Investment is a key to long-term economic growth (Adugna, 2013). However, private sector investment has shown improvement following the 1996 economic reform it still have a fluctuating feature (Alemayehu, 2004). Declining investment ratios and levels are a problem, firstly because investment matters for growth, and secondly because low investment increase vulnerability in the economy (Oshikoya, 2001). One of the key challenges facing the country with the regard to private investment is lack of awareness among the investors about the modern business system (Adugna, 2013). In the case of Ethiopian context, although private sector investment has shown improvement following the 1995 economic reform it still has a fluctuating feature (Alemayehu,2004). Additionally, the role of private sector in the economy is minimum compared with that of the public sector (Agenor, 2005).

1.2. Statement of the problem

Most researchers have focused on the impact of governance, credit availability, exchange rate and interest rate on private investment in Ethiopia, without much emphasis on the infrastructural facilities in the country(Khan & Reinhart,1990).

The private investment has shown different trends of growth and performance in the case of Ethiopia due to shifts in the regimes and political processes. During the Imperial era (1960/61-1973/74), private investment as a percent of GDP at market price was about 10.5 percent and growing by about 6 percent per annum on average. The reasons for a relatively good performance of private investment in this period include the existence of import substitution strategy, market-oriented financial sector policies, a developing share market, the free market where prices were determined purely by supply and demand (Alemayehu and Befekadu, 2002). However, this promising trend was reversed due to the socialist ideology persuaded by the military government that replaced the monarchy in 1974. Thus, the period 1974/75-1990/91 witnessed centralized economic system, where the state was given a significant role in all sphere of the economy. The private investment was given little rooms due to the ideology. During this period(1974-1991), the ratio of private investment as a percent of GDP declined to 4.5 percent. This ratio is far below the Sub Saharan African (SSA) countries where the average rate of private investment to GDP was 10.6 percent (IMF,1995). Between the periods 1992/3-2004/05, the share of private investment rose to around 8 percent of GDP at Market Price. Despite this achievement, the performance the private sector has not been considered adequate in light of twelve years of adjustment efforts and policy incentives directed toward making the private investment take the lead in initiating economic growth. As indication of this inadequate performance could be seen vis-à-vis the average shares of private investment of SSA countries (12.5 %), IMF (2012). And the average real private capital formation as a share of real gross capital formation in Ethiopia over 2004/05- 2013/14 was 4.21 percent whereas real public capital formation account for 3.43 percent. This is an indication of the low share of private sector investment from the total investment which requires efforts to extend its share from the current stage (Addis Ababa Chamber of Commerce Report, 2013).

The resource gap between saving and investment is very high despite the low share of private investment to the country's GDP. For instance, the resource gap between 2009/10 was 19.4 %

which could be considered very high in comparison to the international average share (FDRE, 2010). The low private investment performance as compared to Sub-Saharan African countries and also the global average particularly in terms of its share from the GDP in the one hand and the efforts of the government to attract private investment on the other require researchers, what could be the underlying factors that determine the growth or expansion of private investment (Ambachew,2010).

According to Ethiopian Investment Agency (2014), Ethiopia has great potential for investments for several reasons, among the top performing economies with an average GDP growth of 11% per annum since 2004 (MOFED), stable political environment, government actively promoting private sector investment with attractive incentive packages, large domestic market as the second most populous country in Sub-Saharan Africa, located in the crossroads between Africa, the Middle East and Asia, Preferred access to many international markets, projected national investments of \$73 billion to upgrade hard and soft infrastructure(GTPI), access to low cost electricity due to investments in hydroelectric power(EIA ,2014).

Due to massive and collaborated effort to increase saving through strengthening saving for housing program, selling government bonds and improving social security schemes the share of gross domestic saving increase from 20 percent in 2009/10, 32.40 percent in 2015/16 (MOFEC). Despite the increase in saving mobilization the gap between investment required and the level of domestic saving required is widened the share of gross domestic investment in gross domestic product increased from 24.7 percent in 2009/10 to 38.5 percent by the end of 2015/16 . It has become one of the key macroeconomic challenges to Ethiopia (NPC Annual report, 2015/2016).

Ethiopia require fast growing private sector to ensure structural transformation of the economy and its sustainability which require identification of determinants of private investment to address their respective roles and take policy tools and measures. The other rationale behind undertaking this study currently is to evaluate the investment endeavour of the government in different social and physical infrastructure components of public investment (Adugna, 2013).

In the case of Ethiopia, some studies have been undertaken. Abdushi(2000) studied factors determining private investment in Ethiopia using time series data for the period between 1975 and 1998 and applied OLS models. In his study real gross domestic product and public expenditure are found to have statistically significant effect to promote private investment Adugna (2013) studied determinants of private investment using time series data over the period

from 1981-2010 employing OLS methods and came up with a positive and statistically significant impact of public investment, economic growth and interest rate upon the performance of private investment. Hailu and Debele (2015) studied the effects of monetary policy on the private investment on in the case of Ethiopia using the time series data from 1975-2011 and applied autoregressive distributed lag models and co integration based on ECM. The main findings of their study were that economic growth, exchange rate and public investment has significant long run impacts on the private investment in Ethiopia. This study used OLS regression Model to estimate the relationship between private investment and the determinant variables. Based on these problems, this study will try to examine the following research questions.

1.3. Research Questions

The study is aimed to answer the following core research questions:

1. What is the effect of real GDP on private investment?
2. What is effect of access to bank credit on growth of private investment?
3. How does foreign direct investment affect the growth of private investment?
4. What is effect of foreign exchange reserve on growth of Private investment?
5. How does public investment affect the growth of private investment?
6. What is the effect of inflation on private investment?
7. How affect lending interest rate the growth of private investment?
8. What is effect of external debt servicing on growth of Private investment?

1.4. Objective of the study

1.4.1 General Objective

The main objective of this study is to examine the Major determinants of private investment in Ethiopia over the period between 1996 and 2016.

1.4.2 Specific objective

The specific objectives of this study include:

1. To identify the impact of gross domestic products on real private investment.
2. To investigate the effects of public investment on private investment in the study period.
3. To identify the impact of foreign direct investment on real private investment.

4. To identify the relationship between foreign debt servicing on private investment in Ethiopia under the study period.
5. To investigate the effects of inflation on private investment in the study period.
6. To investigate the effects of foreign currency reserve on private investment in the study period.
7. To investigate the effects of lending interest rate on private investment in the study period.
8. To identify the impact of access to bank credit on real private investment.

1.5. Scope of the study

This study is delimited to assess the determinants of private investment in Ethiopia over the period between 1996 and 2016. The study period is selected based on the availability of data about the private investment and all the variables that are included in the study. And also the period chosen is between the hyperinflation period, world economic crisis in 2008, in addition many studies done within three political ideologies but this study focus mainly when Ethiopia full introduced new market-oriented economies and economic reforms in 1996 thus it is assumed that major economic variables are somehow ‘normal’, can contribute positively to economic growth.

1.6. Limitation of the Study

The research focuses on private investment and not every variable that influence decisions to invest was included. As such, some of the variables such as infrastructure and political uncertainty were excluded to narrow down the scope of the study to manageable dimensions. The problem of identifying the correct model specification and the adequacy and reliability of data on macroeconomic variables. Though it is difficult to draw firm conclusions, that may hinder the private investment activities in the country.

1.7. Significance of the study

A number of studies on the investment especially in developing countries have been carried out. Nevertheless, empirical evidence on the determinants of private investment growth has been limited (Khan and Kumar,1997; Siraj, 2014). In Ethiopia, the presence of little empirical analysis in this context makes this study vital to show the determinants of the private investment in the economy and to help design informed and prudent recommendation in the endeavour to promote private sector development. Researchers and academicians will find this work useful as there is

limited research on the subject matter within the Ethiopian context. The study will therefore add to the existing knowledge in the subject area.

1.8. Organization of the Study

The paper is organized into five chapters. Chapter one is the introduction and it covers background to the study, problem statement, objectives of the study, hypotheses, scope, significance and organization of the study. Chapter two presents review of relevant theoretical and empirical literature. The chapter also presents over view and improvement of private investment climate in Ethiopia. Chapter three discusses the methodology employed in the study, description and sources of data. Chapter four encompass the presentation and analysis of empirical results obtained from the regressions result. Chapter five presents the summary, conclusions and policy recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2. Introduction

The aim of this chapter is to briefly and critically review the pertinent theoretical and empirical literatures by categorizing the study area into four major categories. First, presents a review of the theoretical aspects related to determinants of private investment and its impacts on economy. Second, the review of the empirical literature which states the different studies concerning the determinants of Private investment in Ethiopia. Third, presents the conceptual framework of the variables. Finally, conclusions on the literature review and knowledge gaps are presented in fourth section.

Investment has been defined variously by different authors. Reilly and Keith (2009) defined investment as the current commitment of money for a period of time in order to derive future payments or benefit that will compensate the investor (Asante,2000). In Economics class the term refers to the purchase of a physical asset while in a Corporate Finance course the term could apply to any asset including market securities. Private Investment therefore, is in investment by individual people or firms as opposed to the government as an entity (Fabozzi,2009).

2.1. Private Investment Determinants and their Relationships

Economic theory (Kenya,1936) suggests that there may be many determinants of private sector investment. Evidence tends to support the idea that the level of investment is determined by a number of variables. Empirical studies in this subject in Sub Saharan Africa, Kenya included, and other parts of the world seem to concur with this point of view. Factors that have been explored as attributable to investment changes include; changes in income, the cost of capital, the rate of return, public sector investment, credit to private sector, taxation, the terms of trade, the debt level, the exchange rate, development of urbanization ,among others.(Ronge and Kimuyu ,1997).

Changes in national income are expected to move together with investment levels. As the Accelerator theory postulates (the Keynesian concept of multiplier which states that as the investment increase, income increases by a multiple amount, when income or consumption increases, investment will increase by a multiple amount) changes in investor's expectations about future economic conditions influence the levels of investment, the particular or main

channel or variable to affect is the question of debate between the Keynesians and the Neo-Classical thinkers (Asante, 2000). The same applies to such factors as expected profits and the rate of return on investment while the converse is true for cost factors such as taxes and the cost of capital which are expected to be negative influencers (Were,2001; Quattara,2004).

Many of the studies in this area such as Bakare (2011) are of the view that infrastructural public investment is the one that complements private investment. For public investment, it is just a matter of whether it competes or complements private investment. Asante (2000) observed, a recent track record of private investment is an indication of good investment climate and therefore is expected to encourage present and future private investment. Therefore a positive correlation is expected with its present levels.

As observed in many studies involving developing countries including Ouattara (2004) and Were (2001) among others, credit to private sector is an important determinant of private investment for developing countries. It is expected to exhibit a positive sign in his model as a booster of private investment. As Ronge and Kimuyu (1997) discusses financial repression and controls (especially of credit availability) in developing countries make it such an important factor impacting on the effects of other policy interventions such as fiscal and monetary policies.

Interest rates effects have been, depending, hypothesized to be either positive or negative as many researchers have observed. This would depend on whether they would follow the Mckinon-Shaw hypothesis - of interest rates boosting savings and so investments - or the Neo-Classical view - of interest rate as a cost factor being negatively related to investment (Muraga,2006).

2.2 Theoretical Review on Determinants of Private Investment

The theories of investment clearly emerged with Keynes 1936 publication. The General Theory of Employment Interest and Money but the ideas were well in advance of Keynes (as cited in Galbraith, 1987). The theories of capital and investment have also long been intertwined and related (Gould, 1969). Approaches to the study of investment can be categorized in at least five broad theories. They consist the Accelerator theory, Cash flow theory, Neoclassical theory, Modified Neoclassical (or Bischoff) theory and the Tobin's Q theory. There are also several combinations of these models (Ouattara ,2004).

These standard alternative theories can be classified in various ways. Key among them based on the optimal adjustment path for the firm's capital stock and, secondly in terms of the relative importance of price variables like taxes and interest rates (Cherian,1996). Under the first division, of the five models only the Q theory explicitly considers the optimal adjustment path for the firm's capital stock. Along the second criterion, for the neoclassical model, only price variables matter, for the accelerator and cash-flow models only quantity variables matter. For the Q theory, what relevant are autonomous shocks and for the Modified Neoclassical model, what matters is a combination of price and quantity variables with the latter being somewhat more important. The quantity variables include output, liquidity and shocks such as technological shocks. In explaining investment, a few theoretical models are at work in different literatures underpinning studies on investment decisions and serving as departures for their variants and extensions. Among those, the Accelerator, the Liquidity, the Expected Profits also known as the Cash Flow or Tobin's q and the neoclassical models of investment behaviour have wider coverage in investment literatures (Cherian,1996).

2.2.1 The Accelerator Theory (Clark ,1917)

The Accelerator theory of investment, as proposed by Carver (1903), Aftalion (1909), Bickerdick (1914) and Clark (1917) in its rigid version, and subsequently developed by Chenery (1952), Koyck (1954), Leeuw (1962) and Evans (1967) into its flexible version, explains that investment decision of a firm is determined by changes in demand for its produces (Song et al, 2001, P. 229). In accelerator theory of investment behaviour, desired capital (K_t^*) is proportional to output (Y_t) expressed as $K_t^* = \alpha Y_t$ (as in the Aftalion Clark simple or rigid version); and, actual capital, $K_t = \mu \alpha Y_t$ (as in Chenery and Koyck flexible version), where α is the desired capital output ratio and μ is a constant parameter of adjustment (Ambachew, 2010). The main implication of the model is that the investment expenditure of an investing firm is proportional to its output while its output is a function of demand. Samuelson's accelerator theory suggests that investment is a function of past changes in income (Galbraith ,1987). It follows the Keynesian view that changes in investor's expectations about future economic conditions influence the levels of investment. The desired investment stock depends on planned output. Neoclassical writers believed that investment is very sensitive to the interest rate while Keynes and his followers took the position that changes in investor's expectations about future economic conditions are far important in explaining changes in levels of investment. Both groups agreed

that equilibrium investment occurs when the expected rate of return in investment equals the rate of interest (Byrns and Stone, 1981). On government spending, it is postulated that decreases in government spending directly deflate the demand for goods and services. According to Keynesian view point this leads to decreased investment activities (Bodie, Alex and Marcus, 2009).

2.2.2 Cash Flow Theory (Bischoff, 1971)

Current and past profits or cash flows have been thought of as good proxy for future profit expectations which in turn determine investment (Bischoff, 1971). Additionally, cash flow is also seen as a source of funds so the cost of funds to the firm rises when internal funds are exhausted given imperfect market condition. According to Cherian (1996), the managerial and the information theoretic approaches to investment were the latest. Both approaches emphasize the role of internal finance as the fundamental determinants of investment and can be regarded as the modern versions of liquidity theory. In the managerial view, internal finance is preferred as it facilitates discretionary behaviour by managers while in information theoretic viewpoint, due to information asymmetries between insiders and outsiders.

And also the Expected Profits (Cash Flow) theory of investment formalized by Grunfeld (1960) explains desired capital as a proportion of the market value (V_t) of a firm, $K_t^* = \alpha V_t$, where α is the desired ratio of capital to market value of a firm. Tobin (1969) has also proposed a model regarded as a generalization of the Expected Profits model in which investment expenditure is related to the ratio of the market value of business capital assets (V_t) to the replacement value (δt) of those assets (Cherian, 1996).

2.2.3 Neoclassical Theory (Bischoff, 1971)

The Neo-classical theory argues that the rate of interest is the important determinant of investment. In contrast with the accelerator model, the neoclassical model assumes that the desired stock depends not only on planned output but also on the ratio of output price to the implicit rental price of the services of capital goods (Bischoff, 1971). Basically it derives from a profit maximization process aimed at desired capital given a Cobb-Douglas production function. Bodie, Alex and Marcus (2009) note that Keynesian (demand-side) economists look at effects of taxes on consumption demand whereas supply-siders (Neoclassical) argue that lowering tax rates will elicit more investment and improve incentive to work. Accordingly, monetary policy works largely through its impact on interest rates. Increases in the money supply lower interest rates which in turn stimulate investment demand (Galbraith, 1987).

2.2.4 Modified Neoclassical Theory (Bischoff, 1971).

The Modified Neoclassical (Bischoff) model is a version of Neoclassical model in which the distributed lag is altered to accommodate the empirical observation that capital-output ratio are embodied in new equipment and structures rather than the existing ones (Clark, 1979). Since factor proportions are fixed at the time the equipment is designed, changes in factor intensities dictated by changes in the price of capital take place only as the old capital is replaced; so called the putty-clay hypothesis. Bischoff suggested that real output and the cost of capital should have separate lag structures in the determination of investment expenditure (Fazzari, Hubbard & Peterson 1988).

2.3. Empirical Literature on the determinants of private investment

2.3.1. Empirical Literature on the determinants of private investment in the rest of the world

The purpose of this section is to review related studies in Ethiopia and elsewhere to have a deeper understanding of the factors contributing for private sector investment growth. Sakr (1993) carried on studies on the private investment behaviour in Kenya and found a positive influence of savings, GDP growth and public investment on the behaviour of private investors. He also indicated that output growth did not affect private investment while monetary policy played a less significant role. Further, the paper found that credit provided to the private sector, public investment and GDP growth had a significant impact on private investment. Restrictions on investment financing are a problem broadly documented in the literature on the determinants of investment. Ronge and Kimuyu (1997) suggested that some agents, typically small and medium enterprises (SMEs), are unable to get financing directly from open market debt. Hence, these agents are strongly dependent on bank credit, a market that is usually characterized by imperfections due to asymmetric information between lenders and borrowers. In developing countries, this problem of access to credit is critical, due to the absence of markets and poor access to long-term financing. The evolution of the credit amounts destined for the private sector would be a good indicator of the restrictions operating in the domestic financing of investment.

Ronge and Kimuyu (1997) examined the determinants of private sector investment for Kenya using data over the period 1964-1996. A double-logarithmic form of the investment equation was estimated using ordinary least squares (OLS). The results indicated that both the availability of credit and foreign exchange exerts significant positive effects on private investment confirming

the results in most empirical studies. Private investment, however, was adversely affected by the stock of debt. Specifically, a one percent increase in the lagged debt to GDP ratio reduced private investment by 0.3 percent. The study also establishes a negative effect of exchange rate depreciation on investment while public investment positively affect private investment, contrasting the results of Kazeem et al (2012) where crowding-out was found. The interest rate was also found to be less important in determining the level of private investment in Kenya.

Foreign direct investment (FDI) in any economy brings with it technology, income through taxes, reduces unemployment and if the products it produces are meant for export it earns foreign exchange to the country. Mutenyo et al.(2010) examined the link between FDI and private investment using a panel level of 34 Sub-Saharan African (SSA) countries from 1990-2003 and accounted for the endogeneity of variables using two-stage least squares (TSLS) econometric technique. The study incorporated FDI as one of the variables assess its effects if any in the behaviour of private investment in Kenya (Kazeem et al, 2012).

Asante (2000) investigated the determinants of private investment in Ghana using time series and cross-section data. The survey data comprised of 116 manufacturing firms in Ghana sought to capture the determinants of private investment that are not captured in time series analysis, for example, political instability and policy uncertainties. The study had nine variables in total which included GDP growth rate, Balance of Payment, Credit to the private sector, Public investment as a percentage of GDP, Private investment as a percentage of GDP, Inflation rate, Budget Deficits as a percentage of GDP, Real Exchange Rate and Foreign Direct Investment which is also a percentage of GDP. The study found that public investment had a crowd in effect on private investment while credit to the private sector has a positive influence on private investment. Further, the study found coefficients of the proxies for macroeconomic instability, the real exchange rate, the debt burden, the black market premium, and the inflation rate to be statistically insignificant in explaining private investment. However, the overall indicator of instability was found negative in private investment in Ghana (Asante, 2000).

Kazeem et al (2012) in the study which covered the period 1970 to 2010 used an advanced econometric technique of ARDL bounds testing approach in modeling long run determinants of domestic private investment. Findings from the study showed clearly that difference exists between long and short run determinants. The interest rate, real GDP, exchange rate, terms of

trade, external debts, public investments, credit to the private investment and reforms dummy are the key long-run determinants of domestic private investment while real GDP, public investment and terms of trade are statistically significant in the short run. Kazeem et al (2012) recommended that necessary infrastructures to complement domestic private investment should be put in place and that external debts reduced to the barest minimum and negative effects of external shocks endangered by foreign direct investment uncertainty and deficit terms of trade should be prevented all together.

Frimpong & Marbuah (2010) carried out a study seeking to present an empirical assessment of factors that have either stimulated or dampened private sector investment in Ghana using ARDL framework covering the period 1970 to 2002. From the results it emerges that private investment is determined in the short-run by public investment, inflation, real interest rate, openness, real exchange rate and a regime of constitutional rule, while real GDP, inflation, external debt, real interest rate, real exchange rate and openness significantly influenced private investment response in the long-run. On the policy front, the study indicates that improving the productivity of sectors such as agriculture and manufacturing by providing more efficient advanced technologies as input subsidies could go a long way to increasing private investment levels and growth in output(Frimpong & Marbuah,2010).

In Fiji, Seruvatu et al.(2001) investigated the determinants of the private investment using time series technique. Specifically, the study employed unrestricted error correction model for the period 1966 to 1998 to analyze the long run and short run determinants of private investment. The study found real GDP growth, real lending rate, real private sector investment, real effective exchange rate index, terms of trade index and real unit labour cost to weakly explain private investment with only 35 percent of the variations in private investment being explained by the independent variables. The paper justifies this poor fit of the model by highlighting factors such as perceived inadequacies in the legal system, failure to enforce contractual obligations and property rights, land Effects on private investment (Seruvatu et al,2001).

Badawi (2004) investigated the impact of macroeconomic policies on private investment in Sudan employing annual data over the period 1969-1998. The results suggested the significant crowding-out effect of public investment on private investment in Sudan, devaluation policies also contributed to discouraging private sector capital expansion.

Quattara (2004) employed the ARDL modeling for the period 1970 to 2000 to analyze the determinants of private investment in Senegal. Further, the paper employed Johansen co integration and ARDL bounds approach to estimate the long run relationship between private investment, public sector investment, real GDP, credit to the private sector, foreign aid and terms of trade. The paper found that private investment was positively influenced by public investment, real income and foreign aid flows, but negatively influenced by credit to private sector and terms of trade.

Acosta et al.(2005) investigated the short run and long run determinants of private investment in Argentina for the period 1970 to 2000. The results from the ARDL model revealed that exchange rate, inflation, trade liberalization and shocks in the aggregate demand were the main determinants of private investment in the short run. Further, public investment was found to have a crowding-out effect on private investment in Argentina. In the case of the long run, external debt and domestic credit markets were found to determine private investment.

Osmond (2014) studied the determinants of private investment in Nigeria for the period from 1970- 2012 by estimating the investment rate function derived from life cycle hypothesis while taking into account the structural distinctiveness of developing country. The study employed error correction model to avoid for the problem of spurious relations. The results of the study confirmed that investment rate is positively influenced by the growth rate of disposable income and the real interest rate on bank deposits. Investment rate in Nigeria is found to be influenced negatively due low public infrastructure, high lending rate, low saving rate and political insatiability.

Research on corruption has expanded in recent years, yet work investigating its impact on private investment is still in its infancy. Ronge and Kimuyu (1997) find that an aggregate institutional indicator, a “corruption indicator,” is negatively associated with aggregate investment in his sample of countries. Were (2001) present results from a survey of entrepreneurs that suggest that perceived unreliability of the judiciary, government instability, and corruption negatively influence cross-country differences in aggregate investment. Were(2001) find that among institutional factors, lack of rule of law, high corruption and real exchange rate distortions are the most detrimental for investment.

A number of recent studies have examined the impact of the business environment on investment. (Beddies 1999, Ghura and Goodwin 2000), investigated in a limited number of

countries the link between private investment and perceived business obstacles in developing countries, obstacles such as corruption, unpredictability of the judiciary, onerous regulations for starting a business, tax and labour regulations, and others. Countries where these obstacles were perceived to be fewer had higher levels of private investment. One reason why corruption seems to depress investment is that it acts as a tax on private investment. A “corruption tax” is particularly burdensome for activities such as investment projects that by nature involve a long time horizon and a multiplicity of logistic, administrative and legal steps. Each of these steps is liable to incur corruption taxes, each cascading over the other. The result is an increase in the cost of capital, hence a reduction in anticipated profitability, as well as a relative incentive toward investments involving fewer administrative steps: that is, the tax is distorting, too. But some econometric evidence Beddies (1999), Ghura and Goodwin (2000) indicates that private investment has a stronger, more favourable effect on growth rather than government investment; probably because private investment is more efficient and less closely associated with corruption.

Investigating the impact of corruption on private enterprise and public finance is not a new concept, yet quantifying the impact remains elusive. A recent IMF note reports a survey by a resident representative in some country suggesting that almost 40 percent of a new enterprise’s expenses in the first year are “informal payments.” Forty percent is likely an extreme case, but some results from a recent OECD/World Bank report that provides estimates of social losses for Eastern European countries (Asiedu and Freeman,2009).

Asiedu and Freeman(2009) studied three important economic areas transition countries, Sub-Saharan Africa, and Latin America and the Caribbean. They found that corruption has an adverse effect on investment growth in transition countries, but has no significant effect in Latin America and the Caribbean, and Sub-Saharan Africa. Furthermore, among the variables (firm size, firm ownership, trade orientation, GDP growth, inflation and openness to trade) corruption is the most important determinant of investment growth for transition countries. This shows that the overall effect of corruption on investment is negative.

A study by Bakare (2011) on the impact of corruption on investment showed that corruption was among the most significant obstacles facing investment cited by Afghan business people. Others included access to land, anti-competitive behaviour and tax administration, all closely related to corruption. The World Bank’s report on the investment climate in Afghanistan identifies the

major obstacles to investment as being electricity, access to land, corruption and access to finance.

The survey made by Seruvatu and Jayaraman (2001) on determinants of private investment in Fiji indicated that the principal factors hindering investment are largely policy-related issues. This suggested that while investment incentive schemes might go some way in promoting investment, the key to improving the investment climate is clear policy direction and simple bureaucracy and regulation. The top major obstacles to investment were government policy uncertainty, bureaucratic red tape, government regulations, finding skilled labour, volatile political situations, land issues, law and order instability, a lack of infrastructure, and high utility costs like water and electricity. Consumer confidence, interest rates, shipping costs, profitability, bank fees and charges, price controls, tax rates, racial issues, medical/education facilities, finding suitable land/premises, availability of work/sales, lack of bank lending, wages, cash flow, contract security, and exchange controls were relatively less important. Other impediments to investment include expatriate permits, a lack the Board of Directors' support and interest, lack of management focus and prioritising, trade union issues, lack of local equity, labour rigidity, trade relations, lack of raw material, international tax treaties, and coups and crime.

Ndikumana (2014) domestic savings appear to be an important driver of domestic investment. Similarly, bank credit to the private sector has a positive and statistically significant effect on domestic investment. The effect is nonlinear, suggesting that beyond a certain threshold of the credit to GDP ratio, the relationship between credit and investment turns negative. However, in this particular sample, the threshold implied by the regression results is high, implying that there is plenty of room for credit to increase in the range where the relationship between domestic investment and credit to the private sector is positive. The effect of credit on investment is quantitatively much larger than that of domestic savings. The results suggest that improvements in access to investment capital from the banking sector are a more potent tool to stimulate domestic investment than domestic savings. In other words, while both bank credit and domestic savings constitute potential sources of investment financing, domestic savings that are intermediated through the banking sector ultimately alleviate the financing constraints more effectively. The two results taken together are consistent with prior studies in the literature that have documented a powerful role by financial intermediation for domestic investment in Africa

Different literature in finance and economics has traditionally attributed an important role to domestic savings in the process of long-run growth and economic development. According to Sir Arthur Lewis, economic development involves transformation of a low-saving economy into one with high saving rates. One of the channels of the effect of saving on growth is through domestic investment. In the context of imperfect capital mobility, domestic savings are the key determinant of domestic investment. Formally demonstrated this relationship in the case of developed countries. The relationship would be expected to be even tighter in the case of developing countries which face more constraints to accessing foreign capital markets. Indeed, empirical evidence supports this prediction. However, the evidence also shows important cross-country variations, implying that failure to account for such heterogeneity in cross-section regression analysis may lead to incorrect rejection of the saving-investment relationship. By accounting for heterogeneity using the mean group estimator, the relationship between domestic savings and domestic investment is found to be positive and statistically significant (Khan, and Reinhart (1990).

For a panel data set covering the majority of African countries, Ndikumana (2014) constructs a composite measure of financial intermediation and tests the effects of financial development on domestic investment. The results conclusively confirm a positive relationship between domestic investment and financial development. In the same vein, Ghura and Goodwin (2000) find that private investment in sub-Saharan African countries is significantly influenced by financial development. Using a balanced panel of 20 sub-Saharan African countries to test the saving-investment nexus, Adeniyi and Egwaikhide (2013) find that in general financial deepening matters little for this nexus. However, when saving is interacted with financial development measured by credit to the private sector, they find that the interaction term exerts a positive and significant influence on investment. This suggests an important role for financial development in mobilizing domestic savings to finance investment. Overall, the evidence supports a positive association between financial development and domestic investment in Africa as in other regions (Ndikumana ,2014).

Based on the premise that domestic investment depends on domestic savings, there is a widely held view that capital flows have a positive effect on domestic investment by supplementing domestic savings. Thus, in his investigation of the determinants of the rates of long run growth across countries, Saker (1993) suggested that transfers of capital from developed countries to

developing countries play an important role as a driver of growth. In practical terms, Leontief considered that the key source of foreign capital was foreign aid. This would imply that to the extent that foreign capital inflows are used to finance capital investment, countries that receive more foreign aid would achieve higher levels of investment. However, the effect of foreign aid on domestic investment may be limited if a substantial fraction of foreign aid is allocated to financing consumption. Moreover, it has also been argued that foreign aid may reduce domestic savings and increase consumption in which case aid inflows would have little or no effect on domestic investment. This argument, however, has been contested on both conceptual and empirical grounds. The postulated positive relationship between foreign aid and domestic investment has been an important motivation for promoting increased aid inflows to developing countries as a means of spurring domestic investment, which in turn is expected to stimulate growth. Dollar and Easterly (1999) challenged the aid-investment-growth model by questioning both links in the relationship in the case of African countries. Specifically, they argue that investment does not have a “tight link to growth in the short run, and not even much of a link in the long run in Africa” (Dollar & Easterly, 1999). As for the aid-investment link, the authors argue that it is conditional on good policies: “foreign aid leads to private investment in an environment of good policies, but not in an environment of poor policies” (Dollar & Easterly, 1999). If the Dollar-Easterly claim is correct, then given the remarkable improvement in the policy environment (at least as defined by the authors) in Africa over the past two decades, they observe a positive and tighter relationship between foreign aid and domestic investment in Africa.

2.3.2. Related studies in Ethiopia on determinants of Private investment.

Ambachew,(2010) study on the determinants of domestic private investment in Ethiopia identified that domestic credit given to the private sector reduces domestic private investment because the credit may be diverted to non-productive activities. The study further identifies that the appreciation of the real exchange rate discourages domestic private investment and vice versa. In short, the high value of local currency constrains domestic investment.

Dawit(2010) showed that the following are the success factors for private investment: the maintenance of good accounting records by firms, good managerial skill, experience, government support and training. The major problems are a lack of proper planning and

feasibility studies, lack of skilled staff, delays in securing bank loans, a lack of market for products and service, infrastructure problems and inflation.

A study by Workie (1996) on constraints to entry, operation and expansion of private investment in Ethiopia using investor level information showed that bureaucratic procedures, a lack of infrastructure, power supply problems and access to finance were the leading constraints for operations. The other areas of the business environment (such as political/policy uncertainty and labour regulations) were relatively less important. The survey ultimately confirmed that the availability of finance rather than the interest rate is a crucial determinant of private investment in Ethiopia. Macroeconomic instability and political/policy uncertainty were not found to be significant determinants of private investment.

Adugna (2013) undertook a study covering the period 1981-2010 using Ordinary Least Square (OLS) regression to model the determinants of private investment in Ethiopia. Findings from the study showed that public investments in basic infrastructures and social overheads are essential for private investment. In addition, the rising real per-capital income of the people has a crucial positive effect on private investment by way of increasing market demand for goods and services. These in turn trigger private investment. Likewise, external debt has a favourable effect on private investment in countries like Ethiopia where there is a serious shortage of finance.

A study by Admasu (2002) on the macro and microeconomic determinants of private investment both at national and regional levels in Ethiopia showed that at the micro level the probability of individual's to invest is significantly and positively influenced by the level of education, access to land and investment incentives. The influence of bureaucratic red tape was also found to be negative and significant. Moreover, Deneke's(2001) concluded that unclear land policy, compounded by investors' fear of political instability, has impeded Private sector development.

Getachew (1997) studied the determinants of private industrial investment in Ethiopia using descriptive statistics to analyse micro-level determinants. He found that the real interest rate did not have a significant impact on private investment in Ethiopia. The study revealed that private investment was positively affected by credit disbursement to the private sector in Ethiopia. It also found that severe constraining factors to private manufacturing investment were market, financial, infrastructure, policy, technology, and input related ones.

Sisay(2010) carried on the study of the determinants of private investment in Ethiopia over the period ranging from 1950-2003 motivated by modified flexible accelerator model by applying multivariate single equation ECM estimation methodology. According to his study private investment in Ethiopia is positively influenced by the domestic market, infrastructural facilities and FDI and negatively by macroeconomic uncertainty.

Siraj (2014) tried to evaluate the inter-relationship between private investment and economic growth both in the long and short run. He argued that there is evidence of unia-directional causality between economic growth and private investment. The findings showed that both private and public sector investment have a positive significant impact on real output/economic growth while in the short run public investment has a negative impact on growth and private investment has a positive impact on private investment.

Esubalew (2014) carried on studies on the macroeconomic determinants of private investment in east Africa region with panel data set from the period of 2000-2012. According to his studies macroeconomic factors such as variation in the output and real per capita growth fiscal and monetary policy as well as exchange rate are the most determinant factors for the variation of private investment in eastern African countries over the study period. His study confirmed that domestic private investment is positively influenced by real GDP growth, financial availability as measured by credit to the private sector as the percentage of GDP and the development of human capital as measured by school enrolment has significant positive influence on the private investment of the region. On the other hand variable such as unstable macroeconomic environment, as measured by the inflationary situation, high external debt, fluctuation in the terms of trade, real exchange movement, public investment and real interest rate are found to hinder private investment significantly in East Africa.

Abduishu (2000) the impact of inflation on private investment is moderate in Ethiopia as he stated from the estimation results. These results have confirmed that inflation in Ethiopia in comparison to other Sub-Sahara African Countries and transitional economies was moderate. whereas, the estimation results has confirmed that resource constraints which captured by real GDP, credit availability and foreign reserve availability to private sector highly and significantly influence private investment

The sets of findings in the foregoing analysis of the various relevant literature reveal numerous disparities especially in the empirical component. These may be associated to, among other things, the different settings of respective studies. It may additionally point to the imperfections of the methods used or quality of the data employed in the studies. Evaluation of this topic, therefore, becomes even more important as efforts continue towards consistent or conclusive results.

Table 2.1 Summary of Empirical Literature reviews

Independent Variables	Authors	Relation to dependent variables (Private Investment)
Real GDP	Saker(1993), Kazeemet.al(2012),Osmod(2014),Asiedu and Freeman (2009), Esubalew (2014), Abduishu (2000)	Positive
	Servrav et.al (2001),	Negative
Public Investment	SaKr(1993), Ronge and Kimuyu (1997),Fimpong et.al (2010), Asante(2000), Kazeemet.al(2012), Adugna (2013), Siraj (2014),	Positive
	Seruvatu et.al (2001),Quattara(2004),Acosta et al(2005), Osmod(2014), Esubalew (2014)	Negative
Bank credit	Loungani and Rush1995, Ronge and Kimuyu(1997), Asante(2000), Acosta et al(2005), Ndikumana (2014), Adeniyi and Egwakhide(2013), Dawit (2010), Esubalew (2014), Getachew (1997), Abduishu (2000)	Positive
	Quattara(2004), Ambachew (2010),	Negative
National reserve	Siraj (2014), Abduishu (2000)	Postive
	Sakr(1993)	Negative
Lending Interest rate		
	Ronge and Kimuyu(1997), Fimpong et.al (2010), Kazeemet.al(2012), Seruvatu et.al(2001),	Negative

	Osmod(2014), Getachew(1997),	
Foreign direct investment	Asante(2000), Sisay(2010) ,Abduishu (2000)	Positive
External debt servicing	Fimpong et.al (2010), Acosta et al(2005), Adugna(2013),	Positive
	Kazeemet.al(2012), Ronge and Kimuyu(1997),	Negative
Inflation rate	Asante(2000), Abduishu (2000)	Postive
	Fimpong et.al (2010), Acosta et al(2005), Asiedu and Freeman (2009), Esubalew (2014)	Negative

Source : Different Empirical literature reviews

2.4. Research gap and justification of this paper

A number of studies on private investment especially in developing countries have been carried out. Nevertheless, empirical evidence on the determinants of private investment growth has been limited (Adugna 2013 and Siraj, 2014). Currently, Ethiopian implements Industrialization lead economy and the government hugely make public investment and expanding different industry parks and ‘Sheds’ to attract private investors . Thus, presence of little empirical analysis in this context makes this study vital to show the determinants of the private investment in the economy and to help design informed and prudent recommendation in the endeavour to promote private sector development.

As investment is an engine for economic growth and is one of the most important weapons in poverty alleviation. It improves the productive capacity of the nation and also creates job opportunity for many people. One of the most important components of growth is private investment in which business institutions engage in the production of goods and services with the twin objectives of profit maximization and improving national economy. That is why due attention has been given to private investment. Different factors are expected to affect the performance of private investment.

2.5 Conceptual frame works

The main determinant variables at major determinants of private investment and levels in various research literatures were identified but the study only makes use of independent variables at a microeconomic and macroeconomic level. This research also focused on studying the major determinants that are critical to determinants of private investment in Ethiopia. From the literature review above, the following schematic representation of the conceptual framework/model for this study is developed. It depicts the relationship of variables within the a time series annual secondary data over 1996 to 2016 periods . The study period is selected based on the availability of data about the private investment, the period chosen is between the hyperinflation period,(world economic crisis in 2008), in addition many studies done within three political ideologies (Imperialism/Feudal, Socialist/Dreg regime) but this study focus when Ethiopia fully introduced new market-oriented economies and economic reforms in 1996 thus it is assumed that major economic variables are somehow ‘normal’, can contribute positively to economic growth. In addition, Ethiopia currently make huge investment to attract domestic and foreign investors by building railway infrastructure and industrial parks and shades, this is vital to identify the determinants factors in private investment

Figure 2.1 Conceptual frame work



Source: own construction (by taking the theoretical and empirical review)

2.6. Definition of Variables

Private Investment: Private sector's gross domestic investment is defined as all additions to the stocks of assets or purchases and own-account gross capital formation, less any sales of second-hand and scrapped assets(Asante,2000). The data is in constant price birr and then transformed into natural logarithm.

Real Gross Domestic product: is an inflation-adjusted measure that reflects the value of all goods and services produced by an economy in a given year, expressed in base-year prices, and is often referred to as "constant-price, *RGDP* is one of the most influential variables affecting private investment(Were,2001). GDP/real GDP/Economic growth/Real Income are positively contributes for private investment development. According to Basha and Debela (2015), private investment is positively and significantly affected by real GDP/income. Adugna (2013) also identified that real GDP per capita positively affects private investment. The higher real GDP per

capita is assumed increase effective demands for goods and services and thereby inspire private investors. The data used the constant price (real) in birr and transformed into natural logarithm function.

Public Investment: is the money that a government spends on public services, such as education, infrastructure and health(Abdush,2000). Public Investment expenditure is also another influential variable that determines affecting private investment. The role of public investment is seen from two aspects. On one hand public investment, in the form basic infrastructures, is a complement to private investment and hence promote private sector expansion and development. On the other hand, public expenditure is a competent of private sector and hence, reduces the amount of money available for them. As of Adugna (2013), Jalloh (2002), Ouattara (2004), and Molapo and Damane (2015), Public investment expenditure directly contributes for private investment. According to them public extensive investments on basic infrastructures-such as roads, energy and telecommunication - creates conducive environment for investment. However, Naa-Idar et al (2012) and Kaputo (2011), in Ghana and Zambia respectively, found the results that support the theory of “crowding out effect”. According to them public investment is inversely related with private investment. This shows that there is competition for resources between the public and the private sector.

The data used is Public sectors’ gross domestic investment comprises of all additions to the stocks of assets (purchases and own-account capital formation), less any sales of second-hand and scrapped assets measured at constant prices, done by government units and non-financial public enterprises then transformed into natural logarithm in order to reduce Heteroskedasticity.

External Debt Servicing : Total external debt is defined as debt owed to non residents repayable in foreign currency, goods, or services(Were,2001). It is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, short-term debt, and use of IMF credit. The data is in current U.S. dollars hen transformed into natural logarithm. Theoretically, high external debt may act as a disincentive for private investment since investor think that the future taxation may be used to finance the debt service leaving very few resources for investing in the domestic economy. External debt was expected to be negatively related with private investment.

Inflation: is the rising price of goods and services over time and general increase in prices and fall in the purchasing value of money (Asante,2000). According to Jalloh (2002), inflation reduces private investment, and causes low levels of private investment since domestic investors

foresee a low return on capital. Inflation as measured by the consumer price index (CPI) reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly.

Interest rate(Lending): According to economists interest is the cost of investment (Jalloh ,2002). The results from the studies show that interest rate is inversely related private sector performance in Sierra Leone and Zambia. According to Jalloh (2002), an increase in the real rate of interest will raise the user cost of capital, thereby making investment less profitable. As of Kaputo (2011) real lending interest rate has a significant negative effect in the long-run. This is so because the high cost of investment capital discourages investment by local firms. Real interest rate is the lending interest rate adjusted and transforming it into natural logarithm.

Access to Credit: Access to finance can be broadly defined as access to financial products (e.g. deposits and loans) and services (e.g. insurance and equity products) at a reasonable cost (Osmod,2014). In two out of three cases, credit to private investment negatively affects private sector performance. As of Ouattara (2004), credit to the private sector is negatively related to private investment. This implies that increases in credit to the private sector will not enhance private investment. Weak institutional environment and lack of experienced personnel and expertise were few reasons. In support of above evidence, Mbaye (2014) stated that funds to the private sector do not go to finance new investments because of poverty most people would borrow to finance other matters like education, healthcare and basic necessities. As a result private sector credit is negatively related to private investments. Kaputo (2011), however, suggested that credit plays a significant role in improving private investment.

National Foreign exchange Reserve: A nation's assets held in a foreign currency and/or commodities like gold and silver. Monetary reserves are used to back up the national currency and to provide a cushion for executing central banking functions like adding to the money supply and settling foreign exchange contracts in local currencies (Siraj,2014). The data used is net gold and foreign currency reserve in constant price in birr transformed into natural logarithm.

Foreign Direct Investment: The World Bank World Development Indicators (2014) defined FDI as the net amount invested or reinvested by non-residents to acquire a lasting interest (10 percent or more of voting stock) in enterprises in which they exercise significant managerial control. There are a number of FDI variables included in World Development Indicators data set: net FDI, BOP in current U.S.\$, net FDI inflows as percent of gross capital formation; net FDI

inflows BOP in current U.S \$ and net FDI inflows as percent of GDP. In line with the approach used in the FDI literature, in this study used the net foreign direct investment inflows as a percentage of RGDP. FDI was expected to be positively related to private investment.

CHAPTER THREE

RESEARCH METHODOLOGY

3. Introduction

This chapter outlines the framework for the analysis of determinants of private investment in Ethiopia. Dawson (2002) wrote that, a research methodology provides a framework or a blueprint for conducting a research. Various techniques and methods were used in analysing the determinants of private investment in Ethiopia. The aim of this chapter is therefore to provide arguments for the approaches that the researcher adopt in gathering and in the treatment of the data in order to answer the research questions and objectives. This chapter describes the types and sources of data and the methods and techniques used in the estimation of the models.

3.1. Research Approach and Design

This study is used quantitative research with descriptive type of research design method of data approach, which was collected from secondary data sources in order to tests the main economic variables that determine private investment in Ethiopia. An attempt was made to gather a 21-years data (i.e. from 1996 to 2016) on some important variables. The data was gathered from various sources such as National Bank of Ethiopia (NBE), Ministry of Finance and Economic Corporation (MOFEC), Ethiopian Investment Commission (EIC) and from other reliable sources. The collected secondary data was summarized using tables, charts and other appropriate statistical tools. Then, OLS regression model was used together with other appropriate econometric techniques to explain factors that determine private investment in the country. This model is selected for its simplicity, and is also expected to fulfill the assumptions of efficiency, consistency and unbiasedness.

3.2. Target Population

Population is the whole groups of individuals, phenomenon, or things that the research aims to generalize results on. In this study the target population is defined as private investments in Ethiopia.

3.3. Type & Sources of Data

The study conducted basically using secondary data. An attempt made to gather a 21-years data on some important variables. The study covered the period 1996 when the new investment

reform adopted up to 2016; allowing for full annual data on all the variables. The data gathered from various sources such as NBE, MOFEC, EIC and from other reliable sources. Data thus are purely secondary and is in line with prior studies on economic growth and private investment. Studies by Ghura and Goodwin (2000) in Cameroon; Jalloh (2002) in Sierra Leone; as well as Fatima's (2011) study in Pakistan all used secondary data from national and international statistical organisations, such as IMF and WB.

3.4. Methods of Data Processing & Analysis

The collected secondary data summarized using tables, charts and other appropriate statistical tools. Then, OLS regression model was used together with other appropriate econometric techniques to explain factors that determine private investment in the country. This model is selected for its simplicity, and is also expected to fulfill the assumptions of efficiency, consistency and unbiasedness.

3.5. Model specification

The research approach made use of correlation analysis and fitting of a regression model. Thus after defining the relationship of private investment and its determinants through correlation coefficients, the study first investigate the time series properties of the data by using the Augmented Dickey–Fuller (ADF) . The unit root test used to check the stationarity properties of the data.

The general form of the model estimated is following form:

$$PI = f(GDP, PUI, IR, FDI, NR, EDS, BCR, INF) \text{-----} (1)$$

Where:

- PI= Private investment
- GDP = Gross Domestic Product
- PUI=Public Investment
- IR=Lending Interest Rate
- NR=National Reserve
- FDI=Foreign Direct Investment
- EDS=External Debt Servicing
- BCR=Access to Bank Credit
- INF= Annual rate of Inflation based on consumer price index

Since this study covers the period 1996-2016 and the variables was discussed in the previous section, constitute time-series information, the appropriate modelling strategy is one involving time-series analysis.

The economic model in Equation (1) can be transformed into an econometric model as natural logarithm is applied in order to obtain a linear exponential trend (if any) in the time series data.

$$\ln PI_t = \alpha_0 + \alpha_1 \ln RGD P_t + \alpha_2 \ln PUI_t + \alpha_3 \ln IR_t + \alpha_4 \ln EDS_t + \alpha_5 \ln NR_t + \alpha_6 \ln FDI_t + \alpha_7 \ln BCR_t + \alpha_8 \ln INF_t + u_t \text{ -----(2)}$$

Where the coefficients $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7, \alpha_8$, and α_9 are the parameters of the respective variables and α_0 the constant term, t denotes time and u is the error term.

Table 3.1: **Definition of Variables**

S/No	Factors	Variables	Expected sign
1	Private investment-InPI	Private gross fixed capital formation at Constant prices.	
2	l ending interest rate-InIR	Average rate of lending on bank loans.	Negative
3	Bank credit /Access to credit /-lnBCR	Annual flow of credit to private sector credit	Positive
4	Output -LNRGDP	Gross domestic product (factor cost) at Constant price/real /	Positive
5	Inflation rate -INF	Annual inflation measured by GDP deflator	Negative
6.	Foreign direct investment -lnFDI	Annual inflow of foreign investment in USD	Positive
7	Public investment-lnPUI	Sum of public fixed capital formation and General government fixed capital formation t	Positive
8.	National reserve -lnNR	net gold and foreign currency reserve in constant price in birr transformed into natural logarithm	Positive \Negative
9.	External debt service- lnEDS	the sum of public, publicly guaranteed, and private nonguaranteed long/short-term debt.	Negative \Positive

3.6. Research Hypothesis

Based on the empirical literature on the determinants of private investment in developing countries the study proposes the following working hypotheses to hold true in the researcher analysis. The dependent variable is private investment and the explanatory variables that are expected to determine private investment are Real Gross Domestic Product, inflation, real domestic bank credit, national/monetary/ reserves, foreign direct investment and public investment . The explanatory variable that may affect the decision to invest in the literature are very wide and only variables having sound theoretical explanations and empirical evidences are selected for this study.

H 1. Inflation rate has a negative impact on Private investment.

H 2 Real GDP has a positive impact on private investment.

H 3 Foreign direct investment has a positive impact on Private investment.

H 4. Private investment is negatively affected by external debt servicing

H 5. Access to bank credit have a positive impact on private investment.

H 6. Public investment positively influences private investment.

H 7. National reserve positively affect private investment.

H 8. Annual interest rate has a negative impact on private investment.

3.7. OLS model evaluation and econometrics criteria

3.7.1 Stationarity and unit root testing

A definition of a stationary series is a series whose data generating processes such as the mean, variance, and auto-covariance do not depend upon time, constant mean, constant variance and constant auto-covariance for each given lag(Brook, 2008). If the time-series is non-stationary, the mean, variance or covariance will not be constant and one is likely to end up with spurious regression where statistical inference on the basis of the classical regression model will be invalid. If two stationary variables are generated as independent random series, when one of those variables is regressed on the other, the t-ratio on the slope coefficient would be expected not to be significantly different from zero, and the value of R² would be expected to be very low. This seems obvious, for the variables are not related to one another. However, if two variables are trending over time, a regression of one on the other could have a high R² even if the two are totally unrelated.

So, if standard regression techniques are applied to non-stationary data, the end result could be a regression that ‘looks’ good under standard measures (significant coefficient estimates and a high R²), but which is really valueless. Such a model would be termed a ‘spurious regression’. In this study Augmented Dickey-Fuller tests have been conducted to test for stationarity of the variables. A widely popular approach to test for stationarity is the unit root test. Among different ways of testing for the presence of a unit root: this study employed ADF to determine the existence of a unit root.

Augmented Dickey-Fuller (ADF)

Dickey (1976), and Dickey and Fuller (1981) developed a method for testing the stationarity of a time series variable by directly testing the null of the unit root (non-stationarity). The original Dickey-Fuller (DF) test is based on a simple autoregressive of order one, AR (1) process with a white-noise disturbance. However, because the DF test regression does not include values of variables beyond one lag, there may be the serial correlation among error terms. Results based on such tests may be biased and are not valid. The ADF test avoids this problem because it corrects for serial correlation by adding lagged-difference terms (Greene, 1991).

3.7.2. The Normality (Bera- Jaque)Test

The Jarque-Bera normality test was used to determine whether the regression errors are normally distributed. It is a joint asymptotic test whose statistic is calculated from the skewness and kurtosis of the residuals.

3.7.3. Stability Test

The Model stability is confirmed when Ramsey RESET Test F-statistic and Log likelihood ratios are greater than 5 % . The researcher would test the model stability with the help of Ramsey RESET Test as stable. The test for stability checks the P-value and Prob. Chi-Square both greater than 5%.

3.7.4 Autocorrelation Test

Testing for autocorrelation helps to identify any relationships that may exist between the current values of the regression residuals and any of its lagged values .The null hypothesis of the LM test for autocorrelation is there is no serial correlation on residuals. If the P-value is less than 0.05 then we reject the null hypothesis (Harris, 1995). The test Statistic is given by: $LM = (T-q) R^2$ Where q=degree of freedom R² coefficient of determination that will be obtained from regression and the LM test statistics is chi-square distribution.

3.7.5. Heteroscedasticity Test

The test for Heteroscedasticity investigates whether the variance of the errors in the model is constant or not. Breusch-Pagan-Godfrey test used to check whether the residuals are homoscedasticity. It tests the null hypothesis that the residuals are both homoscedasticity and that there is no problem of misspecification. The test regression runs by regressing each cross product of the residuals on the cross products of the regression and testing the joint significance of the regression. If the White test statistic is significant, that is, P value is less than 0.05; the null hypothesis of homoscedasticity and no misspecification will be rejected (Brooks, 2002).

CHAPTER FOUR

DATA PRESENTATION AND RESULTS

4.1 Introduction

This chapter is divided into three subsections. Section 4.2 presents the descriptive statistics, section 4.3 presents the diagnostic test results and finally section 4.4 presents estimation results.

4.2 Descriptive Statistics

The table that follows presents the descriptive statistics.

Table 4.1: Descriptive Statistics

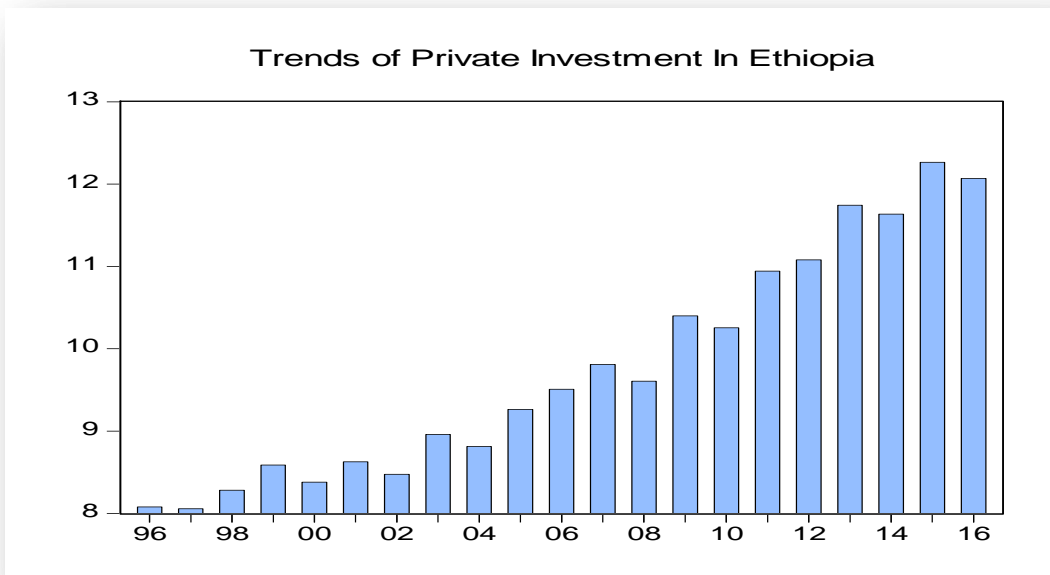
	INF	LNBCR	LNEDS	LNFDI	LNIR	LNNR	LNPI	LNPIU	LNRGDP
Mean	9.69042	8.27555	7.69722	4.71701	2.47386	8.41078	9.75445	11.42214	12.62588
Median	7.50000	7.00753	7.36795	4.38000	2.47486	7.98561	9.50842	10.92053	12.53979
Maximum	55.24131	19.55015	9.77766	8.29800	2.74084	12.91514	12.26552	16.13189	13.50061
Minimum	-10.77339	4.06203	6.26107	1.99000	2.35138	4.71679	8.05705	8.63157	12.01299
Std. Dev.	14.85280	3.20290	1.08872	2.02205	0.10418	2.02152	1.39353	2.10025	0.51677
Skewness	1.54758	2.14363	0.70529	0.33169	1.13769	0.63090	0.47707	0.78900	0.36804
Kurtosis	5.74342	8.41385	2.27023	2.02789	4.18572	2.94589	1.86162	2.63142	1.68554
Jarque-Bera	14.96806	41.72903	2.20702	1.21193	5.76037	1.39569	1.93050	2.29771	1.98590
Probability	0.00056	0.00000	0.33171	0.54555	0.05612	0.49766	0.38089	0.31700	0.37048
Sum	203.49890	173.78660	161.64160	99.05716	51.95114	176.62630	204.84340	239.86490	265.14340
Sum Sq. Dev.	4412.11600	205.17130	23.70635	81.77401	0.21705	81.73049	38.83876	88.22109	5.34093
Observations	21	21	21	21	21	21	21	21	21

Source: Own Computed using Eview6 result based on MOFEC, NBE and EIC data.

From Table 4.1, private investment in Ethiopia for the period under study had a mean of 9.754 and a standard deviation of 1.39 with a minimum and maximum of 8.057 and 12.2655 respectively. Real GDP had a mean of 12.625 and a standard deviation of 0.5167 with a minimum value of 12.0129 and a maximum value of 13.500 for the period under study. The national reserve had a mean of 8.410 and a standard deviation of 2.0215 with a minimum of 4.7167 and a maximum of 12.915. Lending interest rate had a mean of 2.4738 and a standard deviation of 0.104 with a minimum and maximum value of 2.351 and 2.740 respectively while inflation had a mean of 9.690 and a standard deviation of 14.852 with a minimum and maximum value of -10.773 and 55.24 respectively. Credit to the private sector on the other hand had a mean of 8.275 and a standard deviation of 3.202 with a minimum and maximum value of 4.062 and 19.550 respectively. Foreign direct investment had a mean of 4.717 and a standard deviation of 2.022 with a minimum and maximum value of 1.990 6.261 and 9.777 respectively.

The external debt servicing had a mean of 7.697 and a standard deviation of 1.088 with a minimum value and maximum value of 6.261 and 9.777 respectively. Finally, the mean of public investment was 11.422 and a standard deviation of 2.100 with a minimum and maximum value of 8.631 and 16.131 respectively for the period under study. The standard deviation shows how much dispersion exists from the average value. Except inflation a low standard deviation indicates that the data point tend to be very close to the mean, whereas inflation has high standard deviation indicates that the data point are spread out over a large range of values. As shown in the summary statistics, all have low standard deviation (except inflation). This shows stability in the long run relationship between Private investment and its determinant factors.

Figure 4.1 Trends of private investment in Ethiopia (1996-2016)



Source : own computed based on *MOFEC and EIC data*

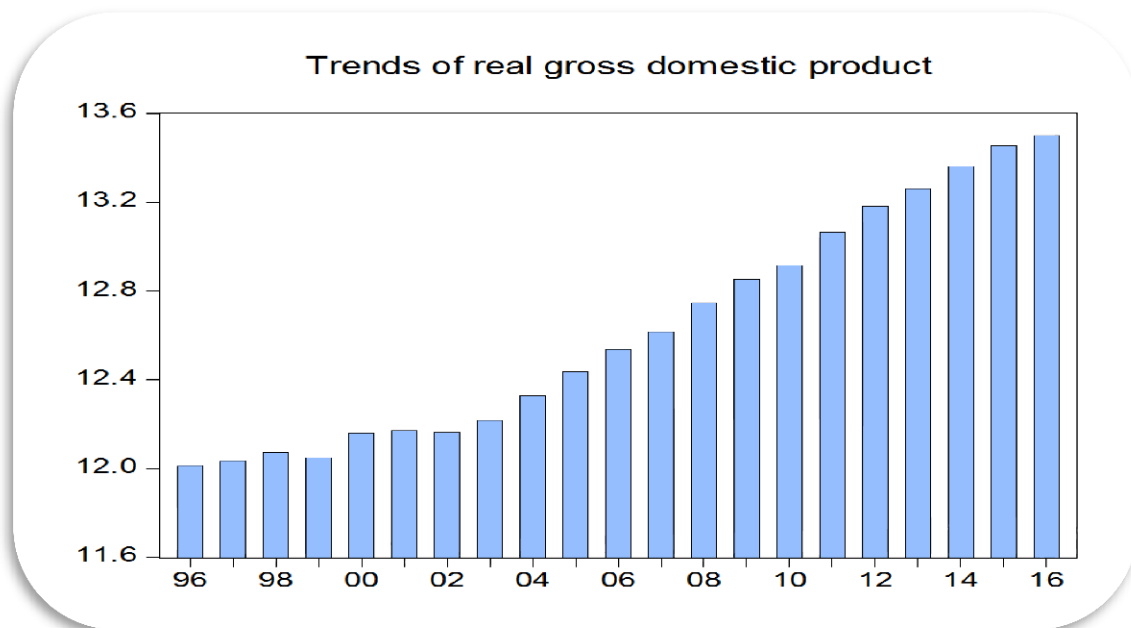
Ethiopia is endowed with abundant and untapped resources such as large number of trainable labour force, vast arable land, varieties of plant and animal stocks, and precious minerals together with favourable weather conditions (EIC, 2015). It has population size of about 88.74 million with estimated growth rate of 1.51% according to CSA(2015), indicating one of the potentially large domestic markets in Africa. Since 1991 major economic and structural reforms have been made and different investment incentives have been given to create investment friendly environment in the country. In spite of the macro-economic, political and structural reforms and ranges of investment incentives given, domestic investment has shown gradual

increase. However, the gradual increase is not consistent and investor's enormous development potential is far under fetched.

During 1996 Ethiopia introduced new investment proclamation and reform in the country. The objectives of the proclamation were to expand the domestic market, increase employment opportunities, strengthen private-sector investment, and encourage the use of domestic raw materials and the absorption of foreign production know-how. The proclamation enabled the private sector to invest in most sectors, except in those areas reserved for the government such as defence industries, the production and supply of electricity, telecommunication and postal services, large-scale air and marine transport services and the import of petroleum and weaponry for the government (Alemnesh ,2012).

As a result, overall economic performance has shown a relative improvement in spite of fluctuations (due to recurrent drought, population pressure, border war, and land degradation) over the period, and the country experienced broad-based growth across sectors (Alemnesh ,2012). The rising importance of private investment during the study period, which was brought about by the liberalization policies pursued by the support of the WB and IMF stabilization policy.

Figure 4.2. Trends of Real GDP in Ethiopia (1996-2016)



Source : own computed based on *MOFEC,NPC and NBE data*

It is obvious from the Fig. 4.2 that Real GDP was continuously increasing from 1996 to 2016, with its minimum point in 1996 of about 12.01 due to unstable political atmosphere that of disfavour economic activities. After the 1996 period the country was able to improve its economic performance through the introduction of various policies like the new investment program in 1996 ,the private financial sector adjustment programme , Growth transformation plan I and II(GTPI II) in 2010 which made real GDP remained positive till 2016.

4.3 Diagnostic Tests Results

4.3.1 Stationarity Tests

The first important step in the estimation of time serious OLS model is to test the stationarity of variables. Non-Stationarity of time series data has often been regarded as a problem in empirical analysis. Therefore working with non-stationary variables lead to spurious regression results, from which further inference is meaningless (misleading regression). A unit root test is a common practice and a first step that are to be undertaken in macro-level data analysis to address the non-stationarity problem of variables. The test examines whether the data series is stationary or not. In order to obtain a consistent and reliable result, we must transform the non-stationary data into stationary data by differencing if the test happens to reveal the non-stationarity of variables. All the variables are stationary after first differencing and indicating that the variables are 1st difference at 5 % significance level .The tests of stationarity based on augmented ducky fuller test has been conducted and presented as below. All the variables are stationary at first differencing at 5 % significant level using ADF test at intercept and trend augmented dickey fuller suggest the entire variable as co-integrated of 1st difference order at intercept and trend. As the following table reveals, except private investment all other variables do not show stationary at level. But, observed from the result from the table the variables that was not stationary at level are stationary at 1st difference. So all variables became stationary and can conclude that there is no stationarity problem in this study.

Table 4.2 .Unit root test

Variables	ADF Test			Critical value	
	Level	1st difference	2nd difference	at 1%	at 5%
lnPI	-2.309	-12.638**	-4.895	-4.53	-3.673
lnPUI	-4.0847*	-5.401	-7.476	-3.808	-3.0206
lnBCR	-3.1	-5.002**	-5.057	-3.808	-3.02
lnNR	-3.295	-4.943**	-5.292	-3.808	-3.02

lnIR	-2.882	-4.620**	-7.012	-3.802	-3.02
lnEDS	-0.518	-4.131**	-7.951	-3.808	-3.02
lnFDI	-2.377	-6.392**	-6.605	-3.808	3.02
INF	-3.744	-6.501**	-7.64	3.808	-3.02
RGDP	1.922	-3.170**	-5.649	3.8085	3.02

Source: own computation from Eviews result

(*) Stationary at level at 1% (**) stationary at 1st difference at 5% significant level.

4.3.2. Test of assumption of Multicollinearity

An implicit assumption that is made when using the OLS estimation method is that the explanatory variables are not correlated with one another. If there is no relationship between the explanatory variables, they would be said to be orthogonal to one another otherwise we are in the state of multi-co linearity problem where the regression model will end up with an incorrect or erroneous result and therefore, invalid conclusion will be prevailed Brooks(2008). The simplest multi-co linearity test is conducted by testing the correlation coefficient between the independent variables. As a rule (rule of thumb), if the correlation coefficient is above 0.75, we should suspect of multi-co linearity problems among independent variables (Gujarati, 2004).

Table 4-3 Correlation result between independent variables

Covariance Analysis: Ordinary								
Date: 12/15/17 Time: 16:18								
Sample: 1996 2016								
Included observations: 21								
Correlation	INF	LNBCR	LNEDS	LNFDI	LNIR	LNNR	LNPUI	LNRGDP
INF	1.000							
LNBCR	0.450	1.000						
LNEDS	-0.020	0.369	1.000					
LNFDI	0.368	0.598	0.587	1.000				
LNIR	-0.352	-0.145	0.259	0.146	1.000			
LNNR	0.370	0.632	0.392	0.382	-0.165	1.000		
LNPUI	-0.041	-0.123	-0.291	-0.180	-0.098	-0.420	1.000	
LNRGDP	0.380	0.651	0.698	0.745	-0.088	0.538	-0.015	1.000

Source: Computed from Eviews6 result

4.3.4 .Test of assumption of Autocorrelation/Serial Autocorrelation test

This assumption states that; disturbance terms is that the covariance between the error terms over time (or cross-sectionally, for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another. Autocorrelation test is conducted by applying Durbin-Watson Test (d-statistics) and Breusch-Godfrey Serial Correlation LM Test. The area in which we do not reject null hypothesis and decide that we do not have autocorrelation problem in

the model is if the Durbin Watson value is located between $4-dL$ and $4-dU$. The relevant critical values for the test $dL= 0.7$, $dU= 1.67$, so $4 -dU= 2.34$ and $4-dL=3.3$. The differenced regression result of the model shows, Durbin Watson statistics value is 2.396705 which is clearly located between dU (1.67) and $4-dU(2.33)$. Therefore, based on the result there is no autocorrelation. The BG test (at 2 lags) which is shown in the below table 4-4 clearly presents the absence of autocorrelation hence the null hypothesis of there is no auto correlation is not rejected as per the p-value of 0.3893 and 0.1644 for the F –statistic and Obs*R-squared respectively.

Table 4.4. Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.038321	Prob. F(2,10)	0.3893
Obs*R-squared	3.61106	Prob. Chi-Square(2)	0.1644

Source: computed from Eviews6 result

4.3.5 Test of assumption of Heteroscedasticity

It is assumed that the variance of the errors is constant, σ^2 this is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be Heteroscedasticity. The study uses Breusch-Pagan-Godfreytest for Heteroscedasticity. The null hypothesis of this test is homoscedasticity or constant variance. With the level of significant 5%, the p-value should be greater than 5% to conclude that there is no Heteroscedasticity problem. As per the results of the test stat all of the three tests are greater than 5% hence we don't reject the null hypothesis of the constant variance of the residual.

Table 4.5. Heteroscedasticity Test

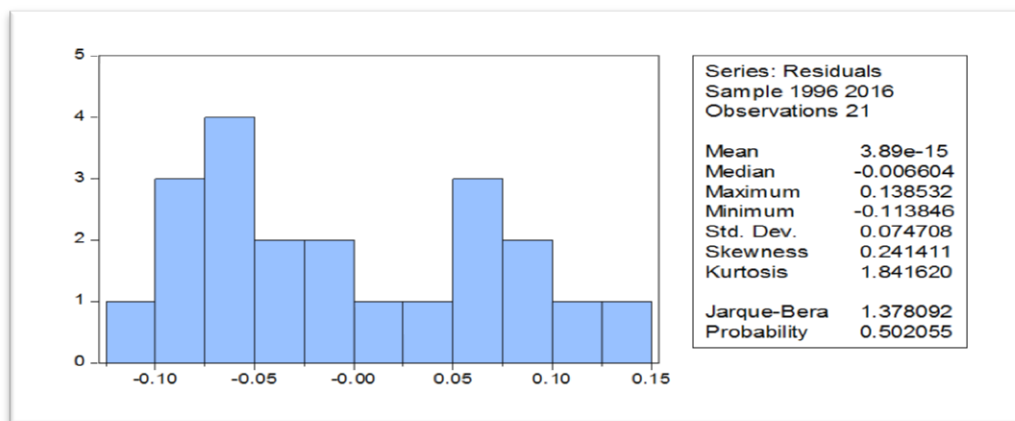
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.336214	Prob. F(8,12)	0.3139
Obs*R-squared	9.893646	Prob. Chi-Square(8)	0.2726
Scaled explained	1.359459	Prob. Chi-Square(8)	0.9948

Source: computed from Eviews result

4.3.6 Test of assumption of Normality

One of the most commonly applied tests for normality is the Bera—Jarque (hereafter BJ) test. Null hypothesis in Jarque-Bera test is that the data have been normally distributed. BJ uses the property of a normally distributed random variable that the entire distribution is characterized by the first two moments the mean and the variance. One of the assumptions of linear regression analysis is that the residuals are normally distributed, at mean zero and standard deviation of one. If the residuals are normally distributed, the Bera—Jarque statistic would not be significant. This means that the p -value given at the bottom of the normality test screen should be bigger than 0.05 to not reject the null of normality at the 5% level (Brooks, 2008).

Table 4-6 Normality distribution of the OLS model



Source: Computed from Eviews6.0 result

As can be seen in the above graph 4-6 and the table on the right side of the graph, the P-value of Jarque-Bera (JB) test is 0.502055 which is much higher than 5% hence the null hypothesis that the data is normally distributed is could not be rejected.

4.3.7 Model Stability Test

The stability of the OLS model and the results of the post-estimation diagnostics could affect the validity of the results and thus model stability should be tested prior to further analysis. The Ramsey RESET Test F-statistic and Log likelihood ratios showing 0.68060 and 0.56070 which are greater than 5%. Hence, the results suggest that the OLS model satisfies the stability condition. See the result below.

Table 4.7. Ramsey Reset Test

Ramsey RESET Test:			
F-statistic	0.178701	Prob. F(1,11)	0.68060
Log likelihood ratio	0.338414	Prob. Chi-Square(1)	0.56070

Source: Computed from Eviews6.0 result

4.4. Estimation Result

In this section, the above presented long run relationship between the dependent variable and explanatory/determinant variables is briefly described and interpreted in light of theoretical underpinnings and contextual realities of Ethiopia. The secondary data collected were classified and tabulated after which the multiple regression technique was used to estimate the respective relationships.

After fulfilling all of Ordinary Least Square basic assumptions and conducting unit root test, regression analysis is conducted. The regression analysis is undertaken with non-stationary variables and differenced variables, to control for non-stationary variable estimation problem.

The regression result is presented on table4-8 below.

The estimated regression equation is;

$$\text{LNPI} = -0.0024*\text{INF} + 0.0385*\text{LNBCR} + 0.1985*\text{LNEDS} - 0.04678*\text{LNFDI} - 0.5493*\text{LNIR} + 0.0178*\text{LNNR} + 0.0699*\text{LNPIUI} + 2.3404*\text{LNRGDP} - 20.9887.$$

Since we have used natural logarithms of private investment, real GDP, public investment, access to bank credit, foreign direct investment, lending interest rate, national reserve and inflation, the estimated parameters show flexibility of private investment with respect to these independent variables. According to results obtained from estimation, we can observe that relationship of Inflation and national reserve rejected as these variables appear to be statistically insignificant. Real GDP, External debt servicing, public investment, access to bank credit foreign direct investment and lending interest rate are not rejected as these variables are significant according to OLS 1%, 5% and 10% significant level criteria. In the following lines, we discuss quantitative impact of these variables on private investment.

In this section discussion of t-test from previous OLS regression test is conducted by comparing the value of t-statistics of each independent variable with the t-table. Using Eviews, we can easily know the result of t-test by comparing Probability of t-value with level of significance. In

this study a 1 percent α or 99% confidence level is used to interpret the results. If the probability of t value <0.01 , then we may conclude that the independent variable is significant toward dependent variable. The explanation of t-test for each independent variable will be presented below:

Table 4.8 Regression result				
Dependent Variable: LNPI				
Method: Least Squares				
Date: 12/20/17 Time: 13:57				
Sample: 1996 2016				
Included observations: 21				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	-0.002354	0.001914	-1.229352	0.2425
LNBCR	0.038514	0.010654	3.615157	0.0035
LNEDS	0.198537	0.036806	5.394141	0.0002
LNFDI	-0.046787	0.019135	-2.445053	0.0309
LNIR	-0.549351	0.254941	-2.154815	0.0522
LNNR	0.017852	0.017001	1.050023	0.3144
LNPUI	0.069943	0.013752	5.086101	0.0003
LNRGDP	2.340412	0.101529	23.05167	0.0000
C	-20.98873	1.292294	-16.24146	0.0000
R-squared	0.997126	Mean dependent var	9.754449	
Adjusted R-squared	0.995210	S.D. dependent var	1.393534	
S.E. of regression	0.096447	Akaike info criterion	-1.542119	
Sum squared resid	0.111624	Schwarz criterion	-1.094467	
Log likelihood	25.19225	Hannan-Quinn criter.	-1.444967	
F-statistic	520.4127	Durbin-Watson stat	2.396705	
Prob(F-statistic)	0.000000			

Source: Computed from Eviews6 result

Coefficient, (R²)and adjusted R² determination

The constant has a negative significant coefficient of - 20.9887 with a P- value of 0.0000 hence in our case significant at 1% confidence level. Holding all independent variables constant, or there is no other activities, Private investment will be decreased by **20.9887%** Ethiopia. The estimated results show that R² and adjusted R² of 0.9971 and 0.9952 respectively. This signifies that 99.7 percent of the variations in private investment is explained by the independent variables. High value of R² indicated that the independent variables (Real GDP, Inflation, bank credit, Interest rate, Foreign direct investment, national reserve, external debt servicing and public investment) succeed to explain the private investment trends.

Impact of Real GDP on private investment

The impact of real GDP on private investment is found to be positive and statistically significant at 1% which means that when every time the country's Real GDP increase the level of investment in the sector also increase, though it is statistically significant. Likewise, the result is as per the researcher expectation, real GDP is explain private investment significantly. Coefficient of real GDP is 2.34, this shows that holding other explanatory variables constant, one percent increase in real GDP causes 2.34 percent increase in private investment in the same period. Real GDP growth can serve as source of increase in aggregate and effective demand thus motivate firms to invest more due to higher sales volume and profitability .The result supports the hypothesis of the study .Hence this study confirms presence of investment accelerator process as reviewed in the theoretical literature.

The result can be supported by accelerator model which assumes that investment as a linear proportion of changes in output. This result also supported by the finding of Abdushu (2000), Osmo (2014), Asiedu and freeman (2009), Esubalew(2014), and ,Kaseem et.al (2012) about the positive and significant impact of real gross domestic product in the growth private investment. Whereas this study contradict the finding of Seruvatu et.al (2001) ,their finding were private investment is negatively affected bay real GDP growth.

Impact of Inflation on private investment

Inflation has a negative sign and insignificant relationship with Private investment growth. The probability value of t-statistics for inflation is 0.2425 which higher than 5 % level of significant. The respective sign is as per the researchers expectation, since inflation has no statistical

significant in this model, it is not further explained. But the result is Contradict finding by Asante(2000), Abdushu (2000) where as the result is supported by the finding of Acosta et.al (2005) , Fimpong et.al (2010) and Esubalew (2014).

Impact of Lending Rate (LNIR) on private investment

Lending rate has a negative relationship at 10% significant level with Private Investment. The probability value of t-statistics for lending interest rate is 0.0522 which is below 10 percent level of significance. Holding other variables constant, a one percent increase of in annual lending rate causes a 0.052 percent decrease the growth of in Private Investment. Private investment is negatively associated with the real interest rate. In line with neoclassical assumption of the increase in cost of debt leads to higher users cost of capital which in turn leads to lower rate of investment. This finding is supported by several scholars such as Fimpong et.al(2010), Kazeem et.al (2012), Getachew(1997), Seruvatu et.al (2001) and Osmod(2014).

Impact of public investment on private investment

The impact of real public investment on private investment is found to be positive and statically significant at 1% .Coefficient of public investment is 0.699. This shows that one percent increase in public investment will increase the growth of private investment by 0.699%. This finding confirms the hypothesized argument about the positive effect of public physical and social infrastructure investment on the private investment. The result is consistent with the findings of some scholars such as Asante (2000), Adugna (2013), Sakr (1993), Fimpong et.al(2010), Kazeem et.al (2012), Siraj (2014) among others, who have conducted research in a similar topic in various developing countries. In Ethiopia, public investment is primarily concentrated on the development of basic economic infrastructures (such as road, telephone, power, irrigation canals, etc), and social infrastructures (like schools, universities, health centers etc.) Such investments obviously create favourable effect on private investment. Whereas the result is contradict the findings of Quattara(2004), Seruvatu et.al (2001), Osmod(2014) and Esubalew(2014), they stated that private investment is negatively affected by public investment.

The impact of Monetary/national/reserve on private investment

The availability of national monetary reserve considered as a measure of country's Gold and foreign currency reserve interims of USD, shows a positive sign with a coefficient of 0.01785 and probability of 0.3144 which is higher than both 1& 5 percent significance level and

indicating an insignificant relationship with Private investment. The respective sign is as per the researcher expectation, national reserve has no statistical significant in this model, it will not further explained. But possibility of insignificant may, according to analysis made on World Bank economic indicator 2014, could be due to the fact that the national reserve of the country is still in progress and the percentage of national reserve as total output or GDP is minimum in Ethiopia.

Impact of Foreign direct investment on private investment

From the regression results above, it shows that when Foreign direct investment increase by 1% will cause decrease private investment by 0.0467% .The results is contradict with the study shown by Asante (2000), Sisay (2010) and Abdishu (2000) who examined the relationship between private investment and foreign direct investment is positively related and statically significant. The effect of foreign direct investment on private sector performance of Ethiopia exerts a significant positive effect on private investment growth which is channelled through its effect on the most important component of private investment on goods and services. In Ethiopian, since 1992 market oriented economic reforms have been given to taken place and emphasis has been attracting FDI. However this result is in contradiction with the hypothesized sign of the variable. The possible reason may the trends of FDI in Ethiopia during study period is not constant and growth rate of FDI is vary in year to year, this may cause negative relation with private investment in Ethiopia.

Impact of External debt servicing on private servicing

External debt refers to the current or long outstanding obligations or which the Central Government and its branches are responsible. It is measured by Debt to real GDP ratio and shows country's ability to pay back its debt. As this study indicates, external debt servicing increase by 1% will cause increase private investment by 0.198%, the sign of external debt revealed positive relationship with private sector performance. This finding is in line with the finding by Frimpong et.al(2010) ,Adugna (2013) and Acosta et. al (2005), but contradicts with that of Kazeem et. al (2012) and Ronge and Kimuyu(1997). Theoretically, too much external debt burden could have negative effect (as it could divert national resources towards debt servicing);or have a positive effect (as it could promote investment in productive capital projects). In Ethiopia, debt to GDP ratio is not so high (MOFEC), and a significant portion of it is soft loan with low interest rate. Besides, loan funds are usually used for productive investment

projects essential for private investment such as huge physical and social development programs. From the results obtained, it shows that when external debt servicing increase by 1% , will increase Private investment by 0.19%. The increase in External debt will increases public investment by government. Thus, public investment has a positive relationship with private investment this lead to increasing several job opportunities by government by providing initial capital for citizens. Having this capital, the Society can create their own business and private investment.

Impact of bank credit availability on private investment

Access to domestic bank credit is one of the explanatory variables which are expected to have a positive influence in the growth of private investment. Since bank credit is relevant to avail access to working capital for investors where there is capital shortage, the prevalence of good and efficient credit facilities has a positive role to promote private investment. Thus, as the researcher expectation the coefficient of the access to bank credit is positive shown in regression result that, 1% increase access to bank credit will result increasing the development of private investment by 0.0385 %. This finding is supported by the study of Asante(2000),Dawit(2010), Esubalew(2014),Abdushu(2000) among the others and Contradict the findings of Quattara(2004) and Ambachew(2010).

To sum up this result that, the study found that real gross domestic product, Public investment, external debt servicing and access to bank credit were positive significant effect on private investment in Ethiopia during study period. However, foreign direct investment and lending interest rate were found to be statistically significant and explained private investments in the study period negatively in Ethiopia .As shown in regression result, inflation and national reserve statistically insignificant to explain the dependent variable during the study period.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

5.1 Introduction

This chapter is divided into four sections, section 5.2 presents the summary of the findings, section 5.3 conclusion of the study, section 5.4 presents policy implications and finally section 5.5 presents the areas of further research.

5.2 Summary of Findings

Primary objectives of the study were; investigation of determinants of private sector investment and the effect of the determinant factors using a time series data from 1996-2016. The study used secondary data, sourced from MOFEC, NBE, NPC, EIC and World Bank data basis. And OLS econometric technique, was employed in data analysis to help in addressing the objectives. The study investigated the determinants of private investment in Ethiopia the relevance of understanding the determinants of private investment lies in the fact that private investment has been the main engine of growth for countries over the decades. The study examined the trending behaviour of real GDP, external debt servicing, lending interest rate, foreign direct investment, public investment, bank credit availability, national monetary reserve and inflation.

The coefficients of Real GDP, external debt servicing ,foreign direct investment, access to bank credit, interest rate and public investment found to be statistically significant, the variables explain changes in private investment in the study period. Further, the study found that coefficients of inflation and national reserve is insignificant therefore, the variables could not explain changes in private investment in the study period in Ethiopia.

5.3 Conclusion

The major objective of this paper was to identify the determinants of private investment in Ethiopia. To fulfill this objective, the researcher have reviewed theoretical explanations and empirical literature regarding to the main determinants of private investment the context of developing countries and in order to identify the trend and characteristic private investment in Ethiopia the study have evaluated various reports. In addition to the theoretical and empirical literature, the empirical analysis that is conducted by using econometrics technique identifies the determinants factors in Ethiopia. The major findings that are obtained through empirical analysis can be concluded as follows:

The study found out that real gross domestic product, public investment, external debt servicing, and access to bank credit have positive significant effect on private investment in Ethiopia and explaining variations in private investment during the study period. However, the study found out that foreign direct investment and lending interest rate have negative effect on private investment during the study period. Inflation and national reserve have no statically significant effect on explaining private investment .The other factors that were sought to be determinants of private sector investment in Ethiopia turned out not to be contrary to what most empirical studies suggested. This implies that the Ethiopian economy is unique in the way it runs its activities internationally and domestically.

5.4 Policy implication

From the analysis of the determinants of private investment in Ethiopia, the study recommends the following policy implications; Since gross domestic product is an important variable that determine private investment in the Ethiopia economy, it is necessary for policy makers to first seek to understand these factors that the study have found are important in the country. In other words making huge investment on infrastructure such as road telecom service and power improve private investment.

For sufficient economic growth and sustainability of Ethiopian's economy, the government needs to promote access to credit for private investor is which is found to have positive and significant impact for private investment to grow, thus address the need to extend the operation of financial institutions such as commercial banks even in remote areas the government should strive to expand and distribute financial institutions such as banks and micro finance institution towards rural and remote areas to promote saving mobilization and credit availability to the growth of private investor.

The impacts of economic growth in the private investment are found to be positive and significant in the study period which implies that economic growth is crucial to the growth of private investment which addresses the need to enhance further the growth of the economy. The result confirm the validity of the accelerator principle that suggest the quantity of domestic output should be expanded as it will increase the profitability of firms , especially those that produce tradable goods. The rationale behind the positive and significant role in economic growth to the growth of private investment is because of the fact that economic growth boosts the demand for produced goods and services of private investment activities and with the

increase in the purchasing power of the societies that resulted from the grown income and increase in the effective demand.

Likewise, external debt, as long as it is used in productive investment (without creating serious debt servicing burden on the economy) has favourable effect on the private investment in countries like Ethiopia where there is serious shortage of finance. Accordingly, the results of OLS regression analysis show that public investments made on infrastructures (social and physical) are essential for private investment in countries like Ethiopia where such basics are in serious shortage, and where private sectors do not usually challenge to go for.

And the researcher suggests the need to conduct a comprehensive study on private investment in Ethiopia by adequately accommodating the essential quantitative and qualitative factors and determinants of private investment for proper policy actions and decisions.

5.5 Areas of further Research

This study focused on the determinants of private investments in Ethiopia for the period 1996 to 2016. Future studies should focus on analyzing the determinants of private investments for a longer period and include other countries especially the East African Community in order to capture individual country effects. This is because most of the investment policies that Ethiopia undertakes are somehow interlinked with most of neighbourhood countries such as Djibouti, Sudan and Kenya investment policies undertaken at the Eastern Africa level.

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Appendix

A1. OLS regression result

Method: Least Squares				
Date: 12/15/17 Time: 15:55				
Sample: 1996 2016				
Included observations: 21				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	-0.002354	0.001914	-1.229352	0.242500
LNBCR	0.038514	0.010654	3.615157	0.003500
LNEDS	0.198537	0.036806	5.394141	0.000200
LNFDI	-0.046787	0.019135	-2.445053	0.030900
LNIR	-0.549351	0.254941	-2.154815	0.052200
LNNR	0.017852	0.017001	1.050023	0.314400
LNPIUI	0.069943	0.013752	5.086101	0.000300
LNRGDP	2.340412	0.101529	23.05167	0.000000
C	-20.98873	1.292294	-16.24146	0.000000
R-squared	0.997126	Mean dependent var		9.754449
Adjusted R-squared	0.995210	S.D. dependent var		1.393534
S.E. of regression	0.096447	Akaike info criterion		-1.542119
Sum squared resid	0.111624	Schwarz criterion		-1.094467
Log likelihood	25.192250	Hannan-Quinn criter.		-1.444967
F-statistic	520.412700	Durbin-Watson stat		2.396705
Prob(F-statistic)	0.000000			

Source : Own commutated using Eviews6

A2. Unit Root Test

Null Hypothesis: D(LNPI) has a unit root				
Exogenous: Constant, Linear Trend Lag Length: 0 (Automatic based on SIC, MAXLAG=2)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-12.6388	0.00000
Test critical values: 1% level			-4.532598	
5% level			-3.673616	
10% level			-3.277364	
*MacKinnon (1996) one-sided p-values. Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 19				
Augmented Dickey-Fuller Test Equation Dependent Variable: D(LNPI,2) Method: Least Squares Date: 12/17/17 Time: 11:01 Sample (adjusted): 1998 2016 Included observations: 19 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNPI(-1))	-1.8925920	0.1497450	-12.6388000	0.0000000
C	0.1372780	0.1031560	1.3307770	0.2019000
1996	0.0245900	0.0088490	2.7788970	0.0134000
R-squared	0.909814	Mean dependent var		-0.0092060
Adjusted R-squared	0.898541	S.D. dependent var		0.6290760
S.E. of regression	0.200378	Akaike info criterion		-0.2332870
Sum squared resid	0.642419	Schwarz criterion		-0.0841650
Log likelihood	5.216226	Hannan-Quinn criter.		-0.2080500
F-statistic	80.70545	Durbin-Watson stat		1.8075260
Prob(F-statistic)	0.000000			

Null Hypothesis:
D(LNRGDP) has a
unit root

Exogenous: Constant

Lag Length: 0 (Automatic based on SIC, MAXLAG=2)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.1703	0.038100
Test critical values:		
1% level	-3.83151	
5% level	-3.02997	
10% level	-2.65519	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNRGDP,2)
Method: Least Squares
Date: 12/17/17 Time: 11:06
Sample (adjusted): 1998 2016
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNRGDP(-1))	-0.718154	0.226525	-3.1703	0.0056
C	0.05574	0.020239	2.754056	0.0136

R-squared	0.371553	Mean dependent var	0.001298
Adjusted R-squared	0.334586	S.D. dependent var	0.057236
S.E. of regression	0.046689	Akaike info criterion	-3.1913
Sum squared resid	0.037058	Schwarz criterion	-3.091886
Log likelihood	32.31735	Hannan-Quinn criter.	-3.174475
F-statistic	10.05081	Durbin-Watson stat	2.108928
Prob(F-statistic)	0.005594		

Null Hypothesis:
LNPI has a unit

root				
Exogenous: Constant				
Lag Length: 0 (Automatic based on SIC, MAXLAG=0)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.08476	0.0056
Test critical values:	1% level		-3.808546	
	5% level		-3.020686	
	10% level		-2.650413	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LNPUI)				
Method: Least Squares				
Date: 12/17/17 Time: 11:09				
Sample (adjusted): 1997 2016				
Included observations: 20 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNPUI(-1)	-0.994263	0.243408	-4.08476	0.0007
C	11.40068	2.852885	3.996192	0.0008
R-squared	0.481048	Mean dependent var		-0.0776
Adjusted R-squared	0.452217	S.D. dependent var		2.97685
S.E. of regression	2.203237	Akaike info criterion		4.512372
Sum squared resid	87.37659	Schwarz criterion		4.611945
Log likelihood	-43.12372	Hannan-Quinn criter.		4.53181
F-statistic	16.68526	Durbin-Watson stat		1.932543
Prob(F-statistic)	0.000695			

Null Hypothesis: LNNR has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic based on SIC, MAXLAG=2)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.295744	0.029
Test critical values:	1% level		-3.808546	
	5% level		-3.020686	
	10% level		-2.650413	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LNNR)				
Method: Least Squares				
Date: 12/17/17 Time: 11:12				
Sample (adjusted): 1997 2016				
Included observations: 20 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNNR(-1)	-0.8068	0.244801	-3.295744	0.0040
C	6.861038	2.075475	3.305768	0.0039
R-squared	0.376341	Mean dependent var		0.195326
Adjusted R-squared	0.341693	S.D. dependent var		2.567637
S.E. of regression	2.083281	Akaike info criterion		4.400404
Sum squared resid	78.12104	Schwarz criterion		4.499977
Log likelihood	-42.004	Hannan-Quinn criter.		4.419842
F-statistic	10.86193	Durbin-Watson stat		1.812259
Prob(F-statistic)	0.004019			

Null Hypothesis:
D(LNIR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=2)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.620006	0.0019
Test critical values: 1% level	-3.831511	
5% level	-3.02997	
10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNIR,2)
Method: Least Squares
Date: 12/17/17 Time: 11:15
Sample (adjusted): 1998 2016
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNIR(-1))	-1.133215	0.245284	-4.620006	0.0002
C	-0.011952	0.020438	-0.58477	0.5664

R-squared	0.55665	Mean dependent var	0.002274
Adjusted R-squared	0.530571	S.D. dependent var	0.128544
S.E. of regression	0.088072	Akaike info criterion	-1.922031
Sum squared resid	0.131862	Schwarz criterion	-1.822617
Log likelihood	20.2593	Hannan-Quinn criter.	-1.905206
F-statistic	21.34445	Durbin-Watson stat	1.244942
Prob(F-statistic)	0.000244		

Null Hypothesis:
D(LNFDI) has a unit root

Exogenous: None

Lag Length: 0 (Automatic based on SIC, MAXLAG=2)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.513327	0.0000
Test critical values: 1% level	-2.692358	
5% level	-1.960171	
10% level	-1.607051	

*MacKinnon (1996) one-sided p-values.

Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNFDI,2)

Method: Least Squares

Date: 12/17/17 Time: 11:22

Sample (adjusted): 1998 2016

Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNFDI(-1))	-1.3279630	0.2038840	-6.5133270	0.0000

R-squared	0.700811	Mean dependent var	-0.206514
Adjusted R-squared	0.700811	S.D. dependent var	3.22301
S.E. of regression	1.762926	Akaike info criterion	4.023023
Sum squared resid	55.94238	Schwarz criterion	4.072731
Log likelihood	-37.21872	Hannan-Quinn criter.	4.031436
Durbin-Watson stat	2.258347		

Null Hypothesis: D(LNEDS) has a unit root
 Exogenous: None
 Lag Length: 0 (Automatic based on SIC, MAXLAG=2)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.16546	0.0003
Test critical values:		
1% level	-2.69236	
5% level	-1.96017	
10% level	-1.60705	

*MacKinnon (1996) one-sided p-values.

Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNEDS,2)

Method: Least Squares

Date: 12/17/17 Time: 11:38

Sample (adjusted): 1998 2016

Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNEDS(-1))	-0.96842	0.232487	-4.16546	0.0006
R-squared	0.489868	Mean dependent var		-0.03509
Adjusted R-squared	0.489868	S.D. dependent var		0.833163
S.E. of regression	0.595074	Akaike info criterion		1.850934
Sum squared resid	6.374035	Schwarz criterion		1.900641
Log likelihood	-16.5839	Hannan-Quinn criter.		1.859346
Durbin-Watson stat	1.431215			

Null Hypothesis: LNBCR has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic based on SIC, MAXLAG=2)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.100776	0.0428
Test critical values:	1% level		-3.808546	
	5% level		-3.020686	
	10% level		-2.650413	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LNBCR)				
Method: Least Squares				
Date: 12/17/17 Time: 11:40				
Sample (adjusted): 1997 2016				
Included observations: 20 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNBCR(-1)	-0.70271	0.226622	-3.100776	0.0062
C	5.968367	1.977052	3.018821	0.0074
R-squared	0.348176	Mean dependent var		0.249121
Adjusted R-squared	0.311963	S.D. dependent var		3.837882
S.E. of regression	3.183445	Akaike info criterion		5.248445
Sum squared resid	182.4178	Schwarz criterion		5.348018
Log likelihood	-50.4845	Hannan-Quinn criter.		5.267882
F-statistic	9.614813	Durbin-Watson stat		2.136147
Prob(F-statistic)	0.006169			

Null Hypothesis: INF has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic based on SIC, MAXLAG=2)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.744617	0.0114
Test critical values:	1% level		-3.808546	
	5% level		-3.020686	
	10% level		-2.650413	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(INF)				
Method: Least Squares				
Date: 12/17/17 Time: 11:42				
Sample (adjusted): 1997 2016				
Included observations: 20 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.832613	0.222349	-3.744617	0.0015
C	8.984502	3.955025	2.271667	0.0356
R-squared	0.437889	Mean dependent var		0.824937
Adjusted R-squared	0.406661	S.D. dependent var		19.16284
S.E. of regression	14.76085	Akaike info criterion		8.316473
Sum squared resid	3921.888	Schwarz criterion		8.416046
Log likelihood	-81.16473	Hannan-Quinn criter.		8.335911
F-statistic	14.02216	Durbin-Watson stat		2.048064
Prob(F-statistic)	0.001484			

Source : Own commutated using Eviews6

A3. Auto-correlation test

Breusch-Godfrey Serial Correlation LM Test:				
F-statistic	1.038321	Prob. F(2,10)		0.3893
Obs*R-squared	3.61106	Prob. Chi-Square(2)		0.1644
Test Equation:				
Dependent Variable: RESID				
Method: Least Squares				
Date: 12/15/17 Time: 15:58				
Sample: 1996 2016				
Included observations: 21				
Pre sample missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	-0.000852	0.002001	-0.426	0.6791
LNBCR	-0.003983	0.011015	-0.36162	0.7252
LNEDS	0.002848	0.04871	0.058471	0.9545
LNFDI	0.008773	0.020025	0.438097	0.6706
LNIR	-0.067519	0.258934	-0.26076	0.7996
LNNR	-0.002328	0.017148	-0.13578	0.8947
LNPI	-0.004744	0.014519	-0.32671	0.7506
LNRGDP	0.019872	0.104933	0.189379	0.8536
C	-0.026718	1.288355	-0.02074	0.9839
RESID(-1)	-0.089192	0.483042	-0.18465	0.8572
RESID(-2)	0.555344	0.57904	0.959077	0.3601
R-squared	0.171955	Mean dependent var		3.89E-15
Adjusted R-squared	-0.65609	S.D. dependent var		0.074708
S.E. of regression	0.09614	Akaike info criterion		-1.54033
Sum squared resid	0.09243	Schwarz criterion		-0.9932
Log likelihood	27.17348	Hannan-Quinn criter.		-1.42159
F-statistic	0.207664	Durbin-Watson stat		1.737417
Prob(F-statistic)	0.989746			

A4. Model Stability test

Ramsey RESET Test:				
F-statistic	0.178701	Prob. F(1,11)	0.6806	
Log likelihood ratio	0.338414	Prob. Chi-Square(1)	0.5607	
Test Equation:				
Dependent Variable:LNPI				
Method: Least Squares				
Date: 12/15/17 Time: 16:00				
Sample: 1996 2016				
Included observations:21				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	-0.001327	0.003135	-0.42346	0.6801
LNBCR	0.026612	0.030243	0.879943	0.3977
LNEDS	0.109603	0.213809	0.512621	0.6184
LNFDI	-0.033721	0.03672	-0.91831	0.3782
LNIR	-0.409584	0.423185	-0.96786	0.3539
LNNR	0.009679	0.026153	0.370107	0.7183
LNPUI	0.043903	0.063225	0.694398	0.5018
LNRGDP	1.606411	1.739517	0.923482	0.3756
C	-12.58335	19.92859	-0.63142	0.5407
FITTED^2	0.016433	0.038873	0.42273	0.6806
R-squared	0.997172	Mean dependent var	9.754449	
Adjusted R-squared	0.994858	S.D. dependent var	1.393534	
S.E. of regression	0.099927	Akaike info criterion	-1.463	
Sum squared resid	0.10984	Schwarz criterion	-0.9656	
Log likelihood	25.36146	Hannan-Quinn criter.	-1.35505	
F-statistic	430.9486	Durbin-Watson stat	2.624909	
Prob(F-statistic)	0.00000			

Source : Own commutated using Eviews6

A 5. Heteroscedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	1.336214	Prob. F(8,12)	0.3139	
Obs*R-squared	9.893646	Prob. Chi-Square(8)	0.2726	
Scaled explained SS	1.359459	Prob. Chi-Square(8)	0.9948	
Test Equation:				
Dependent Variable: RESID^2				
Method: Least Squares				
Date: 12/15/17 Time: 16:02				
Sample: 1996 2016				
Included observations: 21				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.039367	0.062859	0.626273	0.5429
INF	-4.31E-05	9.31E-05	-0.462463	0.652
LNBCR	-0.000151	0.000518	-0.291429	0.7757
LNEDS	0.004303	0.00179	2.403619	0.0333
LNFDI	0.000285	0.000931	0.306352	0.7646
LNIR	-0.011237	0.012401	-0.906127	0.3827
LNNR	0.00043	0.000827	0.51993	0.6126
LNPIU	0.000808	0.000669	1.20776	0.2504
LNRGDP	-0.00411	0.004938	-0.832327	0.4215
R-squared				
	0.471126	Mean dependent var	0.005315	
Adjusted R-squared				
	0.118543	S.D. dependent var	0.004997	
S.E. of regression				
	0.004691	Akaike info criterion	-7.58869	
Sum squared resid				
	0.000264	Schwarz criterion	-7.141037	
Log likelihood				
	88.68124	Hannan-Quinn criter.	-7.491538	
F-statistic				
	1.336214	Durbin-Watson stat	2.433137	
Prob(F-statistic)				
	0.313892			

Source : Own commutated using Eviews6

Heteroskedasticity Test: White				
F-statistic	1.442447	Prob. F(8,12)		0.2735
Obs*R-squared	10.29462	Prob. Chi-Square(8)		0.245
Scaled explained SS	1.414557	Prob. Chi-Square(8)		0.994
Test Equation:				
Dependent Variable: RESID^2				
Method: Least Squares				
Date: 12/15/17 Time: 16:03				
Sample: 1996 2016				
Included observations: 21				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.034475	0.031924	1.079919	0.3014
INF^2	-1.38E-07	1.79E-06	-0.07712	0.9398
LNBCR^2	-1.06E-05	2.12E-05	-0.50089	0.6255
LNEDS^2	0.000303	0.000121	2.515436	0.0271
LNFDI^2	5.45E-05	9.58E-05	0.568385	0.5803
LNIR^2	-0.002283	0.002348	-0.97228	0.3501
LNNR^2	2.62E-05	4.54E-05	0.577773	0.5741
LNPUI^2	3.27E-05	2.77E-05	1.182207	0.26
LNRGDP^2	-0.000253	0.000203	-1.24846	0.2357
R-squared	0.49022	Mean dependent var		0.005315
Adjusted R-squared	0.150367	S.D. dependent var		0.004997
S.E. of regression	0.004606	Akaike info criterion		-7.62546
Sum squared resid	0.000255	Schwarz criterion		-7.17781
Log likelihood	89.06734	Hannan-Quinn criter.		-7.52831
F-statistic	1.442447	Durbin-Watson stat		2.460488
Prob(F-statistic)	0.273532			

Source : Own commutated using Eviews6

A 6. Multi-collinirety test

Covariance Analysis: Ordinary								
Date: 12/15/17 Time: 16:18								
Sample: 1996 2016								
Included observations: 21								
Correlation	INF	LNBCR	LNEDS	LNFDI	LNIR	LNNR	LNPUI	LNRGDP
INF	1.00000							
LNBCR	0.45000	1.00000						
LNEDS	-0.02000	0.36900	1.00000					
LNFDI	0.36800	0.59800	0.58700	1.00000				
LNIR	-0.35200	-0.14500	0.25900	0.14600	1.00000			
LNNR	0.37000	0.63200	0.39200	0.38200	-0.16500	1.00000		
LNPUI	-0.04100	-0.12300	-0.29100	-0.18000	-0.09800	-0.42000	1.00000	
LNRGDP	0.38000	0.65100	0.69800	0.74500	-0.08800	0.53800	-0.01500	1.00000

Source : Own commutated using Eviews6

A 7. Raw data entered into regression except inflation and interest rate presented in millions Birr									
Year	lnPI	lnRGDP	lnPUI	lnBCR	lnNR	INF	lnIR	LNEDS	LNFDI
1996	8.103	12.013	10.527	6.026	7.482	-8.999	2.713	7.447	2.100
1997	8.029	12.036	10.051	4.062	7.350	-2.653	2.741	7.908	5.436
1998	8.317	12.073	14.684	6.073	6.218	0.105	2.451	6.435	4.321
1999	8.580	12.049	14.540	6.712	7.483	10.394	2.464	7.145	1.990
2000	8.415	12.160	9.430	6.036	6.882	1.894	2.485	7.709	3.887
2001	8.595	12.172	10.004	6.793	6.388	-10.773	2.546	7.427	2.800
2002	8.490	12.163	10.485	6.795	7.986	-1.222	2.375	7.071	4.380
2003	8.915	12.218	12.148	6.172	8.805	17.773	2.375	7.225	2.000
2004	8.834	12.328	8.632	6.500	8.077	2.383	2.375	7.368	3.250
2005	9.236	12.437	10.921	7.008	7.087	10.747	2.351	7.359	4.878
2006	9.511	12.540	11.445	8.147	7.561	10.820	2.351	6.889	3.100
2007	9.788	12.618	11.340	10.162	12.915	15.103	2.351	6.261	2.500
2008	9.609	12.746	11.542	6.711	7.479	55.241	2.442	6.616	5.789
2009	10.381	12.853	16.132	8.882	4.717	2.707	2.506	6.500	4.300
2010	10.276	12.914	12.868	8.546	9.308	7.321	2.506	7.131	7.390
2011	10.966	13.066	9.230	19.550	12.042	38.044	2.475	8.178	8.123
2012	11.092	13.181	9.932	8.944	9.297	20.812	2.474	8.818	6.342
2013	11.781	13.261	14.732	9.293	8.224	7.390	2.475	9.376	4.894
2014	11.682	13.361	10.313	8.358	10.800	8.464	2.475	9.429	5.569
2015	12.210	13.453	11.936	12.009	9.137	10.446	2.475	9.778	8.298
2016	12.036	13.501	8.975	11.009	11.388	7.500	2.546	9.573	7.710
Source	MOFED/C, NPC	MOFED/C, NPC	MOFED, NPC	NBE	NBE	NBE,CSA	NBE	MOFED/C, ,NPC	MOFED/C, NPC