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St. Mary's University, Ethiopia

SCHOOL OF POST GRADUATE STUDIES

INSTITUTE OF AGRICULTURE & DEVELOPMENT STUDIES

**The impact of Foreign Capital Inflows on Investment and Economic Growth
in Ethiopia**

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**July, 2021
Addis Ababa, Ethiopia**

ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES

**The impact of Foreign Capital Inflows on Investment and Economic Growth
in Ethiopia**

A Research Thesis Presented in Partial Fulfilment of
Requirements for the Degree of Master of Science in Economics

BY:
WUDIE ASSEFA

July, 2021
Addis Ababa, Ethiopia

DECLARATION

I, the undersigned, declare that the thesis prepared by Wudie Assefa entitled: The impact of Foreign Capital Inflows on Investment and Economic Growth in Ethiopia submitted in partial fulfilment of the requirements for the degree of Master of Science in economics (Development Economics) complies with the regulations of the university and meets accepted standards with respect to originality and quality

Wudie Assefa

Signature._____ **Date.** _____.

ENDORESMENT

This thesis has been submitted to St. Mary's University, School of Graduate Studies for examination with my approval as a university's thesis Advisor.

Wondimagegne Chekol (PhD)

Signature. _____ Date. _____.

ST. MARY'S UNIVERSITY

School of Graduate Studies

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Abstract

As foreign capital inflow plays a great role in boosting domestic saving, investment, and economic development. However, foreign capital inflow does not bring sufficient and sustainable growth of investment and GDP as much as expected. Thus, the main objective of this study is to examine the impact of foreign capital inflows on investment and economic growth in Ethiopia. In this study time series data from 1980 to 2019 was examined by using ordinary least square estimation technique. Economic growth and gross fixed investment were used as dependent variable. Foreign aid, foreign capital inflow, domestic saving, and export were used as independent variables in both models. In addition, labour force and human capital were used in economic growth model. On the other hand, real gross domestic product and external debt are used in gross fixed investment. The result revealed that foreign capital inflow, export, labor force, and human capital have positive significant effect on economic growth. Finally, gross fixed investment is positively affected by foreign capital inflow, export and external debt. Thus it is recommended that the government should diversify export and export both finished and semi-finished goods, using borrowed money and foreign capital inflow for productive investments.

Key words: foreign capital inflow; economic growth; fixed investment; external debt, Ethiopia

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Acronyms

ADF	Augmented Dickey-Fuller
OLS	Ordinary Least Square
WB	World Bank
WTO	World Trade Organization
IMF	International Monetary Fund
FDI	Foreign Direct Investment
FCI	Foreign Capital Inflows
NBE	National bank of Ethiopia
EPRDF	Ethiopian people
GDP	Least Developing Countries
LDCs	Least Developing Countries
UNCTAD	United Nations Conference on Trade and Development
UN	United Nation

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

To bridge the gap between domestic saving and domestic investment and therefore, to accelerate growth, various form of inflow of foreign capital (loans, FDI, grant and portfolio) are indispensable particularly in developing countries like Ethiopia (Cheney and Stroud, 1996). Developing countries are entrapped by the vicious circle of poverty. They already lack the capital resources and the incomes of the people are very low. Because of low incomes, the saving ratios also remain low, resulting in low investment levels. At the same time, due to low income the taxable capacity remains lower, i.e. government earnings also remain low (Basnet, 2013). Due to these under developed countries need foreign capital inflows (FCI) for their development. The amount and the form of the foreign economic assistance of the country differ from country to country. The country size and the economic circumstances of the country are the major determinants of the volume and the form of the FCI (Chong, 2009).The need for foreign capital to supplement domestic resource is being felt by the developing economics, in view of the growing mismatch between their domestic capital stock and capital requirements. This was evidenced by the attention giving to the drive for foreign capital especially in developing countries. Foreign capital inflow has been identified as an important vehicle for augmenting the supply of fund for domestic investment (Fosu and Maguns, 2006).

Developing countries, mainstream economists argue, require more economic integration through trade and investment in order to build a competitive and efficient economy. It is claimed that following such policies would lead towards a surge in exports and attract foreign capital investment to augment domestic savings (Siddiqui, 2012). It would ultimately increase the overall domestic investment in developing countries (Malik, 2012) further, is said that many developing countries face shortages in domestic savings, trade imbalances and a foreign exchange crisis. It is assumed that in the absence of foreign capital, the shortages of external financing are likely to put constraints on the economic growth and living conditions of the

people. It is claimed that failing to attract foreign capital implies that national income and living standards will be negatively affected (IMF, 2010).

Despite the importance of foreign capital inflow Ethiopia's experience of it is very low. For instance, Derg regime in 1974, formulated 10 Years Perspective Economic plan (1985-1994) with an unrealistic expectation of receiving foreign aid to finance more than half of planned investment (World Bank, 1987). During this period (1975-1991) the country obtained Birr 5526.87 million grants and Birr 5658.30 million foreign loans. However, in post 1991 period there exists significant increase in grants and loans, mainly due to the economic policy of EPRDF, significant amount of loans and grants is obtained for stabilization, rehabilitation, reform and sector development programs, and a number of donors have joined the support program.

Generally Ethiopia has been receiving capital inflows in order to fill resource-gaps so as to achieve desired economic objectives. However, investment and in turn economic growth is low. Thus this study was intended to examine the impact of foreign capital inflows on investment and economic growth in Ethiopia

1.2. Statement of the Problem

As foreign capital inflow plays a great role in boosting investment and economic development, the government of Ethiopia has given emphasis concerning this activity. Its purpose was to develop the investment activity by giving major incentives for investors and promotion of investment opportunities for foreign investor to increase the number of participants in this activity. However, foreign capital inflow does not bring sufficient and sustainable growth in domestic saving, investment and GDP as much as expected. This may be due to the controversy at theoretical and empirical levels, over the effects of foreign capital on both national saving and economic growth.

To identify whether foreign capital inflow affects domestic saving, investment, and economic growth positively or negatively requires empirical investigation. Previously there are many studies conducted on the effect of foreign capital inflow on economic growth. For instance, Onyekachi and Vincent, (2017). On the other hand, Yesigat (2014), Ambachew (2010), and

Bethlehem (2010) investigated determinants of only domestic private investment without including foreign capital inflow. Most of the earlier studies examined the direct impact of capital inflows or aid on developing countries' growth in the context of neoclassical framework, and some others does not include foreign capital inflow as a factor, which indicates that the effect of foreign capital inflow on domestic saving, investment and economic growth in Ethiopia currently has not been studied well.

Therefore, to fill the saving and investment gap that helps to achieve sustainable growth and development the country is in need of foreign capital from developed countries. Though capital inflow has its own importance in some aspects, it is in question that whether capital inflow assists generally LDCs and particularly that of Ethiopia in accelerating economic growth by positively affecting saving and investment in the country. Thus this study tried to explain whether capital inflow has a positive and significant impact on economic growth and investment in Ethiopia.

1.3. Objectives of the Study

The general objective of this study is to examine the impact of foreign capital inflows on Investment and economic growth in Ethiopia.

To achieve the above broad objective the study has the following specific objectives

- ✓ To examine uses of capital inflows to the extent that they tend to finance saving investment gaps
- ✓ To look whether inflows are associated with higher investment, and with faster economic growth
- ✓ Empirically investigate the relationship among investment, foreign capital inflow and economic growth in Ethiopia.

1.4. Hypothesis:

Based the theoretical literature the following hypotheses was hypothesized:

Ho. Foreign capital has no direct positive effect on economic growth and gross investment

H2. Foreign capital has a direct positive effect on economic growth and gross investment

1.5. Significance of the Study

Most of the studies carried out so far in this area have dealt with the Nexus between foreign capital inflow on economic growth or saving separately both in the developed and less developed countries over the years. Therefore, the study aims to assess the impact of foreign capital inflow on economic growth, savings and investment in Ethiopia. Moreover, the issue of capital inflow is still on debate and this paper may give a clue for further investigations on this area.

1.6. Scope and Limitation of the Study

The study would explore the possible ways through which foreign capital affects economic growth, savings and investment. To achieve this objective, the period range from 1980 to 2019 is chosen. This period is chosen based on availability of data. Although this study attempts to shed on the nexuses between foreign capital inflow on growth, savings and investment in Ethiopia, yet it suffers from certain limitations. The first problem arises from the problem of inconsistent in data by different institutions. Even data arises from the annual reports of the National bank of Ethiopia shows different figures for the same year. The other problem is that, due to the lack of data the foreign portfolio investment variable is excluded and FDI was used instead as a proxy for foreign private investment.

1.1. Organization of the Paper

This paper is organized based on five chapters. The first chapter presents introduction parts comprising background of the study, statement of the problem, objectives of the study and scope, and delimitations of the study. In the second chapter both theoretical and empirical literatures were discussed. Under the third chapter methodology of the study which includes source and types of data, methods of analysis and estimation techniques were presented. The fourth chapter presents results and discussions of the data used in this study were presented. The last chapter presents conclusion of the findings and policy recommendations.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Theoretical Literature

2.1.1. Capital and Developing countries

Reflections on the problems of developing countries led to the identification of insufficient capital stock as the cause of their low income. According to Singer (1949) the less developed countries suffer from “a dominant vicious circle of low production no surplus for economic development no tools and equipment low standard of production”. Moreover, Nukrse (1953) the problem of these countries was that there is small capacity to save resulting from low level of real income. The low level of real income is a reflection of low productivity, which in turn is due to the lack of capital. The lack of capital is a result of small capacity to save. In under developed countries it is clear that capital is the factor limiting growth (Domar, 1957). Given the need for larger capital stock and inadequacy of domestic saving to finance investment that would make this possible, it was concluded that domestic saving should be supplemented by foreign resources.

This shifted the issue from whether external resources are useful to developing countries to how much was sufficient to help them realize their growth potential. This issue gained popularity in the late 1950s and 1960s, and developed in two directions—the supply side and the demand side. (Befekadu, 1992). The supply side of the volume of foreign resources required by the developing countries was initiated and propagated by the UN and its specialized agencies such as UNCTAD as well as private bodies such as the Pearson Commission. UN (1951) as cited by Befekadu (1992). These organizations and commissions, both for reasons of equity (bridging the huge and growing gap between the rich and the poor countries) and economics (a richer country is a better trading partner), aimed for a maximum feasible volume of foreign resources. The target ranged from 0.7 per cent of the national income of Pearson Commission to the 1 per cent of national income of the UN and its specialized agencies (Ibid). While this approach advocated an increase in the volume of resource flows, it nevertheless suffered from a number of problems (Befekadu, 1992).

First, the recommended level included all resources without distinction between the different types of flows such as aid, direct and portfolio investment and credit from all sources. Neither did it deal with the terms and conditions under which these resources were to be provided, including the thorny issue of whether they were to be tied or untied. Second, the proposals did not have anything to say on the distributional mechanism, i.e., how, if the targeted amount is made available, the amount is to be distributed among the needy countries, and who should have the responsibility of doing so. An approach that paralleled the supply side and became more popular on the strength of its pragmatism is the demand-determined foreign resource requirement (Rodan (1961) & Hoffman (1960) as cited in Befekadu (1992)). Based on purely economic criteria, this approach identifies the resource needs of developing countries on an individual basis, given each country's absorptive capacity and the constraints that limit the productive utilization of its resources (Ibid). This method of determining foreign resource requirements has been justified on a number of grounds, without materially affecting the final outcome UN (1951), (Rodan (1961) & Hoffman (1960) as cited in Befekadu (1992)). One of the earliest justifications was that since the developing countries did not have the necessary volume of savings, foreign resource inflow could supplement domestic resources to increase investment and thus make possible rate of growth that would be higher than that attainable in its absence. (Ibid)

2.1.2. Importance of the Foreign Capital Flows

The purpose of the flow of capital to underdeveloped countries is to accelerate their economic development up to a point where a satisfactory growth rate can be achieved on a self-sustaining basis. Capital flows in the form of private investment, foreign investment; foreign aid and private bank lending are the principle ways by which resources can come from rich to poor countries. The transmission of technology, ideas and knowledge are other special types of resource transfer.

When discuss about the constraints of economic growth, one should refer to the saving gap and foreign exchange gap of the country. A net capital inflow contributes to the filling of both the gaps. The capital flow of countries increases due to the amount of resources available for capital formation above what can be provided by domestic savings. It also raises the recipient economy's capacity to import goods: capital flow provides foreign exchange and eases the problem of making international payments.

Countries in early stages of development assumed to have a primary need for technical assistance and institution building and only limited need for capital assistance chiefly for infrastructure projects. As the need for capital assistance increases, the need for technical assistance shifts from general to more specific skills. The gradual increase in domestic savings and a growing capacity to attract private and other conventional foreign capital on non-concession ally term will progressively reduce the need for foreign aid. The assumption that the need for foreign capital is temporary and limited is underlined by several recipients in Latin America elsewhere and expected attain rapid development in ten to fifteen years but it is recognized that in Asia and Africa, the need for capital flows will remain for a much longer time.

Theoretical and empirical research on the role of foreign capital in the growth process has generally yielded conflicting results. Conventionally, the two-gap approach justifies the role of foreign capital for relaxing the two major constraints to growth (Chenery and Bruno, 1962; McKinnon, 1964). In the neoclassical framework, however, capital neither explains differences in the levels and rates of growth across countries nor can large capital flows make any significant difference to the growth rate that a country could achieve (Krugman, 1993). In the subsequent resurrection of the two-gap approach, the emphasis has generally laid on the preconditions that could make foreign capital more productive in developing countries. The important preconditions comprised presence of surplus labor and excess productive demand for foreign exchange. With the growing influence of the new growth theories in the second half of the 1980s that recognized the effects of positive externalities associated with capital accumulation on growth, the role of foreign capital in the growth process assumed renewed importance. In the endogenous growth framework, the sources of growth attributed to capital flows comprise the spillovers associated with foreign capital in the form of technology, skills, and introduction of new products as well as the positive externalities in terms of higher efficiency of domestic financial markets, improved resource allocation and efficient financial intermediation by domestic financial institutions (de Mello and Thea, 1995; Bailliu, 2000). Since the spillovers and externalities associated with different forms of foreign capital could vary, a pecking order approach to the composition of capital flows is often pursued which helps in prioritizing the capital flows based on the growth enhancing role of each form of capital (Reisen, 2001; Razin, Sadka and Yuen, 1998).

2.1.3. Capital Inflows and the Resource Transfer

For developing economies, the primary benefits of capital inflows are the opportunities to accelerate economic growth and/or to increase current consumption (Bosworth and M. Collins, 1999). The inflows can raise growth rates by supplementing domestic saving and thereby raising the rate of capital accumulation. They may also accelerate growth through the transfer of technology and management skills. Alternatively, capital inflows may be used to raise current consumption, potentially reducing saving (Ibid). Indeed, there is a long-standing interest in the extent to which the resource inflows associated with current account deficits are invested or consumed. Capital inflows need not be associated with a resource transfer. Indeed, significant shares of the flows to developing countries have been offset by reserve accumulation or capital outflows (Bosworth & Collins, 1999).

2.1.4 Growth Theories and the Foreign Capital Component

This section provides various theories of economic growth and how the capital component can be integrated in to these theories. The theoretical view about economic growth can be classified under three broad headlines, namely: (1) the Keynesian (Harod-Domar growth model), (2) the neo-classical (Solow) growth model, and (3) the endogenous growth theory.

2.1.4.1 The Harod-Domar Model

Early theoretical formulations that relate external finance with economic growth were based on the Harod-Domar model. This model uses saving as a ladder to growth (Hansen and Tarp, 2000).The model is based on the assumptions that potential output is proportional to the stock of capital and factor inputs are employed in fixed proportion with no possibility of substitution. The model further assumes that; the economy is closed, there are only two factors of production (labour and capital), labour is homogeneous and grows at a constant rate, and there is no technical progress. Therefore, in the Harod-Domar framework, change in potential output will be:

$\Delta Y = 1/V \Delta K \dots \dots \dots (2.1)$

Where; Y = potential output, K= physical capital and V= constant capital output ratio.

According to the model, change in capital stock equals to gross investment. Hence, considering constant rate of capital depreciation (δ) the growth rate of potential output will be:

$$\Delta Y/Y = 1/V \cdot I/Y \dots\dots\dots(2.2)$$

The model shows that output and capital formations are linearly related. That is, when there is more capital stock (which is financed by saving including its foreign capital components), the higher would be the growth of an economy. From the outset, the Harod-Domar model was used to calculate the amount of finance required to bridge the gap between the available savings and the required amount that must be channeled to investment to bring about the targeted growth rate (Easterly, 1998). This implies, in the Harod-Domar model, constraints on savings is the binding limit to growth. That is, when domestic savings alone are inadequate to bring about the investment level necessary to attain the targeted growth rate then growth is said to be constrained by the savings gap (i.e., short fall of actual savings from the desired level)(Ibid).

Therefore, the role of foreign capital in this regard is to augment domestic savings so as to achieve the targeted rate of growth. Studies beginning from the 1960's extended this analysis to include the gap between import and export (referred to as trade gap) as the other source that limits growth (Chenery and Strout, 1966). This approach is based on the assumption that all investment goods are not produced locally (i.e. some level of capital import is necessary in order to achieve the desired investment level) (Ibid). When foreign exchange earned through export are insufficient, actual import will be lower than the level required achieving a targeted growth rate (Weiskopf, 1973). Thus, the role of foreign capital inflow here is to increase the level of import in which the export earnings is not sufficient to import the required level so as to achieve the targeted growth rate.

The incorporation of this gap led to the Two-Gap model where both savings and foreign exchange act as the constraints that impede growth (Chenery and Strout, 1966). In this model, both gaps represent separate or independent limit to growth where inflow of foreign fund is used to fill the gaps (Ibid). Moreover, according to the model, it is one of the two constraints that would be binding at a given point in time. That is, it is the larger of the two gaps that constrains growth. Therefore, the impact of foreign transfer relies basically on identifying the binding constraint (Weiskopf 1973). The desired rate of growth cannot be attained if foreign finance is

not sufficient to finance the larger gap (Ibid). In addition, if the foreign exchange constraint is binding, the growth impact of aid will not be facilitated via its impact on the level of savings. Rather, aid affects growth through relieving the limits on import. This means, in contrast to the Harod-Domar model where the effect of aid on growth is through saving, growth can be directly influenced by foreign inflow if the trade gap is binding (Hansen and Tarp, 2000).

In the late 1980's, the role of fiscal limitation in affecting growth gained attention in the gap analysis. In this framework, the gap between government revenue and expenditure is considered as the other source of growth hindrance (Taylor, 1994). Actually, fiscal gap is one component of saving gap. However, in theory, the inclusion of this gap plays an important role at a time when a country suffers from external shock and/or when underutilization of capital persists. For instance, expenditure on education, infrastructure, health and so forth is required to expand economic capacity. But, government revenue must be sufficient to meet the expenditure. Otherwise, growth will be limited by fiscal gap (Hjertholm, Laursen and White, 2000). Therefore, fiscal limitation has the potential to be the binding constraint in affecting growth than the other two gaps.

The Harod-Domar model and the extended versions point that the approaches suffer from basic limitations (Easterly, 1998). First, the underlying assumption that growth is proportional to capital stock is unlikely to be true. That is, a linear association of capital and output would imply that as long as the finance (including foreign capital) required for capital formation is available, any growth target would be achieved (Ibid). This assumption is incorrect according to Easterly (1998) even Evsey Domar (co-founder of the Harod-Domar model) had admitted it to be unrealistic and dismissed the original model (Easterly, 1998). Thus, the level of capital formation alone does not guarantee growth as postulated by the Harod-Domar model. Several factors that affect productivity at the same time must be addressed. This includes identifying the relationships between debt, investment, policies and growth. Moreover, the growth impact of foreign aid is not one - for-one as postulated by the Harod Domar type of analysis (Hjertholm, Laursen and White, 2000). Rather, foreign aid may substitute domestic resources, affect the exchange rate and, therefore, may bring undesirable result (Ibid). Hence, the simplistic view of early theories does not adequately address the macro economic impact of aid. In addition to this, gap analysis is developed based on the assumption that the structure of the economy does not

change. The theory, therefore, is inapplicable in times of policy changes that reshape a country's economic structure (Sepehri & Lodhi, 1999).

2.1.4.2 The Neo-classical (solow) growth model

Unlike the Harod-Domar model, the neoclassical growth model allows for factor input substitution and diminishing marginal returns in the production process (Johns, 1998). The basic neo-classical growth model shows that for the growth of an economy capital accumulation is the central issue. The model further show that aggregate saving (investment) determines the growth of capital stock, which, in turn plays a key role in the growth of an economy (Ibid). Technology is considered as exogenous, whose prime role is to augment labour (Ibid). In this framework, the rate of investment and population growth determines the growth rate of per capita output (Ibid).

Nevertheless, growth continues only in the transition to a new steady state. In the long run, the rate of technological change which is exogenous by assumption, determines the growth rate of the economy (Schmidt-Hebbel, Serven and Solimano, 1996). This implies that policy measures do not affect long run growth rate. Thus, the standard neoclassical growth model does not emphasize the contribution of policy for long run rate of growth (Durberry, Gemmell and Greenway, 1998). This model can be briefly explained as follows. The Solow model studies the growth path of economies by assuming a neoclassical production function which combines two factors to produce output: capital and labour. Both factors are perfectly substitutable (Morrissey, 2001) and exhibit diminishing returns to scale (Ray, 2001):

$$Y(t)=K(t)^\alpha L(t)^{1-\alpha} \text{-----}(2.3)$$

Where; $0 < \alpha < 1$

Output is denoted by Y, K is capital, L equals labour and A is technology. The assumption of diminishing returns implies that each additional investment project produces a smaller return until the point where the next project is not profitable (Concessional Budget Office, 1994). When no profit exists there are no incentives to invest and no capital is accumulated. The neoclassical model describes how an economy will eventually converge to a steady state where the growth rate of per capita output is constant in the long run. The growth rate of the economy is

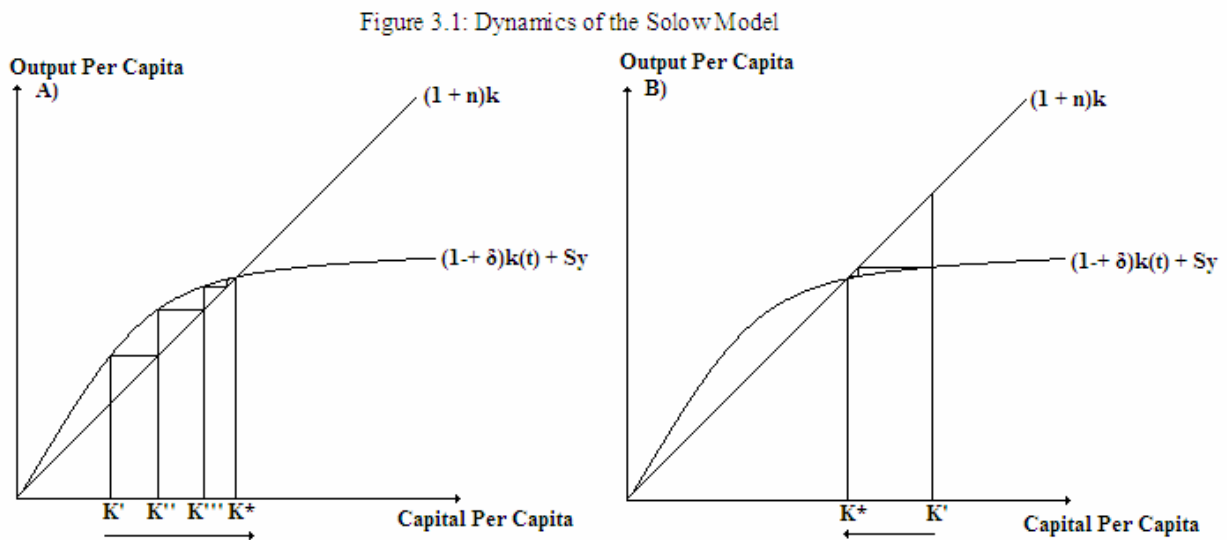
determined by the growth of the labour force and the savings rate which are taken as exogenous. The per capita savings rate is defined as:

$$S_t = I_t / Y_t \dots \dots \dots (2.4)$$

This equation represents the connection between savings and investment which are the driving force behind growth in the Solow Model. Household's savings are lent to investors via banks. These investors can then use the funds to expand production, or replace machinery, with cause's capital to accumulate. The capital movement equation (Ray, 2001) takes the following shape:

$$(1+n)k(t+1) = (1+\delta)k(t) + sy(t) \dots \dots \dots (2.5)$$

Where, $0 < \delta < 1$



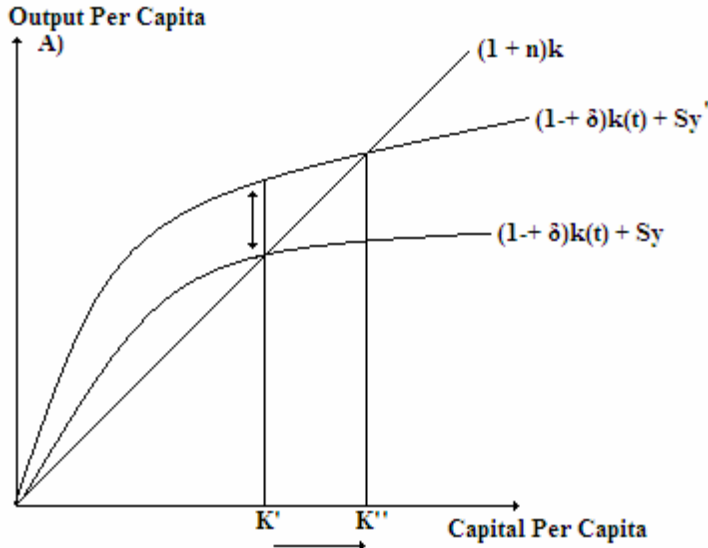
Source: Ray, D (1998) "Development Economic."

At point k' in panel A, the stock of capital is greater than the growth of population $[(1+\delta)k(t) + sy(t) > (1+n)k(t+1)]$ which results in higher capital per capita and a movement from k' to k . This increase in capital per capita caused a decrease in the capital-output ratio due to diminishing returns to capital. This means capital will continue to increase at a decreasing rate until point k^* which is known as the steady state. At this point capital accumulation equals population

growth(Boone, 1996).Panel B shows a situation where growth in the population outstrips accumulation in capital causing the economy to converge back to the steady state (K' to K^*). In the long run diminishing returns imply that the economy will always converge back to a point with a constant growth rate.

The neoclassical model implies that external finance stimulates growth via higher investment levels (Ibid).The average propensity to save is low in developing countries. This is because the developing world suffers from the savings gap and/or the foreign exchange gap. The savings gap stems from a vicious circle in which poor countries initially start with low growth levels which correspond to low income levels. The average propensity to save is low because any income is immediately consumed through basic commodities. Lack of saving prevents capital accumulation which further restricts growth. However, foreign capital (finance) can be used to bridge this gap by relaxing the budget constraints faced by individuals. Often, developing countries cannot domestically produce all the capital goods needed for growth. They have to import from more advanced nations, however, they lack the foreign exchange needed to buy the foreign goods. Foreign aid can eliminate this 'foreign exchange' gap by providing the necessary currency. Consequently investment can occur and growth can increase.

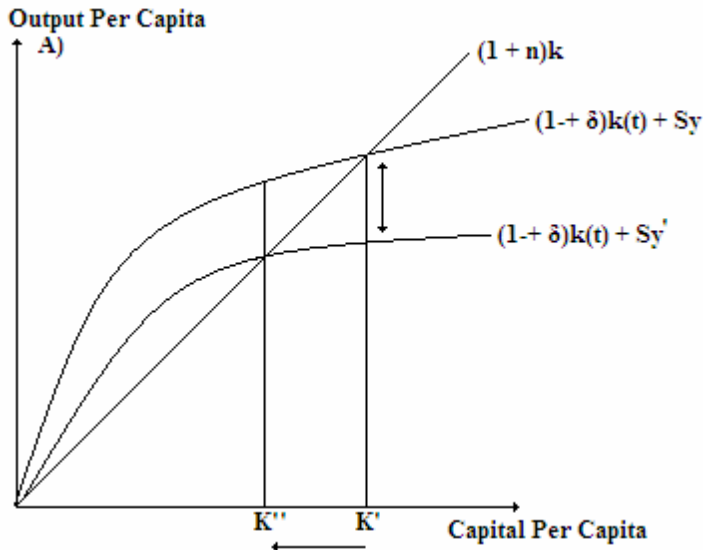
Figure 2.2 illustrates how greater savings due to foreign capital, increase economic growth (although at a decreasing rate), with higher saving levels shifting the $(1 + \delta)k + Sy$ curve upwards. Remaining at point K' means that capital has accumulated faster than population therefore capital per capita increases, causing a gradual movement to a new steady state, K'' . Increasing the amount of capital per worker will cause productivity levels to increase which will ultimately raise GDP (Ray, 1998).To represent the growth path in the presence of distortionary government policy, consider the introduction of a tax. This tax will cause people to save less which shifts the $(1 + \delta)k + Sy$ curve downwards as less capital is accumulated. Remaining at K' means that the population is growing faster than capital accumulation. Gradually capital per capita falls, and the economy moves to K'' . (Ibid)



Source: Ray, D (1998). "Economic Development."

Fig 2.2: Solow Growth Model with Foreign capital.

Figure 3.3: Solow Model with Policy Distortion (Tax)



Source: Ray, D (1998). "Economic Development."

The Solow Model, however, is hindered by two basic limitations (Mankiw, Romer and Weil, 1992): firstly the inability to explain long term growth and the second limitation is the assumption of diminishing marginal returns. The first limitation is that the Solow Model only describes changes in the level of growth in the long run, whilst the rate of growth cannot be changed. Figure 2.4, panel a, shows that an increase in the rate of savings only increases the level of growth and not the rate.

This is because the new growth path remains parallel to the original. However, as shown in section B of panel A, as the economy moves onto a new growth path, growth increase temporarily during the transition period, but in the long run the growth rate is constant. The Solow Model can be augmented with technological progress which means the economy can move onto a new growth path which experiences an increasing growth rate, shown in panel B of figure 2.4. However, this technology is taken as exogenous (Mankiw, Romer and Weil, 1992) and the model fails to explain the sources of the technology. This reliance on exogenous factors without explanation of the source is perhaps the models most serious limitation. This means that an economy cannot experience long term growth without technological progress which just falls from heaven with no explanation.

2.1.4.3. Endogenous Growth Theory

To overcome the limited long term effects of the Solow Model; human capital is introduced in to the theory. Human capital is not subject to diminishing returns (Romer, 2006) allowing growth to occur continuously at a rate of human capital accumulation. This addition into the growth theory changes very little, with foreign capital and policy distortions having the same impact in the short run. However, this endogenous model does drop the assumption of diminishing returns which allows for unbounded long term growth. This is because non diminishing returns to capital mean that the returns on investment projects will never equal the cost (depreciation) which allows for a profit on each subsequent investment. This endogenous model, inspired by Romer (2006), suggests equilibrium can be reached where continuous long term growth exists. This means that foreign aid will increase growth well into the long run.

According to Romer (2006) growth is closely related to the level of human capital. Firms directly benefit from knowledge accumulation due to new innovations and designs that allow for greater productivity. Increase foreign capital leads to greater accumulation of human capital via increase education and widespread Research and Development. Additional human capital causes a higher rate of technological progress, via new innovations. Higher technological progress increases output per capita allowing for unbounded long run growth. Post-Keynesian traditions investment plays a critical role both as a component of aggregate demand (probably the most volatile) as well as a vehicle of creation of productive capacity on the supply side. In post Keynesian demand-driven models investment still plays a crucial role in determining medium run growth

rates. Most of these models assume unemployment and idle productive capacities. A variant but assuming full employment of labor is provided by Nicholas Kaldor who postulated growth models with changes in functional income distribution as a mechanism of macroeconomic adjustment acting through national savings in which capitalists have a greater marginal propensity to save than workers.

In a different vein we have the Austrian school of Von Mises, Hayek and others. In this school, the real interest rate (relative to the prospective return on physical assets) is the equilibrating variable between the supply of loans (savings) and the demand of loans for productive purposes (investment). An investment boom is created when banks or monetary policy keep the interest rate below the “natural rate” (a concept developed by the Swedish economist Knut Wicksell), say the interest rate which equilibrates the demand for loans (investment) with the supply of funds (savings).

In the 1950s neoclassical economics gave rise to a celebrated long run, supply driven, growth models such as Solow (1956). In this model, the rate of technical change, the savings ratio and the rate of population growth are the three parameters that determine the rate of growth of the economy in steady –state. In this model, the investment ratio plays a role only in the transition between steady –states (in practice that transition may take a few decades) but not in the configuration of long run growth equilibrium of the economy. We will see that these transitions are empirically very relevant; in fact, new papers in growth economics are starting to focus more on this rather than on long run growth. In the Solow model, as said before, there is no independent investment function (a concept central to the Keynes of the General Theory). Full wage-price flexibility solves any ex-ante discrepancy between intended savings and desired investment avoiding the sort of macroeconomic fluctuations that were the concern of Keynes and Austrian economists alike. In the “endogenous” growth theory developed since the mid 1980s a new role was recreated for investment to affect long run growth by making the rate of technical change and productivity growth linked either to the accumulation of physical capital or the accumulation of human capital.

The issue of causality between savings, investment and growth has plagued growth economics since the start. The controversy can be cast in terms of two leading theoretical perspectives: the “Marx–Schumpeter-Keynes view” versus the “Mill- Marshall-Solow view“(Chakravarty, 1993

and Solimano, 1997). The first view posits that investment (Keynes, and to some extent, Marx) and innovation (Schumpeter, Marx) are the two variables that drive output growth. In this context, savings adjusts passively to meet the level of investment required to hold macroeconomic equilibrium and deliver a certain growth rate of output (Ibid). In this view growth leads savings. In contrast, in the Mill-Marshall-Solow approach that channel of causality is reversed as it assumed that all savings is automatically invested and translated into output growth under wage-price flexibility and full employment. As a result, in the Mill-Marshall-Solow approach savings leads economic growth. The two schools deliver alternative lines of causality between savings, investment, innovation and growth. These causality issues are still relevant in an open economy with capital mobility, as we shall see in a later section.

2.1.6. National Savings and Investment under International Capital Mobility

In an era of globalization, another important theme is the correlation between domestic savings and domestic investment under international capital mobility. In an influential paper Feldstein and Horioka, FH, (1980) argued that in a world with perfect capital mobility domestic savers would seek the higher rate of return irrespective of the home or foreign origin of the assets to be invested. In turn, attractive investment projects would find adequate financing irrespective of the funds would come from the pool of national savings or from foreign savings. The authors pose that under perfect capital mobility, national savings and domestic investment would be largely uncorrelated. However, FH found empirically that, contrary to the predictions of perfect capital mobility theory there was a strong correlation (and statistically significant) between domestic savings and domestic investment (a high “savings retention coefficient”) when the relation was test for cross section data of industrial economies with (5 years average) data of the 1960s and 1970s.

Taylor (1996) reports those results of various studies included his own that basically find a close correlation between national savings and national investment, a finding that is relatively robust across space and time although it varies in periods of higher capital mobility (i.e. during the gold standard and since the 1970s, a second period of financial globalization). The high correlation of national investments and domestic savings demonstrates that the financial markets are not more integrated today than at the beginning of the 20th century, although a change occurred between the two periods in the composition of capital flows, especially an increase of the short-term

capital flows relatively to long-term capital flows (Baldwin and Martin 1999, Taylor, 1996). In any case, the results of the FH tests reported by Taylor (1996) suggest the existence of “home bias” in terms of the allocation of savings towards national assets and towards national investment projects seems to hold.

Let us now briefly review some historical evidence pertaining to this topic. One feature is that countries change their position of net exporter (or net importer) of capital overtime. From the 19th century until the 1980s the United States was, on average a net exporter of capital. After World War I British financial hegemony was replaced by the United States as the main capital exporter of the world economy. The US role as a net capital exporter lasted until the early 1980s when it started to run current account deficits, importing savings from the rest of the world to finance a level of expenditure above its real output, financing the gap with savings from the rest of the world, mainly from positive net savings economies in Asia and also from international reserves held by Central Banks in developing countries held mostly in U.S securities. In addition, the U.S became a net debtor as its foreign liabilities exceed its net foreign assets. Interestingly, under current conditions, there is a transfer of savings from developing countries (and from “emerging economies”) to the richest economy in the world that spends more than its income generated by nationally owned factors of production.

Thus, national savings are diverted from the financing of growth at home to finance consumption and investment in the richest world economy. In the 19th century and up to World War I, a period known as the first wave of globalization, the most important flow of capital occurred from Great Britain to a group of countries known as the “New World Countries” (Argentina, Australia, Canada, New Zealand, and the United States). London constituted the financial center of the global capital market and was called the “banker of the world”. It is estimated that the surplus of domestic savings over investment in the U.K was around 50 percent in the first decade of the 20th century (Obstfeld and Taylor, 2004).

The British pound was the dominant currency in the context of the international gold standard. The United Kingdom contributed to a peak average of 80 percent of total global foreign investment. In the early 20th century capital flows were characterized by the accumulation of enormous one-way positions and a great portfolio diversification by the principal creditor

countries, in particular Great Britain, and inversely little diversification and high foreign capital “dependence” by the debtor New World countries.

It is interesting to note that capital flew to rich and labor-scarce New World countries instead of going to poor and labor abundant Asian and African countries, where it could, in principle, have been more profitable given the abundance of cheap labor. This is the so-called “Lucas Paradox”. In today’s global capital markets in which capital flows and foreign investment aim for risk sharing and diversification instead of long-term financing to build infrastructure and housing as was the case in the pre-1914 world. Regarding the direction of international capital flows we face also the “Lucas Paradox” in which there is too little capital flows to capital-scarce, poor countries. We may think in various factors why capital does not go to low income countries: the lack of educated and properly trained work force in poor countries, lack of enforceable property rights, bureaucracy, political instability, weak institutions, small domestic markets and other factors (Obstfeld & Taylor, 2004).

2.1.7 Capital Inflows in Africa

Capital flows are neither a necessary nor a sufficient condition to trigger economic transformation. Lack of economic transformation in Africa is due to a combination of shortcomings in policy, institutions and physical and human infrastructure. Overcoming these constraints is important for economic transformation, which is critical for attaining sustainable growth and reducing Africa’s vulnerability to shocks. The analysis of the links between capital flows and economic transformation in Africa indicates that:

Capital flows to Africa during the last four decades have not been accompanied by economic transformation. In countries such as Mauritius and Tunisia, with relatively greater degrees of economic transformation, structural change was not due to capital flows but rather to a combination of sound policies and reforms that attracted domestic and foreign investment into sectors that were more conducive to export promotion and economic diversification; For most of the time, ODA has been the most important source of capital inflows to Africa.

However, ODA flows to Africa have been largely channeled to primary education and other services with very little flow to infrastructure. ODA, in its current structure, has had limited impact on economic transformation. Higher flexibility in donor policy to ensure a more balanced

and productive allocation of ODA flows among various sectors would enhance the effects of ODA on economic transformation;

FDI to SSA is mainly directed to extractive sectors, especially oil and minerals. Such FDI will not induce economic transformation unless revenues from oil and minerals are adequately used to develop infrastructure and institutions and to spur investment in other sectors; Portfolio flows to Africa are unlikely to affect economic transformation as they are quite small in volume and go to countries with more diversified economies and active capital markets; and Research indicates that remittances have been largely driven by the motive to support family consumption and have had little impact on economic transformation. The absence of a notable relationship between capital flows and structural change in Africa is attributable to lack of appropriate policies to influence the nature and allocation of these flows. As the policy environment improves, private capital flows are likely to follow with a greater impact on growth and economic transformation through productivity enhancement, technology transfer, greater access to foreign markets and reallocation of resources in favor of more competitive sectors (ECA, 2006).

2.2 Empirical Literature

A number of studies have dealt with the nexus between foreign capital inflow on savings, investment and economic growth during the last three decades. Most of the earlier studies showed that foreign capital inflow has a negative impact on savings, investment and economic growth of developing countries.

2.2.1 Foreign Capital and Economic Growth

Many studies have been conducted about the link between foreign capital inflow and economic growth. Some of these include: Papanek (1973) disaggregated foreign capital inflows in to three principal components: foreign aid, foreign private investment and all other foreign inflows. He used cross section data of 34 countries in the 1950s and 51 countries in the 1960s. He found that all three flows (foreign aid, foreign private investment, and other foreign inflows) had statistically significant positive impact on growth and the effect of foreign aid on economic growth was stronger than other factors.

Stoneman (1975) tested the impact of foreign capital on the economic growth of poor countries. He criticized his predecessors for failing to distinguish between two main effects of foreign capital: the direct balance of payments effect (inflows of capital enable higher investment and consumption); and effects on the structure of the economy (foreign inflows reduce exports, change the capital output ratios, affecting income distribution etc). He performed an Ordinary Least Square (OLS) regression analysis for a five-year period between 1955 and 1970, on a main sample of 188 countries and several sub-samples, using the following explanatory variables: gross domestic savings, net inflow of direct investment, net inflow of foreign aid other foreign long-term flows and the stock of foreign direct investment. The dependent variable was annual average growth in GDP. His results confirmed the favorable impact of foreign aid and domestic savings on economic growth, but suggested that the stock of foreign direct investment retarded growth and that the significance of this increased when the lag of the dependent variable was used.

Balassa (1978) showed using a simple growth model that labour inputs (L), foreign capital inflows (K_f) and capital formation from domestic savings (K_d) were positively related to output growth (Y), using pooled data of ten countries for the period 1960-73. However the effects of foreign capital inflows on output growth were smaller as compared to domestic capital. Mosley (1980) also disaggregated foreign capital inflows into aid and other financial inflows and lagged foreign aid inflows by five years. Using a Two Stage Least Square (2SLS) regression, he investigated the impact of capital inflows on growth for 83 countries, during the period of 1966-77. The effect of foreign aid and other inflows on growth was negative but statistically insignificant in the case of all 83 developing countries. However, for the 30 poorest countries, foreign aid was significantly positive when lagged by five years.

Dowling and Hiemenz (1983) tried to find the relationship between foreign aid, savings and growth in the presence of policy variables. Their sample covered 52 countries of the Asian region for the period 1968-79. They performed an OLS regression using standard explanatory variables, i.e. foreign aid, other capital inflows and savings, and four policy variables. All three variables were found to be positively and significantly related to economic growth. They reported that economic policies have been conducive to a productive allocation of foreign aid and other resources.

Shabbir and Azher (1992) employed a two equation simultaneous model for economic growth and saving ratio (National saving as a ratio of GNP) using annual time series data for Pakistan during the period 1959 -60 to 1987-88. The model was estimated by the 2SLS method. Their results showed that foreign private investment had a positive and significant effect on economic growth measured by GNP growth rate when total disbursements were excluded. However, this positive impact became insignificant when total foreign disbursements were included. The impact of foreign private investment on national savings turned out to be negative and significant in both cases, i.e. with and without foreign disbursements.

Khan and Rahim (1993) also tried to estimate the impact of foreign assistance on economic development of Pakistan. They employed a single –equation model for estimating savings and economic growth functions for the period 1960 to 1988. They also separated different types of foreign capital and estimated their effects on GNP growth and savings rate using the OLS method. They came up with a negative but insignificant impact of foreign assistance on savings held that different types of foreign capital had different effects. For example, foreign aid was found to have no measured effect on savings, foreign direct investment was inversely related to savings but insignificant and loans were negatively related to domestic savings but with a significant coefficient. Their second equation produced a significant positive effect of foreign capital assistance (one year lagged) on the growth rate of GNP. Foreign loans and grants had positive effects on economic growth. Iqbal Zahid (1998) used a multiple regression framework to separate out the effects of key macroeconomic factors on the economic growth of Pakistan over the period 1959-60 to 1996-97. The quantitative evidence from the OLS regression showed that human capital (proxied by primary school enrollment as a ratio of labour force) was an important prerequisite for accelerating growth. The empirical results also suggested that the openness of the economy promoted economic growth. The budget deficit and external debt were found to be negatively related to economic growth.

Bowen (1998) tried to measure the direct and indirect relationships between foreign aid and economic growth using a cross-country data for 67 less-developed countries for the period 1970 - 88. The direct aid growth relationship was not significant. However, indirect aid-growth relationship, via its interaction with domestic savings, was significant and negative. The results obtained using 2SLS regression analysis showed that low per-capita income rather than low

savings rate led to high aid levels. Burnside and Dollar (2000) estimated a model using a panel data for 56 countries. They used the 2SLS method to estimate simultaneous equations model for growth, aid and policy .They found that foreign aid had a robust positive impact on economic growth in a good policy environment.

Hansen and Tarp (2001) examined the relationship between foreign aid and growth in real GDP in 56 countries covering the years 1974-1993 in five periods was regressed on several policy institutional control variables and foreign aid. Their results showed that foreign aid in all likelihood increased the growth rate and this was not conditional on “good” policy (as suggested by Burnside and Dollar (2000)). They found decreasing returns to foreign aid and the estimated effectiveness of foreign aid was highly sensitive to the choice of estimator and the set of control variables.

2.2.3 Foreign Capital and Domestic Investment

Studies relating foreign capital to domestic investment in developing countries are not that much investigated. Halevi (1976) examined the relationship between long-term capital inflows in aggregate capital formation and in its components, private and public investment and consumption for 44 countries in the late 1960s. When all variables were expressed in per capita terms, he found a positive and significant relationship between long-term capital (aggregate) and private and public inflows and investment. He also found that long-term capital was positively related to public consumption and negatively related to private consumption. He concluded that there was a significant link between long term capital inflow, investment and growth but such capital inflow also tended to increase public consumption. Mosley (1987) found a positive relationship between foreign aid and private investment. Bhalla (1991) estimated a simple investment-growth model for Sri Lanka for the period 1956-86 and found a positive relationship. Snyder (1996) examined the relationship between foreign aid and private investment using annual panel data for 36 developing countries over the period 1977-1991 and found a negative relationship.

Getachew (1997) studied the determinants of private industrial investment in Ethiopia using descriptive statistics to analyze 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

Woldemariam (2018) examined the determinant factors of private investment in Ethiopia using time series data from 1996 to 2016). The author used OLS regression technique. He found that public investment, real GDP, external debt servicing, and access to bank credit have significant positive effect on private investment. On the other hand, lending interest rate and foreign direct investment have significant negative effect on the performance of private investment. Another researcher, Ambachew (2010) studied the determinants of private investment using the data from 1950 to 2003 and he divided the data in to two sub-periods. The author used multivariate single equation error correction model. The author concluded that domestic market, return to capital; trade openness and liberalization policies, infrastructural facilities and FDI have positive significant effect on private investment. Whereas uncertainty, political instability have negative effect on private investment.

Bethlehem (2010) examined the determinants of private investment in Ethiopia using time series econometrics the 1974-2008. Based on the study real private investment determined by only real GDP and inflation rate that means, real GDP has positive impact, where as inflation rate have negative effect on real private investment. This is because coefficients of real government investment, real lending interest rate, and real exchange rate have found to be statistically insignificant both in the long run and in the short run. Another study by Gumi (2011) using OLS method reached on conclusion that GDP has significant impact on private investment both in the short run and long run. In addition exchange rate and interest rate had the same impact on private investment.

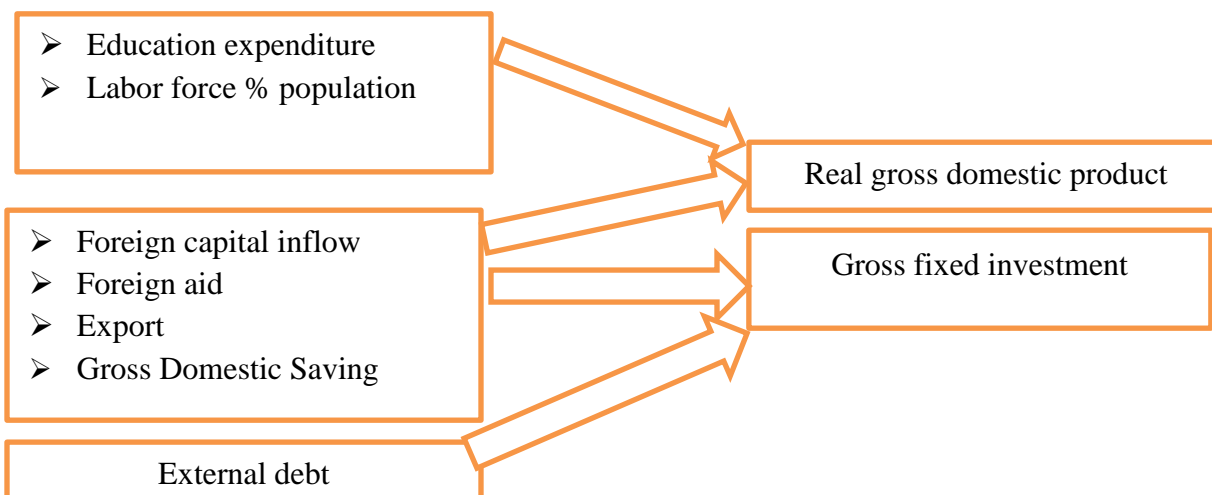
Yesigat (2016) investigated factors that determine domestic private investment in Ethiopia by using the framework of VAR and vector error correction mechanism using annual data covering the period from 1971 to 2014. The regression results show that public investment, real GDP, exchange rate and credit have significant positive long run effect on private investment, while interest rate has significant negative long run effect. In the short run, exchange rate has significant positive contribution to private investment, while inflation has significant short run

negative effect on private investment after one lags. However, the author used only domestic private investment without including foreign direct investment.

The study by Teklay (2017) emphasized the financial determinants of private sector investment in Ethiopia using annual time series data from 1975-2015. OLS regression analysis was used to estimate long run model and ECM was used to find out the short run dynamics. In both long run and short run model the financial determinants variable like broad money supply, bank credit and availability of foreign exchange have positive relation with the private investment. The capital expenditure, which is negatively affect in the long run and positively affect private investment in the short run.

Conceptual framework

Based on the reviewed literature the researcher develops the following conceptual frame work to be tested in the model.



CHAPTER THREE

3. Model Specification and Methodology

This chapter presents source and types of data, theoretical framework and empirical model that were employed in this study to the effect of foreign capital inflow on economic growth and investment in Ethiopia. It also discusses the statistical tools and necessary diagnostic tests using time series ordinary least square (OLS) regression that is expected to be used in this study.

3.1. Research Design

This study employed quantitative analytical research approach. It involves testing the effects of variables whose data are expressed quantitatively. Hence in this study descriptive and inferential / empirical study designs were used. The reason why the researcher used descriptive method is that to collect detailed description of existing phenomenon with the intent of employing data to justify current conditions and whether and whenever possible to draw conclusion from the facts that the researcher could discovered. The empirical study was used to support the descriptive statistics by statistical evidence.

3.2. Data Source and Scope

This study used secondary data mainly drawn from World Bank (World Development Indicators, national bank of Ethiopia) and IMF (World Economic Outlook) 2018 online databases. The study covers a period of 40 years from the period (1980 – 2019). The data from international organizations was collected from their respective databases, whereas sources of data from locally concerned authorities was obtained by directly visiting their offices.

3.3. Method of data analysis

The study employed both descriptive and econometric analysis methods. Tables, graphs and charts were incorporated in order to analyses the overall trends of foreign capital inflow, investment and real gross domestic product. Furthermore, the ordinary least square (OLS) estimation technique was employed as an econometric analysis method so as to indicate whether causalities exist between the independent variables and trade balance, and if so the directions and magnitudes of the effects (Greene,2012).

3.4. Model Specification

In line with the theoretical propositions reviewed in the literature, the impact of foreign capital inflows on investment and economic growth were examined by specifying the following two equations. Model specification refers to the mathematical presentation of the relationship between variables and identifying which variables are independent and which one is dependent. In this study investment and economic growth are used as dependent variables. Independent variables include foreign aid, foreign capital inflow, export, labor force, human capital proxies by education expenditure, the age dependency ratio, and external debt. After testing stationarity of variables, OLS estimation method was employed. Linear least squares regression has earned its place as the primary tool for process modeling because of its effectiveness and completeness (Gujarati, 2004).

3.4.1. Pre- estimation (Unit root test)

Dickey and Fuller (1979) developed a procedure for testing whether a variable has a unit root or, equivalently, that the variable follows a random walk. Hamilton (1994) describes the four different cases to which the augmented Dickey–Fuller test can be applied. The null hypothesis is always that the variable has a unit root. They differ in whether the null hypothesis includes a drift term and whether the regression used to obtain the test statistic includes a constant term and time trend. Becketti (2013) provides additional examples showing how to conduct these tests. The true model is assumed to be:

$y_t = \alpha + y_{t-1} + u_t$, where u_t is an independently and identically distributed zero-mean error term. In cases one and two, presumably $\alpha = 0$, which is a random walk without drift. In cases three and four, we allow for a drift term by letting α be unrestricted. The Dickey–Fuller test involves fitting the model $y_t = \alpha + \beta y_{t-1} + \delta t + u_t$ by ordinary least squares (OLS), perhaps setting $\alpha = 0$ or $\delta = 0$. However, such a regression is likely to be plagued by serial correlation. To control for that, the augmented Dickey–Fuller test instead fits a model of the form:

$$\Delta y_t = \alpha + \beta y_{t-1} + \delta t + \zeta_1 \Delta y_{t-1} + \zeta_2 \Delta y_{t-2} + \dots + \zeta_k \Delta y_{t-k} + \quad (1)$$

Where k is the number of lags specified in the lags () option. The no constant option removes the constant term α from this regression, and the trend option includes the time trend δt , which by

default is not included. Testing $\beta = 0$ is equivalent to testing $\rho = 1$, or, equivalently, that y_t follows a unit root process. In the first case, the null hypothesis is that y_t follows a random walk without drift, and (1) is fit without the constant term α and the time trend δt . The second case has the same null hypothesis as the first, except that we include α in the regression. In both cases, the population value of α is zero under the null hypothesis. In the third case, we hypothesize that y_t follows a unit root with drift, so that the population value of α is nonzero; I do not include the time trend in the regression. Finally, in the fourth case, the null hypothesis is that y_t follows a unit root with or without drift so that α is unrestricted, and we include a time trend in the regression.

3.4.2. Cointegration Test

Most macroeconomic variables are found to be non-stationary and showing trending overtime (Johanson, 1992). However, one can difference or de trend the variables in order to make the variables stationary. If variables become stationary through differencing, they are in the class of difference stationary process. On the other hand, if they are de trended, they are trend stationary. Co integration among the variables reflects the presence of long run relationship in the system. (Gujarati, 1995). There are two approaches used in testing for Co integration. They are: (i) the Engle-Granger (two step algorithm) and: (ii) the Johansen Approach.

A. Johansen (1988) Maximum Likelihood

The Johansen (1988) procedure enables estimating and testing for the presence of more than one co-integrating vector. Moreover, it permits to estimate the model without priory restricting the variables as endogenous and exogenous. Under this procedure, the variables of the model are represented by a vector of potentially endogenous variables. The other important thing in the co integration analysis is the issue of identifying endogenous and exogenous variables in the system. This is required because the Johansen procedure do not restrict the variables behavior a priori. If a variable is weakly exogenous, it implies that its error correction term (i.e., the corresponding W-coefficient) does not enter in the error correction model. This implies that the dynamic equation for that variable contains no information concerning the long run relationship in the system. Hence, variables that are weekly exogenous should appear in the right hand side of the VECM. This restricts the exogenous variables to be contemporaneous with the dependent variable (Harris, 1995).

3.4.3. Vector Error Correction Model (VECM)

Economic variables have short run behavior that can be captured through dynamic modeling. If there is long run relationship among the variables, an error correction model can be formulated that portray both the dynamic and long run interaction between the variables. In the previous discussion, we show that if two variables that are non-stationary in levels have a stationary linear combination then the two variables are co integrated. Co integration means the presence of error correcting representation. That is, any deviation from the equilibrium point would revert back to its long run path. Therefore, an ECM depicts both the short run and long run behavior of a system.

3.5. Empirical model specification

3.5.1. Growth Equation

The growth model, which is used in this study, is based on endogenous growth model. The endogenous growth models developed by Lucas-Romer extend the old neo-classical model by emphasizing the role of endogenous factors (i.e., human capital stock and R&D activities) as the main engines of economic growth. While early neo-classical models assume total factor productivity growth (or technical progress) as exogenously given, the newer endogenous growth models attribute this component of growth to the ‘learning by doing’ effect occurring between physical and human capital, which result in increasing returns to scale in production technology (Lucas, 1988). Therefore, the production function under endogenous growth theory can be written as:

Following the theoretical and empirical review and work conducted by Rana and Dowling (1988) growth is developed. Moreover, attempt is made to incorporate other factors that are believed to affect growth and savings. pointed out that the impact of foreign capital on economic growth of developing countries is controversial and available researches indicate that while foreign capital is a partial substitute for domestic savings these inflows have nevertheless made a positive contribution to economic growth.(Rana and Dowling, 1988). The evidence is less clear-cut regarding the relative importance of various types of foreign capital flows as contrasted with other factors (e.g., the degree of export orientation, saving performance, etc.) and whether foreign capital improves or hinders economic efficiency (Ibid).

As argued by Rana and Dowling (1988), these studies have short coming of inclusion of important variables. Growth performance should include the domestic saving rate, foreign capital and export performance as explanatory variables; while foreign capital, per capita income, gross domestic product and export performance are important determinants of savings behavior. Regression estimates would be biased if any of these variables are omitted. Specifying saving and growth equations including export performance was seen as a remedy to the problems that the previous studies encounter. The growth equation of the Rana and Dowling (1988) model is derived from a two sector model comprising export and non-export sector. The export variable is included in the growth equation for at least four reasons. First, exports enable countries to specialize in the production of commodities in which they have a comparative advantage; resources which are saved in this way can then be used for investment .Second, trade provides a vent for surplus commodities which bring otherwise unemployed resources in to use. Third, trade can expand production possibilities through its effect on such factors as competition, access to new knowledge, technology and ideas; these are the so-called dynamic gains from trade. Fourth, trade enables countries to purchase goods from abroad. If there are no domestic substitutes, the ability to import can relieve bottlenecks in production and thus increase savings and investment; and imports may simply be more productive than domestic resources (Rana and Dowling, 1988).

In addition to the aforementioned variables, according to Acemoglu (2007), human capital can play a major role in economic growth and cross-country income differences. Human capital refers to all the attributes of workers that potentially increase their productivity in all or some productive tasks. The term is coined because much of these attributes are accumulated by workers through investments. Human capital theory, developed primarily by Becker (1965) and Mincer (1974), is about the role of human capital in the production process and about the incentives to invest in skills, including pre-labor market investments, in form of schooling, and on-the-job investments, in the form of training.

Physical-human capital interactions could potentially be important, since a variety of evidence suggests that physical capital and human capital (capital and skills) are complementary, meaning that greater capital increases the productivity of high human capital workers more than that of low skill workers. This may play an important role in economic growth, for example, by inducing a “virtuous cycle” of investments in physical and human capital (Acemoglu, 2007).

Hence, with the expected signs indicated below the variables, growth function is given by:

$$\text{GDP} = f(\text{AID}, \text{FDI}, \text{S}, \text{X}, \text{LF}, \text{HC}) \quad (2)$$

Taking the natural logarithm to all but FDI the growth equation can be rewritten as:

$$\begin{aligned} \text{LnGDP}_t = & \alpha_0 + \alpha_1 \text{LnAID}_t + \alpha_2 \text{LnFDI}_t + \alpha_3 \text{LnS}_t + \alpha_4 \text{LnX}_t + \alpha_5 \text{LnLF}_t + \\ & \alpha_6 \text{LnHC}_t + \varepsilon_t \end{aligned} \quad (3)$$

Where Ln represents the natural logarithm of the respective variable and is the error term. GDP = real gross domestic product, AID=foreign aid as a percentage of GDP, FDI=foreign direct investment as a percentage of GDP, S=gross domestic saving as a percentage of GDP, X= export as a percentage of GDP, LF= labor force, HC=human capital proxies by education expenditure.

3.5.2. Investment Equation

The model for investment we specify here is an adaptation from a framework used by Jenkins (1998), which derives from models of financial constraints or repression. Moreover, attempt is made to incorporate other factors that are believed to affect investment. Domestic investment would be financially constrained by domestic savings and resources flowing in to the country:

In addition to Jenkins (1988) and Hansen and Tarp (2000) pointed out that most empirical studies on investment are built up on a behavioral equation that links total investment to the overall saving. That is, investment is assumed to depend on domestic savings and inflow of foreign resources. Though studies show that the relationship between saving and investment is ambiguous from a theory point of view, the literature on foreign resources inflow emphasizes the existence of positive correlation between foreign inflow and investment. For instance, Harod-Domar and Gap theories consider foreign inflow as an important growth inducing element through bridging the gap between the available resources and the required investment. Standard economic theory, of course, predicts that capital inflows unambiguously increase investment rates in developing countries. The argument runs as follows. In developed countries, savings are abundant but return to investment is low because capital per worker is already high.

In developing countries, on the other hand, return to investment is high as capital per worker is low, but savings are scarce. Hence if capital were allowed to move freely across national

frontiers, a part of the savings of the developed world would be invested in the developing world. So the investment rate would fall below the saving rate in developed countries and rise above the saving rate in developing countries. International capital mobility, therefore, is expected to help poorer nations to achieve faster growth and thus promote economic convergence. Since foreign capital inflow has a debt component, current inflow of debt necessitates its future payments in the form of debt service. If recipient's repayment capacity fails to increase, debt servicing is likely to crowd out investment activity by consuming the available foreign exchange.

Therefore, it is important to assess the issue of whether debt servicing weakens investment or not. Political and social instability tends to deter investment by affecting the incentive framework. Such instability affects investment negatively by raising the value of waiting, threatening property right and making prediction of investment returns difficult (Serven, 1996). One of the factors that induce political and social instability is war. Therefore, this paper checks the potential impact of war in depressing investment using defense expenditure as proxy. Hence, with the expected signs indicated below the variables, the investment function is given by:

$$I = f(S, AID, FDI, Debt, EX) \quad (4)$$

$$I_t = \alpha_0 + \alpha_1 AID_t + \alpha_2 FDI_t + \alpha_3 S_t + \alpha_4 Debt_t + \alpha_5 EX_t + \varepsilon_t \quad (5)$$

Where, I = gross fixed investment as a percentage of GDP, S = gross domestic saving as a percentage GDP, AID = foreign aid as a percentage of GDP, DF= the share of defense expenditure as a percentage of GDP (a proxy of war), Ex = export and Debt= external debt and ε is the error term.

3.6. Description of variables

Real Gross Domestic Product (RGDP): the impact of the real income variable on trade balance is ambiguous. The expected signs under the absorption and monetary approaches are a negative and positive respectively. Higher income levels stimulate increased import demand as well as increased domestic production of tradable, leaving the ultimate impact on the trade balance somewhat indeterminate. However, it is argued that the former effect dominates the latter. It is expected that an increase in GDP causes both saving and investment will increase.

Foreign Aid (AID): a voluntary transfer of resources from one country to another which can take the form of a gift, a grant or loan. It is an international transfer of capital, goods or service from a country or international organization for the benefit of the recipient country or its population. It is defined as aid inflows from external assistance. Since Ethiopia is one of the poorest countries in 25 the world, it needs foreign assistance to fill its resource gap and budget deficits. Foreign aid expected to have positive impacts on economic growth as it is a source of additional finance to run capital and recurrent expenditures. The effect of foreign aid on GDP growth and investment is ambiguous, because in one hand an increase in aid will cause an increase in income and more investment and in turn higher GDP. On the other hand foreign aid will cause the people dependent on it and negatively affects the hard work habit and it in turn decreases GDP and investment.

Foreign capital inflow (FDI): is an investment made by a firm or individual in one country into business interests located in another country. It is an investment in the form of a controlling ownership in a business in one country by an entity based in another country. Foreign capital inflow will have positive effect on GDP and investment, particularly if foreign investor re-invests the profit from foreign direct investment, its effect will be higher.

Gross Domestic Saving (S): is GDP minus final consumption expenditure. It expressed as a percentage of GDP. It consists of saving of household sector, private corporate sector and public sector. In all macroeconomics theories investment is either fully or partially financed by domestic saving. As a result an increase in domestic saving would cause an increase in investment and since investment is one component of GDP as investment increases GDP of a country would increase. Hence gross domestic saving would have positive effect on both investment and GDP.

Export (X): The total amount of commodities exported for the rest of the world per annum in terms of Ethiopian birr. Ethiopia exports primary agricultural products. Because of this the volume of export in Ethiopia is very as compared to our import. It is major source of foreign currency. Thus as export increases it is expected that both investment and GDP would increase.

Human Capital (Education Expenditure) (HC): Human capital is productive investment embodied in human persons including skills, ability, ideas, health and condition often resulting

from expenditure on education on the job training program and medical care. The researcher use government expenditure in education as a proxy variable to measure human capital investment. It is expected that an increase in government expenditure on education proxy for human capital increases GDP growth.

External debt: External debt or borrowing refers to taking monetary aids from a foreign country or institution. Also external debt refers to the portion of a country's debt that was borrowed from foreign lenders including commercial banks, governments or international financial institutions. In order to earn the needed currency, the borrowing country may sell and export goods to the lender's country. If external debt is managed effectively and allocated on productive projects, domestic investment and in turn production increases. The more output produced the more would be investment. However, in Ethiopian context the reverse would outweigh and it would have ambiguous effects.

3.7. Post estimation (Diagnostic) test

3.7.1. Heteroskedasticity

An important assumption of the classical linear regression model is that the disturbance term u_i appearing in the population regression function is homoscedastic i.e. all cross sectional error terms have the same variance. But when there exist an outlier observation in relation to the observation in the sample, the assumption of constant variance is violated and this violation is referred to as heteroskedasticity. Breusch-Pagan or Weisberg test for heteroskedasticity is used which the null hypothesis of constant variance and it is possible to reject this hypothesis when p value is greater than 5% significance level. If the problem of heteroskedasticity persists the remedies suggested to correct the problems of heteroskedasticity are transforming the data to the log and deflating the variable by some measures of size (Maddala, 1992).

3.7.2. Test for Normality

Normality test is used to determine if the data is well-modeled by a normal distribution and to compute how likely it is random variable is underlying the data is set to be normally distributed. In descriptive statistics terms, one measure of goodness of fit a normal model of the data. The null-hypothesis assumes that error terms are normality distributed. Normality of data is tested by Jarque-Bera test. If the test statistics value is greater than 5 percent we accept null hypothesis.

However, econometric theory states that the existence of non-normality does not affect and distort the estimator's BLUE and consistency property (Jarque and Bera, 1987).

3.7.3. Autocorrelation

The correlation between residuals is called autocorrelation which is induced by the transformation of the original data and manipulation of the data through interpretation and extrapolation. The simplest and most widely used model is one where the error term u and u_{t-1} have a correlation ρ . For this model one can think of testing hypothesis about ρ on the base of estimated correlation coefficient between the residuals. A commonly used statistic for this purpose is the Durban-Watson (DW) statistic which is denoted by dw . When DW statistic is zero ($d=0$) the estimated correlation coefficient is 1 and $d=4$ when the correlation coefficient which is estimated is -1. If d is closer to 0 or 4, then the residual are highly correlated. The standard d statistic that serves as a rule of thumb is $d = 2$ which indicates that the estimated correlation coefficient is 0 and hence the residual are not correlated. For existence of autocorrelation it is customary to transform the data on the base of estimated first order autocorrelation and use ordinary least square with the transformed data. If it purees autocorrelation one can use appropriate transformation of the original model so that there we do not have problem of autocorrelation in the transformed model. In this regard we have to use the generalized least square (GLS) method (Madala, 1992). The Lagrange Multiplier Test (LM test) was applied to prove whether there is autocorrelation between error terms or not.

3.7.4. Multi-collinearity

Multicollinearity refers to the condition that independent variables are inter-correlated and it is the future of sample not for the population. The classical linear regression model assumes, for the presence of multicollinearity among the explanatory variables coefficients are indeterminate and there standard errors are infinite. On the other hand if multicollinearity is less than perfect, the regression coefficient, although determinate, have larger standard error (in relation to the coefficient themselves) which means the coefficient cannot be estimated with greater precision or accuracy. Variance inflated factor (VIF) is used to determine whether there exist the problem of multicollinearity in making inferences. When $VIF > 10$, there is the problem of multicollinearity and hence we can reject the hypothesis of no correlation among explanatory variables and vice-versa. There are some remedial measure suggested to the problem of

multicollinearity such as priori information from previous empirical works, combining both cross section and time series data. One of the simplest things to do is dropping the variables which are highly correlated and specification bias. The variables should also be transformed when they tend to move in the same direction (Gujarati, 2004).

3.7.5. Model specification test

The motivation behind the link test is the idea that if a regression is specified appropriately you should not be able to find additional independent variables. To test this, the link test regresses the dependent variable of the original regression against the original regression's prediction and the squared prediction. If the squared prediction regressor in the test regression is significant, there is evidence the model is miss-specified.

CHAPTER FOUR

RESULTS AND DISCUSSION

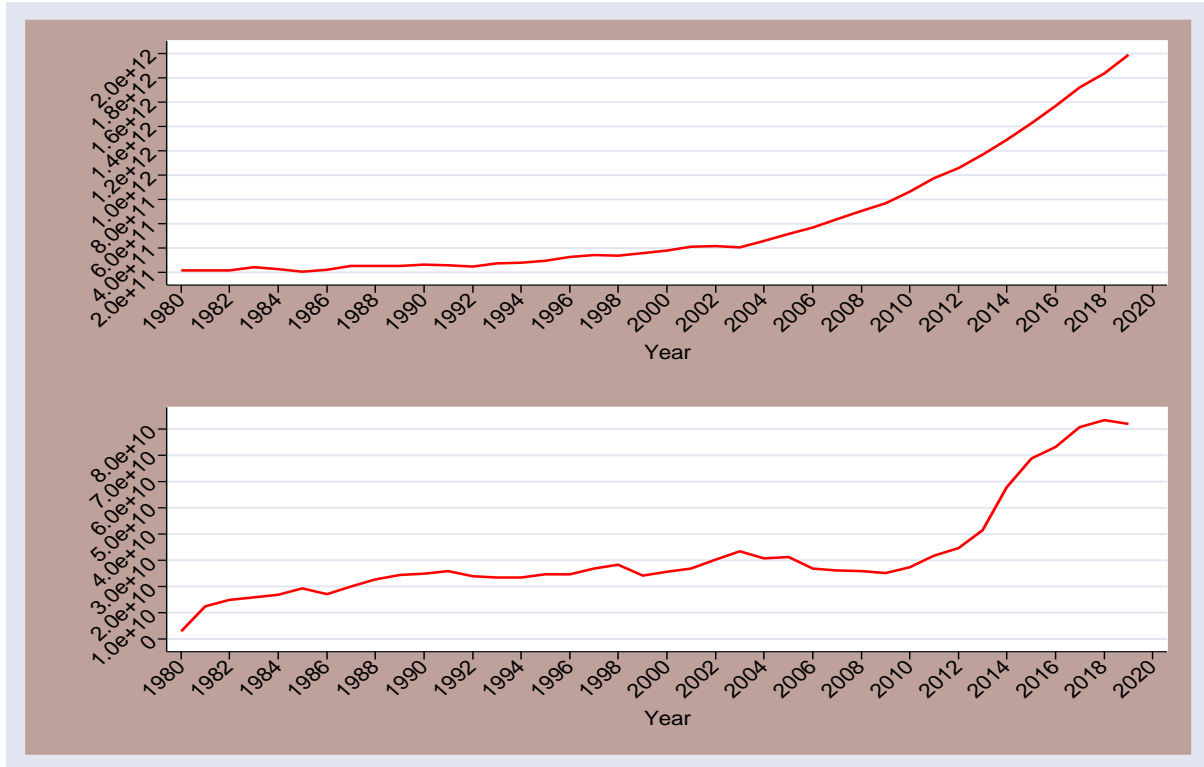
4.1. Introduction

In this chapter time trends of dependent variables, descriptive statistics and econometrics estimation results of dependent variables (real gross domestic product and gross fixed investment) and independent variables (foreign capital inflow, foreign aid, labour force as a percentage of total population, export, external debt, and human capital/expenditure on education,) are discussed. Moreover, stationarity and post estimation diagnostic tests are conducted and reported accordingly.

4.2. Trends of dependent variables

GDP indicates the gross national production the country, accordingly the trend graph show below indicated that from the year 1980 to 1994 the gross domestic product seems doesn't have significant change, and up to the year 2002 it shows some significant changes, however since the year 2002 the GDP had shown increment with an increasing rate. However the level of real gross domestic product shows a little fluctuation from 1980 to 2002. For instance, in 1985 the level of real gross domestic product is the minimum for the study sample. During this time the growth of real gross domestic product is negative which is around negative 9.69 percent. The growth of gross domestic product reaches maximum in 1987, which is around 13.9 percent. The third dependent variable is gross fixed investment, which shows small fluctuation until 2010. Beyond 2010 gross fixed investment shows continuous increase.

Table 4.1: trends of dependent variables



4.2.1. Trends of dependent variables against foreign capital inflow

Real GDP growth and foreign capital inflow growth

As can be seen from the figure below foreign capital inflow and economic growth shows positive relationship. The growth of foreign capital inflow has higher fluctuation and its growth for the study sample ranges from negative 100% to 600%, and the minimum growth is registered in 1992, which may be because of internal political instability, in that during this year there was Ethno-Eritrean war. In this year growth of real gross domestic product is also minimum. On the other hand, growth of foreign capital inflow reaches maximum, during this year the government tried to make the economy free and adopt capitalist economic system.

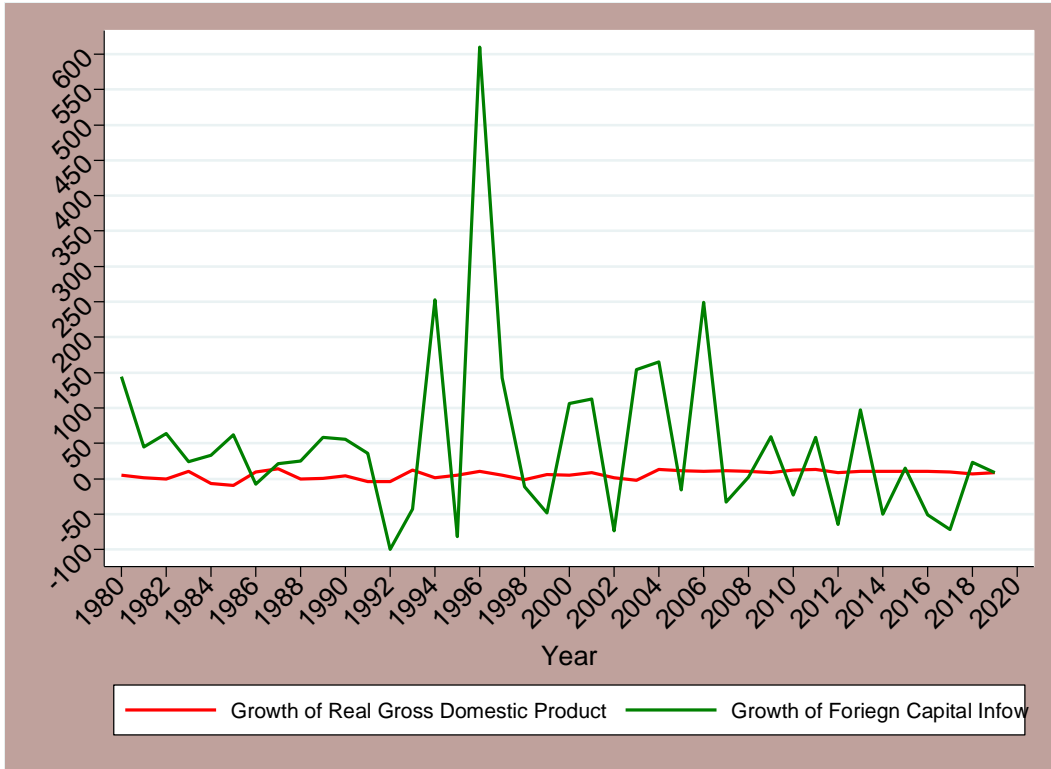


Figure: 4.1. Real GDP growth and foreign capital inflow growth

Growth gross fixed investment and foreign capital inflow growth

As can be seen from the figure below a positive relationship does exist between gross fixed investment and foreign capital inflows. Like other graphs the growth of gross fixed investment is low due to the fact that the growth fluctuation of foreign capital inflows is very high ranging from negative 100 to positive 600%. As we see from the graph below growth of fixed investment shows an increasing trend from 1980 to 2018. Though growth of total private investment shows increasing trend after 2012 it shows sharp increase and in 2018 it reaches more than 500 million birr.

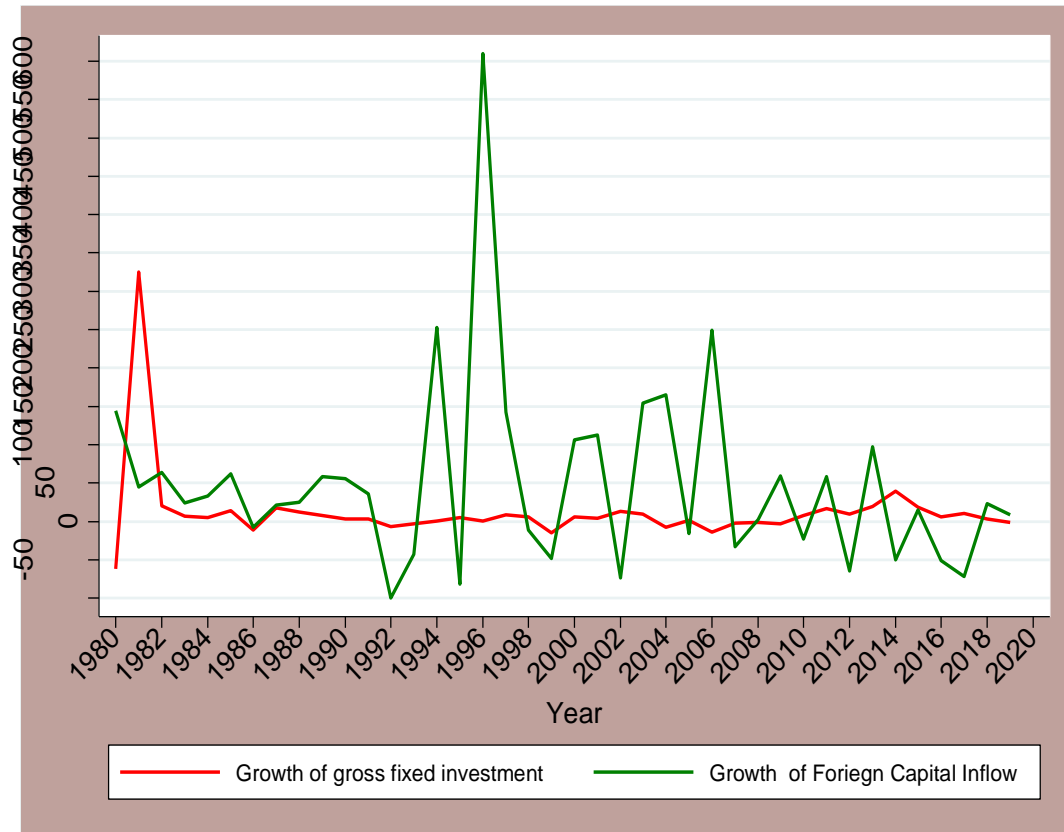


Figure: 4.2. Growth gross fixed investment and foreign capital inflow growth

4.3. Summary statistics of variables

The **real GDP growth** rate used in the empirical analysis averaged 6.012 percent between 1980 and 2019 ranging from negative -9.693 percent to positive 13.57 percent with a standard deviation statistics of 6.01 percent. This growth variation among across time in the country may be because of occurrences in domestic and external factors such as continuous deterioration in terms of trade, falling commodity prices, global economic downturn and financial crisis in the international economies. The mean value of **gross fixed investment** is 11.91 with the standard deviation of 52.93, which shows there is greater variation of gross fixed investment. The minimum and maximum growth is negative 61.93 and positive 325.35 percent respectively. As the ranges shows there is a frequent ups and downs of gross fixed investment. Gross domestic saving has a mean value of 20.396 percent with standard deviation 54.921 and the minimum and the maximum value of negative 92.634 and positive 235.346 percent respectively.

Foreign capital inflow has the highest variation with a standard deviation of 86.354 percent and mean percentage growth of 36.91. The maximum and minimum growth of foreign capital inflow is 252.964 and negative 99.84 percent respectively. The mean growth of foreign aid is 25.1 percent with the standard deviation of 56.43 which very high. This may be because of aid is seasonal that means when economic or political occurs foreign will increase and vice versa. As a result it shows great variation on the growth of foreign aid. The minimum and maximum level of foreign aid is -61.91 and 276.78 percent respectively.

Export of goods is an important factor for the well-functioning of the economy as a whole and for investment and saving in particular. However export in Ethiopia is highly dependent on primary products, which is a major factor for the low performance of export. It has a mean growth of 17.65 with standard deviation of 41.51, which shows very high fluctuation of export in the country. The minimum growth rate of export is negative 44.05 percent indicating almost half value decline in export in the study sample. While from 1980 to 2019 the maximum growth rate of export is 210.53 percent. However this growth is not sustainable. For this study sample the average growth of **external debt stock** in the country remains high averaging 14.223 percent with standard deviation of 30.262. The minimum level of growth of external debt stock is negative 64.037 percent whilst the maximum value recorded at 123.61 percent. This is an indication that Ethiopia is heavily dependent on the external financial source to fill their financial gaps.

Education expenditure is also summarized as follows: its mean growth is 17.123 percent with small variation (standard) deviation of 11.59 percent. The minimum and maximum growth of education expenditure, a proxy for human capital, is negative 1.99 and positive 57.1 percent respectively. For all variables used in this study expenditure on education has maximum growth rate, which is the lowest as compared to other variables used in this study.

Table 4.2: descriptive statistics of variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Real gross domestic product	40	6.012	6.008	-9.692	13.571
Gross Domestic Saving	40	20.396	54.921	-92.634	235.33

Gross fixed investment	40	11.907	52.927	-61.929	325.346
foreign capital inflow	40	36.914	86.354	-99.835	252.964
Foreign aid	40	25.083	56.434	-61.908	276.784
External debt	40	14.223	30.261	-64.037	123.613
Export	40	17.648	41.511	-44.049	210.528
education expenditure	40	17.123	11.593	-1.994	57.067
Labor force % population	40	51.459	1.69387	50.236	56.146

4.4. Stationary test

Time series regression requires the stationary of variables. To test the order of integration of the variables used in this study, a researcher used the augmented Dickey Fuller test. This is considered to be the standard for testing unit roots. The orders of integration of all the variables used in this study are either I (0) or I (1). After confirming the variables' order of integration, the OLS methodology can be applied confidently since it meets the conditions for variables having either I (0) or I (1) order of integration. Using ADF test order of integration is reported on table 4.3 below.

Table 4.3: stationary test of variable

Variables	ADF test statistics	Stationary
Real gross domestic product	-9.726	I(1)***
Gross national saving	-5.604	I(1)***
Gross fixed investment	-3.982	I(0)***
foreign capital inflow	-6.228	I(1)***
Foreign aid	-10.533	I(1)***
Export	-6.384	I(1)***
Labor force % population	-6.458	I(1)***
Human capital (education expenditure	3.493	I(0)**
External debt	-4.452	I(1)***

Source: Author's computation using time series data from 1980-2019

Critical value: ADF: -3.655, -2.961, -2.61 for 1%, 5% and 10% respectively *** and ** represents level of significance at 1 and 5 percent level of precision

4.5. Long run econometrics estimation result

The long run OLS regression results for the three (growth, saving and investment) models are discussed below.

4.5.1. Growth model

The first model is focused on the effect of foreign capital inflow on economic growth of Ethiopia. For this model the value of adjusted coefficient of determination is 98.82 percent. This means explicitly listed independent variables explain 98.82 percent of variation of the dependent variable. The estimation result reported on below table 4.4 shows that among the total of six variables labor force, export, foreign capital inflow, and human capital proxy by expenditure on education have significant effect on economic growth. The regression equation of the model is specified as follows:

Table 4.4: long run estimation result of growth model

	Dependent variable: Real Gross Domestic Product			
Independent variable	Coefficient	Std. error	T-ratio	P-value> t
Foreign aid	-0.002	0.002	-0.96	0.343
foreign capital inflow	0.01	0.0045	1.72	0.095*
Gross national saving	0.01	0.019	0.54	0.590
Export	0.14	0.024	5.5	0.000***
Labour force	0.052	0.02	2.6	0.014**
Human capital	0.22	0.03	7.16	0.000***
CONS	16.12	0.599	26.9	0.000***
Number of obs. 39	R- squared = 0.8067	Adj. R- squared = 0.76.31		
F(7, 31) = 18.49	prob. >F = 0.0000			

4.5.2. Investment model

The third model is investment model and five independent variables were used. Among these variables three variables (foreign capital inflow, external debt and export) have statistically significant effect of gross investment of Ethiopia. The coefficient of determination is 80%, which

shows 80% variation of gross domestic saving comes from the five variables included in the model. The F-statistics value is 21.52 with a probability greater than F-statistics is 0.000. It indicates the overall fitness of the model is good. The equation of the model is specified as follows:

Table 4.5: long run estimation result of gross fixed investment

Dependent variable: Gross National Investment				
Independent variable	Coefficient	Std. error	T-ratio	P-value> t
Foreign aid	-0.012	0.009	-1.28	0.21
foreign capital inflow	0.034	0.017	1.94	0.061*
Gross national saving	0.012	0.062	0.19	0.850
Export	0.174	0.038	4.59	0.000***
External Debt	0.41	0.089	4.59	0.000***
CONS	10.0368	1.84	5.45	0.000***
Number of obs. 40	R- squared = 0.7599		Adj. R- squared = 0.7246	
F(5, 34) = 21.52	prob. >F = 0.0000			

4.6. Co-integration test

4.6.1. Growth model

The concept of co-integration is employed to show the existence of long run or equilibrium relationship to which an economic system converges, overtime. The existence of the co-integration relationship implies the existence of long term relationship in the variable. In order to check for the existence of long run relationship in the model a unit Johansson co-integration test statistics was employed. The test is conducted based on null hypothesis of no co-integration equation and alternate hypothesis assumes H_0 is not correct. If trace statistics is greater than 5% critical value we reject H_0 and it implies there is long run co-integration. Here below on table 4.7 shows that there is a maximum of 2 co-integrating equations.

Table 4.6: Johansen order of co-integration for economic growth model

Johansen tests for cointegration						
Trend: constant			Number of obs =		38	
Sample: 1982 - 2019			Lags =		2	
				trace	5% critical	
maximum		LL	eigenvalue	statistic	value	
rank	parms					
0	56	-85.635285	.	174.2004	124.24	
1	69	-56.208744	0.78749	115.3473	94.15	
2	80	-31.582161	0.72641	66.0942*	68.52	
3	89	-18.175526	0.50619	39.2809	47.21	
4	96	-9.8560278	0.35459	22.6419	29.68	
5	101	-2.7011383	0.31379	8.3321	15.41	
6	104	1.4415547	0.19590	0.0467	3.76	
7	105	1.4649262	0.00123			

4.6.2. Investment Model

Unlike growth and saving model for this investment model there is only one co-integrating equation. This co-integrating equation means that one linear combination exists between the variables that force these indices to have a relationship overtime period, despite potential deviation from equilibrium levels in the short-term.

Table 4.7: Johansen order of co-integration for gross fixed investment model

Johansen tests for cointegration						
Trend: constant			Number of obs =		38	
Sample: 1982 - 2019			Lags =		2	
				trace	5% critical	
maximum		LL	eigenvalue	statistic	value	
rank	parms					
0	42	-241.92256	.	98.1468	94.15	
1	53	-221.1663	0.66460	56.6343*	68.52	
2	62	-208.96139	0.47395	32.2245	47.21	
3	69	-201.43694	0.32701	17.1756	29.68	
4	74	-196.01105	0.24842	6.3238	15.41	
5	77	-193.94405	0.10308	2.1898	3.76	
6	78	-192.84915	0.05600			

4.7. Short run model estimation

After testing co-integration the dynamic short run equilibrium is obtained by regressing the first difference of the explanatory variable and one period lagged error term and it is reported on below table 4.8 and 4.9 for growth and investment model respectively. The short run OLS regression shows, under the study period R of the model describes that 80.7 for growth model and 84.2 for investment model of the short run variation in the dependent variable that means the dependent variables are explained by the employed variables. For growth model in the short run only export has statistically significant effect. On the other hand, in investment foreign aid, foreign capital inflow, export and external debt have significant effect on gross investment of Ethiopia. As it can be seen from the below short run regression models the coefficient of ECM_1 is negative for both models and the value of the ECM_1 coefficient are -0.9975 and -1.074 for growth and investment model respectively and they are statistically significant at 1 and 5 percent level of significance. The coefficient of ECM_1 shows that short run deviations of economic growth is corrected/adjusted to long run equilibrium at a rate of 99.75 percent each year. While for the investment model the coefficient of ECM_1 is -1.074 which indicates the short run deviations adjustment is 107.4%, which indicates as it takes less than a year.

Table 4.8: Error-correction model estimation of economic growth model

	Dependent variable: Real Gross Domestic Product			
Independent variable	Coefficient	Std. error	T-ratio	P-value> t
Foreign aid	-0.0026	0.00165	-1.59	0.122
foreign capital inflow	0.0045	0.00399	1.13	0.267
Gross national saving	0.037	0.0265	1.4	0.171
Export	0.173	0.027	6.34	0.000***
Labour force	0.085	0.0676	1.27	0.214
Human capital	0.0489	0.174	0.28	0.780
ECM_1	-0.9975	0.171	-5.85	0.000***
CONS	0.018	0.027	0.67	0.508
Number of obs. 39	R- squared = 0. 8067		Adj. R- squared = 0. 7631	
F(7, 31) = 18.49	prob. >F = 0.0000			

Table 4.9: Error-correction model estimation of gross fixed investment model

	Dependent variable: Gross National Investment			
Independent variable	Coefficient	Std. error	T-ratio	P-value> t
Foreign aid	-0.014	0.005	-2.76	0.01***
foreign capital inflow	0.021	0.0122	1.72	0.095*
Gross national saving	0.087	0.082	1.06	0.298
Export	0.472	0.086	4.59	0.000***
External Debt	0.261	0.145	1.8	0.082*
ECM_1	-1.074	0.128	-8.42	0.000***
CONS	0.0073	0.044	0.16	0.871
Number of obs. 39	R- squared = 0.8418	Adj. R- squared = 0.8122		
F(5, 32) = 28.38	prob. >F = 0.0000			

4.8. Interpretation of long and short run regression coefficients

4.8.1. Growth Model

Foreign aid has insignificant and negative coefficient. This implies that for the period under consideration, the role of foreign aid was negligible in improving the real gross domestic product. This could be probably explained by aid was used for consumption purpose rather than raising the level of output. In addition, gross national saving has statistically insignificant effect on real gross domestic product.

Foreign capital inflow and economic growth

The regression result, the coefficient of foreign capital inflow is statistically significant at 10 percent level of significance and the coefficient is positive. This shows that a 1 percent change in FDI leads to 0.0076 percent increase in real gross domestic product. The higher inflow of foreign capital inflow to Ethiopia will lead to improvement in technology, skill, and technical knowhow, capital, and the level of output produced in the economy, which in turn leads to improvement in real domestic product of the country. However, in the short run foreign capital inflow is not statistically significant. This result is in line with the estimation result by Hansen and Tarp (2001), Burnside and Dollar (2000). On the other hand, Bowen (1998) found insignificant relationship between foreign capital inflow and economic growth. Contrary to the above result

Stoneman (1975) found that foreign capital inflow affects the structure of the economy and it affects economic growth negatively.

Human capital (investment on education) and economic growth

Human capital (investment on education) and economic growth have positive relationship. Holding other things constant, an increase in human capital by 1 percent cause real domestic product to increase by 0.22 percent. Investment on education increases peoples know how and consequently production level. The majority of the people in the country are uneducated. By taking education as one prerequisite for development, if the government increases its expenditure, it is clear that the nation's output would increase. This is due to the fact that education makes people especially the rural people flexible to adopt new technologies and produce more output. On the other hand in the short run the two variables have insignificant relationship. Zahid (1998) conclude that that human capital (proxy by primary school enrolment as a ratio of labour force) was an important prerequisite for accelerating growth.

Export and real gross domestic product

Export has positive significant on real gross domestic product. As export of goods and services increases this is a direct function of export that means as export increases foreign currency inflow increases and it will used for further increase in production of goods and in turn economic growth. A 1 percent increase in export causes 0.14 percent increase in real gross domestic product. Like long run coefficient the short run coefficient of export is statistically significant and it is positive.

Labour force and real gross domestic product

It is the last statistically significant variable at 5 percent level of significance. A 1 percent increase in population aged between 15 and 64 (labour force) of a country causes real gross domestic product to increase by 0.052 percent. This is because as the proportion of labor force those are active for work increases, total output will increase given employment opportunities. In the short run there is no significant relationship. Balassa(1978) showed using a simple growth model that labour forces has positive significant effect on economic growth.

4.8.2. Investment model

Foreign capital inflow and gross national investment

Foreign capital inflow also has positive and statistically significant effect to investment. It implies that foreign aid played important role in financing capital imports, and supported domestic capital formation activity. Therefore, we can argue that for the period under consideration aid played a positive role in improving the level of investment by filling the saving-investment gap. An increase in foreign capital inflow by 1 percent causes gross domestic investment to increase by 0.034 percent at 10 percent level of precision. This result is consistent with Tolessa (2001) and Wondwosen (2003). In the short run also gross domestic investment has positive significant effect of gross domestic investment. For instance, if foreign capital inflow rises by 1 percent, gross domestic investment will increase by 0.021 percent. This shows that the long run effect is greater than short run effect.

External debt and gross national investment

External debt has positive significant effect on gross domestic investment. In the long run estimation coefficient show that if external debt increases by 1 percent, gross domestic investment will increase by 0.41 percent. While in the short run an increase in external debt increases by 1 percent causes gross domestic investment to increase by 0.261 percent. The long run effect outweighs the short run effect. This is because large investment projects are financed by external borrowing particularly for developing country like Ethiopia it is difficult to finance all domestic investment projects by only domestic source. Due to this the country borrows from international financial institutions and public governments. On the other hand, the impact of external debt on the gross fixed investment is negative and significant (Sajawal and Muhammad, 2007) and Khan & Khan (2007) in Pakistan.

Export and gross national investment

Export positive significant effect on gross domestic investment at 1 percent level of significance. A 1 percent increases in export causes 0.174 percent increases in gross domestic investment. An increase in export volume provides revenues and profits for business which can feed to through an increase in capital investment spending through the accelerator effect. Higher investment

increases a countries productive capacity which further increases the potential for export and in turn increases investment. Like long run estimation coefficient the short run dynamics shows that there is a positive significant relationship between the two variables at 99 level of confidence. For instance, a 1 percent increases in export results 0.472 percent rise in gross domestic investment. Al khatib et al. (2011) in Jordan and Dewata & Swara (2013) in Indonesia found similar results.

4.9. Post estimation diagnostics

4.9.1. Heteroskedasticity

An important assumption of the classical linear regression model is that the disturbance term u_i appearing in the population regression function is homoscedastic i.e. all cross sectional error terms have the same variance. But when there is an outlier observation in relation to the observation in the sample, the assumption of constant variance is violated and this violation is referred to as heteroskedasticity. Breusch-Pagan or Weisberg test for heteroskedasticity is used with the null hypothesis of constant variance and it is possible to reject this hypothesis when p value is greater than 5% significance level. Breusch-Pagan or Weisberg test statistics of the long run growth model and gross fixed investment model is 31.7 and 15.61% those are greater than 5% confirming heteroskedasticity is not a problem in both models.

4.9.2. Testing for Normality

Normality test is used to determine if the data is well-modelled by a normal distribution and to compute how likely it is random variable is underlying the data is set to be normally distributed. In this study normality of the distribution of error terms is tested by Jarque- Bera test. The assumption is based on the premises of rejecting alternate hypothesis, which assumes the distribution of error term is not normal, if test statistics is greater than 5%. In this study the test statistics for long run growth model and gross fixed investment is 84.8 and 62.6 percent that are greater than 5 percent. Hence the error terms are distributed normally.

4.9.3. Autocorrelation

The correlation between residuals is called autocorrelation which is induced by the transformation of the original data and manipulation of the data through interpretation and

extrapolation. The simplest and most widely used model is one where the error term u and u_{t-1} have a correlation ρ . For this model one can think of testing hypothesis about ρ on the base of estimated correlation coefficient between the residuals. A commonly used statistic for this purpose is the Durbin-Watson (DW) statistic which is denoted by d . when DW statistic is zero ($d=0$) the estimated correlation coefficient is 1 and $d=4$ when the correlation coefficient which is estimated is -1. If d is closer to 0 or 4, then the residual are highly correlated. The standard d statistic that serves as a rule of thumb is $d = 2$ which indicates that the estimated correlation coefficient is 0 and hence the residual are not correlated. In this study, Durbin-Watson statistics for long run growth model and gross fixed investment are 2.02 and 2.13 and which are approximately equal to 2 confirming residuals are not correlated.

4.9.4. Multicollinearity

Multicollinearity refers to the condition that independent variables are inter-correlated and it is the future of sample not for the population. The classical linear regression model assumes, for the presence of multicollinearity among the explanatory variables coefficients are indeterminate and there standard errors are infinite. On the other hand if multicollinearity is less than perfect, the regression coefficient, although determinate, have larger standard error (in relation to the coefficient themselves) which means the coefficient cannot be estimated with greater precision or accuracy. Variance inflated factor (VIF) is used to determine whether there exist the problem of multicollinearity in making inferences. When $VIF > 10$, there is the problem of multicollinearity and hence we can reject the hypothesis of no correlation among explanatory variables and vice-versa. There are some remedial measure suggested to the problem of multicollinearity such as priori information from previous empirical works, combining both cross section and time series data. One of the simplest things to do is dropping the variables which are highly correlated and specification bias. The variables should also be transformed when they tend to move in the same direction (Gujarati, 2004). For both models VIF value is less than 10 confirming there is no multicolliearity.

4.9.5. Model Specification Test

To see whether the regression model is correctly specified or no specification bias or error, the researcher used link test. Link test is based on a null hypothesis that the predictive value (\hat{y}) is

statistically significant at 5 % level of significant and square prediction (\hat{y}^2) is insignificant at 5 % level of significant of the regression model. Therefore, to test this in STATA I generated two variables, predictive value (\hat{y}) and square prediction (\hat{y}^2), from the original regression model. After regressing these two variables with the model, if a predictive value (\hat{y}) is statistically significant at 5 % level of significant and square prediction (\hat{y}^2) is insignificant at 5 % level of significant we do have a good model, unless, the model is wrong (Murteira, 2014). The link test clearly shows both predictive values (\hat{y}) for all the three models are insignificant with a p value of 0.32 and 0.354 for growth and investment equation. Therefore, the Link test confirmed that there is no model specification error.

4.9.6. Omitted Variable test

To see whether in the regression model excludes relevant variables from the model Ramsey RESET Test was used. In this test null hypothesis (H_0) assumes there is no omitted variable. If the test statistics value of the test is greater than 5% we accept H_0 and reject if it is less than 5%. In this study for all models the Ramsey RESET Test value is 82.11 and 25.35 percent respectively for growth and investment model. Hence, we failed to reject the null hypothesis of Ramsey RESET test. Result proves that the model did not have omitted variable bias and the models are well constructed.

CHAPTER FIVE

CONCLUSION AND RESOMMENDATION

5.1. CONCLUSION

The estimation of economic growth models revealed that foreign capital inflow has positive significant effect at 10% level of significance and its 1% change affects GDP growth by 0.01; human capital has also positive significant at 1% significance level with a coefficient of 0.22, export and labor force have also positive significant effect on economic growth at 1 and 5% significance respectively. That means the higher inflow of FDI to Ethiopia and improvement in human capital will lead to improvement in technology, skill, and technical knowhow, capital, and the level of output produced in the economy, which in turn leads to improvement in real domestic product. As the proportion of labor force those are active for work increases, total output will increase, particularly it is complementary with foreign capital inflow i.e. foreign capital inflow will create employment opportunities and increasing labor force attracts foreign investors in the form of accessing skilled and cheap labor force in Ethiopia.

Finally, determinants of gross fixed investment and the estimation result revealed that 1% increase in foreign capital inflow increases gross fixed investment by 0.034% and external debt and export have also positive significant effect on gross fixed investment in Ethiopia. For instance, an increase in external debt by 1% causes gross fixed investment to increase by 0.41%. The third significant variable is export in which 1% increase in its value causes gross fixed investment to increase by 0.174%.

5.2. Recommendation

Based on the findings the following recommendations are drawn:

- The government and other concerning bodies should improve investment and GDP growth by allowing foreign capital inflow on productive assets and as a means of creating employment opportunities and it should also improve infrastructure development, which is a major hindrance foreign capital inflow and in turn economic growth.
- to increase investment and economic growth a country should diversify export of goods and services, and there needs to move from export of agricultural raw material to finished and

semi-finished manufactured goods. Moreover, subsidizing exporters will improve the performance of export and in turn investment and economic growth.

- In order to increase investment the government should invest the borrowed money on productive assets and on projects which creates higher employment opportunities instead of investing on defence.
- The Ethiopian investment agency and the government should concentrate on matters that hinder the inflow of foreign capital inflow to the country and implement ways and strategies that should encourage foreign investors to invest in the country. The government of Ethiopia should open its economy to foreign investors. If the economy is not open, there will not be a chance for those investors to invest within the country, even though there is some sort of liberalization.

References

- Acemoglu, Daron, Simon Johnson, and James A. Robinson (2001), 'The Colonial Origins of Comparative Development: An Empirical Investigation', The American Economic Review, 91(5):1369-1401.*
- AERC Research paper 13. (2001), Annual Report on the Ethiopian Economy, Addis Ababa, EEA.*
- Arkebe oqubay (2018) industrial policy and late industrialization in Ethiopia:
- Befekadu, D. (1992), "Growth and foreign debt: The Ethiopian experience: 1964-86". Nairobi:*
- Befekadu, D. and Birhanu, N. (1999/2000), Annual Report on the Ethiopian Economy, Addis Ababa, EEA.*
- Bethelehem, S. (2010). "Determinants of private investment in Ethiopia" B.A. thesis Addis Ababa University.
- Blanchard and Fischer (1989), "Lectures on Macroeconomics". London: The MIT Press Cambridge, Massachusetts, England.*
- Boone, P. (1996), Politics and the effectiveness of foreign aid, European Economic Review, 40:289-329.*
- Bosworth, B. and Collins, S. (1999), "Capital Flows to Developing Economies: Implications for*
- Bowles, P. (1987), "Foreign Aid and Domestic Savings in Less Developed Countries: Some test of Causality" World Development, 15(6), 789-796.*
- Burnside, C. and D. Dollar (2000), "Aid, policies, and growth", American Economic Review, 90,847-868.*
- Coen (2008)[Financial regulation in the European Union - Archive of ...](#)
- C.M. Jarque and A.K. Bera. 1987. "A Test for Normality of Observations and Regression Residuals. International Statistical Review 55:163-172; In Damodar Gujarati. 1995. Basic Econometrics. p. 143.
- Chenery. H.B. and A.M. Strout (1966), "Foreign Assistance and Economic Development*
- Chong C. 2009. Determinant of Bank Profitability in a Developing Country. *Asian Academy of Management Journal of Accounting and Finance, 4(2), 91-112.*

- Dadi *et al.*, (2016) <https://www.researchgate.net › publication Urban sprawl and its impacts on land use change in Central ...>
- G. S. Maddala (1992). Introduction to econometrics, (3rd Ed.). Ohio state university.
- Getachew H.(1997). *Determinants of Private Investment in Ethiopia*, Journal of African Economies, Vol. 7.No. 1, P. 54-61.
- Gujarati, N.(2004). Basic Econometrics, (4th Ed.), Tata McGraw-Hill Publishing Company
- Huber *et al.*(2011). <https://www.annualreviews.org › doi › full › annurev-reso “Organic Agriculture, Food Security, and the Environment “>
- Hyung, J. (2013). An analysis on the effect of old age dependency ratio on domestic saving rate. Working paper, University of California, Berkeley, unpublished. Limited,New Delhi, India.
- Modigliani, F. (1970). The Life-Cycle Hypothesis of Saving and Inter-Country Differences in the Saving. National Bank of Ethiopia (2020). Quarterly Bulletin First Quarter 2019/20 Fiscal Year Series, Addis Ababa, Ethiopia vol. (36) No. (1)
- Negarit Gazeta (2002).A proclamation on the “Environmental pollution control proclamation No.300/2002”, Addis Ababa, Ethiopia.
- Salvatore D, (2006), International Economics, Tata Mc Grow Hill publishing, New Delhi, India
- Savings and Investment, ” Brookings Papers on Economic Activity, 1999/1, pp. 143–180.*
- Teklay, Brhane. *The financial determinants of private sector investment: The case of Ethiopia*.Diss. Addis Ababa University, 2016.
- Woldemariam F. (2018). The determinants of private investment in Ethiopia. Master’s thesis, Addis Ababa University, Ethiopia