FACTORS AFFECTING FDI FLOW IN ETHIOPIA: AN EMPIRICAL INVESTIGATION

BY

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FACTORS AFFECTING FDI FLOW IN ETHIOPIA: AN EMPIRICAL INVESTIGATION

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DECLARATION

I hereby declare that this thesis is my own work and has never been presented in any other university or I have not plagiarized in the preparation of this assignment and have not allowed anyone to copy my work. All sources of materials used for this thesis has been appropriately Acknowledged.

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This is to certify that the thesis prepared by Tamene Atoma Merga, entitled; Factors Affecting Foreign Direct Investment inflow in Ethiopia: An Empirical Investigation and submitted in partial fulfillment of the requirements for the Degree of Master of Art in Development Economics complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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ABSTRACT

The study was carried out to establish the possible factors that determine the inflow of Foreign Direct Investment in Ethiopia. In this study, the researcher used secondary time series data from 1992 to 2015.Vector Autoregressive Model (VAR) and Vector Error Correction Model (VECM) estimation were used. The time series properties of the variables were examined in the process. It first tests for unit root using the Augmented Dickey Fuller (ADF) test and Phillips-Perron (PP) unit-root test. The VAR technique was employed to derive the long-run relationship. The result of long run dynamic model shows that infrastructure development, trade openness, external debt, market size and inflation rate significantly and positively affect the inflow of FDI.

From a policy point of view, the results suggest that, to promote FDI, Ethiopia should develop and introduce policies that increase the level of trade openness, infrastructure development, macroeconomic stability and market size.

Key Words: Foreign Direct Investment , Long Run dynamic, External Debt, Growth Fixed Capital Formation, Openness, Inflation Rate and GDP Growth Rate.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADF = Augmented Dickey Fuller

ARDL = Auto Regressive Distributive Lag

EIA = Ethiopian Investment Agency

EXDT = External Debt

EXR = Exchange Rate

FDI = Foreign Direct Investment

GCF = Gross Capital Formation

GDP = Gross Domestic Product

GDPG = Gross Domestic Product Growth Rate

IMF = International Monetary Fund

INF = Inflation

LDC: Least Developed countries

MNCs = Multi-National Companies

MNE = Multinational Enterprise

MOFEC = Ministry of Finance and Economic Cooperation

OECD = Organization for Economic Cooperation and Development

UNCTAD= United Nations Conference on Trade and Development

VECM= Vector Error Correction Model

CHAPTER ONE

INTRODUCTION

1.1. Background of study

The economic development of a nation depends upon its investment level. The investment in turn depends on savings. However, all African nations suffer from the problem of generation of sufficient gross domestic savings to reorganize the development process. Thus, the foreign direct investment (FDI) is imperative for these economies to fill up the gap between savings and investment. The importance of FDI has been given due importance in the development of the economy by many economists (Todaro, 1992). Foreign direct investment has an important role in the development processes of developing countries (Gichamo 2012, UNCTAD 2002). The role of FDI is quite critical in Africa given the fact that poverty levels are generally high while domestic savings and income remain extremely low as income is mainly channeled to consumption expenditure. The gap between domestic savings and investment is widening in almost all African nations especially in Sub-Saharan Africa as the loans and official developmental assistance by multilateral agencies are gradually declining (Aseide 2003, Mottaleb and Kalirajan 2001, Mohapatra, 2014). FDI also contributes to economic development through: transferring advanced technology and organizational skills; generating technological spillover and creating linkage with local firms; generating employment and developing the skill of human capital and helping to create competitive business environment (UNCTAD 2010, Agrawal and Khan 2011).

Realizing the roles of FDI, most African countries including Ethiopia have undertaken numerous policy measures to create hospitable investment climate for FDI. The major policy measures are: liberalizing controls on foreign exchange & price, liberalizing investment regulations & privatization of public enterprises and creating a stable macroeconomic environment (Getnet and Hirut, 2006, Solomon, 2008).

In 1991, Ethiopia's transition to a market oriented economy started. Since then, the government has made a broad range of policy reforms, including liberalizing the foreign trade regime, decentralizing of political and economic power, devaluation of the national currency and deregulation of domestic price (Solomon, 2008).The government of Ethiopia has also issued

several investment incentives, including tax holidays, duty free importation of capital goods and export tax exemption to encourage foreign investment. Furthermore, Ethiopian Investment Authority (EIA) has been established to service investors and streamline the investment procedures (Mohapatra, 2014). Despite those economic liberalization and other measures taken, Ethiopia's performance in attracting FDI is very poor compared to many Africa countries. For instance, the average annual FDI inflows to Ethiopia from 2005 to 2015 is $ 3633.78 Million, which is only 1.19% of FDI flows to Africa, while representing close to 9% of the population of the continent (World Bank, 2014).

1.1. Statement of the Problem

In Ethiopia, the gap between domestic investment and saving has remained wide due to the low level of income and domestic saving. According to the IMF country report of 2013, the average financing gap was about 9.4 percent of GDP in 1990-2000; it is widened about 17 percent in 2006-2012. In Sub-Saharan Africa (SSA), this gap is much smaller, about 6 percent. This resource gap can be filled by loans and development assistance from multilateral agencies such as World Bank or by private foreign investment. However, the former sources of official finance have been declining (Getnet and Hirut 2006). Due to this, FDI is the most important alternative source of foreign capital for Ethiopia. Recognizing the importance of FDI, Ethiopia has been striving to implement different policy initiatives and incentives to attract capital inflows which can fill the saving-investment gap in the economy. However; the performance of the country in attracting FDI is not encouraging. Ethiopia accounts for less than 2% of FDI coming to Africa (Gichamo 2012). Thus, identifying the determinants of FDI in Ethiopia is a key step to know the factors responsible for the poor performance of Ethiopia in attracting FDI. Few of researches, such as Getnet and Hirut (2006), Solomon (2008), Amanuel (2014), Mitku (2013) and others, have been done to explain this fact and to show the main determinants of FDI in Ethiopia using macro-economic data.

These studies except Mitku (2013), Getnet and Hirut(2005) have not also paid considerable attention towards testing the existing of long term relationship between FDI and its determinant factors, particularly using a co-integration approach. Mitku(2013) found that the existence of long-term relationship between FDI and its determinants by using ARDL approach. On the contrary, Getnet and Hirut (2005) concluded that there is no long-run relationship between

FDI and its determinants by using The Engel-Granger test. Thus, these contradicting results among the few researches conducting on FDI determinants motivate the researcher to do detail analysis using up to date data. Therefore, the paper provides some new evidence on the determinants of FDI inflows by including relatively new variables such as external debt there by filling the gap in their research.

1.2. The Objectives of the Study

To analyze the problem statement as mentioned earlier, the researcher developed the research objective. Generally, the study is intended to identify the different determinants of FDI flow into the Ethiopia. In particular, the study is carried out to:

- ➢ Examine the major factors that influence the inflow of FDI in Ethiopia
- ➢ Forward policy recommendations based on the findings of the study.

1.3 Hypotheses

To achieve the objective stated above, the following hypotheses were tested.

i. The level of gross saving does not determine the FDI inflow to a country.

ii. Financial risk (measured by external debt to GDP) does not determine the inflow of FDI in Ethiopia

iii. Market size does not determine the inflow of FDI into a country.

iv. The level of infrastructure does not impact the inflow of FDI into a host country.

v. Macroeconomic instability has no impact on FDI inflow.

vi. Host country's openness to the outside world in terms of trade relations does not determine the level of FDI inflow into a concerned country.

vii. There is no long-term relationship between FDI and its determinants.

1.4 Significant of the study

Even though, there have been previous studies done on the factors of FDI in Ethiopia, in this case, the researcher added a relatively new variables such as domestic saving and external debt into the model in order to find out whether the amount of domestic saving and external debit affect the FDI inflow of Ethiopia. This study will contribute to policymakers like National Bank of Ethiopia and the Federal Government as it gives a picture of what variables are significantly affecting FDI inflows in Ethiopia. This research   also added new information to literature by testing the existence of long term relationship between macroeconomic factors and FDI inflow using a new approach, Vector Autoregressive Model (VAR) and Vector Error Correction Model (VECM) approach.

1.5 **Limitation and scope of the Study**

The first limitation of the study is the sample size of the research which is too small with only 24 years. Annual data from year 1992 – 2015 was obtained to run the model, however, the data is considered insufficient as the minimum requirement is 30 observations. Even though the researcher tried to include at least 30 years data, it was not possible to get the intended data set. Although, it has the data set limitation this policy paper helps the researcher to dig deep and come up with future study plan.

The work on this paper is limited to macroeconomic factors that were believed to have the potential to influence FDI inflows to Ethiopia based on data availability. It does not account for other factors like international investment agreements such as bilateral tax treaty, institutional factors such as corruption, rule of law etc. Therefore analysis may be expanded to areas not captured by this study for subsequent studies

1.6 Organization of the Paper

The paper has five chapters. Chapter one provides introduction, chapter two provides a review of literature. Mainly the benefits and costs of FDI, the micro-determinants of FDI and the host country determinants FDI are presented. At the end of the chapter empirical studies on the determinants of FDI inflows to developing countries and Africa are reviewed. Chapter three provides methodologies and data set of the study. Chapter four provides results and discussion the final chapter provides the conclusion and the policy advice of the study.

CHAPTER TWO

LITERATURE REVIEW

Attracting foreign direct investment (FDI) has become an important policy element for developing countries to pursue growth. There has been less theoretical disagreement on FDI's potential positive impact on hosting country's economic development. FDI is often regarded as an amalgamation of capital, technology, as well as managerial and marketing skills. In fact, it is suggested that spillovers or the external effects from FDI are the most significant channels for the dissemination of modern technology. In case FDI is considered as a key ingredient for economic growth in developing countries (Mitku, 2013).

Although the theoretical controversies are somehow little, empirical studies have not been able to generate consistent evidence for significant and positive spillover effects from FDI. While many researchers find that there exist significant positive spillovers from foreign direct investment, some others find no or statistically insignificant spillovers effects. Therefore, this chapter reviews the trends, theories of determinants and impacts of FDI and empirical studies accompanying these theories.

2.1. Theoretical Review

2.1.1. Definitions of FDI and Main Concepts

The theoretical explanations of FDI largely stem from traditional theories of international trade that are based on the theory of comparative advantage and differences in factors endowments between countries. Multinational companies are usually attracted to a particular country by the comparative advantage that the country or region offers. FDI is the process whereby residents of one country (the source or home country) acquire ownership of assets for the purpose controlling of production, distribution and other activities of a firm in other country (the host country) for getting new economic advantages abroad (Morgan et al, 1997). FDI is not just only a capital movement. In addition to capital, a controlled subsidiary often receives direct input of managerial skills, technology and other tangible and intangible assets. Unlike portfolio investors, FDIs have substantial control over the management of foreign subsidiary. According to the IMF

(1993)'s Balance of payment manual, an investment by a foreign investor is considered as FDI, if the direct investor holds a minimum of 10 percent of the share or voting power of the firm.

There are different types of FDIs like Greenfield investment, cross border merger and acquisition, and reinvested earnings. Greenfield investment refers to the establishment of a new firm that in turn enables to create productive assets in a host country. Usually, it is financed by capital coming from the investor's country. Selling of local productive assets to a foreign investor is referred as international or cross border merger and acquisition. Reinvested earnings refer part or all of the profit that is not repatriated to the investor's country but reinvested in the host country (UNCTAD, 1998).

FDI can also be categorized into market-seeking FDI which are attracted by the size and growth of national and regional markets, export- oriented which sells their product to non-local markets, and government initiated FDI which are motivated to invest in specific sectors based on the incentives of the government (Accolley et al, 1997). In a similar direction, again based on their primary motives, FDI can also be classified into the following three groups: Market seeking, resource-seeking which are attracted by the low cost of resources and efficiency seeking which are attracted by the productivity of the resources mainly the labor(UNCTAD, 2007).

2.1.2. Theoretical Perspectives

This section reviews the different positions that have been adopted towards FDIs. There are three main approaches to the analysis of FDI which are identified as Developmentalism, Economic Nationalism and dependency school.

The Developmentalism approach argued that developing countries with major obstacles to growth such as low level of savings and inadequate foreign exchange earnings, and considered FDI as essential for breaking out of this vicious circle (Jenkins, 1984). The most recent development of the neo-classical approach is the "internalization theory" which argued that MNEs exist because imperfections of the market. By internalizing their operations firms bypass imperfections in external markets (Buckley & Casson, 1985).

The Economic Nationalism is developed during the 1960s by Hymer (1960) which viewed FDI should to be seen as part of the strategy of large oligopolistic firms and not simply as a resource

flow through identifications of two major motives leading MNEs to control subsidiaries in foreign locations. These include to make use of specific advantages which the MNE has over firms in host countries; and to remove competition between the firms concerned and to eliminate conflict.

The dependency approach criticized the developmentalist assumptions about FDI's contributions in terms of additional foreign exchange, additional savings, and better technology, and management techniques. It notices three main mechanisms that link FDI to underdevelopment (Jenkins, 1987): Drain of surplus viewed as a vast ''suction-pump'' for obtaining resources from the periphery (dependent developing countries); Creation of oligopolistic structures in which Monopolistic firms will tend to repatriate their profits; and Emergence of a dependent bourgeoisie which FDI reduces the local bourgeoisie in developing countries to the subordinate status of a dependent bourgeoisie.

2.1.3. Determinants of FDI

The theories for determinants of FDI can be categories into two groups as micro and macro-level theories. The micro-level theories of determinants of FDI deals with the questions why companies prefer opening subsidiaries in foreign countries rather than exporting or licensing their products, how they choose their investment locations and why they invest where they do.

These theories include the Early Classical Theory of FDI which states interest rate differentials are the main reason for the firms to become a Multinational Companies (Harrison et al, 2000), The Product Life Cycle Theory of FDI developed by Vernon in 1966 in which it states that a product first produced and sold in a home country until it saturate then leads to open subsidiary in other nation at maturity of the home country; the Internalization Theory of FDI developed by Krugman and Obstfeld in 2003

The macro-level determinants of FDI dealt with the host country's situations that affects the inflow of FDI, like market size, growth rate of the economic, GDP, infrastructure, natural resource, the political situation, availability of low labor cost and skilled manpower, inflation, exchange rate variability, fiscal deficit, geographical proximity, legal and regulatory framework, privatization, regional integration (access to regional markets), investment promotion strategy

and incentive structure contract law, the socio-economic image, accessibility of investment fund, governance, human resource development, degree of openness, urbanization, coherent and stable macro & sector policies etc.

2.2.Empirical Review

The comprehensive literature pertaining to empirical findings the trends of, the main determinants of and the rationale to what extent that FDI is necessary for sustained economic growth and development of any economy in this era of globalization are categorized under the following heads.

2.2.1. Global Studies

Trend Related Studies

As shown Global FDI inflows in 2010 reached an estimated $1,244 billion a small increase from 2009's level of $1,185 billion. However, there was an uneven pattern between regions and also between sub regions. FDI flows to developing and transition economies further reduced in 2010. In contrast, those to developing economies recovered strongly. FDI flows to developing economies rose by 12 per cent (to $574 billion) in 2010 (UNCTAD, 2011).

Figure 2.1. FDI flows, global and by group of economies, 1980–2010 (in Billions of dollars)

Year
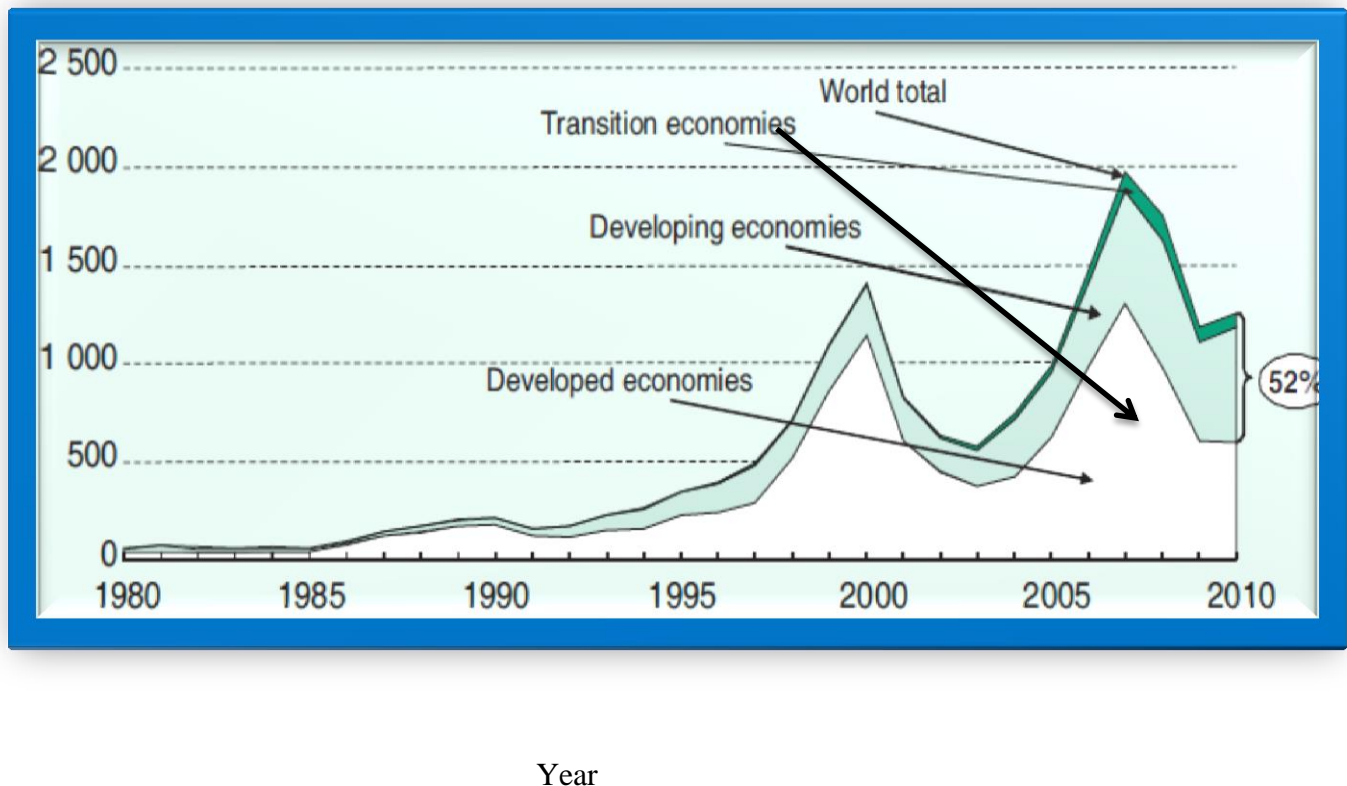
Source: UNCTAD, (www.unctad.org/fdistatistics)

In addition to LDCs, LLDCs and Small Island developing States, flows to Africa continued to decrease, similar to South Asia. In contrast, major emerging regions, such as East and South-East Asia and Latin America experienced strong growth in FDI inflows (UNCTAD, 2011).

Determinant Related Studies

Even though many empirical studies were conducted globally to identify the factors that determine the flow of FDI, the factors which were identified as determinants of FDI greatly varied from study to study and from country to country (UNCTAD, 1998). Batra et al (2003) argue that the determinants of FDI to Africa are different from the determinants to the other parts of the world. Asiedu (2004) agrees with this argument and states that the lessons from East Asia and Latin America countries do not apply to African countries. The foreign investors generally

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collect information separating to five adequate conditions for investment which include competitiveness of human capital; adequacy cost of doing business; access to markets; the diversity of the market; and the extent of available state aid (Zbida, 2011).

Hooda (2011), conducted a study to analyze the determinants of FDI in Indian economy found that exchange rate, R&D expenditure, trade GDP, reserve GDP, and financial position of country have a positive effect in attracting FDI. According to Herzer et al, (2006), the impact level of FDI on growth seems to depend on economic and political conditions in the host country, such as the rate of per capita income, the human capital base, the level of openness in the economy, and the extend of the development of domestic financial markets.

2.2.2. Studies Conducted in Africa

Trend related Studies

During 2001–09, developed economies continued to account for most of the world FDI flows: they were the main source of outward FDI and received about 60 percent of total inflows during this period. Nevertheless, the long-term geographical pattern of the FDI flows has been changing, with more FDI going to developing countries, including countries in. In fact, in 2009, developing and transition countries received almost half of the world's FDI. Preliminary estimates indicate that in 2010—for the first time—developing and transition countries received more than 50 percent of world FDI inflows (Africa Competitiveness Report, ACR, 2011)

Figure2.2. FDI flows into Africa, Asia, and Latin America, 1996 to 2009 (millions of US$)
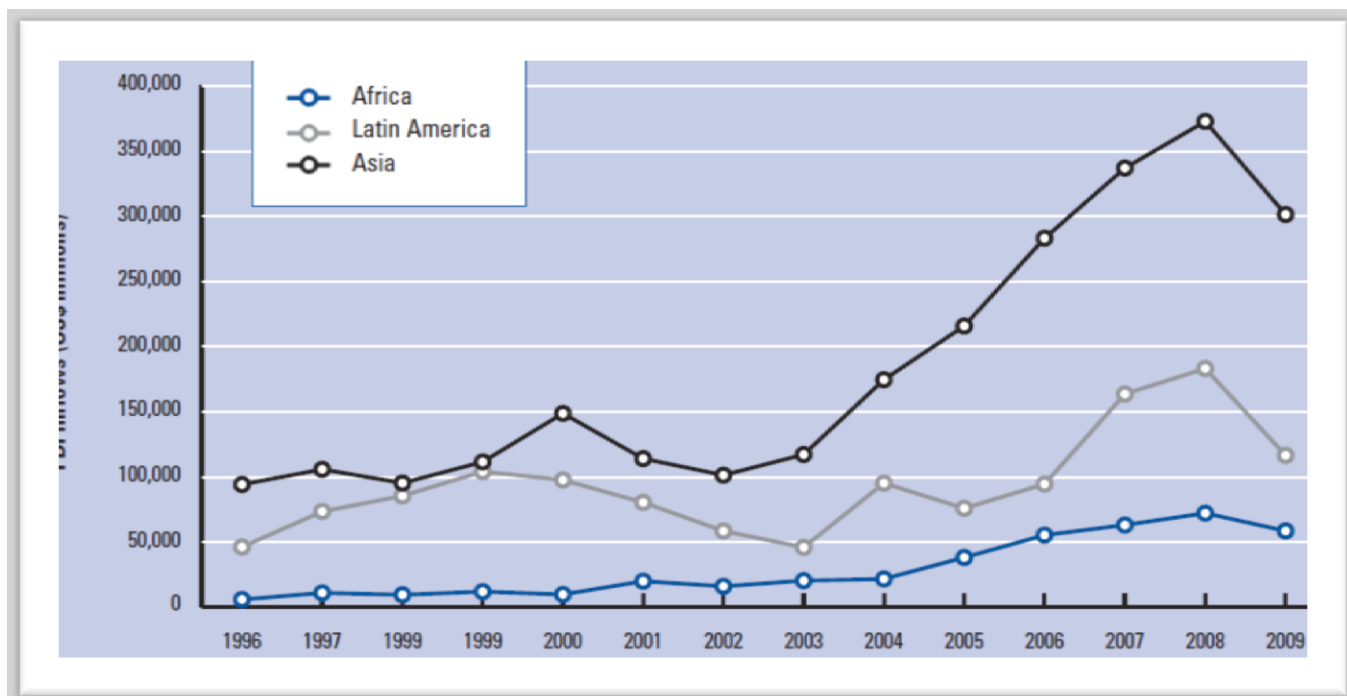
Source: UNCTAD *FDI Statistics* database

African countries also experienced a rise rapidly in capital flows; they received about 8 percent of total capital flows and 10 percent of FDI going to developing countries during 2001–09. Indeed, after years of relatively slow growth, net capital inflows to Africa accelerated in the 2000s and surged between 2004 and 2007. Peaking at almost US$76 billion in 2007, the net capital inflows amounted to about 5 percent of Africa's GDP at that time. This share was close to those of both the Middle East and Latin America (about 6 percent of GDP), but notably below capital flows received by Central and Eastern Europe and the Commonwealth of Independent States countries (15–16 percent of GDP). At the same time, since FDI accounted for the majority of their private capital inflows, African countries were mostly shielded from the sudden halt in capital flows (ACR, 2011).

Determinant Related Studies

Although the reasons for the increase in private capital flows to low-income countries varied, on the "domestic economic fundamentals/pull side" they included privatization and deregulation; improvements in general investment environment, including trade liberalization and cutting costs of doing business; and broader considerations such as political and macro - economic stability. On the "external/push side," private capital flows to low-income countries were closely related to the business cycle upswing and the heightened risk appetite of foreign investors (ACR, 2011). Srinivasan, (2002) found that certain African countries have been able to attract FDI, not because of natural resource availabilities, rather through their significant improvement in the business environment and intentional image-enhancing campaigns. Although most African countries have undertaken substantial economic reform, Asiedu (2002) founds that the decline in African FDI as a ratio of total FDI is partly because improvements in policy environment have not been large relative to reforms in other regions.

Gichamo(2012) investigated the determinants of inward foreign direct investment in Sub-Saharan Africa using the panel data from the period 1986 to 2010. The models used for the study were pooled ordinary least square method, fixed effect method and random effect method. Fourteen Sub-Saharan Africa countries were sampled for the study. Trade openness, gross domestic product, gross domestic product growth, gross domestic product per capita, telephone line (per 100 people), gross fixed capital formation, inflation and the lag of FDI are explanatory variables while the stock of FDI inflow is dependent variable. The study finding shows that trade openness, gross domestic product, inflation, and lag of FDI are the most significant determinants of foreign direct investment inflows to sub-Saharan Africa. Brima (2015) carried out a study on the "Macroeconomic Determinants of Foreign Direct Investment in Sierra Leone: An Empirical

Analysis" using OLS estimation method for time series data covering the period 1990 to 2013. The variables used for the study were market size (proxied by host country"s GDP), openness (the host country's ratio of imports + exports to GDP), exchange rate, inflation, money supply, government expenditure, natural resource availability (measured as a share of minerals, natural gas, forest, and oil in total exports), and political stability expressed as a dummy variable to capture the period of war (1991 to 2001 = 1 and 0 otherwise). The results show that the market size, openness, exchange rate, natural resource availability exert positive effects on FDI while inflation and money supply have negative influences on the FDI in Sierra Leone.

In conducting a study on the "Foreign direct investment, does it matter? A case of Zimbabwe, Sikwila (2015) employed annual time series data for the period 1980 to 2012 by the means of OLS estimation method. The variables employed in the study were output (real GDP), trade openness (as a ratio of exports plus imports to GDP), political stability, domestic Investment measured in terms of fixed capital formation, inflation (a proxy for macroeconomic stability), property rights, and indigenization, using dummy variables (1980 to 2000 = 0 when the policies did not exist and 2001 to 2012 = 1 when the policies exist). The results indicated that output, trade openness, political stability, domestic investment and inflation were significant and as such were exerting influences on FDI flows into Zimbabwe while property rights and indigenization were insignificant.

2.3.Over view of the Ethiopian Economy and FDI

2.3.1. Over View of the Ethiopian Economy

For the last hundred years several staggering facts and figures are have been reported about the socio- economic conditions of Ethiopia. Ethiopian Economic Association (2000) annual report indicated that about 89% of the population lives below 2 dollar a day poverty line. According to World Bank (2008) report, more than 84% of the population lives in rural area. Life expectancy

at birth is 43 years, and only 22% of the population has access to improved water sources. The purchasing power of the people is one of the lowest in the world etc are very few of the many.

Numerous macroeconomic reforms have been implemented with the objective of achieving macroeconomic stabilization and growth since 1991. The macroeconomic reforms include privatization of state owned enterprises, liberalization of trade policy, reduction of import tariff rates, elimination of non-tariff barriers, devaluation and deregulation of price & exchange rate controls (UNCTAD, 2002).

Following these strategic reforms, the Ethiopian economy has shifted to a higher growth trajectory since 2003/04. This has been sustained, and during the last six years over all real GDP has grown rapidly at an average of 11% per annum. The structure of the economy can be decomposed into three main economic sectors: the agriculture sector, the industrial sector and the service sector. The performance of these three main economic sectors i.e. Agriculture, Industry and Service have registered an average annual growth rate of 8.4%, 10%, and 14.6% respectively. This account about 41.6%, 12.9% and 45.5% of the real GDP (GTP, 2010).

From the demand, GDP at a current market price has increases by about 29.6% per annum during the last five years. At the same time gross capital formation, total export and total import registered an average annual growth rate of 28%, 27.1% and 27.6% respectively.

Table 2.1.Percentage share of aggregate consumption to GDP at CMP

Item	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010
Total consumption	94.1	95.4	91.3	94.8	93.6	94.4
Gross capital formation	23.8	25.2	22.1	22.4	22.7	22.3
Exports of goods and services	15.1	13.8	12.7	11.4	10.5	13.6
Imports of goods and services	35.5	36.5	32	30.8	28.7	33
Resource balance	-20.4	-22.7	-19.3	-19.4	-18.2	-19.3
Gross domestic saving	5.9	4.6	8.7	5.3	6.7	5.5

Source: GTP, 2010

Although, export have increased for the last five years the trade balance did not improve as desired. The trade deficit widened during the period because of a significant increase in imports, an increase necessary to sustain the high economic growth level achieved (GTP, 2010)

Table 2.2 Import and export trade as share of to GDP

Item	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	average
Export	6.9	6.6	6.1	5.5	4.5	4.0	5.4
Import	29.5	30.3	26.3	25.5	23.8	23.3	26.1
Trade balance	-22.6	-23.7	-20.2	-20.1	-20.0	-19.3	-20.9

Source: GTP, 2010

2.3.2. FDI inflow to Ethiopia

FDI has been an area of interest in Ethiopia for a long time but it has received increasing attention since 1991. In the pre-1991 period, on the other hand, environment was not encouraging for private investment in general and FDI in particular. Political instability,

insecurity, and the nationalization of major industries made the environment unattractive for private investment. As a result there were no foreign direct investment inflows during that time

In post 1991 period after the Derg regime was over thrown by Ethiopian Peoples' Revolutionary Democratic Front (EPRDF) and this regime has governed Ethiopia ever since. EPRDF has undertaken many macro-economic reforms. The government implemented a series of reform measures like deregulation, privatization, liberalization of foreign exchange market, elimination of export tax, lowering of maximum import duties from and Provision of adequate incentives in order to increase private sector participation in the economy which is believed to have an important role in the development process of the national economy.

One of the major changes brought by this new regime is the replacement of the command system by the free market system. This transpired when the government adopted Structure Adjustment Program (SAP) as per recommendation of the World Bank (WB) and International Monetary Fund (IMF). The government promised to implement a series of policy reform measure in order to remove and change the command economic system with market based economy, to open the economy into the world economy and to encourage the wider participation of the private sectors in the development process of the country. Under SAP the country became more attractive for FDI and made the domestic investors competitive.

In accordance with this, the data shows that there has been a substantial increase in FDI since 1991. FDI has gone from an average annual inflow of $1.4 million in 1980-1990 to $81.6 million in 191-2000 and $470.8 million in 2005-2015 with fluctuations. When we look at it from the perspective of GDP on the other hand, as the figure shows although there is increase in the inflow of FDI into the country the performance of FDI as a percentage of GDP is still low. As it can be observed form the figure below there is a vast difference between the FDI inflow before and after the 1991 reform. The increase in FDI inflows into the country can be attributed to the revision of the investment proclamation after the reform in a way that accounted for higher level of incentives for FDI. Although the trend after this reform has been increasing on average there seems to be a decline after 2006. The inflow goes from an average of 3.7% of GDP from 2000-2006 to an average of 1.2% of GDP form 2007-2014. This indicates that even though FDI inflow into the country is increasing there is still capacity to do more due to the increasing market size and that the country is not performing to the best of its abilities. Furthermore despite the fact that

the inflow of foreign direct investment has been increasing over the last twenty five years due to the investment friendly environment created through the introduction of investment guarantee schemes and incentives, it is still small relative to other African countries. In conclusion the FDI regime is being liberalized but it remains a question if the liberalization process is too slow to convince foreign investors of the changing investment environment.

Figure 2.3: FDI inflows to Ethiopia as a percentage of GDP
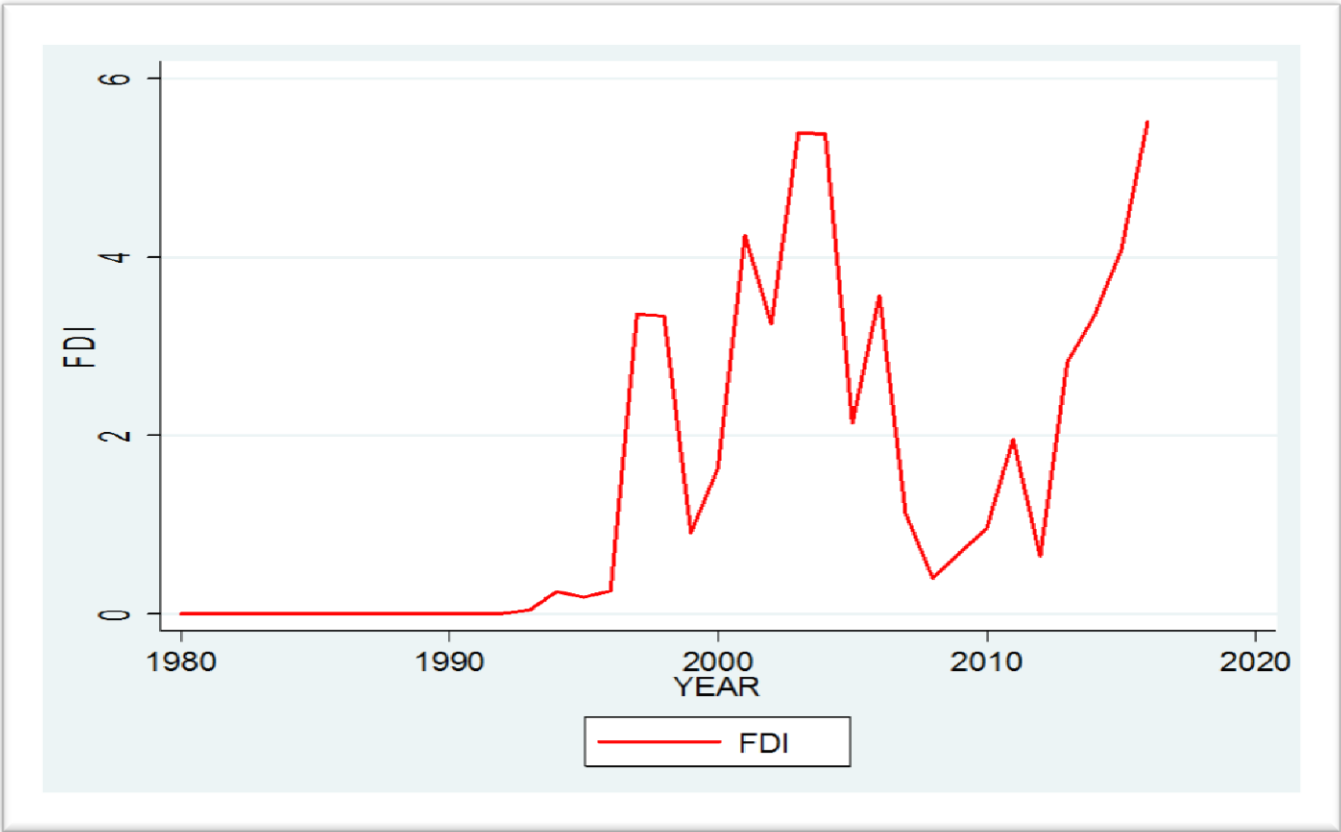
Source: own composition form UNCTAD and World Bank 1980-201

Figure 2.3above shows the trend of FDI (% of GDP) from 1980 to 2015. Since 1992, FDI starts to play its role and increase impacts for economic growth of Ethiopia following the liberalization of trade policy. There were very small flow of FDI in the country during the post 1991 period but after the EPRDF allows the inflow of FDI to the country it shows some change.

FDI flows in Ethiopia increased in absolute terms with some fluctuations. The unstable political environment is the main reason for the fluctuations. In the figure above it is shown that during the two years period of conflicts that Ethiopia had with Eretria (1998-2000) the inflow of FDI

had fallen to a large extent. Beside in 2005 and 2008 during the Ethiopian local election crises time, the FDI extent also declined. By 2000/01 total investment accounted for 16 percent of GDP (Geda (2008)).

Liberalization of trade in 1992 made an impact for the country growth (Economic commission for Africa, P83, (2002)). The reform as well as the government introduction of investment guarantee scheme and incentives helped the county to got/get a higher level of inflow of FDI. The FDI inflows to Ethiopia have been generally treading upward, through with some volatility, since 1992. From 2003-2007, annual average inflow were $409 million compared to $140 million over the 1998-2002 period (UNCTAD (2004)). This is because of the investment proclamation was revised by including a higher level of incentives for foreign investors.

2.3.3. Determinant Related Studies

There have been a number of researches done regarding FDI in Ethiopia with different objectives and various ways of achieving them. A study by Solomon (20008) on the determinants of FDI in Ethiopia aims to study the key factors that determine the inflow of FDI into the country. The study concludes that natural resource and petroleum-rich countries attract sizeable FDI regardless of their political and economic environment. He also concludes that in order of Ethiopia to attract a sizable amount of FDI a certain minimum level of development is necessary.

Similarly Atlaw et al. (2011) study the reason behind boost in FDI and the factors that contribute for the growth of FDI in the country as well as the roles of the government in the achievement. The study concludes that the most important factors are the presence of high economic growth in the past few years and the potential of low cost skilled man power. The study attributes the increase in FDI inflows to the stable political environment, natural resource endowment as well as domestic market and infrastructural development of the country. A study by Miteku (2013) on FDI and the Ethiopian economy he includes three basic channels through which FDI in Ethiopia and through which it can affect the Ethiopian economy. These channels include GDP, human capital development and domestic investment. Using an Autoregressive distributed lag Model he finds that trade liberalization economic growth infrastructure and political stability affect FDI favorably. On the other hand he concludes that human capital macroeconomic instability and market size are unfavorable to attract FDI.

Mohapatra, (2014) conducted a study on the title "Foreign Direct Investment Inflows to Ethiopia during 1992 to 2012: An Empirical Analysis" using an econometric model to determine these potential determinants of equity inflows. He found that among the selected variables Trade, Imports, Exports, Trade Openness, Official Exchange Rate, Gross Capital Formation, Gross National Expenditure and Transport Services found to be significant determinants of FDI inflows to Ethiopia during the period 1992 to 2012. However, GDP Growth, Cost of Starting Business, Gross Savings, Inflation, External Debt and GDP Per Capita found to be non-significant determinants of FDI.

Henok (2014) examined the determining factors of FDI inflow and potential factors that hinder it in Ethiopia. The researcher collected information from sample of foreign firms based in the capital Addis Ababa and the nearby cities, and public servants of Ethiopian Investment Agency (EIA). The empirical results derived from the study shows that domestic and regional market seeking, political and social stability and investment incentives were found as the main determinants of FDI whereas, exchange rate volatility, corruption, and lack of clear policies and regulatory impediments were identified as the three main factors that have the potential to deter foreign investment in Ethiopia.

Getinet and Hirut (2006) investigated the determinants of FDI by using time series analysis for the years between 1974 and 2001.This study provides an extensive account of the theoretical explanation of FDI as well as reviews the policy regimes, FDI regulatory framework and institutional set up in the country over the study period. It also attempts empirical analysis to find the determining factors of FDI in Ethiopia. The study focused on market size (Real GDP per capita and real GDP growth rate are included as a measure of market attractiveness), export orientation (export as a percentage of GDP), macroeconomic stability (rate of inflation based on consumer price index), infrastructure (gross fixed capital formation and number of telephones), Human capital (rate of adult illiteracy) and trade liberalization. There are four regression models the output shows that export orientation, growth rate of real growth domestic product and trade liberalization have positive impact on FDI flow of Ethiopia. However, macro - economic instability and poor infrastructure have negative impact on FDI of Ethiopia.

Applying multiple regression model, Amanuel (2014) empirically investigated the factors that affect FDI of Ethiopia during 1990-2011. The study found that trade openness and inflation rate

is significant factors affecting Ethiopian FDI, while market size, infrastructure and human capital are found to be statistically insignificant factors for FDI of Ethiopia.

Another unpublished study conducted by Megabru, (2011) was focusing on identifying the determinant factors to the FDI inflow in Ethiopia. Secondary data were employed for the study and he tried to identify some variables and make conclusion as follows. Market size, Openness, Government expenditure, Human capital, and domestic investment has positive and statistically significant; Market growth and Inflation positive but statistically insignificant effect on FDI. On the other side Openness, Foreign debt, Telephone line per 1000 people, Lagged FDI has negative effect on FDI. Henok (2014) examined the determining factors of FDI inflow and potential factors that hinder it in Ethiopia. The researcher collected information from sample of foreign firms based in the capital Addis Ababa and the nearby cities, and public servants of Ethiopian Investment Agency (EIA). The empirical results derived from the study shows that domestic and regional market seeking, political and social stability and investment incentives were found as the main determinants of FDI whereas, exchange rate volatility, corruption, and lack of clear policies and regulatory impediments were identified as the three main factors that have the potential to deter foreign investment in Ethiopia.

2.4.Description of Variables and Conceptual frame work

2.4.1. Description of the Variables

By considering the overall reviews of empirical and theory, the main variables that can have great influence on FDI that are to be included in the model are listed under with their definition.

Market size and growth: The size of the market and the growth of the market have proved to be the most prominent determinants of FDI. Foreign investors are highly attracted by large markets in order to utilize resources efficiently and exploit economies of scale.

Trade Openness: The ease of capital movement to and out of the country and the trade openness of the country affect the flow of FDI. The standard way of thinking is that countries with capital control and restrictive trade policies discourage business, compared with countries with liberal policies. Openness of a country could be expressed in different ways. Among others, trade restrictions, tariffs, and foreign exchange control law could be mentioned. Since the data for

variables that measure capital account openness are not readily available, this study has used the ratio of trade to GDP (import plus export to GDP). As openness of an economy is believed to foster the level of FDI, the more open an economy is, the more likely it would grow and attract FDI. Thus, we expect a positive relationship between openness and level of FDI (Yonas, 2016).

*Macroeconomic stability***:** There is a widespread perception that macroeconomic stability shows the strength of an economy and provides a degree of certainty of being able to operate profitably (Balasubramanyam, 2001). Inflation rate is used as proxy variables for macroeconomic stability. Low inflation rate is expected to have a positive impact on FDI.

Infrastructures: A country with high level of infrastructure attracts more FDI. For this study, it covers three main dimensions (telecom services, transportation and electric power utilities).

Human capital: foreign investors are highly attracted with availability of high quality and low cost of labor.

Growth of domestic investment: when domestic investors are highly investing it gives confidence to foreigners to make more investment.

Lagged FDI: Foreign investors are also interested in countries with an existing concentration of different foreign investors.

From empirical literature reviews, the researcher realizes that the studies done in Ethiopia have not included gross domestic savings and external debt as determinants of FDI even though these are important variables that may influence the inflow of FDI in Ethiopia.

Conceptual Framework

Based on reviewed theoretical and empirical literature the study has developed the following schematic representation of the conceptual framework.

Figure2.4. Conceptual frame work of independent and dependent variables

Independent Variables

Market size

Trade Openness

Inflation Rate

Infrastructure

Human Capital

 Domestic Investment

Lag of FDI

Size of Government

Exchange Rate

Dependent Variable

FDI
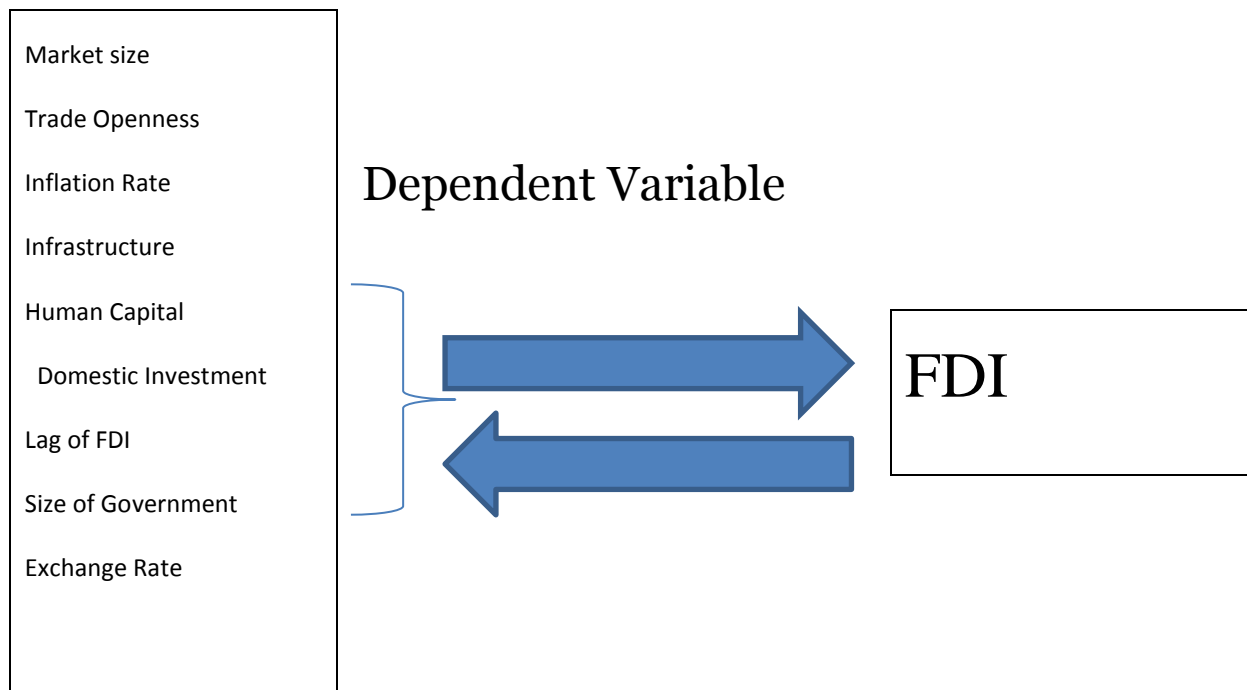
Source: own construction

Figure 2.4 shows that Market Size, Openness, Inflation Rate, Infrastructure, Human Capital, Domestic Investment, Lag of FDI, Size of Government and Exchange Rate affect Foreign Direct Investment of Ethiopia. Foreign Direct Investment also affects all these variables.

CHAPTER-THREE

RESEARCH METHODOLOGY

3.1 Data Set and source of data

3.1.1 Data Set

There are many empirical and theoretical literatures that suggest ways to enhance the inflow of FDI and among them this study try to test which macroeconomic variable has high capacity to influence the inflow. In doing so, this study takes time series data on a number of macroeconomic variables that determine the inflow of FDI in Ethiopia.

3.1.2. Data Type and Sources

To investigate the determinants of foreign direct investments (FDI) inflows in Ethiopia, annual data over the period of 1992-2015, which is the period for which data are available, have been used .This paper was entirely dependent on secondary data. The major data sources are Ministry of Finance and Economic Cooperation (MoFEC), Ethiopia Investment Commission (EIC), Central Statistics Authority (CSA), National Bank of Ethiopia (NBE) and country reports published by the United Nations Conference on Trade and Development (UNCTAD) and The World Bank development Indicator.

Vector Error Correction Model (VECM) is employed for short-run modeling and Johansen co-integration method is used for Long-Run relationships among the variables.

3.2 Specification of the Model

This model analyzes the effect of number of variables on FDI and is presented as follows.

FDI = F (X),

Where X includes market size, trade openness, inflation rate, infrastructure, External debit, Gross fixed capital formation, Ratio of export and import to GDP

FDI= F (RGDPGR, OP,EXDT, GCF, INFR)…... (1)

$$FDI_t = \alpha + \beta_1 RGDPGR_t + \beta_2 OP_t - \beta_3 EXDT_t + \beta_4 GCF_t + \beta_5 INFR_t - \beta_6 GS + \varepsilon_t \ldots\ldots (2)$$

The stationary and co-integration tests that have been conducted suggest that model (3) should be estimated using the first difference variables. The final short run model estimated therefore has the following form:

$\Delta \ln\_FDI_t = \alpha + \beta 1\ \Delta RGDPGR_t + \beta 2\ \Delta OP_t - \beta 3\Delta\ EXDT_t + \beta 4\Delta GCF_t + \beta 5\Delta\ INFR_t + \varepsilon_t\ldots$ (3)

Where, FDI is the net foreign direct investment inflow as a percentage of GDP (measure of FDI).

EXDt. = External debit (as percentage of GDP) (measure of financial risk)

OP = Ratio of export to GDP (measure of openness)

GCF = Gross capital formation (percentage of GDP) (measure of infrastructure)

GDP= Real GDP growth rate (measure of market size)

INF = Annual rate of inflation based on consumer price index (measure of inflation)

The relation between the dependent and explanatory variable in equation (1) can be re written explicitly in the following log (L) linear form to reduce the skewness in data distribution and allowing the coefficient estimates to be interpreted as elasticity

$\ln FDI_t = \beta 0 - \beta 1(\ln RGDPGR_t) + \beta 2(\ln GCF_t) - \beta 3(\ln EXDT) + \beta 4(\ln OP_t) + \beta 5(\ln INF_t) + \varepsilon_t \ldots$ (4)

The coefficients $\beta 0$, $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$ and $\beta 5$ are the parameters of the econometric model, and they describe the directions and strengths of the relationship between FDI and the factors that used to determine FDI in the model (called Explanatory Variables). For instance, $\beta 1$ is the major coefficient of interest that tells the percentage response in FDI growth for a percentage change in RGDPG (% FDI) and ε is error term.

3.3 Description of Variables

Generally, the following variables are selected and included in the model which may influence the inflow of FDI in Ethiopia.

3.3.1 Dependent Variable

FDI: The World Bank World Development Indicators (2012) defined Foreign Direct Investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. In line with the approach used in the FDI literature, the dependent variable used in this study FDI is measured as the net foreign direct investment inflows as a percentage of GDP.

3.3.2 Independent Variables

3.3.2.1 Market Growth rate: GDP Growth Rate

Market size is a fundamental determinant of FDI. The wealth and development of a country can be used as proxy to measure the size of the domestic market. It is believed to be one of the significance determinants that have been used in empirical studies to explicate the inflow of FDI to a host country. Because if the host countries have large market size it will have investment opportunities that will in turn to generate high profit for the foreign firms. Many studies have used real Gross Domestic Product (GDP) growth rate as an indicator of the "size" of an economy. This study follows them and uses this variable as an indicator for market size, and expects to have a positive impact on inward FDI.

3.3.2.2 Trade Openness

Trade openness, meaning the degree of liberalization of trade regime of the host country, is regarded as a very important factor that promotes FDI. Open economies mean greater market opportunities. From the perspective of financial development, trade openness means the ability of an economy to obtain funds from other economies, and willingness to invest its surplus fund to other countries. Trade openness is considered to be a significant FDI determinant in many literatures. Much FDI is export oriented Trade openness promotes FDI and it is measured as the ratio of export to GDP. FDI is expected to have positive relationship. According to Tewodros

(2014), the ease of capital movement to and out of the country and the trade openness of the country affect the flow of FDI. The standard way of thinking is that countries with capital control and restrictive trade policies discourage business, compared with countries with liberal policies. Openness of a country could be expressed in different ways. Among others, trade restrictions, tariffs, and foreign exchange control law could be mentioned.

3.3.2.3 Inflation rate

As it is defined in world development indicator (World Bank, 2014) the calculation of inflation is measured by the consumer price index which indicates the annual percentage change of the average consumer cost in acquiring a basket of goods and services over the interval time. Inflation rate is one of the variables which measures the given countries macro-economic stability. According to Solomon (2008), through its effect on the cost of inputs and the price of outputs, inflation reduces the real return on investment and firms" competitiveness. Hence, countries that pursue policies that reduce inflation rate have better chance in attracting FDI. Low and predictable inflation rate is central for the long-term investment of both domestic and foreign companies. Therefore, higher and unpredictable inflation will decrease the inflow of FDI (Solomon, 2008). Low inflation rates are expected to have a positive impact on FDI. Through its effect on the cost of inputs and the price of outputs, inflation reduces the real return on investment and firms' competitiveness. Hence, countries that pursue policies that reduce inflation rate have better chance in attracting FDI. Low and predictable inflation rate is central for the long-term investment of both domestic and foreign companies. Therefore, higher and unpredictable inflation will decrease the inflow of FDI (Birhanu, 1999).

Rate of inflation is a crucial factor in influencing the inflow of foreign investment. A high rate of inflation signifies economic instability associated with inappropriate government policies, especially the monetary fiscal policy mix (Macpherson, 2013). Khan &Mitra (2014) opine that high rates of inflation distort the economic activities, leading to lesser inflow of capital. A low and stable inflation rate acts as a sign of internal economic stability. This is because it reduces uncertainty and boosts the confidence of people and businesses for making investment decisions. On the other hand high inflation rate signifies the inability of the central bank to set appropriate monetary policies. A high inflation rate also impacts capital preservation of foreign investment.

It affects profitability as higher prices can lead to increased costs and lower profits. So, stable inflation rate is desirable to attract foreign capital (Aijaz, Siddiqui, &Aumeboonsuke, 2014).

3.3.2.4 Infrastructure development

Infrastructure development is one of the well-recognized factors for attracting FDI. The main argument is a well-established infrastructure such as roads, airport, electricity, water supply, telephones, and internet access will reduce the cost of doing business and help maximize the rate of return. It is suggested that the availability of a good quality infrastructure subsidizes the cost of total investment and increasing efficiency of production and marketing. Studies have indicated the presence of an advanced infrastructure like roads, ports, railways, telecommunications system, and other public institutions are indications that the host country has the platform to manage inflow of FDI. Taking in to account Gross Fixed Capital Formation (GFCF) has been included to proxy infrastructure development. It is expected to be positively correlated with FDI.

3.2.2.5 Financial risk

A country's financial risk refers to the ability of an economy to generate enough foreign exchange to meet payments of interest and principal on its foreign debt .The variables most frequently used by international financial institutions and financial analysts in assessing cross-border financial risk include those variables that give information on a country's foreign debt and interest payments. The ratio of external debt as a percentage of GDP can be interpreted as of an economy's financial risk.

Table 3.1 Summary of Expected sign of Variables used in regression

Variables	Abbreviation	Descriptions	Expected signs
Foreign Direct investment	FDI	Inward foreign direct investment stock (% of GDP)	
Market size	GDP	Real GDP growth rate	+
Trade openness	EXPO	Ratio of export to GDP	+
Inflation rate	INF	Average annual inflation rate	-
Infrastructure	GCF	Gross capital formation to GDP	+
Country's financial risk	EXDT	External debit as a percentage to GDP	-/+

Note: own computation

3.3 Estimation Techniques

To examine the relationship between different economic variables and FDI inflow, the present study has employed ADF technique to check the stationary level of the variables. To find out long run co-integration between dependent and independent variables, Vector Auto Regressive (VAR) and Vector Error Correction Model (VECM) approach to co-integration has been used.

3.3.1 Stationarity Test

In the analysis of time series data, the notion of stationarity plays an important role. Proper estimation of a time series model requires a stationary data. Conducting time series analysis on-non-stationary data will results what is called "spurious" or "nonsense" regression, i.e., a situation where the estimated regression has a high R^2 and significant t-values without any economic relationship between the variables. According to Granger and Newbold (1974), Estimation of parameters and hypothesis testing using time series data requires an investigation of the data generating process of the variable under consideration. This investigation helps to avoid estimating a spurious correlation between variables in a regression, where and what actually exist is correlated time trend rather than a meaningful economic relationship. A combination of variables that contain a time trend or are non-stationarity may lead to spurious correlation. Hence, to avoid the problem of spurious correlation, inappropriate model specification and misleading results due to the presence of non-stationary variables in the regression model, the time series properties of the variables used in the model are investigated.

Stationary on the other hand, implies that the distribution of a process remains unchanged when shifted in time by an arbitrary value. More formally, a stochastic process is said to be weakly stationary if its mean and variance are constant over time and the value of the covariance between the two time periods depends only on the distance or gap between the two time periods and not the actual time at which the covariance is computed (Enders, 1995; and Gujarati, 2003). And according to Gujarati (2003), a time series is strictly stationary if all of the moments of its probability distribution are invariant over time. However, the normal stochastic process is fully specified by its two moments, the mean and the variance.

The stationarity of each series is verified with the standard Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests. A time series is said to be integrated of order d, denoted I (d), if it becomes stationary after being differenced a minimum of d times (Dickey and Fuller, 1979, and 1981). The stationarity test results may be sensitive to whether a constant and/or a time trend are/is included in the regression. The appropriateness of including a constant and/or a trend is checked by formally testing whether they are statistically significant in the respective stationarity test regression equations.

3.3.2 Testing for unit roots

A test of stationarity (or non stationarity) that has been become popular over the past several years is the unit root test. There are several ways of testing for the presence of a unit root: the Dickey-Fuller (DF) test, the Augmented Dickey-Fuller (ADF) test and the Phillips-Peron test. This study employs the ADF and Phillips-Peron tests to determine the existence of a unit root. A commonly applied formal test for the existence of a unit root in data is the Dickey-Fuller (DF) test and its simple extension, the Augmented Dickey Fuller (ADF) tests (Harris, 1995). The augmentation is the addition of lagged values (p) of first differences of the dependent variable as additional regressors that are required to account for the possible occurrence of autocorrelation.

First requires thing is to evaluate unit root test for each variable whether the variables are stationary or not. For testing the stationary test there is two famous methodology, i.e Augment DF test and Peter Walison test.   Dickey and Fuller is widely used to testing the stationary (1979; 81). The DF approach to testing the null hypothesis that the series does contain a unit root that is non-stationary against the alternative of stationary is discussed as study based ADF (augment DF test) statistics.

Table 3.2 Thus the augmented dickey and fuller test have three models as flows;

$$\Delta X1t = ṛXt\text{-}1 + \sum Bi\Delta Xt\text{-}1 + \varepsilon t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots1, \text{ without constant}$$
$$\Delta X1t = a + ṛXt\text{-}1 + \sum Bi\Delta Xt\text{-}1 + \varepsilon t\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots2, \text{ with constant}$$
$$\Delta X1t = a + Bt + ṛXt\text{-}1 + \sum Bi\Delta Xt\text{-}1 + \varepsilon t\ldots\ldots\ldots\ldots\ldots\ldots\ldots3, \text{ with constant and trend}$$

Where, Δ is the difference operation, t is the time and Γ is the number of lag variables and α `s are the Constance parameter

As we can show the above table 4.2 there is three way of calculating the stationery test. The first equation represents ADF stationary test mechanism without constant. Second equation showed how calculating the stationery with constant. The thirds equation is shown how calculating stationary with constant and trend.

3.3.3 Long Run Relationship: Co integration

3.3.3.1 Vector Autoregressive (VAR) Modeling and Co integration analysis

According to Wooldridge (2003) , the notion of co-integration, which was given a formal treatment in Engle and Granger (1987), makes regression involving non stationary time series or what is called an integrated of order one, I (1) variables potentially meaningful. It is a notion that a linear combination of two series, each of which is an integrated of order one; I (1) is integrated of order zero, i.e. Stationary. We are concerned about the concept of co-integration because making a variable stationary by differencing only gives the short run dynamics while we are also interested in knowing the long run relationship. Economically speaking, two variables will be co-integrated if they have long run relationships between them. In VAR models the test for co integration is vital because if there is no co-integration relationship between the variables under consideration then there is no point in estimating VECM.

A simple approach to testing for the existence of co-integration is the Engle-Granger (1987) two step approaches. Though this procedure is easily implemented, it has several important limitations. One crucial limitation of the method is that it has no systematic procedure to identify the existence of multiple co-integrating vectors. An alternative approach which addresses the drawbacks of the two step Engle-Granger approach was proposed by Johansen (1988), who developed the maximum likelihood estimation procedure that also allows one to tests for the number of co-integrating relationship. The Johansen (1988) maximum likelihood estimators overcome problems associated with the use of two step estimators. Most importantly it can detect the presence of multiple co integrating vectors. Moreover, the test allows testing restricted versions of the co-integrating vector(s) and the speed of adjustment parameters (Enders, 1995).

The procedure used for co-integration testing and estimation of the VAR in this study follows the methodology developed and used by Johansen (1988, 1991), and Johansen and Juselius (1990). This method is preferred to the single equation based Engel-Granger two step procedure due to the following reasons. The Johansen (1988) procedure allows testing for the presence of more than one co-integration vector. Moreover, it permits to estimate the model without priority restricting the variables as endogenous and exogenous. It is used to determine how each

endogenous variable responds over time to a shock in that variable and in every other endogenous variable.

Johansen (1988, 1991) has shown that the test for co-integration can be expressed as a test of reduced rank of a regression coefficient matrix. The coefficient matrix can be estimated consistently using linear regression techniques and the test statistic can be computed from the solution to an eigen value problem. Moreover, linear restrictions on the co-integrating parameters can be tested by computing the shortcomings of the Engle-Granger method likelihood ratio test statistic which follows a $\chi 2$ distribution (Walls, 1993).

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 will revert back to its long run path. Therefore, an ECM depicts both the short run and long run behavior of a system. Engle and Granger (1987) (cited in Alogoskoufis and Smith, 1995) defined ECM as "a particular representation of a vector auto-regression appropriate for co-integrated results." This means if there exists long run relationship (i.e., co-integration among the variables).

A VAR describes the dynamic evolution of a number of variables from their common history. The use of co integrated VAR model helps account for spurious correlation and exogeneity bias as it is designed for non-stationary time series and requires no endo-exogeneous division of variables. It allows feedback and dynamic interrelationship across all the variables in the system and appears to be highly competitive with the large-scale macro econometric models in forecasting and policy analysis (Rahman, 2004). The General VAR system of equations can be specified as:

$$\Delta Yt = ao + A_1 yt\text{-}1 + A_2\, \Delta Yt\text{-}_2 + \dots + A_k Yt\text{-}k + \varepsilon t$$

Where Yt is an nx1 vector that contains n variables in the system. αO is an nx1 vector of constants and A1 up to An are nxn vector of white noise process, with mean zero and covariance Σ.

Vector Error Correction Models

Since time-series variables have been widely noted to be non-stationary, the results that are obtained from the level VAR are spurious and misleading (Mukhopadhyay and Pradhan, 2010). Moreover, utilizing properly differenced variables in the VAR may lead to model mis-specification if the level variables share the long run relationship or are co-integrated. In this case the VAR should be written in a VECM (Vector Error Correction Model) form as indicated below.

The formation of the VECM treats all variables as potentially endogenous. Each variable, expressed in its first difference, is specified to respond to changes in other variables as well as to the deviation of the variables under consideration from the long run equilibrium path (Mukhopadhyay&Pradhan, 2010).

In order to capture both the short and long-run relationships in the model the study uses Vector Error Correction Model (VECM) which can be specified as

$$\Delta Yt = ao + \textstyle\prod yt\text{-}1 + \Gamma_1\, \Delta Yt\text{-}1 + \Gamma_2\, \Delta Yt\text{-}2 + \dots \Gamma_{k\text{-}1}\Delta Yt\text{-}k + 1 + \varepsilon t$$

Where **Γ= - (Aj+1 + … +Ak), j= 1 ...k-1 and π= -I+A1+A2+A3+…+Ak**

The VEC specification restricts the long-run behavior of the endogenous variables to converge to their co-integrating relationships while allowing a wide range of short-run dynamics. The co-integration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments.

Estimation of non-stationary data will cause spurious regression problems in that the least square estimators of the intercept and slope coefficients are not consistent (Wooldridge, 2000). In order to have non-spurious estimation outcome, we need to apply both unit root test and co-integration analysis as they are the basic components of time series characteristics.

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The VECM describes how variables are adjusted towards the long-run equilibrium state. The coefficients of the error-correction terms indicate the proportion by which the long-run disequilibrium in the dependent variables is corrected in the short-term period.

In this study, different post-estimation diagnostic tests were performed to guarantee that the residuals from the model have a Gaussian distribution. Such as: residual vector serial correlation LM test, residual vector normality test, and residual vector heteroscedasticity test, multicollinearity.

CHAPTER FOUR
RESULTS AND DISCUSSION

This portion of the study analyzes the relationship between Foreign Direct Investment (FDI) and its determinants using annual time series data. Prior to direct estimation of the model, it is advisable first to conduct the unit root test to check whether the time-series is stationary or not and after identifying the optimal lag length and VAR lag exclusion Wald test, the presence of the co-integrating vectors is tested using the Johansen co-integration method. Further the Vector Error Correction Model (VECM) test is employed to find the direction of causality between Foreign Direct Investment (FDI) and its determinants. The long-run and short-run relationship is also identified followed by the post diagnostic test.

4.1 Descriptive Analysis

Descriptive analysis is the first step in this research. It helped to describe relevant aspects of phenomena of foreign direct investment and provide detailed information about each relevant variable. STATA 13 software has been used for analysis of the different variables in this study. Descriptive statistics shows the mean and standard deviation of the different variables used in the study. It also presents the minimum and maximum values of the variables, which help in getting a picture about the maximum and minimum values of a variable.

A national data is collected on the targeted dependent and independent variables that covered for the period of 1992-2015. The descriptive summary of these variables‟ which includes the mean, std. dev., and min/max values of these variables for that period is shown as follows.

Table 4.1 Summary statistics of the data

	FDI	EXDT	OP	GCF	GDPGR	INF
Mean	2.825667	65.40917	.4394167	23.98625	7.31625	9.775
Maximum	5.964	148.29	.78	33.08	5.800101	11.60192
Minimum	.002	10.77	.183	11.76	-8.67	-8.48
Std. Dev.	1.875773	44.07338	.1528975	5.628701	13.57	44.39
Observations	24	24	24	24	24	24

Source: Author's own Computation

As shown in table 4.2 above, the study had 24 observations from 1992 to 2015 .One dependent variable FDI and five independent variables (External Debt, Export to GDP, Gross capital formation, GDP Growth rate, and Inflation). The annual inflow of FDI (as a percentage of GDP) ranges between 0.002 and $ 5.964 indicating the minimum and the maximum inflows, in 1992 and 2015 respectively. The average inflow of FDI (as a percentage) is 2.825667 and each observation is deviated from this average by the value of 1.875773. The External debit as a percentage to GDP ranges between 10.77 and 148.29.   The average external debit (as a percentage of GDP) is 65.40917 and each observation is deviated from this average by the value 44.07338.Trade openness (proxy by export to GDP) ranges between 0.183 and 0.78.   The average trade openness (as a percentage of GDP) is 0.4394167 and each observation is deviated from this average by the value 0.1528975. The mean value Gross capital formation (GCF) as a percentage of GDP)) is 23.98625 and it has 11.76   a minimum and 33.08 maximum value. The standard deviation of this variable is 5.628701 which indicate each observation deviated from the average value by the value of 5. 628701. The Real GDP growth rate has a minimum value of -8.67 and a maximum value of 5.800101. The mean value of GDP growth rate   7.31625 and each observation is deviated from this mean value by 13.57. The annual inflation rate under the study period ranges between -8.48 and 11.60192 indicating the minimum and the maximum inflows. The inflation rate has the mean value of 9.775 and each observation is deviated from the average value by 44.39.

4.2 Unit Root Tests

In macro-level data analysis, unit root test is a common practice to accommodate non-stationarity. If this behavior of macro-variables is left uncorrected, it would lead to the problem of spurious regression when there is a need to model relationships among variables. That is, they may indicate a relationship between variables which does not exist. In order to obtain a consistent and reliable result, we must transform the non-stationary data into stationary data by differencing. In contrast to the non-stationary process that has a variable variance and a mean that does not remain near, or returns to a long-run mean over time, the stationary process reverts around a constant long-term mean and has a constant variance independent of time. Before making a formal test for stationarity, it is advisable to conduct a graphical sketch of each of the variables over time. This helps to informally identify the presence of any trending behavior in the variables in question over time.

Formal testing for stationarity and the order of integration of each variable are primarily undertaken using different methods (mostly ADF and Phillips-Perron). The tests with the ADF and PP methods are performed with different trend assumptions (only intercept, both linear trend and intercept, and no intercept and no trend). Performing the tests under all three alternatives will identify whether only the intercept or both the trend and intercept are significant.

In this study, as it can be seen from table 4.1 the test for stationarity using ADF test shows that all three alternatives are included in all variables such as (lnFDI, lnGs, lngcf, lnOP, lnINFLR and lnGDPGR,) in testing for stationarity. A linear trend is found to be insignificant in all of the test equations. The result shows that all of the variables included in the model are integrated of order 1, i.e., I (1)

Null hypothesis: variables have no unit root,

Alternative: variables have unit root

Table 4.2 Augmented Dickey-Fuller Stationarity Test Result

Variables	Test statistics under different assumptions			
	Intercept	Trend and Intercept	No Trend , No Intercept	Order of Integration
lnFDI	(-0.112)	(-1.727)	(-2.705)	I(1)
D(lnFDI)	(-3.919) ***	(-3.808)	(-2.560)	
exdt	(-0.930)	(-2.447)	(-1.066)	I(1)
d. (exdt)	(-4.230) ***	(-4.105)	(-4.185)	
GCF	(-2.134)	(-3.127)	(-0.834)	I(1)
D. (GCF)	(-6.434) *	(-6.259)***	(-6.224) ***	
OP	(-0.522)	(-2.219)	(-1.550)	I(1)
D(.OP)	(-4.829) *	(-4.736)	(-4.259)***	
INFR	(-3.397)	(-4.093)	(-2.407)	I(1)
D. (INFR)	(-6.470) *	(-6.313)	(-6.630) ***	
GDPGR	(-5.232)	(-5.819)	(-1.910)	I(1)
D. (GDPGR)	(-8.212) *	(-7.897)	(-8.456) ***	

Source: Own Computation and note that: 'D' before each variable represents "first Difference".

Note: *= at 1%, ** =at 5% and *** = at 10% significance level

As can be seen from table 4.1 the tests show that all the variables are not stationary in their levels at 5% level of significance. Hence, we take the first difference of the variables and see if they become stationary. We can also determine the order of integration of the variables in the process. Looking at the results of ADF test conducted on the first difference of the variables, the null hypothesis of unit root is strongly rejected. Hence we can conclude that all the variables become stationary at their first difference and hence are I (1).The Phillips-Perron test (see appendix 1) gives a result that is consistent with and supports the results of the ADF. Therefore, both the ADF and PP results are consistent with each other and demonstrate that all variables included in the model are integrated of order 1, i.e., I (1).

4.3 Diagnostic Tests

Diagnostics test are usually undertaken to detect model misspecification and as a guide for model improvement. These tests include serial correlation, heteroscedasticity, multicollinearity, and normality tests. The serial correlation test can be done using the Durbin-Watson test or the Lagrange multiplier (LM) test. It helps to identify the relationship that may exist between the current value of the regression residuals and lagged values. The study used the LM test to investigate serial correlation. The null-hypothesis of the LM test that the residuals are not serially correlated is accepted at 5% level of significance (see appendix).

The Jarque-Bera normality test is used to see whether the regression errors are normally distributed. The null-hypothesis that the residuals are normal is rejected in this particular study. However, econometric theory states that the existence of non-normality does not affect and distort the estimator's BLUE and consistency property (Enders 1995). The non-normality of vector in our model doesn't affect the coefficients and t-values (see appendix).

The hetreroscedasticity test helps to identify whether the variance of the errors in the model are constant or not. The null-hypothesis of the test is that the errors are homoscedastic and independent of the regressors' and that there is no problem of misspecification. The null-hypothesis that the residuals are homoscedastic is accepted at 5% significance level (see appendix).

The study conducted different post-estimation diagnostic tests to guarantee that the residuals from the model are Gaussian that the assumptions are not violated and the estimation results and inferences are trustworthy the results are presented in appendix.

4.4. Results for Co-integration Test and Vector Error Correction Model

4.4.1 Co-Integration Test Result

Lag Order Selection for Endogenous Variables

The Johansen co-integration test result is very sensitive to the number of lags included for the endogenous variables in the estimation of the VAR. This necessitates the determination of an optimal lag order prior to the test of co-integration. The optimal lag order is determined with the sequential modified Likelihood Ratio test statistics [LR], the Final Prediction Error [FPE], the

Akaiki Information Criterion [AIC], the Schwarz Information Criterion [SC], and the Hannan Quinn Information Criterion [HQ]). LR, FPE, AIC, SC and HQ suggest an optimal lag of one.

Table 4.3 Lag selection-order criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-311.225		2.1e+06	28.7477	28.9956	28.8061
1	-243.567	135.31*	46685.2*	24.8698*	25.2202*	26.3575*
2	-229.128	28.88	185991	25.8298	26.4723	28.5574

Source: Own computation

From the given table above, one can easily observed that all optimal lag order selection criteria suggests that at lag one all criteria's are significance at 5% accept AIC.

The Johansen Co-integration Test Result

The ADF and Philips – Person stationarity test results presented previously indicate that all the variables are not level stationary. This suggests that regression based on the level variables may produce an unreliable outcome. However, the Granger representation theorem states that it is possible for non-stationary variables to produce a stationary relationship if they are co-integrated. This would imply that there is a meaningful long run relationship among the variables. Thus, the presence and the number of such co-integrating relationships are checked using the trace and the maximum- eigen value methods.

The Johansen method of co-integration rank test result is very much dependent on the deterministic trend assumption in the underlying VAR structure, in addition to the number of lags of the endogenous variables. Hence, since the results may differ with the alternatives, a decision must be made as to which one to choose for the purpose of further analysis. So referring to the guide provided by STATA 13. The guide line is when the trace statistics and maximum eigen value is more than 5% critical value there is long run relationships among variables. Hence it is possible to run Vector Error Correction Model (VECM).

Table 4.4 Johansen Co-integration Rank Test

Test	Null Hypothesis	Alternative Hypothesis	Eigen value	Trace test statistics	Critical Value (5%)
Trace test statistics	Ho=0	Ho≠0		143.6954	124.24
	Ho=0	Ho≠0	0.88453	94.0436*	94.15
	Ho=0	Ho≠0	0.78833	58.3314	68.52
	Ho=0	Ho≠0	0.56226	39.3305	47.21
	Ho=0	Ho≠0	0.46625	24.8906	29.68
	Ho=0	Ho≠0	0.43768	11.6500	15.41
	Ho=0	Ho≠0	0.39717	0.0093	3.76
Test	*Null Hypothesis*	*Alternative Hypothesis*	*Eigen value*	*Max-Eigen statistics*	*Critical Value (5%)*
Max statistic	Ho=0	Ho≠0		49.6518	45.28
	Ho=0	Ho≠0	0.88453	35.7122	39.37
	Ho=0	Ho≠0	0.78833	19.0009	33.46
	Ho=0	Ho≠0	0.56226	14.4398	27.07
	Ho=0	Ho≠0	0.46625	13.2406	20.97
	Ho=0	Ho≠0	0.43768	11.6407	14.07
	Ho=0	Ho≠0	0.39717	0.0093	3.76

Note: * denotes rejection of null hypothesis at 5 percent level.

Both the trace and the maximal Eigen value tests identified that at least one co-integrating relationships at 5% significance level are existed (see Table 4.3). Such that, foreign direct investment has significant long-run relationship with trade openness, GDP growth rate, infra-structure, external debt and inflation.

4.5 Long-run Relationship

As explained above, there is one co-integrating relationship based on the Johansen co-integration test. This study aimed to examine the determinants of Foreign Direct Investment in Ethiopia: external debt, trade openness, infrastructure, GDP growth rate and Inflation with Foreign Direct Investment. The equation is solved through Johansen normalization restriction imposed or ad-hoc normalization. And the Johansen trace test was used to confirm the appropriateness of the selected equation.

4.6 Vector Error Correction Model (VECM)

In the previous analysis, it was found that the data has one co-integrating relationship based on the Johansen co-integration test. Hence, VECM is performed by choosing the optimal lag that is chosen based on the information criterion seen in the previous section and by using the result of the Johansen co-integration test. The VECM consists of two parts: the matrix of long-run co-integrating coefficients that is used to derive the long-run co-integrating relationship, and the short-run coefficients which is for the short-run analysis.

Table 4.5 Estimates of β coefficients normalized to LRFDI

	EXDT	GCF	OP	INFR	GDPGR
Coefficient	0.045375	0.1149195	7.319015	0.0867576	0.1562343
Std. Err.	0.0005461	0.0063707	0.2792498	.0019402	.0040901
t-statistics	83.10	18.04	26.21	44.72	38.20

Source: Own computation

The estimation shows that, in the long run, FDI can be explained by External debt, Gross Fixed capital formation, Openness, Inflation rate and GDP growth rate. To understand and interpret the above result more easily we can rewrite the long run equilibrium relationship normalized on LRFDI as

LRFDI= -9.175248 +0.045EXDT + 0.115GCF+ 7.32OP+0.087INFR+ 0.156GDPGR

The above equation shows that, in the long run lnFDI can be explained by Gross Fixed Capital Formation, inflation rate, External Debt, Openness and GDP growth rate. The long run impact of

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GFCF on FDI is found to be positive and significant. A one percent increase change in the level of infrastructure development causes a 0.12% increase change in FDI inflows in Ethiopia assuming other variables are constant. That is GFCF which constitute all kinds of infrastructure development is positively related with FDI given that a good infrastructural facilities in Ethiopia have a significant effect on FDI in the long run since surplus of proper infrastructure decreases the cost of doing business.

Though we expect negative effect, the inflation rate is found statistically significant and has positive relationship. Results indicate that inflation rate is highly significant which attracts the foreign investors to invest in Ethiopia. External Debt also has positive and significant relation with FDI in the long run. More debt servicing is a result of more debt and excessive foreign debt is one source of instability and uncertainty in macroeconomic environment of underdeveloped countries and hence this foreign debt is likely to affect adversely the inflow of FDI. Excessive foreign debt may signal imminent fiscal crises and foreshadow the future economic situation in a county. However, countries like Ethiopia may borrow in order to invest in productive sectors such as infrastructure which could have improved the overall economy of the country and thus attract more FDI.

We find that openness has a positive and significant impact on FDI in the long run. This is expected and is consistent with previous results such as Chakrabarti's (2001) finds openness to trade, measured by exports plus imports to GDP, being positively correlated with FDI. Morisset(2000) finds a positive and significant correlation between trade openness and the investment. Similarly, there is positive and significant relationship between FDI and GDP growth rate in the long run. This result strongly support the study of BurcuTurkean , et al.(2008), that suggest economic growth stimulate growth rate of FDI inflow more than the growth rate of FDI stimulate economic growth. This result also supports the study of Gohou and Soumare (2012) that the impact of enhancement of GDP led more increase in FDI of developing countries as compared to developed countries. Hence, the more developed the country is the more it attract FDI that again translate to higher economic growth.

Short – run Relationship

This part of the study discusses the result of the D (lnFDI) equation in the error-correction model from which the short run impact of External Debt, Gross Fixed Capital Formation (GFCF), Openness, inflation rate (INFr) and Gross Domestic Product growth rate (GDPGR) on Foreign Direct Investment (FDI) can be analyzed.

Table 4.6 Short run coefficient with dependent variable: lnFDI

	COFFICIENT	STD. ERROR	T-VALUE	P-VALUE
CointEq1	-0.2282744	0.0761045	-3.00	0.003
LD.EXDT	-0.0012161	0.0043193	-0.28	0.778
LD. GCF	0.0291422	0.0331167	0.88	0.379
LD. OP	2.328242	1.432555	1.63	0.104
LD. INFR	0.0046944	0.0062834	0.75	0.455
LD. GDPGR	-0.0071774	0.0127631	-0.56	0.574
CONSTANT	0.1021784	0.09841	1.04	0.299

Own computation

As it can be seen from table 4.5, the coefficient of the error correction term for the equation is negative and significant as expected. This tells us that there is a reasonable adjustment towards the long run steady state. This guarantees that although our dependent variable FDI may temporarily deviate from its long-run equilibrium value, it would gradually converge to its equilibrium. The error correction term of -0.2282744 shows that about 22.8 percent of the deviation of the FDI from its equilibrium value is eliminated every year. Or ECT is 22.8%, negative, and statistically significant at 1%. -0.2282744 shows that short run values of FDI converge to its long run equilibrium level by 22.8% speed of adjustment every year by the contribution of EXDT, GCF, OP,INFR and GDPGR. Since error term is negative and significant, therefore there exists a long-run causality running from external debt, gross capital formation, openness, inflation rate and GDP growth rate   to Foreign Direct Investment (FDI) of Ethiopia. The error correction term of -0.2282744 shows that about   22.8 percent of the deviation of the FDI from its equilibrium value is eliminated every year; hence, full adjustment would require a period of less than five years.

As can be seen from the above result in the short run, External debt, Gross fixed capital formation, openness to trade, macroeconomic stability and GDP growth rate is insignificant indicating that it doesn't have a major impact on FDI in the short run.

Table. 4.7 Post – Estimation Diagnostics

Null hypothesis	Variables	Chi2	Prob> chi2
(1) [D_FDI] LD.Exdt = 0	LD.Exdt	0.08	0.7783
(2) [D_FDI]LD.Gcf = 0	LD.Gcf	0.77	0.3789
(3) [D_FDI]LD.OP = 0	LD.OP	2.64	0.1041
(4) [D_FDI]LD.INFR = 0	LD. INFR	0.56	0.4550
(5) [D_FDI]LD.GDPGR = 0	LD.GDPGR	0.32	0.5739

Source: Own computation

As shown from the above table, probability of all independent variables is greater than 5% critical value and not equal to zero. That means there is no short run causality running from external debt, gross fixed capital formation, trade openness, inflation rate and GDP Growth rate to Foreign Direct Investment of Ethiopia. But there is a long run causality running from gross domestic saving, external debt, gross fixed capital formation, trade openness, inflation rate and GDP Growth rate to Foreign Direct Investment (FDI) of Ethiopia.

CONCLUSIONS AND POLICY RECOMENDATIONS

5.1 CONCLUSIONS

This study empirically investigates the possible factors that determine the inflow of Foreign Direct Investment in Ethiopia during 1992-2015 by using Vector Autoregressive Model (VAR) and Vector Error Correction Model (VECM). Based on review of previous researches, five variables have been identified that generally determine the FDI inflows. They are GDP growth rate, trade openness, infrastructure, inflation rate, and external debt. After the selection of variables the study proceed to unit root testing and Johansen co integration approach and then to vector error correction approach.

In estimating the result it is found that in the long run all variables such as External Debt, Openness, Gross Fixed Capital Formation, GDP growth rate and Inflation rate have positive coefficient and are statically significant. As can be seen from the above result in the short run, External debt, gross fixed capital formation, openness, macroeconomic stability and GDP growth rate are insignificant indicating that they don't have a major impact on FDI in the short run.

The table indicates that GDP growth rate has the expected positive sign meaning that the larger the market size of the country the more attractive it is to FDI. A large market size indicates an increase in demand for products and services and allows for the achievement of economies of scale and encourages horizontal FDI. Economic growth can motivate foreign firms to plan new projects or new production facilities since it can generate more profitable opportunities. The finding of positive and significant relationship between FDI and market size is consistent with findings of Anyanwu (2007), Miteku (2013), and Getinet et al. (2005).

The other objectives of this paper is to test the existence of long term relationship between the FDI and the five explanatory variables using a Johansen co-integration approach to co-integration on time series data of Ethiopia from 1992-2015. The result shows that there is co-integration between FDI and the five selected variables. The finding is consistent with Mitku (2013), Asmelash(2015), Liya and Yonas (2016) but inconsistent with Amanuel (2006).

Finally, it can be concluded that the results of this study can be a guideline and provide insight to policymakers such as government and national bank of Ethiopia in determining the ways to attract more foreign direct investment inflow to Ethiopia.

5.2 Policy recommendations

In order to reap the benefit from foreign direct investment countries are expected to conduct numerous studies at national level on the challenges in investing to the country. Recognizing the rapidly growing investment destination of Ethiopia, still many tasks must be done in order to operate smoothly so that the country will benefit from this sector.

As it can be seen from the time series analysis of FDI in Ethiopia, foreign direct investment is more determined by infrastructure development (GCF), Openness (OP), market size(GDPGR), macroeconomic stability (INFR) and external debt (EXDt) in long run case. Hence, in order to increase the inflow of FDI first it is very crucial to concentrate on the above economic activities.

The other factor is there should be a market system that support moderate competition and free entry so that both the domestic and the foreign firms enhance their managerial and technological capacity because prevalence of significant market power may lead to reduce the benefits of the foreign investors that would also translate to exploitation of consumers and workers in the market. In addition to that, the government should give more attention on the potential crowding out effect on domestic investment. This can be done in a way that to create competitive advantage and benefit from spillover effect and the countries should have a higher absorptive capability of advanced technology to fully utilize of FDI benefit.

In our time series analysis we found that GDP growth rate has positive and significant effect on FDI. These suggest the decisive role of growth in stimulating investment by foreign as well as domestic investors. Hence, the current fast economic growth of the country signals a country's economic prospects and encourages foreign investors. Keeping up the growth momentum and ascertaining its sustainability is a key to attracting more FDI. Strengthening the growth performance of the economy through the creation of favorable macroeconomic environment, developing vital infrastructure, ensuring the quality of institutions are some of the important measures essential to attract FDI.

Considering the positive impact the trade liberalization has on FDI the government should improve the investment environment by taking continuous liberalization measures that would make Ethiopia attractive to foreigners and create a hospitable business climate. These liberalizations could include the opening of more sectors to foreign investors. In addition to improving the investment environment of the country these measures could indirectly encourage FDI by improving the poor infrastructure of the country. The insignificant effect of export in the short run in attracting FDI could indicate that measures should be taken to insure that more FDI projects in the country are export oriented. The findings also have implications for Ethiopian policy towards encouragement of FDI inflows and the promotion of exports. It is also recommended that the country should try to attract more export oriented foreign investments not only to increase export growth but also to increase the foreign exchange reserve of the country.

For next researchers who are interested in further studying it is highly recommended that they should increase the sample size to more than 30 observations. Researchers may use monthly, quarterly or semiannual data instead of using annual data. This is because the bigger the sample size, the lower the probability of having multicollinearity, heteroscedasticity and autocorrelation problems. This will prevents the needs to split the model but run it as a whole instead. Hypotheses testing will provide researchers with better results in detecting these problems.

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Appendix 1

Table 4.2 Phillips-Perron test for unit root Result

	Variables	Test statistics under different assumptions			
		Intercept	Trend and Intercept	No Trend , No Intercept	Order of Integration
1	lnFDI	(-0.067)	(-6.607)	(-1.497)	I(1)
	D(lnFDI)	(-17.778)	(-17.803)	(-10.402)	
2	LnS	(-2.624)	(-17.147)	(0.918)	I(1)
	D(LnS)	(-20.550)	(-20.538)	(-20.511)	
3	(exdt)	(-2.171)	(-12.084)	(-1.234)	I(1)
	d. (lnexdt)	(-17.750)	(-17.265)	(-17.952)	
4	(GCF)	(-5.103)	(-16.356)	(-0.500)	I(1)
	D. (lnGCF)	(-28.714)	(-29.130)	(-27.520)	
5	(OP)	(-0.558)	(-10.774)	(-1.247)	I(1)
	D. (lnOP)	(-21.090)	(-21.097)	(-18.843)	
6	(INFR)	(-15.476)	(-19.111)	(-7.720)	I(1)
	D. (INFR)	(-23.991)	(-23.974)	(-23.999)	
7	(GDPGR)	(-22.843)	(-26.276)	(-5.865)	I(1)
	D. (GDPR)	(-8.212)	(-7.897)	(-8.456)	

Source: Own Computation Using STATA 13 and note that: 'D' before each variable represents "first Difference".

Appendix 2

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: fitted values of fdi


        chi2(1)     =     0.41
        Prob > chi2 =   0.5204
```

Appendix 3

```
Durbin-Watson d-statistic(  7,    24) =  2.224065
```

Breusch-Godfrey LM test for autocorrelation

lags(p)	chi2	df	Prob > chi2
1	0.953	1	0.3289

H0: no serial correlation

Durbin's alternative test for autocorrelation

lags(p)	chi2	df	Prob > chi2
1	0.662	1	0.4160

H0: no serial correlation

Durbin's alternative test for autocorrelation

lags(p)	chi2	df	Prob > chi2
1	0.103	1	0.7488

H0: no serial correlation

```
. estat vif
```

Variable	VIF	1/VIF
gcf	5.64	0.177224
gs	5.19	0.192765
op	3.97	0.251885
exdt	2.97	0.336469
gdpr	1.58	0.634641
infr	1.52	0.657085
Mean VIF	3.48	

Appendix 5

```
Ramsey RESET test using powers of the fitted values of fdi
      Ho:  model has no omitted variables
               F(3, 14) =    1.33
               Prob > F =    0.3047


. vecrank fdi gs exdt gcf op infr gdpr, trend(constant) lags(1) max

                     Johansen tests for cointegration
Trend: constant                                Number of obs =      23
Sample:  1993 - 2015                                    Lags =       1
```

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	7	-354.62943	.	143.6954	124.24
1	20	-329.80353	0.88453	94.0436*	94.15
2	31	-311.94743	0.78833	58.3314	68.52
3	40	-302.44699	0.56226	39.3305	47.21
4	47	-295.22706	0.46625	24.8906	29.68
5	52	-288.60674	0.43768	11.6500	15.41
6	55	-282.78641	0.39717	0.0093	3.76
7	56	-282.78174	0.00041		

maximum rank	parms	LL	eigenvalue	max statistic	5% critical value
0	7	-354.62943	.	49.6518	45.28
1	20	-329.80353	0.88453	35.7122	39.37
2	31	-311.94743	0.78833	19.0009	33.46
3	40	-302.44699	0.56226	14.4398	27.07
4	47	-295.22706	0.46625	13.2406	20.97
5	52	-288.60674	0.43768	11.6407	14.07
6	55	-282.78641	0.39717	0.0093	3.76

```
Vector error-correction model

Sample:  1994 - 2015                        No. of obs     =          22
                                            AIC            =   24.99744
Log likelihood = -205.9718                  HQIC           =   25.80354
Det(Sigma_ml)  =  .3196828                  SBIC           =   28.41935

Equation              Parms      RMSE      R-sq      chi2     P>chi2

D_fdi                     9    .304617    0.7105  31.89849    0.0002

                   Coef.   Std. Err.       z    P>|z|     [95% Conf. Interval]

D_fdi
      _ce1
       L1.    -.2282744    .0761045    -3.00    0.003    -.3774365    -.0791122

       fdi
       LD.    -.2324413    .2955398    -0.79    0.432    -.8116886     .346806

        gs
       LD.    -.0294776    .0255778    -1.15    0.249    -.0796091    .0206539

      exdt
       LD.    -.0012161    .0043193    -0.28    0.778    -.0096817    .0072495

       gcf
       LD.     .0291422    .0331167     0.88    0.379    -.0357654    .0940498

        op
       LD.     2.328242    1.432555     1.63    0.104    -.4795146    5.135999

      infr
       LD.     .0046944    .0062834     0.75    0.455    -.0076209    .0170096

      gdpr
       LD.    -.0071774    .0127631    -0.56    0.574    -.0321926    .0178378

     _cons     .1021784      .09841     1.04    0.299    -.0907018    .2950585
```

```
. test ([D_fdi]: LD.gs)

 ( 1)  [D_fdi]LD.gs = 0

           chi2( 1) =    1.33
         Prob > chi2 =   0.2491

. test ([D_fdi]: LD.exdt)

 ( 1)  [D_fdi]LD.exdt = 0

           chi2( 1) =    0.08
         Prob > chi2 =   0.7783

. test ([D_fdi]: LD.gcf)

 ( 1)  [D_fdi]LD.gcf = 0

           chi2( 1) =    0.77
         Prob > chi2 =   0.3789

. test ([D_fdi]: LD.op)

 ( 1)  [D_fdi]LD.op = 0

           chi2( 1) =    2.64
         Prob > chi2 =   0.1041

. test ([D_fdi]: LD.infr)

 ( 1)  [D_fdi]LD.infr = 0

           chi2( 1) =    0.56
         Prob > chi2 =   0.4550

. test ([D_fdi]: LD.gdpr)

 ( 1)  [D_fdi]LD.gdpr = 0

           chi2( 1) =    0.32
         Prob > chi2 =   0.5739
```

Johansen normalization restriction imposed

beta	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
_ce1						
fdi	1	.	.	.	.	.
gs	-.2954418	.0041151	-71.80	0.000	-.3035072	-.2873765
exdt	.045375	.0005461	83.10	0.000	.0443047	.0464452
gcf	.1149195	.0063707	18.04	0.000	.1024331	.1274059
op	7.319015	.2792498	26.21	0.000	6.771695	7.866334
infr	.0867576	.0019402	44.72	0.000	.0829548	.0905604
gdpr	.1562343	.0040901	38.20	0.000	.1482179	.1642507
_cons	-9.175248	.	.	.	.	.

Selection-order criteria

Sample: 1994 - 2015   Number of obs   =   22

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-311.225				2.1e+06	28.7477	28.8061	28.9956
1	-243.567	135.31*	25	0.000	46685.2*	24.8698*	25.2202*	26.3575*
2	-229.128	28.88	25	0.269	185991	25.8298	26.4723	28.5574