

# Loan and Investment in a Developing Economy



# Loan and Investment in a Developing Economy:

*An Ethiopian Perspective*

Edited by

Arnis Vilks, Girma Tegene Demessie,  
Goitom Abera Baisa  
and Kibrom Aregawi Weldegiorgis

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# INTRODUCTION

## ARNIS VILKS

While “development” is a multidimensional concept, covering at least life expectancy, education, and income per capita – the three dimensions which enter the Human Development Index (UNDP, n.d.) – economists tend to focus on income per capita. Arguably, life expectancy, education, and many other aspects of human development, are unlikely to improve considerably unless there is sufficient growth of income per capita. In turn, it is a classic result in Solow’s (1956) equilibrium model of economic growth that, in the long run, income per capita in a country depends on the population growth rate, technological progress, and the rate of saving or investment. The developing countries of Sub-Saharan Africa tend to be weak in all three of these factors: population growth rates are high, technological progress is slow, and the share of investment in GDP is considerably lower than it is in the industrialized countries. It is therefore quite natural that increasing investment is one of the principal means by which developing countries try to raise growth and income per capita.

As it is a national income accounting identity that investment in an economy equals the sum of private saving, public saving, and capital inflows, increasing investment may mean increasing private or public saving or else capital inflows from abroad - in particular, foreign direct investment.

From a microeconomic perspective, every investment needs to be financed. Very often this poses considerable challenges for economic agents in developing countries. Even if the expected net present value of a particular project would justify the required investment, own savings may not suffice, and a loan may not be accessible. Promoting the availability of loans – be it by banks or other sources – is thus a further natural lever by which investment and thereby development can be fostered.

Of course, per capita income as such is a measure of development that completely neglects issues of income distribution – poverty is not necessarily reduced by GDP growth. It is therefore loan provision to



micro-investors that is of particular interest from the perspective of poverty reduction. It may be of similar importance from the perspective of social inclusion, and the prominence of microfinance institutions suggests that these special loan-providing institutions deserve particular attention and scrutiny.

Throughout the developing world, the main part of GDP is produced by micro and small enterprises, and in rural areas. Again, this mandates particular attention to the special issues arising with loan and investment in these sectors.

All of these general considerations are reflected in the contributions to the present volume. They are investigated and discussed from the perspective of Ethiopia, however, and in most cases based on the study of empirical data from Ethiopia.

The papers in part I deal with foreign direct investment (FDI) in Ethiopia. Abiyot Dagne conducts a time series analysis in order to establish the determinants of FDI, Gebrehiwot Hailegiorgis analyses the sectoral composition of FDI in Ethiopia, and the impact it has on economic growth, while Mitiku Gebrekidan uses an Autoregressive Distributed Lag (ARDL) model to conduct a trend, determinant, and impact analysis of FDI.

In part II, three papers look at aspects of the credit markets in Ethiopia: Million Assefa's contribution analyses the short and long-term impact of bank-specific and macroeconomic variables on bank credit to the private sector (also using an ARDL model), while Dereje Getacher uses evidence from Mekelle city in the northern Ethiopian region of Tigray to establish the determinants of trade credit use, and Misraku Molla studies the determinants of the net interest margins in the Ethiopian banking industry.

Microfinance, poverty reduction, and social inclusion are the topics of part III. Achameyeleh Tamiru uses evidence from rural northern Ethiopia to investigate if microfinance actually helps households to achieve an income above self-sufficiency. Muhammedamin Hussen reviews the theoretical and empirical literature on the nexus between loan provision by microfinance institutions and poverty reduction, and links it to local economic development strategies. Artem Boltyenkov discusses an economic policy for financing the social inclusion of the hearing impaired.

Part IV is devoted to the financing of small enterprises. The first paper by Aregawi Gebremichael analyses the impact of bank loan, the second one, by Habtamu Tefera and Aregawi Gebremichael, the impact of owners' financing preferences on the growth of small enterprises. Both papers use empirical evidence from northern Ethiopia. Haftu Arefe conducts a case study on the loan repayment performance of micro and small-scale enterprises, using data from Robe town in the Oromia region.

Rural credit issues are the subject of the final part V: Adem Kedir investigates the rural credit system in the Arsi zone of Oromia, and argues that there is a mismatch between the demand and supply of credit which resembles "prescription without laboratory diagnosis". Ganfure Tarekegn's paper contains an assessment of the reasons why private banks in Ethiopia have served the agricultural sector to only a negligible extent.

Preliminary versions of all contributions of the present volume were presented at an Ethiopian National Research Conference in September 2013 that was jointly organized by Mekelle University's College of Business and Economics and the Ethiopian Public Financial Enterprises Agency.

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**PART I**

**FOREIGN DIRECT INVESTMENT  
AND GROWTH**

# CHAPTER ONE

## DETERMINANTS OF FOREIGN DIRECT INVESTMENT IN ETHIOPIA: A TIME SERIES ANALYSIS

ABIYOT DAGNE BELAY

### **Abstract**

In their attempt to attract Foreign Direct Investment (FDI), most African countries have liberalized trade and attempted to create an enabling environment in recent decades. Ethiopia, like many African countries, took some steps towards liberalizing trade and the macroeconomic regime, as well as introducing some measures aimed at improving the FDI regulatory framework. This paper attempts to study determinants of foreign direct investment in Ethiopia over the period 1973-2003 E.F.Y. The study gives an extensive account for the theoretical explanation of FDI, as well as reviewing the policy regimes, and undertakes an empirical analysis to establish the determining factors of FDI in Ethiopia. Findings show that real GDP growth, export orientation, gross fixed capital formation, per capita GDP and liberalization, have a long run relationship and positive impact on FDI. On the other hand, macroeconomic instability, huge government budget deficit, poor labor productivity, and restricted financial systems also have a long run significant relationship, but negative impact on FDI. These findings simply indicate that higher GDP growth, stable macroeconomic and political environment, sufficient infrastructural development, and outward looking strategy and major improvements in infrastructure are essential to attract FDI to Ethiopia in the long run.

### **Acronyms**

AIC	Akaike information criterion
EEA	Ethiopian Economic Association
E.F.Y.	Ethiopian Fiscal Year

EIA	Ethiopian Investment Authority
FDI	Foreign direct investment
GNP	Gross National Product
GDP	Gross Domestic Product
HQIC	Hannan-Quinn information criterion
IMF	International Monetary Fund
LDCs	Least Developed countries
MNCs	Multinational corporations
MoFED	Ministry of Finance and Economic Development
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
SBIC	Schwarz's Bayesian information criterion
SNNPR	Southern Nations, Nationalities and Peoples Region
SSA	Sub-Saharan Africa
UNCTAD	United Nations Conference on Trade and Development

## 1. Introduction

### 1.1. Background of the Study

Foreign direct investment (FDI) is an alternative source of capital to bridge the gap between savings and the required investment level. The proponents of foreign direct investment point out that FDI fills savings, foreign exchange, and local revenue gaps of developing economies. FDI can also provide managerial, entrepreneurial, and technological skills, increases exports, and integrates the country's economy into the global economic network. Conversely, the other group argues that the benefits that can be derived from FDI inflows are quite small compared to the adverse effect. The major "costs" of FDI include stifling of infant domestic industries, loss of political sovereignty, and deterioration of balance of payment due to the foreign investors' excessive capital good importation and repatriation of profits. Consequently, most developing countries were skeptical about the virtues of FDI.

Ethiopia's domestic savings rate is low compared to the fast pace of capital accumulation observed between 2004 and 2011. Ethiopia has been experiencing single-digit domestic saving rates, while economic growth was in double digits, supported by investment rates beyond 25 percent of GDP. Consequently, Ethiopia is confronted with a persistent and wide domestic saving and investment gap which has been financed by external sources (World Bank, 2013). In recent years, Ethiopia has started encouraging the inflow of FDI by

improving the investment climate and providing different incentive packages to enhance its growth and development.

This study focused on:

- Review of the economic and FDI performance of Ethiopia
- An empirical investigation of some of the determinants of FDI inflows into the country

## **1.2. Statement of the Problem**

The Ethiopian economy has grown at an annual growth rate of at least 11% for the last decade, so that the country can attain the per capita income level achieved today by average Sub-Saharan African (SSA) countries. However, Ethiopia's gross domestic savings as a proportion of GDP is quite low, and it is unlikely to achieve this growth rate by mobilizing the meagre domestic savings (EEA, 2000 and 2007). The current government of Ethiopia has realized the inadequacy of the domestic capital and opened several economic sectors to foreign investors. Since 1992, market oriented economic reforms have taken place, and emphasis has been given to attracting FDI (Ethiopian Economics Association, 2004). As a result, there has been a significant increase in the inflow of FDI to Ethiopia. However, the gap between gross investment and domestic savings has remained wide due to the low levels of income and domestic savings. FDI as a source of capital and other business know-how is therefore desperately needed to finance growth and development. The gap between investment and savings in Ethiopia is very wide due to the low level of income and domestic savings (Getinet and Hirut, 2006). Accordingly, out of the total investment projects licensed between 1992 and 2012, FDI's share is about 15.71 percent (MoFED, 2012). However, in 2011/12 the overall trend of investment, both by the total number of projects and capital invested, has shown a decline.

The savings investment gap in Ethiopia is met through investments generated from Official Development Assistance (ODA) from abroad and Foreign Direct Investment. However, as mentioned above, the FDI inflow has remained very small. Ethiopia's performance in attracting FDI is very poor compared to many African countries. At this juncture, identifying the determinants of FDI in Ethiopia is a key step towards knowing the factors responsible for the poor performance of Ethiopia in attracting FDI. Getinet Haile and Hirut Assefa (2006), and Solomon Mamo Woldemeskel (2008) have tried to identify the factors that are responsible for the performance

of Ethiopia in attracting FDI. Unlike the two previously developed lines of enquiry, this study tried to analyze the determinants of FDI and whether there is the long run relationship using a Vector Error Correction Model. This study further explores, both analytically and empirically, the determinants of foreign direct investment in Ethiopia, and its linkage to the growth of the country's economy in the long run.

### **1.3. Objectives of the Study**

The ultimate objective of this study was to identify the major determinants of inflows of FDI to Ethiopia. Therefore, this study answered the main research questions:

1. What are the major determinants of FDI inflows in Ethiopia?
2. Does a long run relationship exist between FDI and economic growth?

Moreover, an objective was to forward some policy implications that can be expected to improve the contribution of FDI in order to ensure sustained economic growth.

### **1.4. Significance of the Study**

This study hopes to contribute to further research and the unsettled debate on determinants of FDI, and further inform policy makers to take prompt policy action in order to attract investments from abroad to boost economic growth.

### **1.5. Limitation of the Study**

Due to a problem in accessibility of data, particularly on effectiveness of FDI and FDI outflow, the scope of this research is limited to investigating only FDI inflow.

### **1.6. Organization of the Study**

This project has six chapters. After the above introduction, chapter two provides a review of theoretical and empirical literature related to FDI and its relationships with the determinants. Chapter three provides a brief review of the economic structure of Ethiopia, the FDI policy of the country, and the sectoral and regional distribution of FDI in Ethiopia. The

data types and sources, model specification and estimation techniques are discussed in the fourth chapter. Chapter five reports the results of the empirical analysis, and chapter six presents conclusions and recommendations

## **2. Literature Review**

The crucial role of FDI in terms of capital formation, and spillover effects on trade and technological progress has led to the development of theoretical and empirical literature that has focused on identifying the possible determinants of FDI. This section provides a survey of this literature on FDI and its linkage to economic growth.

### **2.1. Theoretical Explanations of FDI**

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 factor endowments between countries. The theory of portfolio investment is one of the earliest explanations of FDI. The basis for this explanation lies in interest rate differentials between countries. Capital, according to this explanation, moves in response to changes in interest rate differentials between countries/regions, and multinational companies are simply viewed as arbitrageurs of capital, from countries where its return is low to countries where it is high. This explanation, however, fails to account for the cross movements of capital between/across countries. In practice, capital moves in both directions between countries. In addition, that capital is only a complementary factor in direct investment, and this theory does not explain why firms go abroad, nor does it contribute to the criticism of the neoclassical theory of portfolio investment (Harrison et al., 2000).

Vernon's product life cycle theory is another explanation of FDI. This theory focuses on the role of innovation and economies of scale in determining trade patterns. It states that FDI is a stage in the life cycle of a new product, from its invention to maturity. A new product is first manufactured in the home country for the home market. When the home market is saturated, the product is exported to other countries. At later stages, when the new product reaches maturity and loses its uniqueness, competition from similar rival products becomes more intense. At this stage producers would then look for lower cost foreign locations. This theory shows how market seeking and cost reduction motives of



companies lead to FDI. It also explains the behaviour of multinational companies and how they take advantage of different countries that are at different levels of development (Getinet and Hirut, 2006).

Dunning (1993) identified three possible motives for FDI:

*Market seeking FDI:* refers to FDI for the purpose of serving local and regional markets. Host countries' characteristics that can attract market-seeking FDI include market size of the host country, per capita income, and growth (potential) of the market.

*Resource/asset seeking FDI:* refers to FDI for the purpose of acquiring resources which are not available in the home country. Such resources include natural resources, availability of raw materials, and productivity and availability of skilled and unskilled labor.

*Efficiency seeking FDI:* this kind of FDI occurs when the firm can gain from the common governance of geographically dispersed activities, especially in the presence of economies of scale and scope and diversification of risk. The above three motives of FDI are categorized under economic determinants of FDI.

A formal definition for FDI, as a phenomenon of international business, is investment “that reflects the objective of a resident entity in one economy obtaining a lasting interest in an enterprise resident in another economy” (IMF 1993, p. 86). The resident entity (foreign investor) owns an equity capital stake of at least 10% of the ordinary shares in an incorporated enterprise, or its equivalent for an unincorporated enterprise. This reflects a long-term relationship between the investor and the enterprise, and implies a significant degree of influence by the investor in enterprise management. A direct investment enterprise can be a subsidiary (a non-resident investor owns more than 50%), associates (an investors owns 50% or less) and branches (wholly or jointly owned unincorporated enterprises) either directly or indirectly owned by the foreign investor.

Foreign Direct Investment can also be defined as an investment made by a firm or an entity based in one country, into a firm or entity based in another country. According to the World Bank, foreign direct investment is defined as “an investment made to acquire a lasting management in an enterprise operating in a country other than that of the investor”.

## 2.2. Empirical Evidence on the Determinants of FDI

Many studies have examined the determinants of foreign direct investment. Nonnenberg and Mendonca (2004) explored the determinants of foreign direct investment in developing countries. They used an econometric model based on panel data analysis for 38 developing countries (including transition economies) for the 1975-2000 period, and argued that FDI is correlated with level of schooling, economy's degree of openness, risk and variables related to macroeconomic performance, like inflation and average rate of economic growth.

Root and Ahmed (1979) empirically analyzed the determinants of non-extractive direct investment inflows for 70 developing countries over the period 1966-70. Their analysis focuses on testing the significance of the economic, social, and political variables in explaining the determinants of FDI. They conclude that developing countries that have attracted the most non-extractive direct foreign investment are those that have substantial urbanization, a relatively advanced infrastructure, comparatively high growth rates in per capita GDP, and political stability.

Singh and Jun (1995) find export orientation (export as percentage of GDP) to be the strongest factor for explaining why a country attracts FDI. Chakrabarti (2001) finds openness to trade, measured by exports plus imports to GDP, being positively correlated with FDI. Bende-Nabende (2002) found market growth, export-orientation policy, and liberalization as the most dominant long run determinants of FDI. Salisu (2003) found openness to trade to have a positive and significant effect on FDI in Nigeria, while Tsikata et al. (2000) found export-orientation as a significant determinant of FDI inflows to Ghana. Asiedu (2002), using exports and imports as a percentage of GDP to proxy openness, comes to a similar conclusion for Sub-Saharan African host countries. In general, the empirical evidence supports the theoretical argument in favor of favorable government policies and liberal trade regimes as important determinants of FDI. From the theoretical point of view, market size, which is usually measured by real per capita income, plays an important role in attracting FDI, especially market seeking FDI. However, the empirical evidence for market size as a determinant of FDI has mixed results. Obwona (2001) found market size to be a significant determinant of FDI in Uganda. Investigating the determinants of FDI in developing and developed countries, Chakrabarti (2001) concludes that host country market size, measured by per capita GDP, has a positive and significant effect on FDI. The World Investment Report (1999) states that factors most frequently mentioned by foreign

investors in Africa as having a negative influence on investment are bribery, high administrative cost of doing business, and access to capital. Human capital, both in terms of quantity and quality, is another important factor in promoting labor intensive and export oriented FDI in particular. Noorbakhsh et al. (2001), using secondary school enrolment ratio and the number of accumulated years of secondary and tertiary education in the working age population as a proxy to human capital, found human capital to be a significant determinant of FDI inflows for 36 developing countries. Lewis (1999) also provides support to the proposition that human capital in host countries is a key determinant of foreign direct investment in developing countries. He noted that education, especially in technical disciplines, provides the least developed countries with the skills that are required by the multinational companies. Nunnenkamp (2002) analyzed globalization-induced changes in the relative importance of foreign direct investment in developing countries. His findings indicate that traditional market-related determinants are still dominant factors, but the availability of local skills has become a relevant pull factor of FDI in the process of globalization.

Getinet and Hirut (2006) studied the nature and determinants of foreign direct investment in Ethiopia over the period 1974-2001. The study gave an extensive account of the theoretical explanation of FDI, as well as reviewing the policy regimes, the FDI regulatory framework, and institutional setup in the country over the study period. It also undertakes empirical analysis to establish the determining factors of FDI in Ethiopia. This paper's findings show that the growth rate of real GDP, export orientation, and liberalization, among others, have a positive impact on FDI. On the other hand, macroeconomic instability and poor infrastructure have a negative impact on FDI.

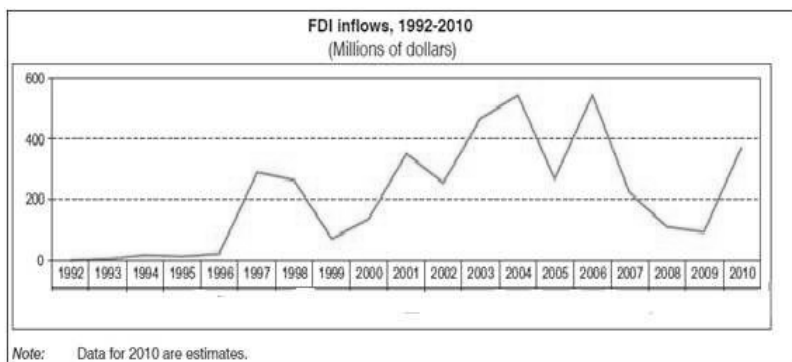
### **3. Overview of Ethiopia's Recent Economy and FDI**

#### **3.1. Macroeconomic Performance**

The Ethiopian economy has shifted to a higher growth trajectory since 2003/04. This has been sustained, and over the last five years, overall real GDP has grown rapidly at an average of 11% per annum. Agriculture, industry and services have registered an average annual growth rate of 8.4%, 10%, and 14.6%, respectively. By sustaining the current economic growth over the next five year period, the government aims to achieve the MDG targets by 2015, and its longer term vision of being a middle income country by 2020-2023 (MoFED, 2010).

The Ethiopian Investment Agency and regional Investment Offices licensed some 56,421 investment projects with an aggregate capital of Birr 1.1 trillion during 1992/93 – 2010/11. Of these projects, 47,420 were domestic, 8,896 foreign, and 105 public. In terms of capital, Birr 424.1 billion was attributed to domestic investors, Birr 382.2 billion to foreign investors, and Birr 272.4 billion to the public sector (NBE, 2010).

**Figure 1. FDI Inflows in Ethiopia**



Source: UNCTAD World Investment Report 2011

FDI inflows into the agricultural sector account for 32% of the total Ethiopian FDI inflows, and it has increased heavily since 2005 according to the Ethiopian investment agency.

### 3.1.1. Regional Distribution of FDI

The flow of FDI to Ethiopia has been unevenly distributed among the various regions. Even though the incentive system encourages foreign investors to invest in the least developed regions (Gambella, Afar, Somali and Benishangul-Gumuz) of the country by providing special benefits including provision of land free of charge, their performance in attracting FDI is very poor (EIA, 2008 and Tagesse, 2001).

As shown in table 1, most of the FDI is destined for Addis Ababa, the capital. Out of the total projects (from 1992-2011), 62% were situated in Addis Ababa. This is because of the region's better infrastructure, stable political environment, and better supply of trained manpower. Oromia Region has attracted a sizable amount of FDI with respect to the amount of capital invested. That is, of the total FDI operating in Ethiopia during

1992-2011, 36.9% of the capital was invested in Oromia. This may be due to the region's proximity to Addis Ababa, availability of natural resources (arable land and favorable climate), and large market size as it is the most populous region in the country. About 4% of the total FDI was invested in the Amhara region.

Conversely, Harari, Gambella, Afar, Somali and Benishangul-Gumuz's performance in attracting FDI has been very poor. For example, there is only one project in the Harari and Benishangul-Gumuz Regions each, and no foreign investments in the Somali region since the country opened its door to foreign investors.

**Table 1. Numbers and Capital (in Thousands of USD) of Approved Projects by Region**

Regions	2008/09		2009/10		2010/11		Percentage share to Total	
	No. of Projects	Investment Capital	No. of Projects	Investment Capital	No. of Projects	Investment Capital	No. of Projects	Investment Capital
Tigray	543	10,863	626	7,224	349	11,112	5.52	4.45
Afar	46	4,880	32	1,307	26	399	0.41	0.16
Amhara	1,425	12,167	743	17,371	722	32,753	11.42	13.13
Oromia	2,689	63,573	1,558	20,739	1,386	32,219	21.93	12.92
Somali	11	56	58	345	127	2,738	2.01	1.10
Benishangul-Gumuz	182	644	111	1,389	56	81,611	0.89	32.71
SNNPR	543	4,488	163	2,020	160	49,751	2.53	19.94
Gambella	132	681	11	2,675	14	3,920	0.22	1.57
Harari			2	7	48	276	0.76	0.11
Addis Ababa	2,773	120,471	2,902	29,195	3,221	30,627	50.97	12.28
Dire Dawa	190	8,079	172	1,455	207	2,995	3.28	1.20
Multiregional Projects	273	13,623	118	12,689	6	1,067	0.09	0.43
<b>Grand Total</b>	<b>8,807</b>	<b>239,524</b>	<b>6496</b>	<b>96,415</b>	<b>6322</b>	<b>249,469</b>	<b>100</b>	<b>100</b>

Source: Ethiopian Investment Agency

### 3.1.2. Sectoral Distribution of FDI

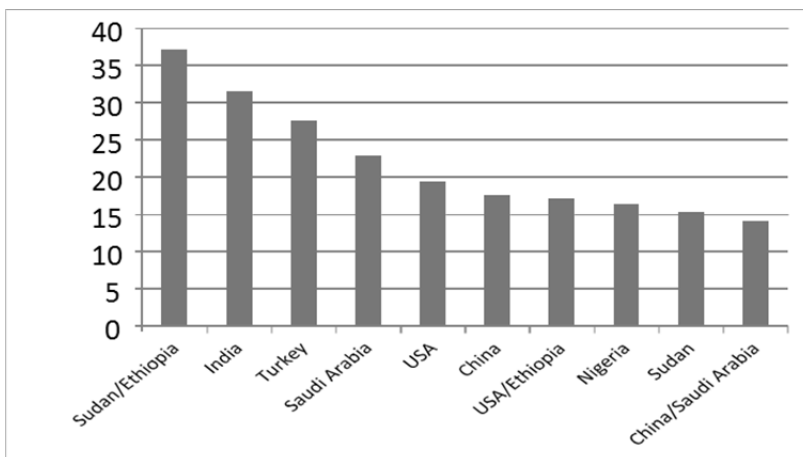
The distribution of FDI flows to Ethiopia is fairly diversified into various sectors, ranging from the primary including all types of agricultural activities and mining and quarrying to the secondary sector or the industrial activities or to the tertiary sector including electricity generation,

construction, real estate, trade, hotel and tourism, transport service, education and health service. The manufacturing sector accounted for 42.9% of the total FDI, followed by agriculture which accounted for 26.5% from 1992-2012 and real estate, machinery and equipment rental and consultancy service constitutes 13.86% of the total FDI flows to Ethiopia. Construction contracting, including water well drilling, constitutes 11.73%. However, the mining, health, and tourism industries are areas that have not received much FDI in the country, with each accounting for less than 1% of the total inflow.

### 3.1.3. FDI Flows by Country of Origin

During the period 1992 - July 2005, Saudi Arabia accounted for half of the FDI flows to Ethiopia. The Ethiopian Economic Association (2007) reported that one company - MIDROC group investment - highly dominates FDI flows originating from Saudi Arabia. Other than this company, Saudi was followed by the United Kingdom, accounting for 9.4%. France, USA, China and India were the other major source countries during that period. However, now, China has the largest investment in the country, followed by India, Sudan, and USA.

**Figure 2. Flows to Ethiopia by Country of Origin (in billion Birr) from July 1992 to July 2005**



## 4. Data Source and Methodology

This paper was entirely dependent on secondary data. The major data sources were the Ministry of Finance and Economic Development (MoFED), world investment reports, the Ethiopian Investment Authority (EIA), and country reports published by the United Nations Conference on Trade and Development (UNCTAD). Both quantitative and qualitative methods of data analysis were employed in this study.

### 4.1. Definitions of Variables

The World Bank defines FDI as the net amount invested or reinvested by non-residents to acquire a lasting interest (10 percent or more of voting stock) in enterprises in which they exercise significant managerial control. There are a number of FDI variables included in World Development Indicators: net FDI, BOP in current U.S. \$, net FDI inflows as a percentage of gross capital formation, net FDI inflows BOP in current U.S \$, and net FDI inflows as a percentage of GDP. In line with the approach used in FDI literature, the dependent variable used in this study is the net foreign direct investment inflows as a percentage of GDP. The choice of independent variables is constrained by data availability, as is mostly the case with time-series data in developing countries. For example, time-series data on some of the factors such as tariff rates, trade taxes, real effective exchange rate, real wages, and corruption index that are used in some studies of this nature are not readily available for Ethiopia over the (entire) study period. Notwithstanding this constraint, this study uses the following variables that are commonly used in studies of FDI. The dependent variable, FDI, is measured as the net foreign direct investment inflow as a percentage of GDP, and is a widely used measure (see Adeisu, 2002; Quazi, 2005; Good speed et al., 2006).

**Market Size:** the market size hypothesis states that multinational firms are attracted to a larger market in order to utilize resources efficiently and to exploit economies of scale (Chakrabarti, 2001). Market size has been represented by real per capita GDP and growth rate of real GDP (as market growth potential). Real GDP per capita and real GDP growth rates are included in the regression as measures of market attractiveness, and FDI is expected to be positively related to these two variables

**Export orientation:** openness promotes FDI, and one indicator of openness is the relative size of the export sector (Singh and Jun, 1995).

**Openness:** It is a standard hypothesis that openness promotes FDI (Hufbauer et al. 1994). The ratio of trade to GDP is often used as a measure of openness of a country and is also often interpreted as a measure of trade restrictions. This proxy is also important for foreign direct investors who are motivated by the export market. Empirical evidence (Jun and Singh, 1996) exists to back up the hypothesis that higher levels of exports lead to higher FDI inflows. We therefore include trade/GDP in the regression to examine the impact of openness on FDI.

**Macro-economic stability:** there is a widespread perception that macro-economic stability shows the strength of an economy and provides a degree of certainty of being able to operate profitably (Balasubramanyam, 2001). Inflation rates and exchange rates are used as proxy variables for macro-economic stability. Low inflation and stable exchange rates are expected to have a positive impact on FDI. As pointed out earlier, data on the real exchange rate are not readily available. As a result, only the rate of inflation (based on the consumer price index) is included to capture the effect of macro-economic stability on FDI.

**Infrastructure:** infrastructure covers many dimensions ranging from roads, ports, railways, and telecommunication systems to the level of institutional development. The availability of well-developed infrastructure will reduce the cost of doing business for foreign investors and enable them to maximize the rate of return on investment (Morriset, 2001). Therefore countries with good infrastructures are expected to attract more FDI. Taking this into account, gross fixed capital formation (percent of GDP) has been included in proxy infrastructure development. It is expected to be positively correlated with FDI.

**Liberalization:** liberalization of trade and FDI regimes is assumed to have a positive influence on the inflow of FDI since they facilitate a freer trade and investment in conjunction with the repatriation of dividends and profits to home countries (Bende-Nabende, 2002). As explained in section three, Ethiopia has been introducing some liberalization measures since 1991, and a dummy variable is used to capture the effect of the change in policy environment on FDI. The dummy variable assumes a value of 0 for the pre-liberalization period (i.e. up to 1990) and 1 for the post liberalization period (from 1991 onwards). The dummy variable is expected to have a positive sign.



## 4.2. Model Specification

The general form of the model estimated has the following form:

$$FDI = f(GDPG, GDPC, EXPO, IN, GFCF, LIB, BOP, OPP, OPLR, BD),$$

where

GDPG = Growth Rate of Gross Domestic Product

GDPC = Gross Domestic Product per capita (per capita GDP)

EXPO = Export orientation as percentage of GDP (measures openness)

INF = Annual rate of inflation based on consumer price index

GFCF = Gross Fixed Capital Formation (as percent of GDP)

LIB = Measure of liberalization (dummy variable)

OPP=Openness to trade (used as proxy to measure financial restrictions)

OPLR=output per labor ratio (labor productivity)

BD= budget deficit

The model employed for the analysis can be given by

$$FDI_t = \alpha + \beta_1 GDPG_t + \beta_2 GDPC_t + \beta_3 EXPO_t + \beta_4 INF_t + \beta_5 GFCF_t + \beta_6 LIB_t + \beta_7 BOP_t + \beta_8 OPP_t + \beta_9 OPLR_t + \varepsilon$$

## 4.3. Stationary and Integrated Stochastic Processes

In general, regression models for non-stationary variables (mostly macro-economic variables) give spurious results. A stochastic process  $Y_t$  is called stationary if it has time-invariant first and second moments. In other words,  $Y_t$  is stationary if:

1.  $E(Y_t) = \mu_y$  for all  $t \in T$
2.  $E[(Y_t - \mu_y)(Y_{t-h} - \mu_y)] = \mu[h]$   
for all  $t \in T$  and all integers such that  $t - h \in T$

Based on the above properties the following tests were employed to resolve the non-stationarity nature of the macro economic variables.

## 4.4. Augmented Dickey-Fuller (ADF) Test

An AR (p) process is integrated when  $\alpha(1) = 1 - \alpha_1 - \dots - \alpha_p = 0$ . In other words, a hypothesis of interest is  $\alpha(1) = 0$ . To test this null hypothesis

against the alternative of stationarity of the process, it is useful to parameterize the model. Subtracting  $Y_{t-1}$  on both sides and rearranging terms results in a regression:

$$\Delta y = \Phi Y_{t-1} + \sum_{j=1}^{p-1} \alpha_j^* \Delta Y_{t-j} + \mu_t$$

In this model the pair of hypotheses:

$H_0: f=0$  versus  $H_A: f<0$  is tested based on the  $t$ -statistic of the coefficient  $f$  from an OLS estimation of the model (Fuller, 1976; Dickey and Fuller, 1979). It does not have an asymptotic standard normal distribution, but it has a nonstandard limiting distribution.

$H_0$  is rejected if the  $t$ -statistic is smaller than the relevant critical value. If  $f = 0$  (that is, under  $H_0$ ) the series  $Y_t$  has a unit root and is non-stationary, whereas it is regarded as stationary if the null hypothesis is rejected.

***Integrated processes:*** Nonstationary stochastic processes that can be made stationary by considering first differences are said to be integrated of order one (I(1)). More generally, a DGP is said to be *integrated of order d* (I(d)) if first differences have to be applied  $d$  times to make the process stationary or asymptotically stationary. Denoting the *differencing operator* by  $\Delta$  (i. e.  $\Delta = 1 - L$ ) so that for a time series or stochastic process  $y_t$  we have  $\Delta y_t = y_t - y_{t-1}$ , the process  $y_t$  is said to be I(d) if  $\Delta y_t$  is stationary, whereas  $\Delta^{d-1}$  is still nonstationary.

***Test for cointegration:*** Having tested time-series for stationarity, the next step of time-series analysis is testing for cointegration, which amounts to checking whether the linear combination of the variables is stationary or not. It requires the variables of interest to have the same order of integration. It is only when the variables are integrated of the same order that a linear relationship among them can be expected. Variables are said to be cointegrated if a long run equilibrium relationship exists among them.

The stationarity and cointegration tests conducted necessitate the estimation of the model using an Error Correction Model involving long run.

The general setup of a VECM allowed for in JMulTi is of the form:

$$\Gamma_0 \Delta y_t = \alpha [\beta' : \eta'] \begin{bmatrix} y_{t-1} \\ D_{t-1}^{co} \end{bmatrix} + \Gamma_1 \Delta y_{t-1} + \dots + \Gamma_p \Delta y_{t-p} + B_0 x_t + \dots + B_q x_{t-q} + CD_t + \mu_t$$

where  $y_t = (y_{1t} \dots \dots y_{Kt})'$  is a vector of  $K$  observable endogenous variables,  $x_t = (x_{1t} \dots \dots x_{Mt})'$  is a vector of  $M$  observable exogenous or unmodelled variables,  $D^{co}$  contains all deterministic terms included in the cointegration relations, and  $D_t$  contains all remaining deterministic variables. Deterministic variables may be constants, linear trends, seasonal dummy variables, or other user-specified dummy variables. Notice that a single deterministic term cannot appear in both  $D_t$  and  $D^{co}$ , so the two vectors have to contain mutually exclusive terms. The residual vector  $u_t$  is assumed to be a  $K$ -dimensional unobservable zero mean white noise process with positive definite covariance matrix  $E(\mu_t \mu_t') = \Sigma_\mu$ .

The parameter matrices  $\alpha$  and  $\beta$  have dimension  $(K \times r)$  and they have to have rank  $r$ . They specify the long run part of the model with  $\beta$  containing the cointegrating relations and  $\alpha$  representing the loading coefficients. The column dimension of  $\eta$  is also  $r$  and its row dimension corresponds to the dimension of  $D^{co}$ . The notation:

$$\beta^* = \begin{bmatrix} \beta \\ \eta \end{bmatrix}$$

will be used in the following and the row dimension of  $\beta^*$  will be denoted by  $k^*$ . Hence,  $\beta^*$  is a  $(k^* \times r)$  matrix. The cointegration rank  $r$  has to be specified by the user. It has to be in the range  $1 \leq r \leq K - 1$ .

### 4.5. Johansen Procedure

The Johansen RR procedure can be used to estimate models of the form:

$$\Delta y_t = \alpha \beta^{*'} \begin{bmatrix} y_{t-1} \\ D_{t-1}^{co} \end{bmatrix} + \Gamma_1 \Delta y_{t-1} + \dots + \Gamma_p \Delta y_{t-p} + CD_t + \mu_t$$

without parameter restrictions. The cointegration matrix  $\beta^*$  is automatically normalized as follows:

$$\beta^* = \begin{bmatrix} I_r \\ \beta^*(k^* - r) \end{bmatrix}, \text{ where } \beta^*(k^* - r) \text{ is a } ((k^* - r) \times r) \text{ matrix.}$$

This normalization requires that the order of the variables is specified such that the first  $r$  variables are actually involved in the cointegration relations. In other words, meaningful cointegration relations must result with normalization.

## 5. Empirical Results and Analysis

As can be seen from the appendix, based on ADF test of series, the first difference is all variables are integrated processes of order one  $I(1)$ . Variables are said to be cointegrated if a long run equilibrium relationship exists among them.

### 5.1. Number of Cointegrating Relationships

The study has found a number of cointegrated equations using trace. According to probabilities given in table 3, the analysis rejects the null hypothesis that there is no cointegrated vector, there is at most one cointegrated vector, there are at most two cointegrated vectors, there are at most three cointegrated vectors, and that there are at most four cointegrated vectors. This means that there are five cointegrated vectors in long run results. It shows high association between explanatory and dependent variables used in the current study.

#### Table 2. Johansen Trace Test

Sample range: [1975, 2003], T = 29

Included lags (levels): 2

Dimension of the process: 9

Intercept included

Response surface computed:

r0	LR	pval	90%	95%	99%
0	516.84	0.0000	201.69	208.27	220.99
1	368.95	0.0000	163.45	169.41	180.95
2	237.61	0.0000	129.22	134.54	144.91
3	150.67	0.0000	98.98	103.68	112.88
4	91.44	0.0021	72.74	76.81	84.84
5	59.23	0.0149	50.50	53.94	60.81
6	37.96	0.0228	32.25	35.07	40.78
7	20.29	0.0480	17.98	20.16	24.69
8	8.50	0.0671	7.60	9.14	12.53

## OPTIMAL ENDOGENOUS LAGS FROM INFORMATION CRITERIA

Sample range: [1983, 2003], T = 21

Optimal number of lags (searched up to 10 lags of levels):

Akaike Info Criterion: 2

Final Prediction Error: 6

Hannan-Quinn Criterion: 2

Schwarz Criterion: 2

**5.1.1. VECM (Long Run Estimates)****Table 3. Estimation Results**

Variables	Estimated cointegration relation(s):				
	Coefficients	Standard Errors	p-values	T-Statistics	Conclusion
FDI(t-1)	1.000	(0.000)	{0.000}	[0.000]	Significant
GDP_log(t-1)	12.183	(0.085)	{0.000}	[143.905]	Significant
CPI_log (t-1)	-0.798	(0.014)	{0.000}	[-55.273]	Significant
GFCF_log(t-1)	1.740	(0.018)	{0.000}	[99.084]	Significant
EXPO_log(t-	2.908	(0.052)	{0.000}	[55.640]	Significant
OPP_log (t-1)	-16.135	(0.062)	{0.000}	[-261.954]	Significant
OPLR_log(t-1)	-36.332	(0.101)	{0.000}	[-360.155]	Significant
GDPC_log(t-	58.635	(0.116)	{0.000}	[503.612]	Significant
BD_log (t-1)	-4.048	(0.011)	{0.000}	[-355.104]	Significant
LIB(t-1)	5.563	(0.017)	{0.000}	[327.027]	Significant
CONST	-106.237	(0.408)	{0.000}	[-260.243]	Significant

The above estimation shows that, in the long run, FDI can be explained by real GDP growth rate, consumer price index, trade intensity (export orientation), infrastructure development, openness to trade, labor productivity, per capita GDP, budget deficit, and trade liberalization in Ethiopia. The long run impact of real GDPG on FDI is found to be positive, implying that it has an encouraging impact on FDI in the long run. It also measures the growth prospects of the economy/market, and has a positive and significant coefficient in the long run. This finding is in line with the hypothesis that a growing economy attracts more FDI.

The inflation variable (consumer price index) is significant with the expected sign.

This finding implies that macroeconomic stability is an important long run determinant of foreign direct investment inflows to Ethiopia.

The estimated coefficient of the market size variable (RGDPC) has the long run expected positive sign and is significant. The possible explanation could be that a high level of per-capita income has an encouraging effect on market-seeking FDI to Ethiopia.

An important finding is the positive and significant effect of export orientation (i.e. exports/GDP ratio). This finding suggests that FDI in Ethiopia is of the vertical type, which is normally export-oriented and likely to be unaffected by the market size of the host economy.

The coefficient of GFCF, which constitutes all kinds of infrastructure development, is also found to be positive and significant. This indicates, again, that the 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.

Similarly, the liberalization dummy is found to be a significant determinant of FDI, with the estimated coefficient possessing the expected sign in the long run estimations. This result suggests that liberalization of the Ethiopian economy has encouraged FDI inflows, and it also supports the proposition that foreign investors are more likely to invest in countries that have opened up to the outside world.

On the other hand, trade openness (the average of export and import) as a measure of financial restrictions shows negative and significant effects on FDI in the long run; that the restricted financial systems and weak transaction of financial facilities in Ethiopia are having a detrimental effect on FDI in the long run.

The long run impact of output per labor ratio (OPLR) on FDI was expected to be a positive sign. But poor labor productivity has a detrimental impact on attracting FDI in Ethiopia. Similarly, a high budget deficit of the government has a negative and significant impact on attracting FDI, as the estimated coefficient proposes in the long run.