

Research Article

Determinants of Foreign Direct Investment (FDI) Inflows to Ethiopia: An ARDL Model Approach

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Abstract

FDI plays a critical role in Ethiopia's economic growth and development. However, despite government reforms designed to promote stability and economic expansion, FDI inflows have exhibited a declining trend, marked by volatility and unpredictability. Thus, this study aims to examine the key determinants of FDI inflow into Ethiopia. To attain this objective, the study employed a time series analysis using the ARDL model to investigate the short-run and long-run relationships among the variables. Data spanning thirteen years, from 2012 to 2024, was provided by the NBE, WB, EIC, and MoFED datasets. The study's main findings indicate that macroeconomic stability, trade openness, inflation rate, real GDP per capita, infrastructure, GDP growth, and exchange rate are all significant factors that affect FDI inflows to Ethiopia. In the short run, the empirical findings of the study show that exchange rate, infrastructure, market size, and trade openness are significant positive determinants of FDI. On the other hand, the inflation rate negatively affects FDI; a 1% rise in inflation corresponds to a 1.03% decrease in FDI inflows, suggesting that higher inflation may deter FDI due to economic instability. The long-run equation, on the other hand, revealed that the real GDP per capita, inflation rate, exchange rate, infrastructure, and GDP growth all exhibit the expected signs and are statistically significant at the 5% level. However, at the 5% level, macroeconomic stability and the trade openness index are positive but statistically insignificant. Finally, based on the study's findings, appropriate policy measures have been recommended.

Keywords

Determinants of FDI, Time-Series Analysis, ARDL Model, Bound Test, Ethiopia

1. Introduction

The economic growth of a country is contingent upon the overall amount of investment, which is heavily influenced by savings. However, developing nations are distinguished by a relatively low amount of gross domestic savings Asiedu, [6]. Foreign direct investment (FDI) is a viable option for financing and can help bridge the difference between local savings and the necessary investment for economic growth Demirhan & Masca, [12]. In addition, foreign direct invest-

ment (FDI) contributes to job creation, enhances managerial expertise, and facilitates the transfer of technology to the host country. Consequently, FDI acts as a catalyst for economic growth, as stated by Asiedu, [5] and Asiamah et al., [4]. Due to a shortage of adequate foreign cash in many developing nations, FDI can serve as a means to bridge this gap in foreign currency Alfaro et al., [2].

Foreign direct investment plays a crucial role in the eco-

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economic development of developing countries that lack sufficient capital. FDI serves as a reliable and consistent means of bringing in capital. Additionally, it facilitates the transfer of technology, generates employment opportunities, and fosters international trade linkages Saidi et al., [31]. These factors collectively contribute to creating a competitive business environment and promoting overall growth. Over the past few decades, there has been a significant rise in the amount of foreign direct investment flowing into countries worldwide. However, African countries had an extraordinarily low proportion of worldwide foreign direct investment Asongu et al., [8].

In the continent's economic milieu, Africa has emerged as a notable entity, brimming with potential. With its large population, pivotal geographical positioning, and abundance of natural resources, Africa stands as a beacon of hope for regional advancement Tetteh & Gao [37]. Despite encountering considerable hindrances in luring foreign direct investment (FDI), Africa's potential still needs to be improved. The World Investment Report has verified that FDI in East Africa plummeted to \$6.5 billion in 2020, marking a 16% decrease compared to the previous year. To address this, numerous studies have been carried out using both time-series and cross-sectional methodologies to identify the factors that influence FDI. Understanding and influence in this area are crucial Reiter & Steensma, [28]. Similar to this, Ayadi, [10] conclude in their analysis of developing countries that market size, trade openness, and infrastructure have a positive and significant impact on attracting FDI inflows, whereas inflation and tax rates are negative indicators. Another study by Anyanwu, [3] on the determinants of FDI inflows to Africa found that public expenditure, market size, and natural resource endowment encourage FDI inflows, whereas financial development has a negative impact.

Ethiopia, in recent years, has been subjected to a discernible diminishment in the inflow of foreign direct investment (FDI). This trend persists despite the observation of a noteworthy gross domestic product (GDP) growth rate of 6.1% in the year 2020, which can be ascribed to key industries such as manufacturing, agriculture, and hospitality Neveling, [26]. Nevertheless, a decline exceeding 25% in FDI inflows was recorded between the years 2018 and 2019. The causative factors for this downturn are multifaceted, incorporating elements such as the COVID-19 pandemic, a climate of political instability, and incidents of local unrest. Although the Ethiopian government has undertaken initiatives aimed at enticing multinational corporations (MNCs), several impediments, notably a convoluted regulatory framework, and deficiencies in infrastructural capacity, have served to obstruct the inflow of FDI Ababulgu Abasimel & Wana Futa, [1]. Consequently, the trajectory of Ethiopia's economic growth, along with its ambition to attain middle-income designation by the year 2025, is shrouded in uncertainty Demieessie, [17].

In Ethiopia, several recent studies have examined the factors that influence inflow of FDI. As study by Haile & Assefa

[18] examined the factors that influenced FDI in Ethiopia. They found out that macroeconomic instability and inadequate infrastructure have significant negative effects on FDI entering Ethiopia, whereas real GDP growth, an export-orientated economy, and liberalization have a positive and significant effect on the FDI inflows. The main factors that have the potential to deter foreign investment in Ethiopia are exchange rate volatility, corruption, and a lack of clear policies and regulatory impediments. On the other hand, Atlaw et al., [9] conducted a firm-level investigation on the factors that drive FDI in Ethiopia and found that political and social stability, domestic and regional market seeking, and investment incentives had a significantly positive influence on FDI inflows, encouraging the audience to consider the investment incentives in Ethiopia. Furthermore, Mekonnen, [23] states that the market size, infrastructure, human capital, and inflation rate all affect the amount of foreign direct investment that enters Ethiopia. Fantaye, [12] looks into the variables that affect Ethiopia's ability to attract foreign direct investment, including trade openness, GDP growth, infrastructure, domestic credit, inflation, and external debt. In addition, Shamebo et al., [33] evaluated the variables influencing the inflows of foreign direct investment into Ethiopia. He claims that market size, exchange rate, physical infrastructure, trade openness, and school enrolment rate are the most important factors that affect FDI inflows in Ethiopia during the study period.

This study differed from previous research in terms of the type of research design and approach it adopted, as well as the time it was conducted. As far as researchers know, not enough studies have been carried out on the determinants of FDI in Ethiopia. Hence, this fact started to deal with this specific topic. Besides, previous researchers attempted to examine well-known determinant variables that affect investment in different areas using only a case-and-effect relationship. In addition, they did not set facts that exist under the current that will be the determinates of FDI performance. In contrast to the available studies, the papers here concentrate on events prior to 2012, which is a big gap between pre- and post-2012 comprehensive FDI analysis. Recently, the dynamics of FDI flows in Ethiopia have been greatly influenced by various factors, including political changes, economic reforms, and infrastructure improvements, as well as regional and global conditions. This changed environment has prompted the need for an up-to-date examination of the FDI flows and the factors that impact FDI flows in Ethiopia. To bridge this gap, the study seeks to provide current insights into the changes in the factors that impact FDI in Ethiopia, as well as foreign direct investment inflows in Ethiopia up to 2024. This would be beneficial for policymakers and investors as they plan and invest strategically in Ethiopia's shifting economic development trajectory in the future. Finally, while there is extensive literature on FDI drivers in regional settings, there needs to be more literature regarding data to analyze FDI flows into Ethiopia.

Thus, this research was conducted with the aim of filling the gap above and contributing to the development of the sector by identifying the key determinants of FDI inflows to Ethiopia through an ARDL model approach, using a data set from 2012-2024.

Definition of Key Concepts

FDI refers to a type of investment made by a person or company from one country (the direct investor) with the purpose of gaining a significant stake in a business located in another country (the direct investment enterprise). In order to be considered FDI, the investing company must own at least 10% of the target company's value and have a significant influence over its operations Cardillo et al., [14]. that involves a long-term relationship and demonstrates a lasting interest and control of a resident entity in one economy by a foreign direct investor or parent enterprise in a different economy (referred to as the FDI enterprise, affiliate enterprise, or foreign affiliate) De Silva, [16]. FDI refers to a situation where an investor has a substantial level of control and involvement in the administration of a business based in a different country. Specifically, a direct investor is someone who owns at least 10% of the ordinary shares or voting power of a company incorporated in a foreign country. FDI comprises of three distinct elements: equity capital, reinvested earnings, and intra-company loans, as stated by UNCTAD in 2007.

2. Theories of FDI and Its Determinates

The theoretical foundation of FDI continues to be an intricate and diverse field of research. There currently needs to be a widely acknowledged theory that adequately explains the underlying reasons behind multinational corporations' investment choices in FDI. Economists provide many explanations for why corporations engage in cross-border investments. Several viewpoints have focused on why multinational corporations allocate their capital across international borders. However, there still needs to be a comprehensive, cohesive, and widely understood theory on FDI Nayak & Choudhury, [25]. Nevertheless, this analysis supports and utilizes the imperfect competition hypothesis of FDI. Theories such as monopolistic advantage, product life cycle, and eclectic theory are considered relevant in this study.

2.1. The Theory of Portfolio Investment

Investors can utilize a reasoning-based model to evaluate the allocation of their capital across distinct countries and asset classes; this is referred to as the Portfolio Investment Theory. This theory, which is principally relevant in the context of FDI, centers on the assumption that investors aim to diminish the overall risk and elevate the potential returns on their investments. This is achieved by investing in international markets and diversifying their investment portfolios

Bartram & Dufey, [11].

Investors, according to this view of motivation, are generally looking for higher return opportunities as well as diversification benefits. The superior growth potential of emerging markets, which generally have higher levels of economic growth compared to more advanced economies, can offer them greater returns on investment. Diversification across these economies can mitigate potential risks related to economic and political instability, as well as other country-specific risks. For Ethiopia, attracting FDI typically involves demonstrating the country's growth potential and unique investment opportunities to potential foreign investors who are looking for opportunities to optimize investment portfolios and take advantage of opportunities in emerging markets. In practice, the Theory of Portfolio Investment says that a state's attractiveness to FDI is dependent on the country's risk-return profile relative to other investment destinations. Economic stability, market size, growth prospects, and investment climate are all critical in shaping a state's risk-return profile. Therefore, an understanding and responsiveness to these factors can make the state more attractive to FDI, leading to higher amounts of FDI and, in turn, the economic growth and development that accompanies greater international capital contribution Harrison et al., [20].

2.2. The Eclectic Theory of FDI

The Eclectic Theory, commonly referred to as the OLI Framework pertaining to FDI, presents an insightful viewpoint regarding the factors that ascertain the engagement in FDI by amalgamating three pivotal dimensions: ownership (O) advantages, location (L) advantages, and internalization (I) advantages. Per the stipulations of this theoretical structure, entities elect to allocate resources internationally when they are endowed with ownership advantages, which may encompass exclusive technological innovations, pronounced brand equity, or superior managerial competencies. Such advantages are posited to render the option of direct investment more appealing in comparison to alternatives such as the exporting of goods or the licensing of their intellectual property Stoian & Filippaios, [34].

The advantages pertaining to location are associated with the unique characteristics of the host nation that render it a desirable site for investment activities. Such characteristics encompass aspects like the magnitude of the market, stability in the economy, availability of resources, and governmental policies that are deemed favorable. The features of the host country can profoundly impact decisions regarding FDI, as investors generally pursue environments that promise opportunities for growth and enhanced operational efficiency. Internalization advantages, on the other hand, revolve around the benefits of executing operations directly rather than opting for partnerships or licensing arrangements. This mode of operation enables firms to exercise superior control over quality, safeguard intellectual property, and reduce transac-

tion costs. When one engages with the Eclectic Theory, it becomes possible to understand the role of this theoretical framework in evaluating the interplay of these factors in driving FDI movements and the manner in which they influence investment determinations across varying contexts. The Eclectic Theory is instrumental in elucidating the rationale behind firms' preference for investment in specific countries, while also illuminating how they balance the merits associated with ownership, location, and internalization in their overarching strategic formulation.

2.3. Vernon's Product Life Cycle Theory

Vernon product life cycle (PLC) theory provides a useful contextual framework for understanding the determinants of FDI, as it highlights the changing production and investment strategies as a product moves through its life cycle. Under the PLC theory, a product begins in the introduction stage and is developed and manufactured in an innovative country, which means there are significant innovation and market development costs Jensen & Thursby, [21]. Suppose the product is successful and gains market acceptance, resulting in demand growth. In that case, it moves into the growth stage, and firms begin exporting to other developed countries to expand and take advantage of early competitive advantages.

After the product reaches the maturity stage, firms often shift production to less developed countries to take advantage of lower labor costs and scale economies Vernon, [38]. This shift aids in cost reduction and enhances the firm's competitiveness. In the decline stage, when demand for the product wanes, production may continue in these low-cost regions, and the original market may transition into an importer. Vernon also discusses that investment decisions can also be influenced by competition from rival firms or the host countries' import substitution policies, which can serve as a 'trigger' for international investment. However, the theory has faced criticisms for not accounting for cases where firms may decide to neither follow the export phase nor switch into FDI mode. This calls for a more nuanced understanding of FDI determinants, beyond the scope of the product life cycle theory.

2.4. Empirical Literature Review

In order to precisely determine the key factors that impact FDI in Ethiopia's economy, it is essential to construct a comprehensive model and analyze how the anticipated outcomes with relevant theoretical frameworks are deemed significant and impactful. Several empirical studies have been carried out in Latin America, Africa, and Asia to investigate the factors that affect private investment and the inflow of FDI in various countries. These empirical studies frequently yield divergent conclusions about the factors that influence foreign investment. Consequently, this section examines many empirical studies that mostly focus on developing nations

worldwide, with a specific emphasis on Ethiopia.

2.4.1. Studies on Developing Countries

A study by Sattarov, [32] investigated the variables affecting FDI inflows into Kazakhstan and Uzbekistan, two countries in Central Asia. He employed two distinct econometric approaches, seemingly unrelated regression (SUR) and ordinary least squares (OLS), with data sets spanning from 1996 to 2010. The study's conclusions imply that key factors influencing FDI inflows into Kazakhstan and Uzbekistan include market size, economic stability, and reliability. Apart from the previously mentioned factors, it was found that trade openness played a crucial role in attracting foreign direct investment into Uzbekistan.

Located in South Asia, the Sahoo, [30] study aims to explain the factors affecting foreign FDI inflow in this region. This study, based on panel cointegration, demonstrated a long-term equilibrium between FDI and its principal determinants in South Asia. The paper shows that market size, labor force growth, and infrastructure development have significantly affected FDI inflow in the region. However, it emphasizes that the region should focus on sustaining economic growth to increase market size, invest in infrastructure, and adopt more liberal trade policies to attract more FDI inflow, thereby underlining the importance of trade openness in attracting FDI.

A study by Liargovas & Skandalis, [22] undertook a comprehensive study to explore the relationship between FDI and trade openness. Their use of a fixed effect model and panel regression analytic approaches, along with the inclusion of nominal GDP, real GDP per capital, exchange rate stability, and political risk as additional variables, provided a robust framework for their analysis. The study encompassed a total of 36 developing nations from diverse regions, including 12 from Latin America, ten from Asia, four from Africa, four from the Commonwealth of Independent States, and six from Eastern Europe, with data collected from 1990 to 2008. The results underscored the significant impact of political stability, exchange rate stability, market size, and trade openness on FDI inflow, with trade openness emerging as a particularly enduring and beneficial factor.

In her empirical study, Asiedu, [7] used panel data from 1984 to 2000 to examine the determinants of FDI in 22 SSA countries. The study revealed that local markets, high-quality infrastructure, low inflation, and natural resource endowments have a significant positive role in attracting FDI. She stated that corruption and political instability pose a significant negative impact on FDI inflow in SSA countries. The research conducted by Onyeiwu & Shrestha, [27] investigated the factors that influence foreign direct investment in Africa. The researchers employed the fixed and random effect model to elucidate the impact of the determinant of foreign direct investment (FDI) on FDI flows in Africa. They conducted their analysis using panel data from 29 African nations spanning the years 1975 to 1999. The study discusses several key

characteristics that have a significant impact on the influx of FDI in Africa, including inflation, economic growth, openness, foreign reserves, and natural resources. Variables such as common wisdom, political rights, and infrastructure have been determined to have no major impact on attracting foreign direct investment (FDI) in Africa.

The study conducted by Cleeve, [15] analyzed data from 16 sub-Saharan African countries using cross-sectional time series data from 1980 to 2007. The study employed both pooled ordinary least squares (OLS) and maximum likelihood optimization of 11 general linear models (GLM) estimate techniques. The study's findings indicate that variables such as human development, infrastructure, labor cost, and market size have a significant role. Also, the study found macroeconomic and political stability, property rights protection, and other laws that promote and affect the influx of FDI. Moreover, Rjoub et al., [29] examined the factors that influence the flow of FDI into landlocked countries in Sub-Saharan Africa (SSA) from 1995 to 2013. They employed a pooled ordinary least squares (OLS) and random effects methodology for their analysis. The research findings suggest that human capital, market size, domestic investment, and trade openness have a significant role in attracting FDI into those countries. Conversely, macroeconomic instability and the tax imposed by the host country have a negative impact on FDI flows to SSA counties.

2.4.2. Empirical Studies on Ethiopia

The factors influencing foreign direct investment (FDI) in Africa are unique compared to those in other developing regions Hailu, [19]. Adding to this complicity, (Asiedu, 2004) highlights the distinctive features of the East African economy, which differ significantly from those of South Africa and North Africa. Therefore, to accurately investigate the key determinants of FDI in Ethiopia, it is essential to apply appropriate empirical research methods tailored to the specific economic context. The study conducted by Berhanemeskel, [13] demonstrates that factors such as macroeconomic instability and financial health exert a detrimental influence on foreign direct investment (FDI). These findings suggest that the presence of a strong financial system and stable macroeconomic conditions are crucial for attracting foreign direct investment to Ethiopia.

Similar to this, Haile & Assefa, [18] analyzed the determinates of FDI in Ethiopia from 1974 to 2001. Their investigations involve both theoretical and empirical studies in order to explore the factors influencing FDI in Ethiopia. The study's findings suggest that export orientation, real GDP growth rate, and trade liberalization have a significant positive impact on FDI in Ethiopia, whereas macro-economic instability and low infrastructure have a significant negative impact on FDI inflows. In their investigations, they argue that greater infrastructure, a better environment, and trade liberalization are vital to encouraging FDI in Ethiopia. Mohapatra, [24], did a study on the factors that influence the amount of foreign

direct investment coming into Ethiopia. The study used time series data from 1992 to 2012. He believes that a variety of factors, including the exchange rate, growth capital formation, trade openness, exchange rate, gross national expenditure, external debt, inflation, and market size, have a significant impact on FDI. Contrasting the conclusions reached by Tesega, [36], a more recent study conducted by Workneh, [39] analyzed the factors that influence FDI in Ethiopia using time-series data from 1990 to 2011. He also incorporated factors such as trade openness, inflation rate, market size, human capital, and infrastructure. His findings revealed that infrastructure, human capital, and market size have an insignificant effect on FDI, while the relationship between the inflation rate and trade openness has a notable and significant effect on the inflow of FDI in Ethiopia.

The study conducted by Bekana, [12] investigated determinants of FDI in Ethiopia, using time series data from 1991 to 2013. The researcher's findings indicate that the variables that determine foreign direct investment in Ethiopia are literacy rate, real GDP per capita, gross capital formation, labor force growth rate, inflation, telephone lines per 1000 people, and official exchange rate. On the other hand, the variables of exports of goods and services and energy consumption per capita in the transport sector are found to be insignificant in determining FDI in Ethiopia.

Moreover, Teka, [35] descriptive analysis suggests that factors such as the desire to access local and regional markets, social and political stability, and investment incentives play a significant part in influencing FDI in Ethiopia. Nevertheless, the report also pinpointed problems that may deter foreign investment, such as fluctuating exchange rates, corruption, regulatory ambiguity, and impediments.

2.5. Summary of the Literature Gap and Justification

While the literature on determinants of FDI inflows worldwide is vast, few studies look specifically at Ethiopia's case. The bulk of past work has focused on general economic determinants affecting FDI in Africa or developing regions, largely overlooking country-specific dynamics. Furthermore, studies that do examine FDI inflows into Ethiopia frequently employ static econometric models, which have limitations in capturing how investment flows and their determinants evolve. We found few uses for complex econometric methods like the (ARDLM) method when we looked at time series data about FDI coming into Ethiopia. This is a crucial placeholder in our understanding of the complex economic, political, and social setup that determines foreign direct investment inflows into Ethiopia.

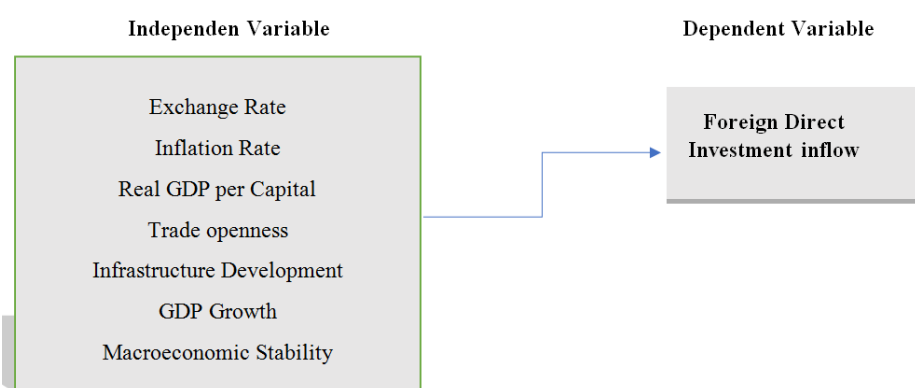
There are a number of reasons why addressing this research gap is important. We therefore seek to provide a specific and nuanced perspective about the nature of FDI in Ethiopia, which may differ greatly from general trends elsewhere, by focusing very narrowly on Ethiopia. The ARDL method

permits a more thorough examination of the time series data from 2012 to 2024. It is a comprehensive model in the sense that it accurately captures the short- and long-term dynamics of FDI inflows, thereby offering better insight into how certain factors influence investment over different timeframes. This critical period of foreign direct investment (FDI) inflows to Ethiopia needs a proper analysis based on the time series data from 2012 to 2024. There has also been a striking research desert of publications regarding this since 2012. That significant gap in our understanding of Ethiopia's development matters, especially as the country has undergone rapid economic and political transformation for nearly a decade now. Specific developments in the Ethiopian economy char-

acterize all three periods: major shifts in government policy that may have influenced FDI patterns and, indeed, fluctuating trends in global economic conditions from 2012–24. It is, therefore, important to realize that the absence of this period covered in some studies implies that the FDI literature does not encompass more recent dynamics and drivers directly associated with inflows.

2.6. Conceptual Framework of the Study

Based on the previous literature and empirical analysis, the study generated the following graphic representation of the conceptual framework:



Source: constructed by the author's based on the literature reviewed above.

Figure 1. Conceptual Framework of the Determinants of FDI.

Figure 1 shows the conceptual framework for both dependent and independent variables of FDI determinants.

3. Materials and Methods

3.1. Methods

To analyze the determinants of FDI in Ethiopia, this study used an ARDL model with error terms showing long-run relationships. Indeed, using this approach is especially convenient when dealing with time series data because it can capture both the short-run and long-run effects of the variables that explain FDI inflows. The study used secondary time series data and annual data for the period 2012 to 2023, collected from various sources, including the National Bank of Ethiopia (NBE), the Central Statistical Authority (CSA), the Ethiopian Investment Commission (EIC), the World Bank (WB), and the Ministry of Finance (MOF). Besides these primary data sets, the study included a survey of different national development programs, policies, and laws, such as the Ethiopian Investment Code, journals, and annual reports. This approach to data collection was useful in enhancing the total method of evaluation and analysis of various factors explaining FDI inflows during the study period.

3.2. Model Specification and Variables

This is because there has been much controversy as to the nature of FDI, and to date, researchers as economists have yet to agree to provide a unifying theory of FDI. For that reason, concerning the checking of the hypotheses, linking FDI inflows with other economic indicators, this study employed the Augmented Dickey-Fuller test for the identification of the integration of the data as well as for checking the integration of the employed data at the first order, also known as the unit root. In assessing the long-run relationship of the dependent and independent variables, the Ordinary Least Squares Method cointegration technique was used. However, cross-sectional data analysis was also conducted using the econometric model, the Statistical Package for Social Science (SPSS), where regression model results were generated using linear regression. To achieve this goal, we forecasted the impact of independent variables such as exchange rate, macro-economic stability, real GDP per capita, inflation rate, infrastructure, international business mobilization, and trade openness on FDI inflows using the autoregressive distributed lag model (ARDLM).

$$\Delta FDI_t = \alpha_0 + \sum_{i=1}^p \alpha_i \Delta X_{t-i} + \beta_1 FDI_{t-1} + \beta_2 X_{t-1} + \epsilon_t$$

The Liner econometric model will be state as

$$FDI = B_0 + B_1 (EXR) + B_2 (INFR) + B_3 (RGDPPC) + B_4 (OPENN) + B_5 (INFRAS) + B_6 (GDPG) + B_5 (MACRO-ECST + \text{err}$$

EXR: Exchange rate

MACROECST: Macroeconomic Stability

RGDPPC: Real GDP per Capital

INFR: Inflation Rate

INFRAS: Infrastructure

OPPEN: Trade Openness

$\epsilon_{\text{epsilon_tet}}$ is the error term.

4. Empirical Result and Discussion

This chapter presents the research outcomes and provides an analysis of the results. After an examination of the descriptive statistics, different tests are presented, and their outcomes are made available.

4.1. Descriptive Statistics of Variables

The summary of all the variables, independent and dependent, over the study period is shown in the following table below.

Table 1. Summary static.

| Variable | Mean | Median | Maximum | Minimum | Std. Dev. |
|-----------|--------|--------|---------|---------|-----------|
| EXR | 11.67 | 8.67 | 26.11 | 2.80 | 6.19 |
| FDI | 2.30 | 2.05 | 5.46 | 0.00 | 1.84 |
| GDPG | 4.75 | 4.50 | 10.35 | -1.23 | 3.22 |
| INFR | 9.24 | 7.45 | 55.24 | -10.77 | 13.46 |
| INFRAS | 65.84 | 43.55 | 182.81 | 11.05 | 54.63 |
| MACROECST | 78.12 | 75.00 | 150.23 | 30.12 | 28.46 |
| OPENN | 19.94 | 14.02 | 56.43 | 1.67 | 16.12 |
| RGDPPC | 285.91 | 179.38 | 767.56 | 111.36 | 204.85 |

Source: Eviews 10 own computation

Table 1. displays descriptive statistics for the variables in the study's basic model, which includes 12 periods. During that period, Ethiopia's average annual exchange rate was 11.67, with a standard deviation of 6.19, a maximum of 26.11, and a minimum of 2.80. As a percentage of GDP, FDI inflow averaged 2.30%, with a standard deviation of 1.84%, and ranges between a maximum of 5.46% and a minimum of 0.00%. The average GDP growth rate for the period was 4.75%, with a maximum of 10.35%, a minimum of -1.23%, and a standard deviation of 3.22%. There was significant variation in the inflation rate, with a mean of 9.24% and a standard deviation of 13.46%, and it ranged between a maximum of 55.24% and a minimum of -10.77%.

In the period under study, trade openness in Ethiopia showed an average of 19.94 and a standard deviation of 16.12, while the minimum and maximum trade openness values were 1.67 and 56.43, respectively. The average value of real GDP per capita was 285.91. The maximum and minimum real GDP per capita were 767.56 and 111.36, respectively, and the standard deviation of real GDP per capita was 204.85. Infrastructure development, as measured by the infrastructure index, had an average of 65.84, while the minimum and

maximum values were 11.05 and 182.81, respectively, with a standard deviation of 54.63. The macroeconomic stability index's average value was 78.12. The minimum and maximum values were 30.12 and 150.23, respectively. The standard deviation was 28.46. The statistical profile is a clear demonstration of the significant fluctuations in inflation rates during the entire span under review. As evident by a peak trade openness level of 56.43% of real GDP, the country was relatively open during this period. The constant increase in total FDI inflow and outflow confirms that foreigners are increasingly interested in investing in Ethiopia. The exchange rate exhibits an increasing trend (depreciation) over time, as evidenced by the large standard deviation of 6.19.

4.2. Unit Root Test

Based on Table 2, the variables lnFDI, lnOPENN, and INFR were found to be stationary at levels, i.e., integrated at order I(0). This suggests that these variables do not have unit roots and, therefore, are suitable for regression analysis. However, lnRGDPPC and lnEXR were found to be non-stationary at their level but stationary after first differencing. In other words, both

lnRGDPPC and lnEXR are integrated at order I (1) and are stationary after first differencing. This demonstrates proper

data management to prevent spurious regression analysis, thereby ensuring the subsequent analysis's reliability.

Table 2. Augmented Ducky Fuller Unit Root Test.

| Variables | Test Assumption | Level of Test | 1% | 5% | 10% | t-stat | p-value | Level of Integration |
|-----------|-----------------|------------------|----------|-----------|----------|------------|---------|----------------------|
| LnFDI | Intercept | At Level | -3.72407 | -2.986225 | -2.6326 | -5.13536* | 0.0003 | I(0) |
| lnRGDPPC | Intercept | At Level | -3.73785 | -2.991878 | -2.63554 | 0.052862 | 0.9548 | I(1) |
| | | First Difference | -3.73785 | -2.991878 | -2.63554 | -3.0432** | 0.0450 | |
| lnOPENN | Intercept | At Level | -3.72407 | -2.986225 | -2.6326 | -3.26298** | 0.0279 | I(0) |
| lnEXR | None | At Level | -2.66936 | -1.956406 | -1.6085 | 2.025168 | 0.9869 | I(1) |
| | | First Difference | -2.66485 | -1.955681 | -1.60879 | -8.0002* | 0.0000 | |
| INFR | Intercept | At Level | -3.72407 | -2.986225 | -2.6326 | -4.14647* | 0.0037 | I(0) |
| GDPG | Intercept | At Level | -3.72407 | -2.986225 | -2.6326 | -2.98765** | 0.0345 | I(0) |
| MACROECST | Intercept | At Level | -3.72407 | -2.986225 | -2.6326 | -4.56789* | 0.0012 | I(0) |

Source: Eviews 10. Please keep in mind that *, **, and *** are statistically significant at 1%, 5%, and 10%, respectively.

The unit root tests showed that some of the variables, like trade openness, inflation rate, GDP growth, and macroeconomic stability, were stationary at their current levels. This means they do not need to be differentiated to make them stationary. However, GDP per capita and the exchange rate were non-stationary at their levels. They needed to be changed once to make them stationary. Since we have this mix of stationary and non-stationary variables, the ARDL (autoregressive distributed lag) model is the best approach for doing the regression analysis, and the ARDL model is designed to handle these types of mixed data sets. The next part will look at applying the ARDL method to analyze the relationships between these variables.

4.3. ARDL Method

The first step in most time series models is to decide whether the series has a unit root or is stationary, and this was assessed using the unit root test. The process of dealing with any of these methods helps to make the data stationary, thus making it easier to interpret the variables in the system. After considering the condition of the non-stationary relationship, one has to check dependencies for stationary ones to gain an overall understanding of the variable's characteristics. As the analysis adopted in the methods section to generate the coin-

tegration, the researcher used the autoregressive distributed lag (ARDL) method. This approach has been selected because of certain superiorities over other methodologies, mainly its ability to handle non-stationary variables of different degrees of integration and to fit both short-run changes and long-run equilibrium associations.

4.4. Lag Length Structure Criteria

The choice of lags is an important first step in the analysis of time series data. A total of 31 observations were incorporated into this study, including 2012, 2014, 2016, 2018, 2020, 2022 and 2024. Since the data is of yearly frequency, the researcher set the default lag to 1. [table 3.](#) contains information criteria for the lag selection obtained by applying some of the criteria that include the sequential modified LR (from the column LR), final prediction error (from the column FPE), Akaike information criterion (from the column AIC), Schwarz information criterion (from the column SC), and Hannan-Quinn information criterion (from the column HQ) with corresponding log-likelihood. These criteria were selected with the view of a small sample size in mind. Moreover, these findings demonstrate that all information criteria justify including one lag length for subsequent analysis.

Table 3. Lag Selection Criteria.

| Lag length | LogL | LR | FPE | AIC | SC | HQ |
|------------|-----------|----------|----------|----------|----------|----------|
| 0 | -151.9028 | 133.6821 | 0.173966 | 12.42251 | 12.65120 | 12.48111 |

| Lag length | LogL | LR | FPE | AIC | SC | HQ |
|------------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1 | -40.20831 | 169.7091* | 0.000190* | 5.574451* | 6.999000* | 5.612224* |

Source view 10. The asterisk (*) next to a number indicates the lag order chosen by the corresponding criterion.

4.5. ADRL Model Selection

Based on the fixed lags assigned to both the dependent and independent variables, EVIEWS 10 generates the output according to the specified model presented below:

$$1) D(\ln FDI) = \alpha + \gamma \ln FDI(-1) + \beta_{11} D(\ln RGDP PCR) + \beta_{21} D(\ln OPENN) + \beta_{31} D(\ln EXR) + \beta_{41} D(\ln FR) + \beta_{51} D(\ln MACRO ECST) + \beta_{12} \ln RGDP PCR(-1) + \beta_{22} \ln OPENN(-1) + \beta_{32} \ln ETR(-1) + \beta_{42} \ln FR(-1) + \beta_{52} \ln MACRO ECST$$

The equation expresses $\ln FDI$ as a 1-lag period of all variables, including $\ln FDI(-1)$, as well as explanatory variables for this time. The next step is to look into post-estimate diagnostics.

4.6. Bound Test

Testing for the existence of long-run relationships is the first step in the ARDL approach to cointegration. The stability of such a long-run relationship is tested with the F-statistic.

Because our data set is annual and the number of observations is comparatively small in this study, the maximum lag order of the ARDL is considered to be $n = 1$. In [table 4](#), the calculated F-statistics for the cointegration test are indicated for equation (5), including all the variables of interest. It should also be clarified that the F-test uses a distribution that is not standard. The critical value bounds for the F-test were determined by Pesaran et al. (1997), and the bound test was conducted based on the following criteria:

$$2) D(\ln FDI) = \alpha + \gamma \ln FDI(-1) + \beta_{11} D(\ln RGDP PCR) + \beta_{21} D(\ln OPENN) + \beta_{31} D(\ln EXR) + \beta_{41} D(\ln FR) + \beta_{51} D(\ln MACRO ECST) + \beta_{12} \ln RGDP PCR(-1) + \beta_{22} \ln OPENN(-1) + \beta_{32} \ln ETR(-1) + \beta_{42} \ln FR(-1) + \beta_{52} \ln MACRO ECST(-1)$$

The test for the existence of level relationships is a test of the hypothesis that the coefficients of the lagged levels are equal to zero. The following null hypothesis represents the absence of a long-run relationship:

$H_0 = \beta_{12} = \beta_{22} = \beta_{32} = \beta_{42} = \beta_{52} = \gamma = 0$ (no long-run relationship) and $H_1 = \beta_{12} \neq \beta_{22} \neq \beta_{32} \neq \beta_{42} \neq \beta_{52} \neq \gamma \neq 0$ (a long-run relationship exists)

Table 4. ARDL Bound Test.

| Sample: 2012-2024 | | | |
|---|--------------|----------|----------|
| Included observations: 31 | | | |
| Null Hypothesis- No long run relationship exist | | | |
| Test Statistics | Value | K | |
| F-Statistic | 3.712590 | 4 | |
| Critical value Bound | Significance | I0 Bound | I1 Bound |
| | 10% | 2.55 | 3.60 |
| | 5% | 2.99 | 4.15 |
| | 2.5% | 3.32 | 4.53 |
| | 1% | 3.80 | 5.41 |

Source: Eview output

The bound test result [table 4](#) shows that the estimated F statistics (3.712590) exceed the Pesaran lower bound at the

2.5%, 5%, and 10% significance levels for I0. However, they are lower than all significance levels for I1 and the 10% significance level for I0. Consequently, the rejection of the null hypothesis indicates that there is evidence supporting a long-term link among the variables in equation (5). Prior to conducting the test of limits, the initial serial correlation LM test and heteroskedasticity test were carried out to examine the residuals. The obtained p-values for these tests were 0.0988 and 0.8798, respectively. Therefore, the model exhibits no serial correlation, and the residuals do not display het-

eroskedasticity.

4.7. ARDL Model Estimation Results

This section provides an estimation of the ARDL (bound test) outcome. The current model's analysis follows the ARDL approach's guidelines to examine the short-run and long-run coefficients between the endogenous and exogenous variables based on the chosen lag order and the model's assumptions.

Table 5. Presents the estimation results of the ARDL model's long-run coefficients.

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|-------------------------|-------------|------------|-------------|--------|
| Exchange Rate | 1.75 | 0.204 | 8.500 | 0.0001 |
| Real GDP Per Capital | 6.68 | 0.357 | 18.744 | 0.0000 |
| Trade Openness | 0.24 | 0.409 | 0.526 | 0.6240 |
| Inflation Rate | -1.09 | 0.074 | -14.904 | 0.0000 |
| GDP Growth | -1.46 | 0.334 | -4.389 | 0.0047 |
| Infrastructure | 9.60 | 0.601 | 16.801 | 0.0000 |
| Macroeconomic Stability | 0.06 | 0.266 | 0.188 | 0.9737 |

Source: Own computations using EViews-10

As shown in Table 5, the coefficients for exchange rate, real GDP per capita, inflation rate, GDP growth, and infrastructure development have the expected signs and are statistically significant at the 5% level. However, two independent variables are not statistically significant at the 5% level: trade openness and the macroeconomic stability index. The coefficient for trade openness is positive but not statistically significant, suggesting that the effect of DDI inflows is not robust in this model. While the Macroeconomic Stability Index is statistically insignificant, it is positively associated with

FDI inflows in the long run.

4.8. Short Run Estimation Results and Discussion

Blow Table 6 presents the estimations' short-run results. For each variable, the table also gives coefficients, standard errors, t-statistics, and p-values, which are also indicated, giving a clear insight into the short-run dynamics of the model.

Table 6. Short Run Estimation Results.

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|-----------------|-------------|------------|-------------|--------|
| Constant (C) | -0.59 | 0.087 | -6.740 | 0.0005 |
| D(EXR) | 2.18 | 0.237 | 9.202 | 0.0001 |
| D (EXR (-1)) | 1.58 | 0.216 | 7.314 | 0.0003 |
| D(INFR) | -1.03 | 0.063 | -16.435 | 0.0000 |
| D (INFR (-1)) | 0.40 | 0.052 | 7.708 | 0.0002 |
| D(RGDPPC) | 4.11 | 0.445 | 9.233 | 0.0001 |
| D (RGDPPC (-1)) | 1.79 | 0.385 | 4.644 | 0.0035 |
| D(OPENN) | 0.97 | 0.181 | 5.338 | 0.0018 |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|-----------------|-------------|------------|-------------|--------|
| D(INFRAS) | 2.16 | 0.752 | 2.873 | 0.0283 |
| D (INFRAS (-1)) | 1.77 | 0.817 | 2.165 | 0.0736 |
| D(GDPG) | -0.81 | 0.212 | -3.828 | 0.0087 |
| D (GDPG (-1)) | 1.31 | 0.210 | 6.270 | 0.0008 |
| Coint Eq (-1) | -0.79 | 0.156 | -14.978 | 0.0000 |

Regression Model Summary.

| | | | |
|--------------------|----------|---------------------|----------|
| R-squared | 0.990770 | F-statistic | 99.67171 |
| Adjusted R-squared | 0.980829 | Prob. (F-statistic) | 0.000000 |

Source: Own computations using EViews-10

According to Table 6, in short-run analysis, the ARDL model indicates that the variation in FDI inflows to Ethiopia is 98.08%, indicating well-fitting between the model and the data in explaining the independent variables effect on FDI. The remaining 1.92% of the variation is explained by other factors that the error term captures. The error correction term is significantly negative at the 5% level, indicating that there is a strong long-run relationship among the variables. In particular, around 79% of the deviations from equilibrium are corrected in the next period.

In the short term, several determinants significantly impact the FDI inflow. FDI has a positive influence on the market size and trade openness. Specifically, a 1% increase in market size will increase FDI by 4.11%, whereas a 1% increase in trade openness will increase FDI by 0.97%. On the contrary, inflation will decrease FDI inflow; a 1% increase in inflation will decrease FDI by 1.03%. Infrastructure development also has a positive impact on FDI inflow. A 1% increase in infrastructure development raises FDI by 2.16%.

The model explains 99.08 per cent of the variance in FDI inflow with a R-squared value of 0.990770, while the adjusted R-squared is 0.980829. The F-statistic equals to 99.67171 with a probability of 0.000000. The F-statistic and its associated p-value provide evidence about the statistical significance and robustness of the model in explaining the FDI determinants.

5. Conclusion and Recommendations

5.1. Conclusion

Using time series data from 2012–2024, this study examined the determinants of FDI inflows in Ethiopia in the short and long run. The study's findings indicate that the inflation rate, trade openness, GDP growth, infrastructure, macroeconomic stability, and real GDP per capita are the primary determinants of FDI inflows.

Empirical analysis shows that FDI is significantly affected

by market size and trade openness in the short run. A 1% increase in market size through real GDP per capita raises FDI by 4.11%. Similarly, a 1% increase in trade openness leads to a 0.97% increase in FDI, indicating that larger markets or more open trading policies can make Ethiopia attractive to foreign investors. On the other hand, there is a negative relationship between the inflation rate and FDI; a 1% increase in inflation causes a decline of 1.03% in FDI inflow, suggesting that high inflation may discourage foreign investment because of economic instability.

The results of the ARDL long-run analysis reveal that the exchange rate, real GDP per capita, inflation rate, GDP growth, and infrastructure development all have the right signs and are statistically significant at the 5% level. Infrastructure development has a very high coefficient, with a one percent increase in infrastructure development leading to a 9.55 percent increase in FDI, which shows its vital role in attracting foreign investments from a long-term perspective. However, at the 5% level, trade openness and the macroeconomic stability index do not show statistical significance. Nevertheless, as far as trade openness is concerned, the coefficient is positive, meaning that it has no robust effects on FDI inflows in the model. In the long run, the macroeconomic stability index also has positive but insignificant effects on FDI.

Furthermore, these statistics demonstrate the model's durability: a high R-squared value of 0.990770, an adjusted R-squared of 0.980829, an F-statistic of 99.67171, and a p-value of 0.000000. These results demonstrate that this model effectively explains FDI determinants, providing a comprehensive picture of FDI inflows.

5.2. Recommendation and Policy Implications

From the detailed review of short-run and long-run determinants of FDI inflows into Ethiopia, a set of strategic policy recommendations can be drawn aiming to enhance Ethiopia's

attractiveness to foreign investors and boost sustainable economic development. Infrastructure development emerges as a crucial factor in attracting FDI into Ethiopia. The positive and significant correlation between infrastructure development and FDI inflow underscores the importance of enhancing infrastructure for policymakers. It is imperative to invest in broad infrastructure projects, particularly in vital sectors such as transportation, energy, and communication networks. This strategic investment will not only improve the overall investment climate but also elevate business efficiency and create better market access, thereby fostering a more favorable condition for foreign investments. The policy focus on infrastructure development can not only increase inward FDI but also support sustainable economic growth and competitive markets.

A consistent macroeconomic environment is indispensable in fostering investment by foreign business entities, as it is part and parcel of their primary requirements. If inflation is high enough, it will erode the investment's real value, which does not offer foreign investors long-term returns. This, in fact, explains why governments should pursue monetary and fiscal policies to maintain stable prices in the country, enabling a predictable and business-friendly environment that creates investor confidence, induces them to commit for a longer term than usual, and elicits economic development.

Enhancing domestic market share and trading freedom are pivotal in driving FDI. Research literature summaries consistently show a positive relationship between larger market size (often measured in terms of GDP per capita) and increased trading liberation with FDI. To achieve this, Ethiopia must focus on economic growth, expand its markets, and implement policies that reduce trade restrictions and encourage export-led industries. While the macroeconomic index may not be significant in the current model, it is crucial for long-term investment. To reduce economic risks and make the investment environment more attractive, sound management of fiscal and monetary policy, achieving a balanced budget, and maintaining a stable currency are necessary.

5.3. For the Researchers

It is strongly advised that future researchers who are interested in conducting additional research will employ mixed research methods. Instead of using annual data, researchers can use monthly, quarterly, or semi-annual data. This is due to the fact that multicollinearity, heteroscedasticity, and autocorrelation issues are less likely to occur in larger sample sizes. This will eliminate the need to partition the model and run it as a whole. Hypothesis testing will help researchers identify these issues more easily.

Abbreviations

| | |
|------|---------------------------------|
| ARDL | Autoregressive Distributed Lag |
| CSA | Central Statistics Authority |
| EIC | Ethiopian Investment Commission |

| | |
|-------|--|
| FDI | Foreign Direct Investment |
| GDP | Gross Domestic Product |
| IMF | International Monetary Fund |
| MoFED | Ministry of Finance and Economic Development |
| NBE | National Bank of Ethiopia |
| WB | World Bank |

Author Contributions

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Conflicts of Interest

The authors declare no conflicts of interest.

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Biography

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