



The Effect of Macroeconomic Variables and Political Instability on Foreign Direct Investment in Ethiopia: A Time Series Analysis Using VECM Model

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**The Effect of Macroeconomic Variables and Political
Instability on Foreign Direct Investment in Ethiopia: A
Time Series Analysis Using VECM Model**

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**A thesis submitted to the Department of Economics in
Partial fulfilment of the requirements for the Degree of
Master Science in Corporate Finance (With Specialty in
Investment Management)**

**Addis Ababa University School of Commerce
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DECLARATION

Candidate's Declaration

I hereby declare that this Thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

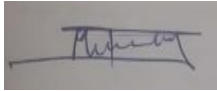
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THESIS SUBMISSION APPROVAL FORM

This is to certify that the thesis entitled “**The Effect of Macroeconomic Variables and Political Instability on Foreign Direct Investment in Ethiopia: A Time Series Analysis Using VECM Model**” has been carried out by **YIFRU YIRDAW FEREDDE** under my supervision. This thesis is submitted for the fulfillment of the requirements for the **Master of Science in Corporate Finance (With Specialty in Investment Management)** program at Addis Ababa University. I confirm that the candidate has met the necessary academic requirements and recommend the thesis for submission and defense.

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Acronyms

ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
EIC	Ethiopian Investment Commission
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
HGER	Home-Grown Economic Reform
HQIC	HQIC - Hannan-Quinn Information Criterion
IMF	International Monetary Fund
INF	Inflation
M&A	Mergers and Acquisitions
MoF	Ministry of Finance
NBE	National Bank of Ethiopia
PI	Political Instability
Phillips-Perron	Phillips-Perron
PWAER	Period Weighted Average Exchange Rate
RGDP	Real Gross Domestic Product
RLIR	Real Lending Interest Rate
SBIC / BIC	Schwarz Bayesian Information Criterion
UNCTAD	United Nations Conference on Trade and Development
VAR	Vector Autoregression
VECM	Vector Error Correction Model
WGI	Worldwide Governance Indicators

Abstract

This study analyzes the effect of key macroeconomic determinants and political instability on foreign direct investment (FDI) inflows in Ethiopia from 1992 to 2024. Using annual time-series data and the Vector Error Correction Model (VECM), the study explores both long-run and short-run relationships between real GDP, inflation, real lending interest rates, the period-weighted average exchange rate, political instability, and FDI inflows. The findings indicate the presence of long-run equilibrium relations between FDI and the explanatory factors. High interest rates are found to discourage FDI through increased borrowing costs, and exchange rate volatility has a negatively effect on investor confidence. Political instability also serves as a significant deterrent, eroding economic stability and discouraging long-term investment. Specifically, inflation, interest rates, and political instability are long-run forcing variables, influencing macroeconomic trends without adjusting themselves in the short term. On the other hand, FDI, GDP, and exchange rate variables respond to restore long-run equilibrium after shock. These results highlight the necessity of macroeconomic stability and political certainty in foreign investment inflows. The studies identify the necessities of specific policy responses, including exchange rate stabilization, interest rate moderation, and improving governance, to improve the investment climate in Ethiopia. Policymakers should give priority to long-term economic reforms rather than short-term adjustments to realize investment growth sustainably. By reducing macroeconomic instability and improving institutional stability, Ethiopia can attract and retain foreign investors.

Keywords: *Foreign Direct Investment (FDI), Macroeconomic variables, Political instability, VECM model, investment determinants*

CHAPTER ONE

1. INTRODUCTION

1.1. Background

Investment is putting money into assets with the hope of receiving returns in the future, i.e. profit or interest (Graham, 2017). Investment decisions in modern economic systems especially **Foreign Direct Investment (FDI)** are influenced by macroeconomic conditions, institutional factors, and global financial dynamics. The evolution of investment methods, particularly in the 20th century with the models of Modern Portfolio Theory as well as the Efficient Market Hypothesis, has enabled investors to become more sophisticated in evaluating risk and return (Sethi, 2021).

The path of history and future development in investments demonstrates the duality of opportunity and problems within the dynamic landscape of investments. The development from the rough trade finance of the past to the high-technology online marketplaces characteristic of the present time is indicative of underlying shifts in technology, economics, and societal structures. These shifts impact individual and corporate investor decision-making processes as well.

Investment decisions-making entails committing resources—financial, human, and physical—to assets or projects that will give returns in the future. These are crucial decisions for businesses, individuals, and governments, and are affected by numerous variables, especially macroeconomic factors (Jacobs, 2024). Investment decisions-making could be complicated (Raj & A.J Anuradha, 2024). Businesses have to go through an extensive process to decide if they should expand or start new projects. If the choice is to invest in an overseas market, the considerations will be broad consideration of the macroeconomic conditions of that target country will be paramount (Pettinger, 2021).

Macroeconomic data reflect the performance of the economy of a nation; however, the reliability of such data is contingent on the level of development of the country (Raj & A.J Anuradha, 2024). The developed nations tend to have more accurate data compared to nations

in the emerging economies. Though the potential disparities in accuracy, such data are of paramount significance in making investment decisions across the globe (Jacobs, 2024).

Being a developing country, Ethiopia needs huge investment to realize its Development Plan and Investment Programme for 2023/24 to 2025/26 (MoF, 2020). The government has revised more than 80 investment and business regulations to ease doing business and passed a new investment law to open up many sectors. However, the way investors react to the nation's invitation to 'come and invest in Ethiopia' is not satisfactory. Though there is a rise in the number of licensed investors from time to time but the numbers of investments coming into operation continue to be too small (EEA, 2018).

There are researches examine investment decision by private or corporate level based on macroeconomic conditions for developing economies in general as well as that of Ethiopia in particular (Ambe, 2017); (Waktola, 2020); (Jacobs, 2024). There are also research works which investigate focusing on the determinants of Foreign Direct Investment in Ethiopia (Sofoniyas, et al., 2023); (Workneh, 2014); (Hordofa, 2023); (Desulie & Ashalatha, 2022); (Haile & Assefa, 2006); (Legesse, 2018); (Bekana, 2018). (Shah & Gizaw, 2023), conducted research on the effect of some macroeconomic variables on economic growth.

For developing nations such as Ethiopia, FDI is crucial for economic transformation, but is a challenge due to factors like macroeconomic and political instability (Jacobs, 2024), (MoF, 2024). Most of the literature concentrates on the effect of macroeconomic determinants on investment in developing nations, but there has been little work on Ethiopia. This research seeks to fill this gap by analysing the effect of macroeconomic factors and political instability influence FDI decisions in the Ethiopian context.

1.2. Statement of the Problem

Investment is a fundamental driver of economic growth, connecting current undertakings to future prosperity (Graham, 2017). Globally, governments seek to formulate supportive policies and create conducive environments that appeal to investors. However, more so in developing nations, macroeconomic instability, uncertainty, and adverse legal environments tend to deter investors (Farooq, et al., 2022); (Mankiw, 2019), (Bishop & Green, 2011); (Legesse, 2018).

The World Investment Report (2023), published by UNCTAD indicates that developing nations, including Ethiopia, are confronting increasing investment deficiencies that have lately been affected by global crises, mainly the hike in foodstuff and energy prices, together with the war in Ukraine (UNCTAD, 2023).

Ethiopia has taken steps to implement a string of economic reforms aimed at improving its investment climate and attracting more foreign direct investment (FDI). Among these is the Home-Grown Economic Reform (HGER) agenda, which places a premium on macroeconomic stability, liberalization, and institutional reform. Further, Investment Proclamation No. 1180/2020 offers different incentives such as guarantees against expropriation, the remittance of profits, and access to land (MoF, 2020), (Proclamation, 2020).

Moreover, efforts have been made to modernize customs systems and align regulatory frameworks with international standards. Despite these efforts, the country has struggled to convert policy initiatives into tangible FDI outcomes (MoF, 2020); (MoF, 2024). FDI inflows decreased significantly from \$4.3 billion in 2021 to \$3.7 billion in 2022 and further down to \$3.3 billion in 2023, reflecting declines of 14% and 11%, respectively. This means increasing worry on the part of investors for inflation, exchange rate instability, interest rate changes, and policy uncertainty (MoF, 2024), (UNCTAD, 2023). These trends indicate that reform efforts, though necessary, will not be enough unless the general macroeconomic setting encourages stable and secure investment. Apart from curbing inflows, Ethiopia also has serious issues related to investment realization and maintenance.

The 2025 Federal Auditor General's report states that only 24% of the 18,559 investment licenses issued in the last 26 years have reached the stage of being operational projects (Italo, 2025). Moreover, a huge 69% of the 1,550 permits issued since 2013 remain dormant, reflecting continued challenges. Most significantly, the Ethiopian Investment Commission has signed no new bilateral investment agreements since 2019, weakening the nation's ability to engage in global investment connections and offer assurance to prospective investors (Yoseph, 2025).

One such critical factor discouraging foreign investment is the increased political instability that has come to define Ethiopia. Research by (Desulie & Ashalatha, 2022) highlights the

significant negative impact of internal conflict, civil unrest, and regional insecurity on FDI flows between 2017 and 2020. Political instability increases risk perceptions among investors, undermines institutional credibility, and amplifies uncertainty, making long-term investment decisions riskier and less attractive. Even with legal guarantees and reform agendas, such instability can nullify the potential benefits of favourable macroeconomic indicators.

While previous studies have greatly accounted for firm-level determinants of investment, few have examined the effect of macroeconomic determinants and political instability on FDI decision-making in general in the case of Ethiopian (Bekana, 2018), (Legesse, 2018), (Haile & Assefa, 2006), (Ambe, 2017); (Mekonnen & Mogess, 2021); (Pettinger, 2021); (Shah & Gizaw, 2023); (Waktola, 2020); (Sofoniyas, et al., 2023). This is an avenue that needs further study to enhance the investment climate of Ethiopia.

Therefore, this study aims to examine the effect of key macroeconomic variables such as GDP, inflation, interest rate, exchange rate, and political instability on FDI decisions in Ethiopia using time-series analysis. By identifying which variables most significantly influence FDI, the study provided valuable insights for policymakers aiming to improve the country's investment climate and accelerate economic growth.

1.3. Objective of the Study

1.3.1. General Objectives

To analyze the effect of macroeconomic determinants and political instability on foreign direct investment (FDI) in Ethiopia using time series data.

1.3.2. Specific Objectives

- i. To analyze how **inflation** affects foreign direct investment (FDI) in Ethiopia.
- ii. To examine the impact of **interest rates** on FDI decisions in Ethiopia.
- iii. To analyze the influence of **exchange rates** on FDI inflows.
- iv. To investigate the effect of **GDP growth** on FDI.
- v. To evaluate the effect of **political instability** on FDI trends in Ethiopia.
- vi. To study the **short-run and long-run effects** of these macroeconomic variables and political instability on FDI using time-series econometric models - VECM.

1.3.3. Research Questions

- i. Inflation significantly influences the level of foreign direct investment in Ethiopia.
- ii. Interest rates have a measurable impact on FDI decisions in Ethiopia.
- iii. Fluctuations in exchange rates affect the volume of FDI inflows into Ethiopia.
- iv. GDP growth positively contributes to foreign direct investment trends in Ethiopia.
- v. Political instability plays a critical role in shaping FDI patterns in Ethiopia.
- vi. There are statistically significant short-run and long-run relationships between macroeconomic variables, political instability, and foreign direct investment in Ethiopia.

1.4. Significance of the Study

This study holds significant relevance for researchers, investors, and policy makers. It tries to address a significant gap in current literature by examining the impact of macroeconomic determinants and political instability on foreign direct investment (FDI) in Ethiopia based on time series data and advanced econometric.

The study closely examines the impact of macroeconomic determinants and political instability in Ethiopia on foreign direct investment decisions. It offers key insights regarding the Ethiopian investment climate according to significant macroeconomic indicators such as GDP, inflation, interest rate, exchange rate, and political instability. Such findings are especially helpful for foreign investors who want to make informed and strategic decisions. Grasping the interplay between these variables allows investors to better analyse risks and opportunities in a volatile macroeconomic and turbulent political landscape.

The study contributes to the literature in the form of empirical evidence based on a rigorous time series analysis and thereby enriches the knowledge on FDI trends in Ethiopia. It also serves as a reference for future study on investment behaviour amidst macroeconomic and political uncertainty, especially for economics with similar economic and institutional characteristics.

In addition, the study will support Ethiopian policymakers in formulating evidence-based policies for attracting and retaining FDI. More insightful comprehension of macroeconomic and political investment determinants can be used to make more targeted reforms aimed at improving economic stability, boosting investor confidence, and achieving long-run development goals.

1.5. Scope of the study

This research explores the effect of some macroeconomic determinants specifically real GDP, inflation, real lending interest rates, the period-weighted average exchange rate and political instability on foreign direct investment inflows into Ethiopia. The research covers 33-years, from 1992 to 2024, with time-series data to be analyzed.

Though numerous determinants can influence FDI like institutional quality, technological progress, human capital availability, market size, trade openness, and regulatory frameworks. This study is limited to macroeconomic and political determinants due to constraints in obtaining comparable long-term data for conducting time series analysis.

The research cautiously examines both the theoretical and empirical significance of the variables chosen, making reference to the requirement for stable long-run data required to conduct time series analysis.

Specifically, the variables to be utilized are:

- **Real GDP:** Reflects inflation-adjusted growth and is a measure of overall economic performance and foreign investor market potential.
- **Real lending Interest rate:** is the real cost of borrowing and shows the actual return on investment. It indicates how investment choices are affected due to the change in the interest rate level.
- **Period Weighted Average Exchange Rate:** gives a more insightful assessment of exchange rate trends over a period and reflects the effects of currency movement on FDI decisions.
- **Inflation** – records the general rise in price levels and helps to assess the stability of the macroeconomic environment. It helps to show the level or instability of inflation on FDI decision.
- **Political Instability:** measured by indicators such as the Political Stability and Absence of Violence/Terrorism index. It captures the perceived risk of government

disruption, civil unrest, or violence, which can significantly affect the confidence and decision-making of foreign investors.

The research is strictly confined to the Ethiopian situation alone and does not try to generalize its findings to other nations that may share similar or different political or economic situations.

1.6. Limitations of the study

Despite its potential relevance, the study was confronted with several limitations. The study is based on secondary data from the National Bank of Ethiopia (NBE), the Ethiopian Investment Commission (EIC), and the World Bank. The completeness of the study was determined by the availability, consistency, and accuracy of long-term historical or periodically gathered data. Particularly the data related to political instability are not available before the 1990's.

The focus of the analysis in this research was solely on macroeconomic and political determinants. The other determinants of FDI such as quality of governance, infrastructure, sectoral policies, external debt, fiscal balance, and regulatory environment are not considered due to time constraints and limited time series data. It also didn't consider behavioural, institutional, and investor perceptions, cultural determinants, or administrative barriers.

1.7. Delimitations of the study

The research specifically examines the effect of five important variables GDP, interest rate, exchange rate, inflation, and political instability on foreign direct investment in Ethiopia from 1992 to 2024. Other macro and institutional variables that could affect investment decisions, including government expenditure, trade balance, external debt, governance, institutional quality, and business environment conditions have been left out by design for the sake of methodological consistency and in light of data limitations.

Geographically, the research is confined to Ethiopia, and therefore the findings cannot be generalized to other countries with different economic system and regulatory frameworks. In addition, the quantitative time series method restricts the study to quantifiable variables and therefore does not consider intangible variables such as investor perceptions, policy

effectiveness, or investment practice within particular industries. Additional research can utilize the potential of blending qualitative methods or comparative research between nations.

1.8. Organization of the study

The study organized into five chapters. Chapter one presents the introduction part including: background, Statement of the Problem, research objectives, research questions, significance, scope of the study, and limitations, delimitations and study organization. Chapter Two provides a comprehensive review of theoretical and empirical literature on the relationship between macroeconomic variables, political instability, and FDI, with a focus on developing countries and Ethiopia. It includes the conceptual framework and research gap. Chapter Three outlines the research methodology, including the research approach, design, data sources, and econometric model VECM used for analysis. Chapter Four is the research presentation of findings with an emphasis on significant findings from the analysis, evaluation, and interpretation of results. Chapter Five is the study summary with a synthesis of findings, conclusions, and recommendations.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Theoretical Literature Review

2.1.1. Investment

Investment is the deliberate commitment of resources such as time, effort, and financial capital with the aim of generating future returns in the form of income or profit. The investment could be in an extensive range of assets, from stocks, bonds, and real estate to the setup of a business enterprise, with the hope that these assets would appreciate in value over time, thereby generating wealth (Graham, 2017).

In the 20th century, investment theory began to take shape in a more concrete form. Pioneering scholars such as Harry Markowitz and Eugene Fama largely contributed to the development of modern investment methods. Markowitz's Modern Portfolio Theory, developed in the 1950s, demonstrated how risk could be avoided through diversification, while Fama's, Efficient Market Hypothesis, developed in the 1960s, again revolutionized investors' methods towards financial markets (Sethi, 2021)

Investment theory is also consistent with the great economic schools of thought, predominantly classical and Keynesian economics. Classical economists such as Adam Smith and David Ricardo considered investment as a key stimulator of economic growth, which arises out of the processes of savings and capital accumulation (Smith, 1776); (Ricardo, 1817). Smith took for granted that investment, as a rational outcome of savings, aimed to increase material welfare and to maximize profits (Smith, 1776). Ricardo, in his seminal work, 'Principle of Political Economy and Taxation' stressed the link between investment and economic growth (Ricardo, 1817).

Keynes, revised investment theory in his, 'General Theory of Employment, Interest, and Money' (1936), by emphasizing a new idea that expectations and uncertainty are key drivers in the determination of investment decisions (Keynes, 1936). According to Keynes, the two factors of the marginal efficiency of capital and interest rates, were the main factors that determined investment, though the psychological factor of investor confidence played an

important part. Thus, investment is not just a simple financial transaction; it is actually a critical way of connecting today's resource allocation with future prosperity (Graham, 2017).

2.1.2. Foreign Direct Investment

Foreign Direct Investment (FDI) refers to an investment made by a firm or individual in one country into business interests located in another country, typically by acquiring a lasting interest in an enterprise and exerting a significant degree of influence on its management. As the International Monetary Fund (IMF) defines it, FDI occurs when the investor buys at least 10% of the voting stake in a foreign enterprise (IMF, 2009). In contrast to short-term capital flows, FDI is rather a long-term investment in a host economy in terms of physical establishment of assets such as infrastructure, factories, or machinery.

Not all investments in a foreign country are FDI. For instance a portfolio investment seems an FDI but has different features. Portfolio investment is a passive ownership of bonds and stocks of a foreign country. Portfolio investment is different from other types of investments. Unlike FDI investors, portfolio investors do not need control or active management in the companies they invest in. Portfolio investment is short-term and more responsive to fluctuations in interest.

On the other hand, foreign direct investment has also different features than the domestic investments made by local residents or companies within the host country. Though both engage in similar industries and contribute to capital formation, the domestic investments lack the international dimension, including cross-border knowledge transfer and global value chain integration, that FDI offers (Todaro & Smith, 2020).

FDI plays a vital role in the economic development of host countries by enhancing capital formation, technology transfer, managerial skills, employment generation, and integration into global markets. It is distinguished by its long-term horizon, controlling interest, and multifaceted impact on the host economy, (UNCTAD, 2023). Its types and motivations reflect diverse strategic goals that influence its effects on development.

2.1.2.1. Types of FDI

Depending on the nature and objectives of the investment or how the investment is structured FDI can take various forms. The main types of FDI are three; Greenfield Investment, Brownfield Investment and Mergers and Acquisitions (M&A).

i. Greenfield Investment

It occurs when an investor builds a new business from the ground up in a foreign country. The investor constructs new production facilities, offices, or plants from scratch. As the company is new, it has a direct contribution to job opportunities and necessitates the building of factories, roads and other facilities and other infrastructural development.

It is highly beneficial to host countries as it benefit the local economy. Another aspect of this investment is that the investor will enjoy complete control of operations and management. This helps the investor in reduction of risks from inherited inefficiencies. It is a common type of investment in sectors like manufacturing, technology, and retail expansion. (Dunning & Lundan, 2008).

ii. Brownfield Investment

In this case, rather than starting from scratch, a foreign investor acquires or leases existing facilities to begin new production activity in the host countries. Since the infrastructure is already in place, the investor can start operations quickly. Such investment may be less impactful than Greenfield in terms of initial job creation however, it enables the reuse of existing land and other facilities including the existing employees. In the brownfield investment projects can be quicker to launch and there is a possibility of quicker market entry. It reduces start-up costs but may involve restructuring. It is most commonly used in real estate, energy and heavy industries sectors (OECD, 2020).

iii. Mergers and Acquisitions (M&A)

One form of FDI happens when a foreign business merges with or acquires a domestic registered and operating business. Just as the brownfield investment, the potential to enter the new markets without the need to start from scratch and the potential to more effectively utilize the benefits of inheriting an established brand, customer list, resources and supply chain. In M&A the acquired company will be benefited from modernizing its service by introducing new or upgraded technologies, adopting global best practices and getting additional capital.

However, it may also lead to concerns over monopolization or loss of national control over strategic sectors by the host country. It is common in financial services providers, healthcare institutions and telecommunications (UNCTAD, 2022).

2.1.2.2. FDI Investment Decision

Investment decisions are defined by the deliberate allocation of resources financial, human, or physical to ventures or investments that assure returns in a specified time frame. These decisions are crucial for governments, individuals, and corporations, and they are heavily influenced by various factors, particularly macroeconomic variables (Jacobs, 2024). Macroeconomic determinants become a central factor in the evaluation process, when assessing potential investments in foreign economies (Pettinger, 2021). For business, organizations are confronted with a multifaceted decision-making task when they deliberate on the possibilities of business expansion or launching new business entities.

FDI decisions are made based on a complex array of economic, political, institutional, and strategic factors. These vary by industry, firm type, and host country, but certain overall trends are apparent. Macroeconomic stability in the host country can be described as low inflation, stable GDP growth, and lower volatility in exchange rates and interest rate-related risks. The second equally important consideration being made in the FDI decisions is political stability of the host country. Investors are too sensitive to this and incidence of violence and unrest deter investors (Globerman & Shapiro, 2003).

Macroeconomic indicators offer crucial information on the economic landscape of a nation; however, their credibility may differ depending on the development phase of the subject nation (Raj & A.J Anuradha, 2024). In the case of developed economies, such indicators are more credible, whereas emerging economies such as Ethiopia may present less consistent data. Despite this disparity, macroeconomic determinants continue to be a significant force in shaping global investment choices (Jacobs, 2024).

Investment undoubtedly has a vital role in stimulating national economies, creating a bridge between current economic activities and future wealth. It promotes development, innovation, and general well-being (Graham, 2017). Nations consistently create policies, security measures, and regulations to attract investors. Yet, if investors feel uncertainty, instability, or

poor legal and regulatory frameworks, they might scale down their inflows of capital or even avoid investing altogether (Mankiw, 2019); (Bishop & Green, 2011).

Politically, stability and good governance are essential. Investors seek out countries in which property rights are enforced, legal regimes are clear, and regulatory environments are stable. Political risk in the form of corruption, institutional weakness and war, and has a well-documented deterrent effect on FDI inflows (Globerman & Shapiro, 2003).

People invest for various reasons, including the generation of wealth, quest for financial independence, and realization of long-term aspirations. Some of the most common rationale for investment choices are generation of passive income, inflation hedging, diversification of assets, and saving for future spending (Bodie, et al., 2014). Investment is a vehicle whereby business grow, become more productive, remain competitive in rapidly evolving markets (Shiller, 2015). All these decisions are made with consideration of the general economic environment.

Classical economic theory suggests that investment decisions are closely tied to the relationship between savings and interest rates in a way that high savings enable high investment (Keynes, 1936). Ricardo stressed the applicability of comparative advantage in making investment decisions, especially in foreign trade (Ricardo, 1817). Keynesian economics, on the other hand, stress aggregate demand, expectations, and government intervention in determining investment decisions (Mankiw, 2019). For Keynes, the investment decision is based on the rate of return on investment one may anticipate; if the return anticipated is greater than the prevailing rate of interest, the likelihood of investing is the greater (Keynes, 1936).

Keynes also integrated the psychological aspect into investment decision-making process. Regardless of the economic situation signalling a good time for investments, investors' confidence can have a deep impact on the final decision taken. This is a departure from the classical viewpoints, which tend to view investment decisions as results of pure rational profit-based calculations. Keynes argued that the uncertainty surrounding expectations necessitated the stabilization of the economy through government intervention (Keynes, 1936).

Investment choices are more complicated and cover a wider set of variables when the investment is in an overseas location. Of the FDI theories, the eclectic paradigm happens to be the most inclusive FDI theory. The eclectic paradigm of FDI, or the OLI model, was established by (Dunning & Bansal, 1997). It is regarded as a paradigm due to its unification of various significant theories explaining the internationalization processes of companies. Eclectic paradigm prescribes three conditions that determine if an organization is to carry out FDI: (O) ownership advantages, (L) location/host country-specific advantages and (I) internalization advantages (Dunning, 1993).

Companies acquire ownership advantages by acquiring access to special assets or methods that offer a competitive edge over current competitors in the international market. These advantages may take the form of tangible assets, or intangible assets such as patented technology. Multinational companies engage in foreign investments to utilize their firm-specific advantages in foreign markets and get maximum returns (Dunning, 1993).

Firms may also invest abroad to get advantages derived from location. Establishing production facilities in foreign markets can often be more cost-effective than exporting goods from the home country. This avoid the effect of high transportation costs, market access barriers, and regulatory policies like tariffs and import restrictions. The host country's natural resources or presence of high quality or low cost labour force serve as key location-related incentives for FDI (Dunning, 1993).

The concept of internalization advantage is the most sophisticated aspect of the OLI model since it deals with the firm-specific desire to maintain control over the production in its own organization in a foreign market rather than exporting the production process or business model technology for which it is required to a local firm (Jensen, 2003). Multinational companies engaging in foreign production, distribution, and other value-chain functions realize advantages through the maintenance of complete control over operations, protection of confidential expertise, and a decrease in risks of buyer uncertainty. Moreover, current paradigms have been enhanced and broadened in the theoretical context through the inclusion of cultural aspects and strategic issues (Woodcock, et al., 1994); (Dunning & Bansal, 1997); (Narula, 2010).

The motives for undertaking FDI are varied and largely depend on the investing firm strategic objectives. According to Dunning's Eclectic Paradigm (OLI Framework) firms' motives to pursue FDI for three reasons such as Market Seeking, Resource seeking and Efficiency seeking FDI.

i. Market-Seeking FDI

Firms invest in foreign markets to access new markets to expand their customer base. This helps the firm to get new consumers and high sales volume. Such motives often occurs in large or rapidly growing economies. The investors may be influenced by trade barriers that makes local production more viable than exports. This is common in industries such as telecommunications, retail, and automobiles (Dunning, 1993).

ii. Resource-Seeking FDI

Firms invest abroad seeking to access natural resources like oil, minerals, and agricultural products or to access human resources like getting cheap labour in the host country. This enables the investor secure raw materials at with skilled labour at competitive wages that are the main input in many firms. This type of FDI is often observed in developing countries rich in natural resources and common in industries like mining, agriculture and energy (Asiedu, 2006).

iii. Efficiency-Seeking FDI

Investors look for opportunities to optimize production costs and improve competitiveness by exploiting economies of scale and enhancing efficiency in labor division. Countries offering low-cost manufacturing, skilled labor, favourable tax regimes, or logistics or strong infrastructure attract efficiency-seeking firms aiming to improve their supply chain. Efficiency-seeking FDI is frequently associated with global production networks (Narula & Dunning, 2000).

2.1.3. Macroeconomic Factors Affecting FDI inflows

Foreign Direct Investment is affected by variety of macroeconomic variables, which also comprises GDP, Inflation, Interest rate and exchange rates.

i. Gross Domestic Product (GDP)

Gross Domestic Product GDP is a critical measure of the economic performance of a country by measuring consumption, investment, government spending, and net exports (Mankiw, 2019). A rising GDP indicates a strong economy that attracts foreign investors, which is an indicator of good business climates, expanding markets, and increased consumer demand. Conversely, a declining GDP can discourage investment due to reduced demand and the possibility of economic uncertainty (Blanchard, 2021); (Romer, 1990); (IMF, 2021).

Unstable GDP growth rate in certain nations may make it difficult for them to attract foreign investment as a result of perceived risk and uncertainty by the prospective investors (Rodrik, 1999). Conversely, On the contrary, stable GDP growth provides a favourable investment climate that enhances market confidence and encourages investment in capital markets and business development (Blanchard, 2021); (Solow, 1956).

ii. Inflation

Inflation affects investment in that it lowers the real value of returns and also generates uncertainty about spending in the future. Moderate inflation can trigger investment as it is a sign of economic activity, but high inflation deters investment because of the risks and uncertainty associated with it (Keynes, 1936); (Blanchard, 2021).

To investors, moderate and stable inflation gives cost predictability, enabling long-term investment planning. Unstable or high inflation has the ability to erode confidence due to expected rises in the production cost and uncertainty of prices (IMF, 2021). Inflation affects FDI decisions, since investors desire assets with returns higher than inflation in order to maintain or raise their real returns (Fama & Schwert, 1977); (Mishkin, 2007).

iii. Exchange Rate

Stability in the currency exchange rate is key in foreign investment decision-making because the movement of currency values influences the value of returns upon conversion to the home currency of the investor. Exchange rate volatility exposes investors to a myriad of risks by rendering it hard for them to accurately forecast returns. Conversely, a stable exchange rate

mitigates the risk of devaluation of currency, hence a more stable environment for investment (UNCTAD, 2023).

Volatility in exchange rates can generate instability, hence elevating investment risk. Currency devaluation means more expensive imports, which reduces profit margins for import-dependent businesses. It can deter investment as firms experience elevated costs and reduced profitability (Keynes, 1936). Conversely, a depreciating home currency can make a nation more attractive for foreign direct investment (FDI) because it reduces the cost of labor and other inputs (IMF, 2021).

iv. Interest Rate

Interest rates play a crucial role in determining investment decisions as they determine the cost of accessing funds. Cheaper financing costs due to low interest rates are bound to stimulate investment activities, while high interest rates can deter investment by increasing the cost of borrowing (Keynes, 1936); (Mankiw, 2019).

Interest rates have an impact on FDI decisions. With stable interest rates, investors and companies can make plans for the future with greater certainty, improving the assessment of project viability. High or volatile interest rates, however, generate uncertainty, thereby deterring investment since companies turn risk-averse when it comes to financing costs (IMF, 2021).

An overall grasp of the interconnections among the different macroeconomic variables is critical in coming up with a unified view of the economy. This single integrated approach assists investors in comprehending the financial markets successfully. A sense of how these indicators stand in relation to each other enables policymakers, investors, and analysts to measure the current economic condition and predict future trends. A deep examination of the aforementioned economic drivers provides insightful information, which facilitates stakeholders in making sound decisions to overcome economic challenges and capitalize on opportunities for growth and stability (Jacobs, 2024).

For investors, firms, and policymakers, access to such data can help enhance strategic decision-making, facilitate risk management, and guide investment decisions, thereby guaranteeing that choices are in conformity with the existing macroeconomic environment.

In-depth examination of economic indicators is also vital in making these choices since it assists stakeholders in leveraging opportunities in the face of uncertainty. Organizations can take measures to counter the impact of rising costs if inflation is anticipated to rise, and higher GDP can stimulate investment in expansionary initiatives (Jacobs, 2024).

2.1.4. Political stability and FDI inflows

As Macroeconomic factors, the inflow of FDI also influenced by political stability of the host country. Political stability is one of the most determinants of FDI inflows because a lack of stability affects the investor confidence, risk perception, and the predictability of the business environment that can deter investors from committing capital to a country (Mokoena, 2025). It directly affects the level of investor confidence.

In politically unstable environments, investors face heightened risks such as expropriation, breach of contract, and abrupt changes in laws and regulations. Such uncertainty increases the perceived risk-adjusted cost of investment and discourages long-term commitments. Conversely, a stable political climate fosters confidence among foreign investors by assuring them that their investments are protected and that the business environment will remain conducive (Busse & Hefeker, 2007).

One of the determinants of foreign direct investment (FDI) is the consistency and dependability of government policy. Political stability tends to guarantee that economic strategies, tax regimes, and investment regulations do not undergo sudden or arbitrary changes. Investors like to operate in places where rules are clear and remain so for extended periods to allow them to schedule operations and forecast returns with certainty (Globerman & Shapiro, 2003).

Political stability is closely linked with institutional quality and the effectiveness of governance systems. Stable political environments often coincide with functioning legal systems, lower levels of corruption, efficient bureaucracy, and strong enforcement of property

rights. These institutional factors create a favourable climate for foreign investors by reducing transaction costs and improving the ease of doing business (Asiedu, 2006).

2.1.5. Trends in FDI

The International Monetary Fund (IMF, 2021), recognizes that nations with sound economic policies, minimal inflation, and stable growth patterns draw greater Foreign Direct Investment (FDI). The IMF once more highlights the importance of macroeconomic stability in lowering risk perceptions among investors and fostering increased long-term investment inflows.

i. Global FDI Trend

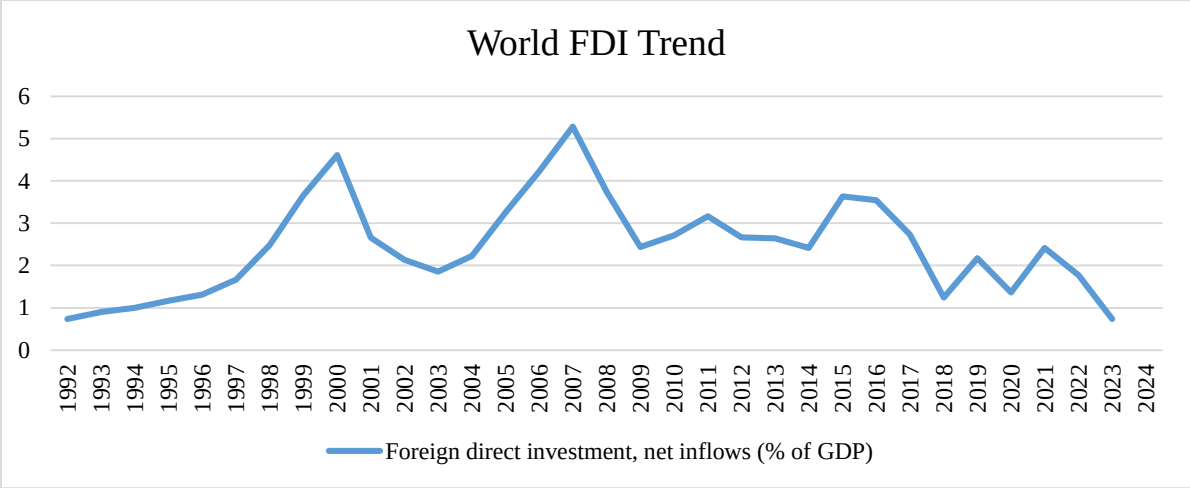
Investment is commonly recognized as a significant source of economic growth, bridging current economic activity and future prosperity (Graham, 2017). Governments' worldwide try to create sound policies and secure conditions for attracting investors. Economic uncertainty, instability, and weak legal systems, on the other hand, are more likely to deter (Farooq, et al., 2022); (Mankiw, 2019); (Bishop & Green, 2011); (Legesse, 2018).

Global investment trends have been shaped by a number of drivers ranging from technological innovations to geopolitical conflicts and economic downturns. The World Investment Report 2023, as presented by the UNCTAD, shows that foreign direct investment (FDI) global flows decreased by 12% to \$1.3 trillion in 2022. This decrease was largely driven by rising energy and food prices, ongoing geopolitical tensions, and tightening financial conditions (UNCTAD, 2023).

The same report identifies an expanding yearly investment deficit that developing economies experience. The worldwide decline in FDI is a consequence primarily of simultaneous global crises like Ukraine crisis, inflated food and energy costs, and increasing public debt (UNCTAD, 2023).

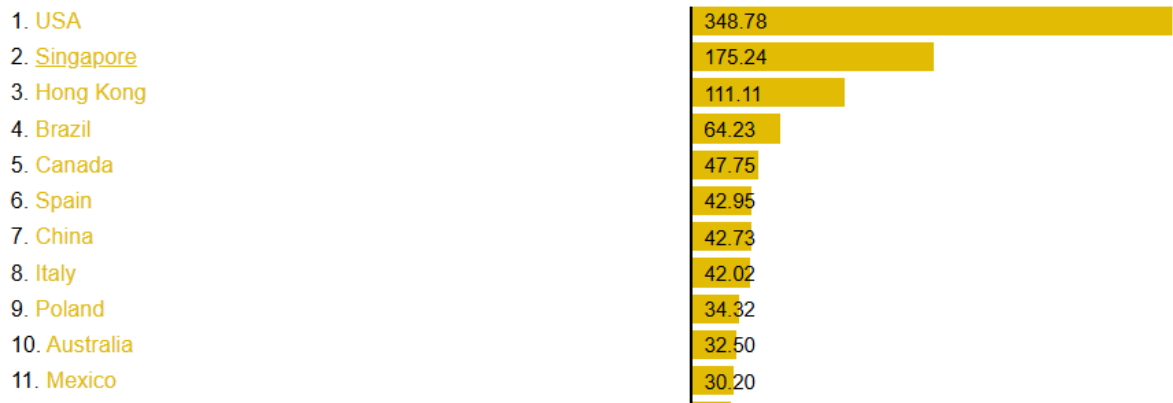
For the year 2023, the average level of Foreign Direct Investment as a percent of GDP for 173 nations was 3.16 percent. The following is a graph of the data for all countries from 1992 through 2023 for which data exist, according to the (WorldBank, 2023).

Figure 1: World FDI Trend 1992-2024



Foreign Direct Investment, billion USD, 2023: The average for 2023 based on 173 countries was 4.49 billion U.S. dollars. The highest value was in the USA: 348.78 billion U.S. dollars and the lowest value was in the Netherlands: -309.01 billion U.S. dollars. Below is a chart for top ten countries (WorldBank, 2023).

Figure 2: Top ten FDI, billion dollars, 2023



Source: world bank

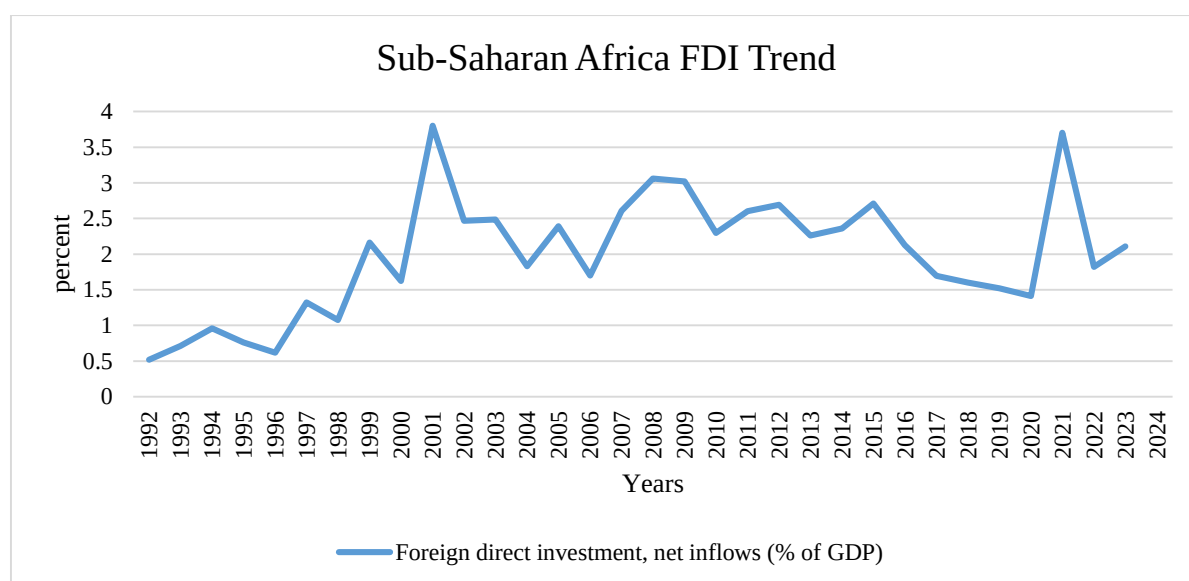
ii. Africa and Sub-Saharan Africa FDI

In Africa, FDI flows have held up in some regions of the continent despite headwinds elsewhere in the world. According to (UNCTAD, 2023), African FDI inflows totaled \$45 billion in 2022, 5% more than the previous year. Sub-Saharan Africa continues to lag behind

in attracting investment, with countries like South Africa and Mauritius performing better than their counterparts due to relatively stable economic and political situations.

Foreign Direct Investment, percent of GDP, 2023: The average for 2023 based on 50 African countries was 3.81 percent. The highest value was in Namibia: 18.58 percent and the lowest value was in Angola: -2.5 percent. Regarding Sub-Saharan Africa countries the average for 2023 based on 45 countries was 4.04 percent. The highest and lowest value were still taken by Namibia and Angola 18.58% and -2.5%, respectively. The all sub-Saharan countries trend from 1992 to 2023 indicates the countries current position is below the average of the region. This incapacity mirrors wider challenges by Sub-Saharan Africa, as revealed in the 2024 Global Opportunity Index (Switek, et al., 2024). Whereas other countries, such as Mauritius and South Africa, have succeeded in attracting foreign investment. Below is a chart for all Sub-Saharan countries where data are available.

Figure 3: Sub-Saharan Africa FDI trend 1992-2024



iii. FDI Trend in Ethiopia

Consistent with regional trends, foreign direct investment (FDI) in the 33 African least developed countries (LDCs) represented 58% of total LDC inflows, and seven of them received more than \$1 billion. Ethiopia attracted the highest, \$3.7 billion FDI in 2022, a decrease of 14% compared to 2021. The inflows fell further to \$3.3 billion in 2023, a decline of 11%, (UNCTAD, 2023). Being one of the large Sub-Saharan African economies, Ethiopia

has been confronted with unstable investment flows, triggered by common worldwide issues like soaring food and energy prices, and the war in Ukraine, which have propelled a widening investment gap (UNCTAD, 2023).

Of critical significance, the driver of investment trends is the impact posed by macroeconomic determinants like inflation, exchange rate, interest rate, and policy stability (Mankiw, 2019). These factors have an influencing impact on investor behaviour since they influence expected economic policies since companies are profit maximization-oriented. In light of the requirement for massive investment for Ethiopia to achieve its Development Plan and Investment Program (2023/24-2025/26) (MoF, 2020), the Ethiopian government has amended more than 80 business and investment regulatory frameworks and passed a new investment law to open up various sectors for liberalization. These reforms are intended to improve the business environment and to attract foreign investment.

Despite these efforts, such as the Home-Grown Economic Reform (HGER) agenda launched in 2019, Ethiopia still continues to struggle with mobilizing adequate investment (MoF, 2020); (MoF, 2024). The reaction of investors to the "Come and Invest in Ethiopia" drive has been slow. Whereas the number of registered investors has risen, the number of actual operational investments is low (EEA, 2018).

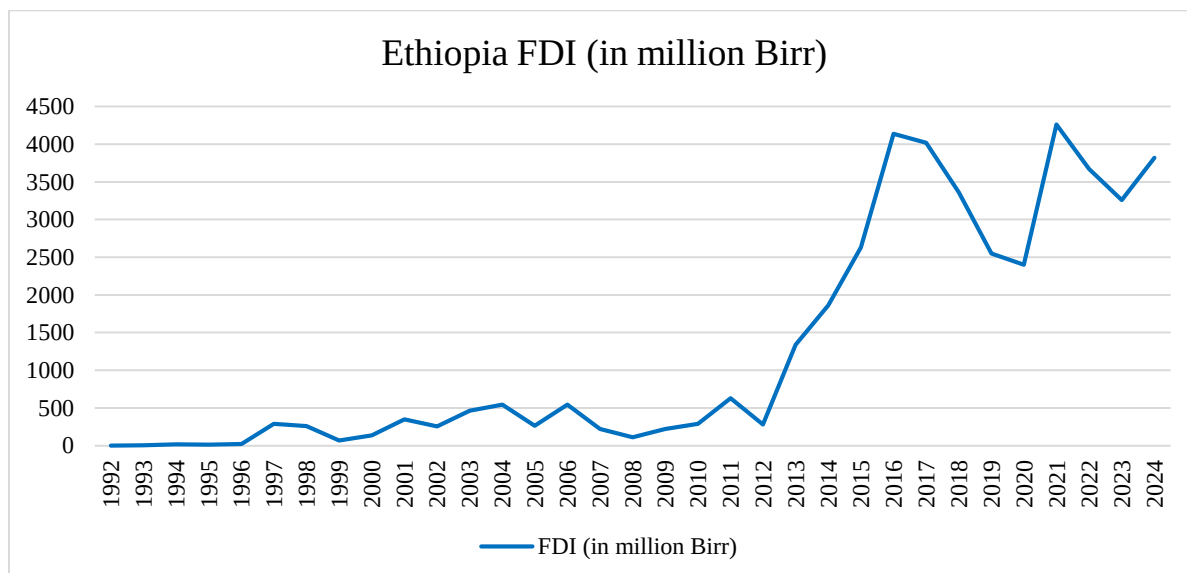
In order to further incentivize investment, Ethiopia has put in place several measures, such as the right of ownership of property and investment guarantees in Proclamation No. 1180/2020 (Proclamation, 2020); (Sofoniyas, et al., 2023). The consecutive decline in FDI inflows from \$4.3 billion in 2021 to \$3.67 billion in 2022, and down to \$3.26 billion in 2023 highlights the continuation of FDI attraction and retention issues (MoF, 2024); (UNCTAD, 2023)

Though Ethiopia's FDI shows continuous decline, the country still placed the third in Africa next to South Africa and Egypt and the second from Sub-Saharan African countries next to South Africa.

The latest value from 2024 is 3.28 billion U.S. dollars, a recover from 3.26 billion U.S. dollar in 2023 that has been declined by 11.2% from the 3.67 billion U.S. dollars in 2022. In comparison, the world average is 4.49 billion U.S. dollars, based on data from 173 countries. Historically, the average for Ethiopia from 1992 to 2023 is 1.2 billion U.S. dollars. The

minimum value, 0.17 million U.S. dollars, was reached in 1992 while the maximum of 4.26 billion U.S. dollars was recorded in 2021.

Figure 4: Ethiopia FDI from 1992 to 2024



In order to address these issues, Ethiopia has embarked on several reforms, such as a customs reform launched by the Ministry of Finance in September 2021. The reform revised the customs tariff regime, bringing it in line with international best practices and rendering producers more competitive by transferring the tariff burden from raw materials and intermediate products to finished products (Finance, 2024). In addition to this, incentives like ownership of property, guarantee of investment, transfer of funds, and visa facilities are offered by the government (FDRE, 2020).

In spite of all these reforms, Ethiopia continues to confront significant challenges such as macroeconomic instability, inflation volatility, and policy uncertainty (Sofoniyas, et al., 2023); (Ambe, 2017). Maintaining macroeconomic stability and policy consistency remains important in order to ensure a healthy investment environment (Mekonnen & Mogess, 2021). Yet empirical confirmation and detailed data on these relationships for the Ethiopian case remain scarce (Ambe, 2017). The recorded downturn in FDI is essentially due to these macroeconomic issues, exacerbated by political instability and regulatory hurdles (Finance, 2024).

2.2. Empirical Literature Review

Investment is affected by a number of macroeconomic variables and political conditions of countries, especially in developing and emerging countries. The interaction between macroeconomic variables such as GDP, inflation, interest rate, and exchange rate on investment behaviour at the corporate and national levels with the effect of political stability on FDI inflow has been examined by a host of studies. The empirical literature gives an understanding of the way these variables determine investment behaviour in developing and emerging nations, Ethiopia being a specific case. It comprises the results regarding the impact of macroeconomic variables and political stability on FDI.

2.2.1. FDI in Developing and Emerging countries

(Anuradha & Raj, 2024), considered the impact of economic indicators, market conditions, geopolitical tensions, and policy regulations on investment. They highlight the risk and uncertainty caused by changing economic conditions. (Kuzey, et al., 2021), considered multinational companies entering India and concluded that FDI acts as a source of employment, technological advancement, and economic development in emerging economies.

A number of studies have focused on the impact of macroeconomic determinants on investment in emerging and developing economies. (Samson & Olaolu, 2023), noted that GDP has a significant impact on private residential property investment in Nigeria. (Zajac, et al., 2024), recognized GDP as a key driver of investment in the manufacturing sector of Poland, specifically in the chemical sector. Similarly, (Muthamia, 2020) also established that GDP has a significant effect on investments in Kenya.

Inflation has been extensively researched as a driver of investment. (Samson & Olaolu, 2023), indicated that inflation significantly negatively affected private residential property investment in Nigeria. Conversely, (Ndugbu, et al., 2017) discovered that inflation positively influenced foreign direct investment (FDI) in Nigeria, indicating a complicated interaction between inflation and investment based on the economic structure.

Interest rates are a key determinant of investment choice. (Samson & Olaolu, 2023), noted that increased interest rates had an adverse impact on private residential property development

in Nigeria. (Kamamia, 2018), established that interest rates have a significant influence on the financial performance of investment banks in Kenya, indicating that the cost of borrowing can affect investment activities. (Ndugbu, et al., 2017) found that interest rates significantly affected FDI inflows in Nigeria, supporting the notion that high interest rates can deter investment as it becomes costly to borrow.

Exchange rate stability is another major determinant of investment. (Kwoba & Kibati, 2016), investigated the influence of exchange rates on FDI in Kenya and established that exchange rate volatility had a negative but insignificant influence.

(Basavarajappa, 2022), investigates the influence of political and economic stability pact on foreign direct investment (FDI) decisions. The study examines case studies from diverse economies, such as the United Arab Emirates, Argentina, Vietnam, Nigeria, and South Korea, to illustrate the practical implications of this relationship. These cases showcase how stable political and economic environments can attract FDI, fostering job creation, technology transfer, and sustainable development. The study concluded that political and economic stability are pivotal determinants of FDI decisions. A symbiotic relationship exists, wherein stability in both realms reinforces investor confidence and contributes to overall economic prosperity (Basavarajappa, 2022).

(Busse & Hefeker, 2007), in a cross-country analysis, found that various indicators of political risk such as government stability, internal and external conflict, and law and order—have significant negative effects on FDI inflows. Their findings underscore that political risk is a substantial deterrent to investment, and minimizing this risk through political stability is crucial for attracting FDI.

(Globerman & Shapiro, 2003), argue that countries with strong governance structures and political continuity are more likely to attract FDI, as these conditions reduce the risks associated with investment uncertainty. Their study emphasized the importance of a reliable policy environment as part of the “governance infrastructure” that supports FDI inflows.

(Asiedu, 2006), focusing on African countries, concluded that political instability significantly hampers FDI inflows. She found that despite favourable resource endowments or large market sizes, countries experiencing political instability received far less FDI compared to more

stable counterparts. This suggests that institutional quality, reinforced by political stability, is a more decisive factor than traditional economic variables alone.

2.2.2. FDI in Ethiopia

Several studies have examined how macroeconomic variables influence investment decisions in Ethiopia. (Ambe, 2017), found that GDP growth positively impacts private investment, while inflation has a significant negative effect. (Sofoniyas, et al., 2023), also reported that inflation negatively affects corporate investment decisions in Ethiopian commercial banks. (Workneh, 2014), in his study taking 21 years data from world bank found that inflation rate had a significant impact on the flow of FDIs to Ethiopia.

FDI has been a prominent area of research in Ethiopian investment. (Haile & Assefa, 2006), established that real GDP growth, along with export orientation, and trade liberalization have a positive impact on FDI, while macroeconomic instability discourages foreign investors.

(Legesse, 2018), established economic liberalization and exchange rate devaluation as prominent drivers of FDI, while high inflation and inadequate infrastructure discourage inflows.

(Bekana, 2018), concluded that GDP growth, interest rates, and inflation significantly impact FDI inflows in Ethiopia. (Desulie & Ashalatha, 2022), noted a decline in FDI inflows post-2017 due to political instability and the COVID-19 pandemic, emphasizing the importance of stability and policy reforms to sustain foreign investments.

(Waktola, 2020), examined determinants of private investment in Ethiopia and established that real GDP growth rate, availability of credit, and public investment have a positive influence on private investment, while macroeconomic instability, lending rates, and consumer price index (CPI) have a negative influence on it.

Interest rates and exchange rates are also imperative factors in Ethiopia's investment decision. (Kamamia, 2018), established that interest rates have a significant influence on the financial performance of investment banks. (Hordofa, 2023), analysed the effect of exchange rates on the economic growth of Ethiopia and established a nonlinear, intricate relationship. (Legesse, 2018), stressed that the devaluation of the exchange rate is positively related to FDI inflow, reaffirming the attraction of investment due to exchange rate policy.

The empirical literature highlights the significant role of macroeconomic variables in influencing investment decisions. GDP growth in developing nations and Ethiopia is always found to positively affect investment, whereas inflation and higher interest rates tend to discourage investment activity. Stability in the exchange rate creates a favourable climate for investment, although its influence on FDI continues to be intricate. Ethiopia-specific studies indicate that macroeconomic stability and good fiscal and monetary policies play a key role in attracting foreign direct investments.

2.3. Research Gap

Notwithstanding the voluminous research on the impact of macroeconomic variables and political instability on FDI, some gaps still exist, in the Ethiopian situation. The majority of the existing works in developing and emerging economies address overall investment patterns without giving a detailed study specific to the peculiar macroeconomic situation and political condition of Ethiopia.

Studies reviewed shows that the researchers have used various combination of the Macroeconomic variables and political instability factors to check their effect on investment. For instance studies by (Legesse, 2018) combined inflation and interest rate with other macroeconomic, social and political variables, (Haile & Assefa, 2006) studied GDP with infrastructure, liberalization and others, (Bekana, 2018) has used inflation, interest rate and GDP with international trade, energy consumption, labour force growth and others, (Desulie & Ashalatha, 2022) attempted to examine the FDIs in terms of the number of projects, capital inflow, employment, and sectorial compositions. (Workneh, 2014), used market size, level of trade openness, inflation rate, infrastructure, and human capital to empirical investigate factors affecting FDI inflow in Ethiopia, (Hordofa, 2023) used FDI as an independent variable to investigates the short- and long-term impacts of foreign direct investment (FDI), remittances, real exchange rates, and imports on Ethiopia's economic growth.

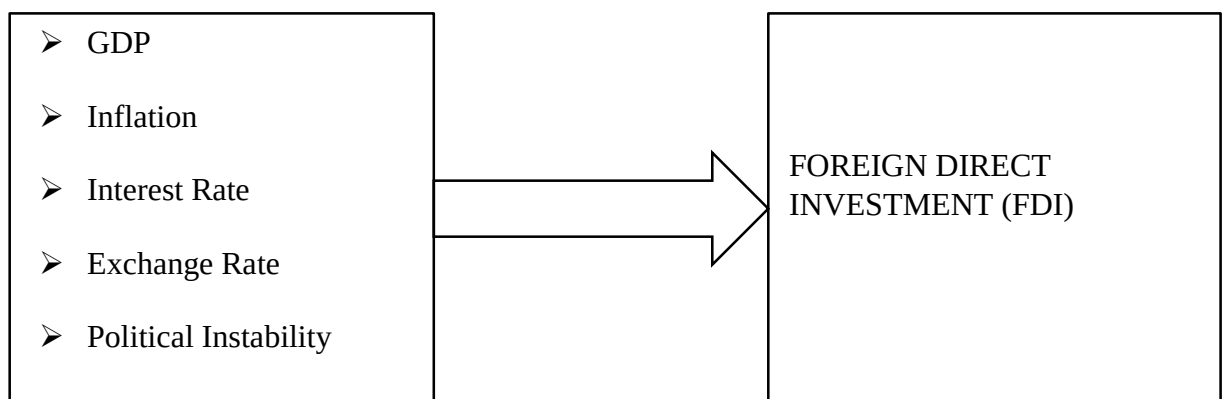
In general, this research seeks to bridge this gap by examining four major macroeconomic variables GDP, inflation, interest rate, and exchange rate as well as political instability, on investment in Ethiopia using time-series analysis. Through the utilization of more advanced empirical techniques, this study will provide broader insight into the relationship between macroeconomic variables and investment in Ethiopia. The results will offer useful information

to policymakers, enabling them to formulate evidence-based policies that promote investment and stimulate sustainable economic development.

2.4. Conceptual framework

This framework conceptualizes how key macroeconomic variables impact investment decisions in Ethiopia by analysing historical time-series data from 1992-2024, the study seeks to identify causal relationships between the Macroeconomic and political conditions and foreign investors decisions to invest in a given economy. If the investor's expectations are met it is believed that the investor will decide to allocate capital into projects, financial instruments, and or physical assets.

Here presented the pictorial demonstration of how these macroeconomic and political instability conditions determine the investment decisions of an investor so that investment on a given area or nation, in this case to invest in Ethiopia.



2.4.1. Explanation of the Framework

- **GDP:** Economic growth is a key driver of investment decisions. Higher economic growth (GDP) is expected to positively influence investment decisions by creating a favourable economic environment. It signals a robust economy, resulted in attracting foreign investors.
- **Inflation:** Stable inflation rates reduce uncertainty, making it easier for investors to plan and allocate resources so it encourage investment. While high or volatile inflation can deter investment.

- **Interest Rate:** The cost of borrowing and the real return on investments influence investment decisions. Lower interest rates reduce borrowing costs, encouraging investment and makes investment more attractive.
- **Exchange Rate:** Currency fluctuations affect the competitiveness of exports and imports, influencing investment in trade-oriented sectors. While a stable or competitive exchange rate boosts investor confidence.
- **Political Instability:** stability and good governance affects investor's decisions. A stable political condition, absence of violence and terrorism, protected property rights, transparent legal systems, and predictable regulatory environments positively influence investor's decisions.
- **Foreign Direct Investment:** are influenced by the interplay of macroeconomic variables and Political conditions of the country. Investors allocate resources based on the economic environment, expected returns, and political risk assessments.

While the study focuses on macroeconomic factors, and political instability other external factors such as, institutional quality, government policies and other so many social and economic conditions may also influence investment decisions. However, these are beyond the scope of this research. So only the mentioned macroeconomic variables and political instability are taken into considerations as it is portrayed in the conceptual framework.

CHAPTER THREE

3. METHODOLOGY

3.1. Introduction

The research seeks to examine the impact of macroeconomic determinants on investment in Ethiopia. In particular, it examined the effect of Real GDP, Inflation, Real lending Interest Rate, Period Weighted Average Exchange Rate and Political Instability on investment patterns in Ethiopia. Secondary data obtained from valid and authoritative sources such as the National Bank of Ethiopia (NBE), Ethiopian Investment Commission (EIC), World Bank, International Monetary Fund (IMF), and United Nations reports. This section presents the research design, data collection procedures, variables and measurements, analytical methods, validity and reliability assurance strategies and ethical considerations.

3.2. Research Design

This research employed an Explanatory research design, which is appropriate for the identification and analysis of cause-effect relationships between variables. In particular, the research looks into the effect of macroeconomic variables (real GDP, inflation, interest rate, and exchange rate) and political instability on foreign direct investment (FDI) inflows in Ethiopia. The explanatory design is appropriate because the research also seeks not just to describe trends, but to test hypotheses and establish cause-effect relationships using time-series econometric models.

3.3. Research Approach

This study adopts a deductive research design in which theoretical arguments and existing empirical evidence are used to develop hypotheses on how FDI responds to macroeconomic and political variables. These hypotheses are then empirically tested using annual time-series data covering 1992-2024. The deductive approach is appropriate given that the study begins with conventional economic and investment theory (i.e., the eclectic paradigm and Keynesian models) and attempts to test their applicability in the Ethiopian context using statistical modeling processes like the Vector Error Correction Model (VECM) and Granger causality testing.

3.4. Population and Sampling

The study population consists of all macroeconomic variables along with the investment data applicable to Ethiopia from 1992 to 2024. The sample consist of yearly observations related to the subsequent variables: Real GDP, Inflation, Real Lending Interest Rate, Period Weighted Average Exchange Rate, Political Instability, and Foreign Direct Investment in Ethiopia. Data gathering was conducted through reputable sources for accuracy, consistency, and completeness.

3.5. Data Collection Methods

Secondary data was utilized for analysis that was obtained from reliable organizational sources that are considered to provide valid and credible information regarding macroeconomic indicators and investment statistics.

- The National Bank of Ethiopia (NBE)
- Ethiopian Investment Commission Agency
- World Bank
- International Monetary Fund (IMF)
- United Nations reports

3.6. Variables and Measurements

The primary variables employed in this study are the commonly utilized macroeconomic indicators that are most important in ascertaining the big picture of the economy and political instability that shows good governance, with their effect on FDI decisions in Ethiopia. The independent and dependent variables employed in this study are explained below. That is, the study employed five independent variables with one dependent variable:

Table 1: Variables description

	Original Name	Description	Abbreviation used
Dependent Variable	Foreign Direct Investment	FDI inflows in Birr	fdi
Independent Variables	Real GDP	Real Gross Domestic Product	rgdp
	Inflation	Annual inflation rate (%)	inf
	Real Lending Interest Rate	Real interest rate on lending	rlir
	Period Weighted Average Exchange Rate	Annual avg. exchange rate (Birr)	pwaer
	Political Instability Index	WGI Political Stability score (Ranks 0 to 100)	pi

3.7. Data Analysis Methods

For analysing the interaction among the macroeconomic variables, political instability and foreign direct investment decisions, several advanced econometric techniques were applied. Firstly, stationarity of time-series data was checked to see if the variables have constant mean and variance over time. In this case, both Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) test were employed to detect if transformation such as differencing is required to make them stationary. The variable were then tested for cointegration. Vector Error Correction Model (VECM) would be used if the variables are cointegrated but non-stationary.

Granger Causality Test used to check for causal relationships between macroeconomic variables, political instability and FDI. The Johansen Cointegration Test also used to determine the presence of long-run equilibrium relationships among the variables and thus relate macroeconomic indicators and political instability factors to investment outcomes. Data analysis carried out using STATA software.

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \varepsilon_t$$

Where;

Y = Foreign direct investment (FDI): it is the dependent variable it defines the placement of capital into projects, financial instruments, and physical assets to yield returns in the future. It is quantified as the overall yearly investment in Ethiopia

β_0 = Intercept of the regression equation.

$\beta_1, \beta_2, \beta_3, \beta_4$, and β_5 = Beta Coefficient of variable i (the slope of the regression)

X_1 = Real GDP (RGDP): Symbolizes the yearly real gross domestic product of Ethiopia, adjusted for inflation, showing the overall economic production.

X_2 = Inflation (Inf): refers to the general rise in price levels and helps to assess the stability of the macroeconomic environment. It helps to show the level or instability of inflation on FDI decision.

X_3 = Real rate of Interest on lending (RLIR): Refers to the real lending interest rate in Ethiopia as the price of borrowing capital after accounting for inflation.

X_4 = Period weighted average Exchange Rate (PWAER): Refers to the annual average exchange rate of Ethiopia's currency against major foreign currencies.

X_5 = Political instability (PI): the perceived risk of government disruption, civil unrest, or violence, which can significantly affect the confidence and decision-making of foreign investors. It is measured by Percentile Rank that ranges from 0 to 100

ε = Error term

$$FDI_t = \beta_0 + \beta_1rgdp_t + \beta_2inf_t + \beta_3rlir_t + \beta_4pwaer_t + \beta_5pi_t + \varepsilon_t$$

3.8. Validity and Reliability

To verify the credibility and validity of the findings, data gathered from authoritative organizations only. ADF and PP tests employed to ensure stationarity of for making it apt for econometric modelling. Application of the Johansen Cointegration Test as well as Granger Causality Test also confirmed assumptions of the models selected and relationships between variables. Additionally, robustness test carried out to check for the consistency and reliability of results under alternative specifications.

3.9. Ethical Considerations

As this study relies on secondary data in the public domain, ethical concerns regarding data collection and use are minimal. All data sources are properly cited and attributed to maintain openness and academic honesty. The study adhered to ethical guidelines during the research process to guarantee that the data used are managed with responsibility and the findings are presented with integrity.

CHAPTER FOUR

4. RESULTS AND DISCUSSION

4.1. Introduction

This chapter presents the empirical findings based on the Vector Error Correction Model (VECM) estimation, analyzing the impact of macroeconomic variables and political instability on Foreign Direct Investment (FDI) in Ethiopia. It includes unit root tests, lag length selection, and verification of both long-run equilibrium relationships and short-run dynamics through Johansen cointegration tests. Additionally, it examines VECM estimation results and evaluates long-run (weak exogeneity) and short-run (Granger causality) relationships.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
fdi	33	41.02378	66.38256	.0004808	260.524
rgdp	33	962.4863	726.3913	224.767	2566.566
inf	33	12.36273	11.89105	-8.48	44.36
rlir	33	1.767576	9.163762	-19.79	21.32
pwaer	33	17.46587	15.4035	2.828505	68.2
pi	33	10.68651	5.233859	3.773585	25.53192

The dataset highlights key macroeconomic trends in Ethiopia's economy, revealing substantial volatility and instability. FDI inflows demonstrate extreme fluctuations, with a standard deviation exceeding the mean. While real GDP exhibits long-term growth, its high standard deviation points to uneven development patterns. Inflation remains highly unstable, fluctuating between deflation and sharp inflationary points, reflecting significant price volatility. Real lending interest rates vary widely, ranging from negative values to periods of tight monetary policy. The real exchange rate has undergone considerable depreciation, while political instability persists as an ongoing challenge.

The above data summary offers initial insights into Ethiopia's macroeconomic conditions, emphasizing high levels of instability and volatility. To further explore these dynamic relationships, this study employs the Vector Error Correction Model (VECM) to estimate both long-run and short-run interactions among the variables and FDI.

4.2. VECM Model Specifications

Before applying the Vector Error Correction Model (VECM), a log transformation is performed to enhance model efficiency, interpretability, and variance stabilization. This transformation is applied to three variables, FDI, RGDP, and PWAER based on their scale and growth patterns. FDI exhibits exponential growth and extreme fluctuations, making log transformation useful for stabilizing variations and clarifying trends. RGDP typically measured in large units (millions or billions), so log transformation helps linearize relationships. And the third variable, PWAER follows a nonlinear scale, and log transformation improves variance stabilization and interpretability. Conversely, the other three variables are retained in their original form. Since they are best interpreted in their original form without log transformation. The INF is already expressed as a percentage and RLIR does not follow an exponential growth pattern whereas the PI is a Categorical or index-based, making log transformation unnecessary.

4.2.1. Unit Root Tests

To ensure the validity of the time series analysis, particularly for Johansen Cointegration and VECM application, it is essential to confirm the stationarity of all variables. Unit root tests were conducted using both the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test on the following variables: Foreign Direct Investment (FDI), Real Gross Domestic Product (RGDP), Inflation (INF), Real Lending Interest Rate (RLIR), Period Weighted Average Exchange Rate (PWAER), and Political Instability (PI). These tests determine whether each variable is stationary and establish their respective orders of integration.

While the ADF test is widely used to detect unit roots, it assumes homoskedastic and uncorrelated error terms. These assumptions that may not hold in macroeconomic time series data. To address these limitations, the PP test serves as a complementary approach, adjusting test statistics non-parametrically to enhance robustness against heteroskedasticity and autocorrelation. Thus, the PP test is used in the study not as a repetition of the ADF test but a crucial diagnostic tool for improving stationarity assessment reliability.

Both tests were conducted at level and first-difference forms to determine the integration order of each variable. Failure to reject the null hypothesis in either test indicates the presence of a

unit root, suggesting non-stationarity. Consistent results across both tests strengthen confidence in conclusions regarding each variable's stationarity status.

Hypotheses for ADF and PP Tests:

- **H₀:** The variable has a unit root (non-stationary).
- **H₁:** The variable does not have a unit root (stationary).

Table 3: Unit Root Tests on Level Variables for ADF and PP Tests

Variable	ADF Test Statistic	ADF p-value	PP Test Statistic	PP p-value	Conclusion (Levels)
lnFDI	-1.966	0.3017	-3.690	0.0043	Non-stationary (ADF), Stationary (PP)*
lnGDP	0.718	0.9902	0.498	0.9848	Non-stationary
Inflation	-2.385	0.1460	-2.989	0.0360	Non-stationary (ADF), Stationary (PP)*
Real Int. Rate	-1.258	0.6482	-2.552	0.1034	Non-stationary
Exch. Rate	2.123	0.9988	-0.117	0.9477	Non-stationary
Pol. Instab.	-1.080	0.7230	-1.428	0.5686	Non-stationary

According to the ADF results, all six variables were non-stationary at their levels. In contrast, the PP test suggested that lnFDI and inflation might be stationary at levels, likely due to its robustness against autocorrelation. Nevertheless, after first differencing, all variables became stationary at the 1% significance level in both tests. This consistent outcome confirms that the variables are integrated of order one (I(1)), fulfilling the requirement for cointegration analysis and supporting the use of the VECM model.

For the ADF test, all variables were differenced to achieve stationarity. In the PP test, only those variables found to be non-stationary at levels were differenced. These steps ensured that all series met the stationarity condition prior to VECM estimation.

Table 4: Unit Root Tests on First-Differenced Variables

Variable	ADF Test Statistic	ADF p- value	PP Test Statistic	PP p- value	Conclusion (1st Diff)
dlnFDI	-6.229	0.0000	-11.063	0.0000	Stationary
dlnGDP	-4.103	0.0010	-8.467	0.0000	Stationary
dInflation	-7.294	0.0000	-15.314	0.0000	Stationary
dReal Int. Rate	-8.445	0.0000	-19.293	0.0000	Stationary
dExch. Rate	-3.838	0.0025	-4.301	0.0004	Stationary
dPol. Instab.	-7.214	0.0000	-18.521	0.0000	Stationary

4.2.2. Lag Length Selection

Selecting the optimal lag length is crucial for the VECM model to ensure residuals are free from autocorrelation and to avoid misspecification. The optimal lag length was determined using information criteria such as the Akaike Information Criterion (AIC), Schwarz Bayesian Information Criterion (SBIC/BIC), Hannan-Quinn Information Criterion (HQIC), reported in the VECM output. Based on the majority of information criteria in the VECM output, the optimal lag length was determined to be three. This selection provides balancing between capturing past influences while avoiding over-parameterization. As per the below selection-order criteria table the lag is 3 where AIC and HQIC are lowest. The AIC and HQIC criteria suggest that lag 3 is optimal, while SBIC favors lag 1. But given the need to effectively capture economic dynamics, lag 3 was selected.

Table 5: Selection Order Criteria

Lag Length Selection Criteria	Lag 1	Lag 2	Lag 3
AIC	14.1267	13.7638	12.1528*
HQIC	14.7469	14.9155	13.836*
SBIC	16.1069*	17.4413	17.5277

4.2.3. Cointegration Test (Johansen Test)

Cointegration analysis identifies long-run equilibrium relationships among non-stationary variables. The Johansen cointegration test, based on maximum eigenvalue and trace statistics, was applied to determine the number of cointegrating vectors.

H_0 : No cointegration exists.

H_1 : Cointegration exists

The Johansen test results indicate three cointegrating relationships (rank = 3) at the 5% significance level, confirming the presence of stable long-run equilibrium among the six variables: FDI, GDP, inflation, interest rates, exchange rate, and political instability. This suggests that these variables tend to move together over time, maintaining long-run equilibrium despite short-run fluctuations.

Table 6: Johansen tests for cointegration

Cointegration Rank	Trace Statistic	Critical Value (5%)	Decision
0	164.4164	94.15	Reject H_0
1	109.0032	68.52	Reject H_0
2	61.0809	47.21	Reject H_0
3	27.1459*	29.68	Fail to Reject H_0

Since the null hypothesis is rejected for $r = 0$, $r = 1$, and $r = 2$, but not for $r = 3$, confirming the existence of three cointegrating relationships among the variables.

Table 7: Vector Error Correction Model (VECM) Results

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_lnFDI	16	0.445963	0.8568	77.76593	0.0000
D_lnRGDP	16	0.02489	0.9600	311.8093	0.0000
D_inf	16	9.75527	0.6901	28.94437	0.0243
D_rlr	16	7.97288	0.5379	15.13461	0.5148
D_lnPWAER	16	0.047924	0.9116	134.1277	0.0000
D_pi	16	2.97487	0.5488	15.81091	0.4662

The high R-squared values in most equations indicate a strong model fit, while the low $P > \chi^2$ values suggest statistical significance, demonstrating that the model effectively captures variations in the differenced variables.

Long-run Cointegrating Equations

The Johansen cointegration test identifies three significant long-run relationships among the variables (FDI, RGDP, INF, RLIR, PWAER, PI) at the 5% level. These relationships reveal how macroeconomic and political instability variables jointly influence the economic environment. There are three cointegrating equation normalized on a different variable; FDI, RGDP and INF. The normalization allows us to interpret long-run relationships in terms of these key macroeconomic variables.

Table 8: Summary of Normalized Cointegrating coefficients (CE1, CE2, CE3)

Variable	CE1 (Normalized on lnFDI)		CE2 (Normalized on lnRGDP)		CE3 (Normalized on INF)	
lnFDI	1.000	Normalized	1.39e-17	Insignificant value	-2.66e-15 (insignificant)	Insignificant value
lnRGDP	2.22e-16	insignificant	1.000	Normalized	-3.55e-15 (, ns)	Insignificant value
INF	3.47e-18	insignificant	0	Omitted	1.000 (normalized)	Normalized
RLIR	-0.05578,	p = 0.000	-0.01560,	p = 0.003	+0.49322,	p = 0.007
lnPWAER	-4.25224,	p = 0.000	-1.22737,	p = 0.000	+12.5605,	p = 0.000
PI	-0.04536	p = 0.053	-0.01965,	p = 0.015	+1.88745,	p = 0.000
_cons	+12.041		-1.7539		-77.6174	

i. Cointegrating Equation 1 (CE1)

CE1 is normalized on FDI, making FDI the dependent variable for interpreting long-run effects.

$$\ln \text{FDI} = f(\ln \text{RGDP}, \text{INF}, \text{RLIR}, \ln \text{PWAER}, \text{PI})$$

$$\ln \text{FDI}_t = -0.05578 \cdot \text{RLIR}_t - 4.25224 \cdot \ln \text{PWAER}_t - 0.04536 \cdot \text{PI}_t + 12.041$$

In this normalized cointegrating equation, lnRGDP and INF have near-zero coefficients, suggesting that the variables have no meaningful long-run effect on FDI. It implies economic growth does not directly drive FDI in Ethiopia. The result for inflation showed that it has no

strong long-run impact on FDI, suggesting that inflationary trends are not a primary concern for investors. The positive constant term highlights that Ethiopia's baseline attractiveness for investment regardless of specific macroeconomic trends.

In the long run, Foreign Direct Investment (FDI) is significantly influenced by the $rlir$, $pwaer$, and pi . These variables have statistically significant and negative long-run effects on FDI. CE1 shows that a 1 percentage point increase in RLIR reduces FDI by about 5.6%, suggesting that high interest rates deter FDI inflows due to increased borrowing costs. Similarly, a 1% increase in the exchange rate (currency depreciation) reduces FDI by 4.25%, reinforcing the importance of exchange rate stability. Political instability negatively affects FDI, with a 1-unit increase in the political instability index decreasing FDI by about 4.5%, with marginal significance ($p=0.053$). Instability weakens investor confidence, reducing FDI inflows.

ii. Cointegrating Equation 2 (CE2).

The second cointegration equation CE2 is normalized on GDP.

$$\ln RGDP = f(\ln FDI, INF, RLIR, \ln PWAER, PI)$$

Here, the coefficients for $\ln FDI$ and INF are near zero, indicating that these variables have no long-run effect on economic growth in this equation.

$$\ln RGDP_t = -0.0156 \cdot RLIR_t - 1.22737 \cdot \ln PWAER_t - 0.01965 \cdot PI_t - 1.7539$$

Economic growth is negatively affected by increases in the $rlir$, $pwaer$ volatility, and pi in the long run. A 1 percentage point increase in RLIR lowers economic growth by 1.56%, while a 1% increase in the period-weighted average exchange rate results in a long-run decrease in real GDP by approximately 1.23%, holding other variables constant. A 1-unit increase in political instability weakens economic output by about 2%.

iii. Cointegrating Equation 3 (CE3).

The third cointegration equation CE₃ is normalized on inflation.

$$INF = f(\ln FDI, \ln RGDP, INF, RLIR, \ln PWAER, PI)$$

$$INF_t = 0.4932 \cdot RLIR_t + 12.5605 \cdot \ln PWAER_t + 1.8874 \cdot PI_t - 77.617$$

In this equation, $\ln FDI$ and $\ln RGDP$ have near-zero coefficients, suggesting that these two variables have no long-run impact on inflation. This relationship reveals that inflation is significantly affected by monetary and political conditions. In the long run, inflation increases significantly with the real interest rate. A 1 percentage point increase in RLIR is associated with a 0.49-unit increase in inflation, holding other factors constant. Meanwhile, a 1% depreciation in the exchange rate leads to a 12.56-unit increase in inflation, and a 1-unit increase in the political instability index results in a 1.89-unit increase in inflation.

4.2.4. Vector Error Correction Model (VECM) Estimation

Given the confirmed cointegration, a VECM was estimated to model both the short-run dynamics and the long-run adjustments of the variables. The VECM explicitly incorporates the cointegrating relationships (error correction terms) to capture the speed at which variables adjust to their long-run equilibria.

The Error Correction Terms (ECT) coefficients determine how quickly variables respond to deviations from cointegration and adjust in the short run to restore long-run equilibrium following a shock. These coefficients measure the speed at which each variable realigns with its long-run equilibrium relationship. A statistically significant negative ECT coefficient indicates that the variable actively corrects disequilibrium, ensuring stability within the system.

4.6 Short-Run Dynamics

These coefficients represent short-term interactions between variables in an error correction model, illustrating how past changes in one variable influence another within the system without considering long-run equilibrium adjustments. The short-run effects were examined using first-differenced coefficients within the VECM framework, demonstrating how changes in the dependent variable are affected by its own past values and movements in other variables.

Table 9: Short-Run Dynamics Table

Dependent Variable	Independent Variable / CE	Coefficient	P-Value	Significant?
D_lnfdi	_ce1 L1	-1.43	0.000	Yes (***)
D_lnfdi	rlir LD	-0.042	0.036	Yes (**)
D_lnfdi	lnpwaer LD	-4.34	0.052	Marginal (*)
D_lnfdi	lnpwaer L2D	-4.90	0.033	Yes (**)
D_lnrqdp	_ce2 L1	0.100	0.024	Yes (**)
D_lnrqdp	lnrqdp L2D	-0.573	0.012	Yes (**)
D_inf	inf L2D	-0.510	0.054	Marginal (*)
D_inf	rlir L2D	-0.800	0.051	Marginal (*)
D_lnpwaer	_ce2 L1	0.278	0.001	Yes (***)
D_lnpwaer	_ce3 L1	0.005	0.020	Yes (**)
D_lnpwaer	inf LD	-0.0042	0.010	Yes (***)
D_lnpwaer	inf L2D	-0.0030	0.022	Yes (**)
D_rlir	rlir LD	-0.770	0.033	Yes (**)

a. Short-Run Dynamics of FDI (dl_nFDI)

The ECT coefficient (-1.4275, $p = 0.000$) for FDI confirms that the system corrects 142.75% of disequilibrium per year, indicating a rapid adjustment back to long-run equilibrium following economic shocks. This speed of correction suggests that FDI responds quickly to macroeconomic changes, reinforcing its volatility in reaction to shifts in interest rates and exchange rates.

Only the first long-run equilibrium relationship (ce1) significantly affects short-run FDI growth. About 142.75% of the previous period's disequilibrium is corrected in the current period, implying fast convergence to long-run equilibrium. The lagged dependent variable (FDI), is not statistically significant suggesting that past short-run changes in FDI do not strongly influence current changes.

The ECT coefficient (-0.0423, $p=0.036$) for interest rate (RLIR) has a significant negative effect, indicating that higher borrowing costs immediately discourage foreign investment. In

the short run, a 1% increase in RLIR leads to about 0.042 percentage points reduction in FDI growth, holding other factors constant.

Exchange rate (PWAER) has an ECT coefficient of (-4.3382, $p=0.052$). The negative and nearly significant result reveals currency volatility leads to short-term reductions in FDI. A 1% depreciation of the exchange rate (higher log value) two periods ago is associated with a 4.9% decrease in FDI in the current period.

Political Instability has a weak short-run effect, indicating that instability impacts investment decisions gradually rather than through immediate reactions. The ECT coefficient is (-0.0566, $p=0.272$).

Overall, FDI responds significantly to past disequilibria and is negatively affected by rising interest rates and exchange rate depreciation. The strong and significant error correction term supports the presence of a stable long-run relationship, confirming that FDI quickly adjusts to restore equilibrium.

b. Short-Run Dynamics on GDP (dlngfp)

GDP is adjusting to disequilibrium from the second cointegration vector at a modest rate, with an ECT coefficient of 0.1003 ($p=0.024$). Deviations from the long-run relationship expressed in CE2 have a statistically significant and positive short-run effect on RGDP changes.

Lagged RGDP (L2D) with (-0.5733, $p = 0.012$) suggests that a 1% increase in real GDP two periods ago is associated with a 0.57% decrease in GDP growth now.

FDI, Interest Rate, and Political Instability have weak short-run impacts on economic growth, confirming that structural investments take time to reflect in GDP.

c. Short-Run Dynamics for inflation (dinf)

Inflation from two periods ago reduces current inflation by about 0.51%, suggesting policy correction or inertia effects (coef. = -0.5097, $p = 0.054$). Inflation dynamics are modestly affected by its own and interest rate lags, indicating short-term adjustments. Lagged real interest rates reduce inflation, consistent with contractionary monetary policy effects. coef. = -0.8001, $p = 0.051$).

Exchange rate depreciation fuels inflation, confirming that currency volatility induces price instability.

There is short-run negative persistence in real lending rates; an increase last period tends to reduce the current rate. ECT coefficient of RLIR -0.7702 , and significant with $p = 0.033$.

d. Short-Run Dynamics for exchange rate (dlnpwaer)

The adjustment of the exchange rate is significantly driven by disequilibrium in the second cointegration equation (CE2 (Coef. = **0.2775**, $p = 0.001$).

Higher past inflation reduces current exchange rate growth, consistent with inflation weakening the currency (LD: Coef. = -0.0042 , $p = 0.010$) and (L2D: Coef. = -0.0030 , $p = 0.022$). Real interest rates show short-run inertia.

4.3. Granger Causality Test Results

4.3.1. Long-Run Granger Causality (Weak Exogeneity Tests)

Weak exogeneity tests investigate whether individual variables adjust to correct deviations from the long-run equilibrium. If a variable is weakly exogenous, it does not respond to the error correction terms, implying that other variables bear the burden of adjustment to restore equilibrium.

The Wald test was used to assess causal relationships. The Findings presented in the following table.

Table 10: Granger causality (Wald test results)

Dependent Variable (Equation)	Chi-squared (df=3)	Prob > Chi2	Conclusion (at 5% significance)	Long-Run Exogeneity
FDI (D_lnfdi)	30.37	0.0000	Reject H0	Not Weakly Exogenous/ Significant causality
GDP (D_lnr GDP)	15.14	0.0017	Reject H0	Not Weakly Exogenous/ Significant causality
Inflation (D_inf)	1.74	0.6282	Fail to Reject H0	Weakly Exogenous/ No causality
Interest Rate (D_rlir)	0.78	0.8538	Fail to Reject H0	Weakly Exogenous/ No causality
Exchange Rate (D_lnpwaer)	16.01	0.0011	Reject H0	Not Weakly Exogenous/ Significant causality
Political Instability (D_pi)	0.94	0.8165	Fail to Reject H0	Weakly Exogenous/ No causality

The results indicate that Inflation (inf), Real Lending Interest Rate (rlir), and Political Instability (pi) are weakly exogenous at the 5% significance level. This indicates that these variables do not significantly adjust in the short-run to correct deviations from the long-run relationships. Implies their movements are driven by external shocks rather than past disequilibrium. They act as long-run forcing variables that drive the system. The short-run movements of these variables not primarily influenced by the disequilibrium.

Foreign Direct Investment (lnfdi), Real Gross Domestic Product (lnrgdp), and Period Weighted Average Exchange Rate (lnpwaer) are not weakly exogenous, indicating strong Granger causality from past economic instability.

These findings align with endogenous growth theory (Romer, 1990), where FDI and GDP interact dynamically, while contrasting with the instability harms growth perspective (Alesina & perotti, 1993) due to Ethiopia's unique reform-driven context.

4.3.2. Short-Run Granger Causality (Block Exogeneity Tests)

Short-run Granger causality tests examine whether past values of one variable can significantly predict another variable current value, after accounting for its own past values and the long-run equilibrium relationships.

H₀: The lagged values of the independent variables **do not** Granger cause the dependent variable.

H₁: The lagged values of the specified variables **do** Granger cause (significantly explain) the dependent variable.

The results of the pairwise short-run Granger causality tests are summarized in Table 4.8. indicate that P-values greater than 0.05 lead to failing to reject the null hypothesis, implying no significant short-run Granger causal relationship among the variables.

Table 11: Short-Run Block Exogeneity (Granger Causality) Test Results

Dependent Variable (Equation)	Chi-squared (df=10)	Prob > Chi2	Conclusion (at 5% significance)	Short-Run Granger Causality from others
D_lnfdi	15.79	0.1059	Fail to Reject H0	No
D_lnrqdp	12.95	0.2268	Fail to Reject H0	No
D_inf	11.65	0.3090	Fail to Reject H0	No
D_rlir	6.34	0.7856	Fail to Reject H0	No
D_lnpwaer	17.91	0.0565	Fail to Reject H0	No (at 5%) / Yes (at 10%)
D_pi	10.21	0.4220	Fail to Reject H0	No

The block exogeneity tests reveal limited short-run Granger causality among the variables. At the 5% significance level, no variable is jointly Granger-caused by the collective lagged changes of the other variables. This suggests that, in the short run, past changes in these variables do not significantly help predict the current changes in their respective dependent variables beyond what is already explained by their own past values and the long-run equilibrium relationships.

However, at a 10% significance level, results suggest that the block of other variables jointly Granger cause the exchange rate (lnpwaer) in the short run. This indicates a relatively weak short-run predictive relationship. For the remaining variables (lnfdi, lnrgdp, inf, rlir, pi), their short-run dynamics appear to be primarily driven by their own past values or the error correction mechanism, rather than by joint lagged changes of other variables.

4.4. Summary of Findings

This study examines the effect of macroeconomic determinants and political instability on Foreign Direct Investment (FDI) in Ethiopia, using time series data for the period 1992-2024. The analysis employed the Vector Error Correction Model (VECM) after establishing the stationarity of the variables with the ADF and PP tests, and long-run cointegration with the Johansen Cointegration Test.

The key findings are summarized as follows:

i. Long-Run Relationships:

- The test revealed that all six variables, namely Foreign Direct Investment (FDI), Real Gross Domestic Product (RGDP), Inflation (INF), Real Lending Interest Rate (RLIR), Period Weighted Average Exchange Rate (PWAER), and Political Instability (PI), were found to be integrated of order one, $I(1)$.
- Johansen's test detected three significant cointegrating equations, indicating the existence of stable long-run relationships between the variables.
- FDI, GDP, and Inflation are significantly influenced by interest rates, exchange rate conditions, and political instability in the long run.
- Inflation, political instability, and interest rates have been identified as long-run driving forces, that is, they influence other variables without adjusting themselves.
- FDI, GDP, and exchange rate variables were endogenous in the long run, actively adjusting to restore equilibrium.

ii. Short-Run Dynamics:

- FDI adjusts most rapidly to disequilibrium, with an error correction coefficient of -1.4275 ($p = 0.000$), indicating high sensitivity to economic shocks.
- GDP shows a moderate speed of adjustment (coefficient = 0.1003, $p = 0.024$), while inflation, interest rate, and exchange rate are sluggish and take a long time to adjust to short-run shocks.
- Granger causality tests indicate limited short-run causality, implying that economic relationships are mostly driven by long-run adjustments.

iii. Effects of Individual Variables on FDI:

- Higher interest rates deter FDI inflows by increasing the cost of borrowing.
- Exchange rate depreciation also discourages FDI, highlighting the need for currency stability.
- Political instability highly discourages investor confidence and diminishes foreign direct investment in the long term.

CHAPTER FIVE

5. Summary of Findings, Conclusions, and Recommendations

5.1. Conclusions

The findings of this study have several important implications for policymakers and stakeholders aiming to promote FDI and ensure macroeconomic stability in Ethiopia:

- Macroeconomic stability is necessary to attract FDI. The fact that the variables show high cointegration reveals that long-term policy stability, particularly in interest and exchange rate management, plays a decisive role in investment behaviour.
- Political stability is one of the main determinants of long-term investment trends. Ensuring good governance and reducing political uncertainty will enhance investors' confidence.
- The prompt responsiveness of FDI to macroeconomic shocks underscores the need for transparent and stable monetary policies in order to establish a favorable investment climate.
- The sluggish reaction of GDP and inflation indicates that short-term policy measures are inadequate; instead, structural economic reforms and long-term planning are necessary to sustain economic growth and investment.
- Policy measures targeting inflation control, moderating interest rates, and political stability will yield more substantial and lasting effects on FDI than short-lived, responsive measures.

In conclusion, the study provides evidence that long-term economic planning and governance reform are vital in improving Ethiopia's investment attractiveness and overall economic performance.

5.2. Recommendations

To enhance macroeconomic stability and investment growth, policymakers should strive for structural transformation and long-term policies that limit economic fluctuations and build investor confidence.

First, interest rate policies should be carefully managed to balance inflation control and investment incentives. Excessively high lending rates discourage FDI without significantly boosting GDP. A moderated interest rate environment fosters capital inflows, ensuring foreign investors perceive Ethiopia as a viable investment destination.

Second, exchange rate stabilization is essential for maintaining investor confidence. High volatility in exchange rates negatively impacts investment decisions, making currency management a crucial priority. Policies should focus on reducing depreciation risks while implementing effective currency hedging strategies to mitigate sudden exchange rate shocks.

Third, political stability must be reinforced through stronger institutional governance and transparency. Uncertainty regarding government policies and regulatory changes weakens investor confidence, restricting FDI inflows. Strengthening governance frameworks, ensuring legal certainty in investment policies, and fostering political stability can significantly improve Ethiopia's investment climate.

Additionally, inflation-targeting measures should be implemented to ensure long-term price stability, preventing excessive inflation from distorting economic performance. By adopting controlled inflation policies, Ethiopia can create a predictable business environment, increasing foreign investor interest.

Finally, long-term policy planning should take precedence over short-term reactive measures. This study confirms that macroeconomic stability is achieved through structured, long-term interventions, rather than temporary stimulus efforts. Policymakers should design economic strategies that promote sustainable growth, productivity enhancement, and institutional capacity-building to strengthen Ethiopia's resilience to economic uncertainties.

5.3. Limitations

This study explored the long-run and short-run relations among major macroeconomic variables by applying Vector Error Correction Model (VECM) analysis. Although this VECM approach is beneficial, it has some limitations. The variables selection, and the sample time period can influence the results. Future research can build on this research by incorporating other macroeconomic variables, political conditions measurements and using other econometric methods to extend the range of interactions, thereby developing a more detailed understanding of how the shocks transmit through the system.

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ANNEXES

Annex I - Augmented Dickey-Fuller test for unit root

. dfuller lnfdi, lags(1)				
Augmented Dickey-Fuller test for unit root		Number of obs		= 31
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z(t)	-1.966	-3.709	-2.983	-2.623
MacKinnon approximate p-value for Z(t) = 0.3017				
. dfuller lnrgdp, lags(1)				
Augmented Dickey-Fuller test for unit root		Number of obs		= 31
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z(t)	0.718	-3.709	-2.983	-2.623
MacKinnon approximate p-value for Z(t) = 0.9902				
. dfuller inf, lags(1)				
Augmented Dickey-Fuller test for unit root		Number of obs		= 31
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z(t)	-2.385	-3.709	-2.983	-2.623
MacKinnon approximate p-value for Z(t) = 0.1460				
. dfuller rlir, lags(1)				
Augmented Dickey-Fuller test for unit root		Number of obs		= 31
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z(t)	-1.258	-3.709	-2.983	-2.623
MacKinnon approximate p-value for Z(t) = 0.6482				
. dfuller lnnpwaer, lags(1)				
Augmented Dickey-Fuller test for unit root		Number of obs		= 31
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z(t)	2.123	-3.709	-2.983	-2.623
MacKinnon approximate p-value for Z(t) = 0.9988				
. dfuller pi, lags(1)				
Augmented Dickey-Fuller test for unit root		Number of obs		= 31
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z(t)	-1.080	-3.709	-2.983	-2.623
MacKinnon approximate p-value for Z(t) = 0.7230				

Annex II – Phillips-Perron test for unit root

. pperron lnfdi				
Phillips-Perron test for unit root		Number of obs =		32
		Newey-West lags =		3
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z (rho)	-5.930	-17.676	-12.724	-10.340
Z (t)	-3.690	-3.702	-2.980	-2.622
MacKinnon approximate p-value for Z(t) = 0.0043				
. pperron lnrgdp				
Phillips-Perron test for unit root		Number of obs =		32
		Newey-West lags =		3
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z (rho)	0.169	-17.676	-12.724	-10.340
Z (t)	0.498	-3.702	-2.980	-2.622
MacKinnon approximate p-value for Z(t) = 0.9848				
. pperron inf				
Phillips-Perron test for unit root		Number of obs =		32
		Newey-West lags =		3
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z (rho)	-14.987	-17.676	-12.724	-10.340
Z (t)	-2.989	-3.702	-2.980	-2.622
MacKinnon approximate p-value for Z(t) = 0.0360				
. pperron rllir				
Phillips-Perron test for unit root		Number of obs =		32
		Newey-West lags =		3
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z (rho)	-12.949	-17.676	-12.724	-10.340
Z (t)	-2.552	-3.702	-2.980	-2.622
MacKinnon approximate p-value for Z(t) = 0.1034				
. pperron lnnpwaer				
Phillips-Perron test for unit root		Number of obs =		32
		Newey-West lags =		3
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z (rho)	-0.122	-17.676	-12.724	-10.340
Z (t)	-0.117	-3.702	-2.980	-2.622
MacKinnon approximate p-value for Z(t) = 0.9477				
. pperron pi				
Phillips-Perron test for unit root		Number of obs =		32
		Newey-West lags =		3
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z (rho)	-4.378	-17.676	-12.724	-10.340
Z (t)	-1.428	-3.702	-2.980	-2.622
MacKinnon approximate p-value for Z(t) = 0.5686				

Annex III – Dickey-Fuller test for unit root first Differences

. dfuller dlnfdi				
Dickey-Fuller test for unit root		Number of obs =		31
Test Statistic	1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	Interpolated Dickey-Fuller 10% Critical Value	
Z(t)	-6.229	-3.709	-2.983	-2.623
MacKinnon approximate p-value for Z(t) = 0.0000				
. dfuller dlnrgdp				
Dickey-Fuller test for unit root		Number of obs =		31
Test Statistic	1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	Interpolated Dickey-Fuller 10% Critical Value	
Z(t)	-4.103	-3.709	-2.983	-2.623
MacKinnon approximate p-value for Z(t) = 0.0010				
. dfuller dlnf				
Dickey-Fuller test for unit root		Number of obs =		31
Test Statistic	1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	Interpolated Dickey-Fuller 10% Critical Value	
Z(t)	-7.294	-3.709	-2.983	-2.623
MacKinnon approximate p-value for Z(t) = 0.0000				
. dfuller drlir				
Dickey-Fuller test for unit root		Number of obs =		31
Test Statistic	1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	Interpolated Dickey-Fuller 10% Critical Value	
Z(t)	-8.445	-3.709	-2.983	-2.623
MacKinnon approximate p-value for Z(t) = 0.0000				
. dfuller dlnpwaer				
Dickey-Fuller test for unit root		Number of obs =		31
Test Statistic	1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	Interpolated Dickey-Fuller 10% Critical Value	
Z(t)	-3.838	-3.709	-2.983	-2.623
MacKinnon approximate p-value for Z(t) = 0.0025				
. dfuller dpi				
Dickey-Fuller test for unit root		Number of obs =		31
Test Statistic	1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	Interpolated Dickey-Fuller 10% Critical Value	
Z(t)	-7.214	-3.709	-2.983	-2.623
MacKinnon approximate p-value for Z(t) = 0.0000				

Annex IV – Phillips-Perron test for unit root first Differences

. pperron D.dlnfdi				
Phillips-Perron test for unit root		Number of obs =		30
		Newey-West lags =		3
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z (rho)	-31.197	-17.540	-12.660	-10.300
Z (t)	-11.063	-3.716	-2.986	-2.624
MacKinnon approximate p-value for Z(t) = 0.0000				
. pperron D.dlnrgdp				
Phillips-Perron test for unit root		Number of obs =		30
		Newey-West lags =		3
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z (rho)	-24.217	-17.540	-12.660	-10.300
Z (t)	-8.467	-3.716	-2.986	-2.624
MacKinnon approximate p-value for Z(t) = 0.0000				
. pperron D.dlnf				
Phillips-Perron test for unit root		Number of obs =		30
		Newey-West lags =		3
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z (rho)	-34.443	-17.540	-12.660	-10.300
Z (t)	-15.314	-3.716	-2.986	-2.624
MacKinnon approximate p-value for Z(t) = 0.0000				
. pperron D.drlir				
Phillips-Perron test for unit root		Number of obs =		30
		Newey-West lags =		3
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z (rho)	-43.157	-17.540	-12.660	-10.300
Z (t)	-19.293	-3.716	-2.986	-2.624
MacKinnon approximate p-value for Z(t) = 0.0000				
. pperron D.dlnpwaer				
Phillips-Perron test for unit root		Number of obs =		30
		Newey-West lags =		3
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z (rho)	-20.338	-17.540	-12.660	-10.300
Z (t)	-4.301	-3.716	-2.986	-2.624
MacKinnon approximate p-value for Z(t) = 0.0004				
. pperron D.dpi				
Phillips-Perron test for unit root		Number of obs =		30
		Newey-West lags =		3
Test Statistic		1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z (rho)	-45.290	-17.540	-12.660	-10.300
Z (t)	-18.521	-3.716	-2.986	-2.624
MacKinnon approximate p-value for Z(t) = 0.0000				

Annex V – Lag length Selection-order criteria

Selection-order criteria

Sample: 1996 - 2024

Number of obs = 29

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-320.451				241.473	22.5139	22.6025	22.7967
1	-162.837	315.23	36	0.000	.058293	14.1267	14.7469	16.1069*
2	-121.575	82.524	36	0.000	.057711	13.7638	14.9155	17.4413
3	-62.2152	118.72*	36	0.000	.035978	12.1528*	13.8361*	17.5277
4	.	.	36	.	-2.4e-34*	.	.	.

Endogenous: lnfdi lnrgdp inf rlir lnnpwaer pi

Exogenous: _cons

Annex VI – Johansen tests for cointegration – number of cointegration relationships

Johansen tests for cointegration						
Trend: constant			Number of obs =		30	
Sample: 1995 - 2024			Lags =		3	
maximum				5%		
rank	parms	LL	eigenvalue	trace statistic	critical value	
0	78	-153.6964	.	164.4164	94.15	
1	89	-125.98981	0.84231	109.0032	68.52	
2	98	-102.02868	0.79758	61.0809	47.21	
3	105	-85.061167	0.67734	27.1459*	29.68	
4	110	-77.039605	0.41420	11.1028	15.41	
5	113	-73.234656	0.22405	3.4929	3.76	
6	114	-71.488219	0.10991			

Annex VII – Vector error-correction model, Johansen tests for cointegration relationships determination

Vector error-correction model						
Sample: 1995 - 2024			Number of obs =		30	
Log likelihood = -85.06117			AIC =		12.67074	
Det(Sigma_ml) = .0000117			HQIC =		14.23964	
			SBIC =		17.57494	
Equation	Parms	RMSE	R-sq	chi2	P>chi2	
D_lnfdi	16	.445963	0.8568	77.76593	0.0000	
D_lnrgdp	16	.02489	0.9600	311.8093	0.0000	
D_inf	16	9.75527	0.6901	28.94437	0.0243	
D_rlir	16	7.97288	0.5379	15.13461	0.5148	
D_lnnpwaer	16	.047924	0.9116	134.1277	0.0000	
D_pi	16	2.97487	0.5488	15.81091	0.4662	

Annex VIII – Vector error-correction model – Short run Dynamics

		Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
D_Infdi							
	_ce1 L1.	-1.42753	0.272037	-5.25	0	-1.96071	-0.89434
	_ce2 L1.	0.527705	0.795048	0.66	0.507	-1.03056	2.085971
	_ce3 L1.	-0.03251	0.021491	-1.51	0.13	-0.07464	0.009607
Infdi	LD.	0.277528	0.216853	1.28	0.201	-0.1475	0.702552
	L2D.	0.082048	0.221745	0.37	0.711	-0.35256	0.516659
Inrgdp	LD.	1.869998	5.095477	0.37	0.714	-8.11695	11.85695
	L2D.	2.758379	4.097249	0.67	0.501	-5.27208	10.78884
inf	LD.	0.013685	0.015216	0.9	0.368	-0.01614	0.043507
	L2D.	0.006661	0.012067	0.55	0.581	-0.01699	0.030312
rlir	LD.	-0.04238	0.020157	-2.1	0.036	-0.08189	-0.00288
	L2D.	-0.01008	0.018779	-0.54	0.592	-0.04688	0.026731
Inpwaer	LD.	-4.33827	2.228102	-1.95	0.052	-8.70527	0.028728
	L2D.	-4.90396	2.296436	-2.14	0.033	-9.4049	-0.40303
pi	LD.	-0.05666	0.051527	-1.1	0.272	-0.15765	0.044334
	L2D.	-0.04705	0.044722	-1.05	0.293	-0.13471	0.040599
	_cons	2.648533	0.768367	3.45	0.001	1.142561	4.154505
D_Inrgdp							
	_ce1 L1.	0.021745	0.015183	1.43	0.152	-0.00801	0.051503
	_ce2 L1.	0.100329	0.044374	2.26	0.024	0.013358	0.1873
	_ce3 L1.	-0.00081	0.0012	-0.68	0.498	-0.00316	0.001539
Infdi	LD.	-0.01602	0.012103	-1.32	0.186	-0.03974	0.007707
	L2D.	-0.00628	0.012376	-0.51	0.612	-0.03054	0.017977
Inrgdp	LD.	0.131556	0.284392	0.46	0.644	-0.42584	0.688955
	L2D.	-0.57332	0.228678	-2.51	0.012	-1.02152	-0.12512
inf	LD.	-0.00045	0.000849	-0.53	0.595	-0.00212	0.001213
	L2D.	8.75E-05	0.000674	0.13	0.897	-0.00123	0.001408
rlir	LD.	5.66E-05	0.001125	0.05	0.96	-0.00215	0.002262
	L2D.	0.000396	0.001048	0.38	0.706	-0.00166	0.00245
Inpwaer	LD.	0.11256	0.124356	0.91	0.365	-0.13117	0.356294
	L2D.	0.220256	0.12817	1.72	0.086	-0.03095	0.471465
pi	LD.	0.00414	0.002876	1.44	0.15	-0.0015	0.009776
	L2D.	0.002002	0.002496	0.8	0.423	-0.00289	0.006894
	_cons	-0.11194	0.042885	-2.61	0.009	-0.19599	-0.02788

D_inf							
	_ce1 L1.	-0.95064	5.950711	-0.16	0.873	-12.6138	10.71254
	_ce2 L1.	-3.19165	17.39137	-0.18	0.854	-37.2781	30.89481
	_ce3 L1.	-0.59249	0.470111	-1.26	0.208	-1.51389	0.328912
lnfdi	LD.	-6.36077	4.743573	-1.34	0.18	-15.658	2.936465
	L2D.	2.832133	4.850575	0.58	0.559	-6.67482	12.33909
lnrgdp	LD.	-120.117	111.4616	-1.08	0.281	-338.578	98.34355
	L2D.	130.8408	89.62572	1.46	0.144	-44.8224	306.504
inf	LD.	-0.37882	0.332834	-1.14	0.255	-1.03116	0.273522
	L2D.	-0.50966	0.263962	-1.93	0.054	-1.02701	0.0077
rlir	LD.	-0.1649	0.440919	-0.37	0.708	-1.02909	0.699283
	L2D.	-0.80008	0.410789	-1.95	0.051	-1.60521	0.005052
lnpwaer	LD.	69.44951	48.73886	1.42	0.154	-26.0769	164.9759
	L2D.	-56.029	50.23364	-1.12	0.265	-154.485	42.42714
pi	LD.	-0.07595	1.127141	-0.07	0.946	-2.28511	2.133201
	L2D.	-0.06747	0.978277	-0.07	0.945	-1.98486	1.849919
	_cons	0.087747	16.80773	0.01	0.996	-32.8548	33.03029
D_rlir							
	_ce1 L1.	1.682222	4.863454	0.35	0.729	-7.84997	11.21442
	_ce2 L1.	-11.6167	14.21378	-0.82	0.414	-39.4752	16.24179
	_ce3 L1.	-0.11259	0.384217	-0.29	0.769	-0.86564	0.640462
lnfdi	LD.	0.991739	3.876873	0.26	0.798	-6.60679	8.590269
	L2D.	-2.07125	3.964324	-0.52	0.601	-9.84119	5.698682
lnrgdp	LD.	89.35654	91.09638	0.98	0.327	-89.1891	267.9022
	L2D.	34.52494	73.25016	0.47	0.637	-109.043	178.0926
inf	LD.	0.089785	0.272022	0.33	0.741	-0.44337	0.622937
	L2D.	0.123783	0.215733	0.57	0.566	-0.29905	0.546613
rlir	LD.	-0.77019	0.360358	-2.14	0.033	-1.47648	-0.0639
	L2D.	-0.28197	0.335734	-0.84	0.401	-0.94	0.376051
lnpwaer	LD.	-1.92728	39.83376	-0.05	0.961	-80	76.14546
	L2D.	19.76774	41.05543	0.48	0.63	-60.6994	100.2349
pi	LD.	0.591415	0.921201	0.64	0.521	-1.21411	2.396935
	L2D.	1.196852	0.799535	1.5	0.134	-0.37021	2.763912
	_cons	-0.12551	13.73678	-0.01	0.993	-27.0491	26.79808
D_lnpwaer							
	_ce1 L1.	-0.02099	0.029234	-0.72	0.473	-0.07828	0.036308
	_ce2 L1.	0.277543	0.085437	3.25	0.001	0.11009	0.444996

	_ce3 L1.	0.005382	0.00231	2.33	0.02	0.000855	0.009908
Infdi	LD.	0.007155	0.023303	0.31	0.759	-0.03852	0.052829
	L2D.	-0.00195	0.023829	-0.08	0.935	-0.04865	0.044759
Inrgdp	LD.	-0.9465	0.547566	-1.73	0.084	-2.01971	0.126714
	L2D.	-0.43299	0.440295	-0.98	0.325	-1.29595	0.429977
inf	LD.	-0.00419	0.001635	-2.56	0.01	-0.0074	-0.00099
	L2D.	-0.00296	0.001297	-2.29	0.022	-0.00551	-0.00042
rlir	LD.	0.002335	0.002166	1.08	0.281	-0.00191	0.00658
	L2D.	0.000527	0.002018	0.26	0.794	-0.00343	0.004482
Inpwaer	LD.	0.219126	0.239435	0.92	0.36	-0.25016	0.688409
	L2D.	-0.0662	0.246778	-0.27	0.789	-0.54987	0.417479
pi	LD.	-0.01034	0.005537	-1.87	0.062	-0.02119	0.000517
	L2D.	-0.005	0.004806	-1.04	0.298	-0.01442	0.004418
	_cons	-0.11206	0.08257	-1.36	0.175	-0.27389	0.049774
D_pi							
	_ce1 L1.	-1.72961	1.814673	-0.95	0.341	-5.2863	1.827083
	_ce2 L1.	1.07511	5.303508	0.2	0.839	-9.31957	11.46979
	_ce3 L1.	-0.05283	0.143361	-0.37	0.712	-0.33381	0.228151
Infdi	LD.	2.679139	1.446555	1.85	0.064	-0.15606	5.514336
	L2D.	0.888451	1.479186	0.6	0.548	-2.0107	3.787602
Inrgdp	LD.	38.3699	33.99027	1.13	0.259	-28.2498	104.9896
	L2D.	7.143656	27.33141	0.26	0.794	-46.4249	60.71224
inf	LD.	0.103073	0.101498	1.02	0.31	-0.09586	0.302005
	L2D.	0.04577	0.080495	0.57	0.57	-0.112	0.203538
rlir	LD.	-0.13046	0.134458	-0.97	0.332	-0.394	0.133072
	L2D.	0.013373	0.12527	0.11	0.915	-0.23215	0.258898
Inpwaer	LD.	-6.60044	14.86294	-0.44	0.657	-35.7313	22.53039
	L2D.	-5.15582	15.31878	-0.34	0.736	-35.1801	24.86843
pi	LD.	-0.38661	0.343722	-1.12	0.261	-1.0603	0.287069
	L2D.	0.174905	0.298326	0.59	0.558	-0.4098	0.759613
	_cons	-2.3563	5.125526	-0.46	0.646	-12.4022	7.689544

Annex IX – Johansen Normalization – Cointegrating equations

Cointegrating equations

Equation	Parms	chi2	P>chi2
_ce1	3	1034.799	0.0000
_ce2	3	694.0856	0.0000
_ce3	3	61.04002	0.0000

Identification: beta is exactly identified

Johansen normalization restrictions imposed

beta	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
_ce1						
lnfdi	1	.	.	.	.	.
lnrgdp	2.22e-16	.	.	.	.	.
inf	3.47e-18	.	.	.	.	.
rlir	-.055782	.0151097	-3.69	0.000	-.0853964	-.0261676
lnpwaer	-4.252237	.1680462	-25.30	0.000	-4.581602	-3.922873
pi	-.0453553	.0234586	-1.93	0.053	-.0913332	.0006227
_cons	12.04104	.	.	.	.	.
_ce2						
lnfdi	1.39e-17	.	.	.	.	.
lnrgdp	1	.	.	.	.	.
inf	0 (omitted)	.	.	.	.	.
rlir	-.0156008	.0052183	-2.99	0.003	-.0258285	-.0053732
lnpwaer	-1.227373	.0580366	-21.15	0.000	-1.341123	-1.113623
pi	-.0196479	.0081017	-2.43	0.015	-.0355268	-.0037689
_cons	-1.753901	.	.	.	.	.
_ce3						
lnfdi	-2.66e-15	.	.	.	.	.
lnrgdp	-3.55e-15	.	.	.	.	.
inf	1	.	.	.	.	.
rlir	.4932215	.1842216	2.68	0.007	.1321537	.8542893
lnpwaer	12.56046	2.048871	6.13	0.000	8.544747	16.57617
pi	1.887445	.2860141	6.60	0.000	1.326868	2.448023
_cons	-77.61742	.	.	.	.	.