Determinants of Foreign Direct Investment in India: A VECM Analysis of Economic Indicators

Imran Ali, Imran and Foday, Foday and Zahid Usman, Muhammad

National Research University Higher School of Economics, Russia, National Research University Higher School of Economics, Russia, Bahauddin Zakariya University Multan, Punjab, Pakistan

1 August 2024

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1st Author: Imran Ali

Master, Faculty of Management**,** National Research University Higher School of Economics, Russia

Email: imranalieco@mail.com. Phone: +79875556251

ORCID: IMRAN ALI https://orcid.org/0009-0002-9864-6741

Address: Lvovskaya street 1v, Nizhny Novgorod, Russia

2nd Author: Foday Daboh
National Research University Higher School of Economics
Masters Economics and Economic Policy
Email: fodaydaboh45@gmail.com.
fdabo@edu.hse.ru
ORCID: https://orcid.org/0000-0002-5558-845X

3rd Author: Muhammad Zahid Usman
M.Phil. Business Economics Scholar
School of Economics
Bahauddin Zakariya University Multan, Punjab, Pakistan
zahidusmanbzu@hotmail.com

Abstract:

This study investigates the complex Relationship between Foreign Direct Investment (FDI), Exchange Rates (LEXR), GDP per Capita (LGDPPC), Inflation (LINF), and Natural Resources (LNR). Understanding these dynamics is pivotal for formulating effective economic policies and enhancing economic sustainability. The primary objective is to analyze the long-term and short-term relationships among these variables and to identify their impacts on FDI. The study aims to address how each variable influences FDI and to assess the policy implications of these relationships. By Employing the Johansen Cointegration Test and Vector Error Correction Model (VECM), the study examines the equilibrium relationships and dynamics among the variables. Granger Causality tests are used to determine the predictive relationships between FDI and its determinants. The long-run analysis shows that exchange rates significantly increase FDI, while higher GDP per capita reduces FDI. Inflation and natural resources also affect FDI but to a lesser degree. Short-term dynamics reveal that GDP per capita and natural resources have significant positives impacts on FDI, whereas the effects of exchange rates and inflation are weaker. Granger Causality tests confirm that GDP per capita influences FDI and exchange rates, while inflation affects GDP per capita. The study highlights the importance of economic growth, stable exchange rates, and controlled inflation

for attracting FDI. Recommendations include investing in infrastructure and innovation, managing exchange rate volatility, and implementing transparent resource management policies to enhance economic stability and growth.

Keywords: Foreign Direct Investment, Exchange Rates, GDP per Capita, Inflation, Natural Resources, Vector Error Correction Model, Cointegration, Granger Causality.

JEL Codes: F21, F31, O16, O40.

1. INTRODUTION

Foreign Direct Investment (FDI) has played a crucial role in the economic development, growth, and globalization strategies of developing countries, with India being a prime example. Over the last four decades, specifically from 1980 to 2022, India's economic landscape has undergone a remarkable transformation, largely shaped by FDI inflows. This period saw substantial shifts in policies, along with a move towards liberalization and integration into the global economy, all of which contributed to the current investment climate. In the early 1980s, India's economic policies were characterized by strict regulations, a dominant public sector, and trade policies that focused on protectionism, partly influenced by its close ties with the USSR. During this time, the industrial policy was restrictive, involving limited participation of foreign equity and significant government intervention in the market. This environment was not conducive to FDI, resulting in only modest foreign investment during this period [1]. The economic crisis of 1991, however, marked a pivotal moment in India's financial history. Faced with a balance of payments crisis, the government—under the leadership of economist and then-Finance Minister Dr. Manmohan Singh—implemented sweeping liberal economic reforms aimed at addressing the crisis and liberalizing the economy. The introduction of the New Industrial Policy in 1991 was a landmark reform that removed licensing requirements for most industries, lowered trade barriers, and allowed greater participation of foreign investors through increased foreign equity limits. These reforms laid the groundwork for creating a more favorable environment for FDI [2]. Following the liberalization efforts, FDI inflows began to rise steadily. The government continued to improve the investment climate by enhancing infrastructure, simplifying regulatory frameworks, and providing fiscal incentives to attract foreign investors. One notable reform was the enactment of the Foreign Exchange Management Act (FEMA) in 1999, which streamlined foreign exchange

regulations and significantly eased the process of conducting business in India [3]. The 2000s saw a rapid acceleration in FDI inflows, driven by strong economic growth and a rising middle class. The establishment of Special Economic Zones (SEZs) during this period provided further incentives for foreign investment, as these zones offered tax benefits, improved infrastructure, and a simplified regulatory environment. This period also witnessed a surge in mergers and acquisitions, joint ventures, and strategic alliances, signaling increased investor confidence in India's markets [4]. In 2014, the government launched the "Make in India" initiative, aimed at positioning India as a global manufacturing hub. This initiative targeted key sectors such as automotive, electronics, textiles, and renewable energy, promoting infrastructure development, skill enhancement, and innovation. As a result, India saw significant FDI inflows, which further stimulated manufacturing activity [5]. The global economic downturn caused by the COVID-19 pandemic posed new challenges, impacting FDI flows worldwide. Nevertheless, India continued to demonstrate resilience, maintaining its position as an attractive destination for foreign investments. During this period, the government introduced several reforms, including production-linked incentive (PLI) schemes aimed at bolstering domestic manufacturing and attracting FDI in critical sectors such as electronics, pharmaceuticals, and automotive [6]. In more recent years, India has shifted its focus towards sustainable development and technology-driven growth. The adoption of digital technologies, advancements in e-commerce, and initiatives toward green energy have created new opportunities for foreign investments. The government's efforts to improve the ease of doing business, enhance transparency, and maintain regulatory stability continue to be key drivers in attracting FDI [7].

Despite the steady inflows of FDI and the government's efforts to create a conducive environment for foreign investment, the factors influencing FDI in India from 1990 to 2021 remain varied and complex. This study aims to explore and analyze these key determinants, focusing on understanding the macroeconomic variables and policy measures that drive FDI inflows into India. By examining the period from 1980 to 2021, the study aims to provide a comprehensive understanding of the evolution of FDI in India, highlighting the impacts of liberalization, economic reforms, and recent policy measures. The findings are expected to offer valuable insights that could help shape future policy decisions to ensure a stable and attractive investment environment, fostering sustainable economic growth.

Research Questions

1.What is the long-term relationship between Foreign Direct Investment (FDI) inflows and key macroeconomic variables in India, such as GDP per capita, official exchange rates, inflation, and natural resources?

2. How do short-term fluctuations in official exchange rates, GDP per capita, inflation, and natural resources affect FDI inflows in India?

3. Does causality exist between FDI inflows and each of the macroeconomic variables, and if so, what is the direction of this causality?

4. What role do natural resources and inflation play in shaping FDI inflows, considering the potential for both long-term and short-term impacts?

5. How stable is the model used to analyze the relationship between FDI inflows and the selected macroeconomic variables?

Research Objectives

1. To examine the long-term equilibrium relationship between FDI inflows and macroeconomic variables, including GDP per capita, official exchange rates, inflation, and natural resources in India from 1990 to 2021.

2. To assess the short-term dynamics and their effects on FDI inflows in relation to the selected macroeconomic variables using the Vector Error Correction Model (VECM).

3. To investigate the causal relationships between FDI inflows and the macroeconomic variables using the Granger Causality Test.

4. To determine the influence of natural resources and inflation on FDI inflows, and to analyze their significance both in the short run and the long run.

5. To validate the stability and reliability of the econometric model used through various diagnostic tests, including tests for stationarity, heteroskedasticity, and serial correlation.

Although numerous studies have examined the relationship between Foreign Direct Investment (FDI) and economic growth, there remains a significant gap in understanding the interplay between FDI inflows and specific macroeconomic variables like exchange rates, GDP per capita, inflation, and natural resources within the Indian context. Much of the existing literature either concentrates on broader economic indicators or does not fully investigate the long- and short-term effects using an integrated econometric framework. This study seeks to address this gap by

employing a robust time-series analysis, specifically the Vector Error Correction Model (VECM), to capture both equilibrium relationships and the dynamic adjustments between FDI inflows and critical macroeconomic factors over a substantial period. Furthermore, the inclusion of natural resources as a determinant adds a distinct dimension to this analysis, which has often been overlooked in previous FDI studies, particularly in the Indian context.

This study focuses on the macroeconomic factors influencing FDI in India, including exchange rates, GDP per capita, inflation, and natural resources, over the period from 1990 to 2021. It encompasses key policy shifts and economic reforms that shaped FDI inflows during this time. However, the study is constrained by the availability and accuracy of historical data and does not incorporate micro-level factors such as firm-specific characteristics or industry-specific dynamics. Additionally, the effects of global economic conditions and geopolitical events are considered only insofar as they impact the selected macroeconomic variables.

2. Literature Review

This chapter reviews a brief method on the factors affecting FDI in India from 1980 to 2023 from the existing body of literature. Thus, FDI is an important catalyst leading to economic development through provision of capital, technology and skills. India has a big market place and is geographically positioned in a correct approach thus being a potential FDI host nation which is influenced by policies, market forces, infrastructure, political stability, and governance systems. This review includes the economic reforms, size of the market, infrastructure, political condition, labor market conditions, trade liberalization, technology and business environment based on the twenty chosen articles. This work breaks down the explanations of how these circumstances have influenced the India FDI environment, considering factors influencing attraction and hindrances.

2.2 Specific Factors Influencing FDI

2.2.1 Economic Policies and Reforms

The aim of the paper is to study the impact of industry-specific FDI on economic growth in India post liberalization using panel co integration regression and Granger causality test on sectors wise data. The results reveal that FDI has a positive interaction with manufacturing output but there is no such effect in the primary sector and only short term in services though FDI in services transfers positive effects to manufacturing through backwash. Thus, there is an implication for the formulation of sector-specific type-of policy so that efficient and effective flows of FDI are created, which is important for India's development strategy after liberalization. Possible future research topics might concern the quality of institutions, impact of FDI for labor markets, regional dimension of FDI and FDI synthesized with domestic investment [8].

The purpose of this article is to review India's investment regulation environment after the LPG reforms begun in the year 1991. Similar to the above-discussed analysis, India, as an investment hot spot, continues to experience issues like increased bureaucratic processing time, numerous requirements, and regulatory issues that limit the right FDI in the nation's economy. The study also consists the stock taking of existing legislation and practices, analyze the issue and provide recommendations on reforms. Besides, it elaborates the policy to the FDI including the launch of the Foreign Investment Facilitation Portal which has been designed to simplify the processes and increase the flow of FDI in the country. The continuation of such research could include the analysis of policy adjustments, and the efficiency of investments via the digitization process, states' reform, and a comparison with other emerging markets [9].

This paper sought to find out the determinants of FDI in India through assessment of GDP, the inflation rate, interest rate, patents, growth of money stock, and foreign trade and aimed at determining the best fit ARIMA (p, p, q) model. The research

hypotheses included the FDI and Gretl model calibrated models employed with heteroscedastic and autocorrelation tests, while the qualitative changes of FDI policy were captured with dummy variables. It was established that GDP; inflation rate and scientific research had an impact in FDI inflows and particularly so with regards to the policy changes between 1995 and 1997. It means that the econometric model was able to capture the variation of FDI inflows to the extent of 63 percent while the remaining 37 percent was beyond the model's coverage. Subsequent research was suggested to incorporate other factors; exchange rates in this study, so that more factors accounting for the remaining FDI variation could be captured [10].

2.2.2 Market Size and Growth Potential

This paper focused on the cross-cultural Management and Human Resource Management for MNEs to undertake business in India. The study which involved interviews with the senior managers of MNCs in Delhi and Singapore also revealed that MNCs require long term focus, clear expatriate management policies and substantial investment. Some of the important strategies for India remain cultural and geographical knowledge, trustful relations with Indian people, cooperation with local partners, and adaptation of the worldwide best practices. The study also found that the problem associated with high staff turnover and retention of talent only can't be solved with the provision of competitive remuneration packages, but it is important to offer talented employees an opportunity to work in challenging positions and to grow professionally. However, the study presents valuable data regarding operational situations of MNCs in India that might be useful for those companies that either are already present in the Indian market or which are considering expanding their business to India [11].

The economic planning is carried out in India since 1951, early plans focused on manufacturing, agriculture, poverty disappearance, social development etc. In 1991, ceding to an acute economic and currency crunch, India set off on the policy path of Liberalization, Privatization, and Globalization (LPG) that brought in a visible positive change on the country's economy. Another place of the economic fluctuation was as a result of the global financial crisis that occurred in the year 2008. Explaining the Indian experience of LPG policies from 1991 to 2013 the presented paper covers the successes and the failures of the Indian economy. As of now, there is still the absence of empirical examination of these reforms' impacts on income distribution, intraregional disparities, and incorporating technological innovations and sustainable development aims in economic strategies [12].

This research aimed at providing an appraisal of FDI and the contribution the FDI makes in the development of under developed and developing nation to the problem, the important role they play in gap between inadequate domestic savings and the desirable investment required for economic transform. FDI contributes to the long-term development through technology transfer, development of physical facilities, increase in level of productivity and employment. In India, FDI had emerged as crucial after the 'Liberalization' of 1991 with a substantial increase in inflows. This paper sought to review FDI patterns after liberalization, forecast the pattern and compare factors affecting FDI. It made assessment to accounting factors that led to poor FDI inflows and recommended some remedies to address this issue. The research gap is thus in extending analysis of these measures and more broadly placing India's FDI strategies under examination alongside other successful developing countries [13].

2.2.3 Infrastructure Development

This paper was aimed at establishing the impacts of FDI as one of the causes of economic growth particularly among the developing nations, such as India. FDI is defined as the investment where the business entities of the home country invest directly to purchase an asset that can be used for the management in the host country helps in building up the infrastructure, expertise and technology. Nevertheless, FDI also contributes to regional disparities on the grounds that it is geo-politically skewed across the various regions. Through the research made on investment, it was realized that areas such as Mumbai, New Delhi, Chennai, and Gujarat receive significant foreign investment while others are not investors' destination of choice. The study emphasizes the necessity to plan for the equal distribution of FDI to enhance the development of all the regions. Therefore, this study aims at exploring the barriers to FDI from less attractive regions to provide information on factors that hinders FDI for the development of policies [14].

This paper investigated the effect of physical capital and human capital on FDI in developing countries with special reference to India within the period 1991-2010. As formulated by Dunning, the eclectic paradigm was used by the research to assess major structural conditions that affect FDI. In its study it discovered that Railway transport, road infrastructure and human resource factor are key influencing factors in FDI to India while Air transport and communication infrastructure on the other hand is relatively undeveloped in its ability to attract FDI. As for the underdeveloped sectors, the study recommended the way to bolster India's attraction for the next round of FDI inflows. The research gap was thus in addressing these weak areas to increase FDI inflow [15].

2.2.4 Political Stability and Governance

The progressive economic reforms of India augment its good performances in attracting FDI; however, FDI is not equally distributed. Two of the countries contribute to more than half of the total equity investment whereas two of the states get more than half of total FDI equity investments. Moreover, a similar account has been made by the services sector that has been receiving nearly half of the FDI being witnessed over the last few years. This paper notes historical trend of FDI Inflow in India beginning from 2000-01 and government policies in the current period. This paper identified a research gap in the analysis of the motivational factors leading to such unbalanced distribution and the search for ways to spread FDI more evenly across the states and fields for more efficient development of the country's economy [16].

According to the author's intention, he tried to categorize the nature of institutional and political factors which determines the access of FDI in Brazil, Russia, India, China and South Africa in 2000-2010. The variables include the macroeconomic stability as; inflation rate, political stability/no violence in the country, government effectiveness, regulatory quality, control of corruption, voice and accountability and rule of law as the determinant of FDI and the methods used in data analysis included the panel unit-root test and multiple regression test. The analysis also showed that there is a positive relationship between the economic quality of the government and FDI in the BRICS nations; they also confirmed that the quality of regulation, which a BRICS nation's government guarantees, also possess a direct relation to FDI. On the other hand, FDI, political stability, voice and accountability as well as control of corruption were found to have negative effect on FDI inflows hence implying that these factors were not that importance in influencing FDI inflows. A research gap can also be identified in the context of other factors that can affect FDI in BRICS and in terms of the analysis being carried out

only up to the year 2012 – it is important to consider more recent years in order to understand the current tendencies [17].

This paper analyses the relationship of good governance for FDI for the member countries of SAARC for a period of nine years from 2006 to 2014. Good governance has inspired many cross-sectional analyses of FDI flows which utilize the Worldwide Governance Indicators. From the random effects panel estimation technique, the study found political stability and regulatory quality have positive and significant impact on inward FDI. In contrast, high rates of corruption impede multinationals' FDI in SAARC countries in the same vein. Also, the traditional concepts of FDI location determinants such as size and the level of market development remained influential positively. Nevertheless, they have been found insignificant with regard to their potential influence on FDI inflows, though both equally important – the openness of the host economy and human capital. Hence the major research result is that good governance exerts a high level of influence on inflow FDI in the SAARC region [18].

2.2.5 Labor costs and Productivity

It is crystal clear that Information technology combined with globalization has transformed national and global contexts for operation with doubled speed and has achieved higher rates of economic growth and enhanced rates of living standards and has generated unprecedented challenges for workers. This study was conducted with an aim of identifying the tendencies of employment and issues concerning IT professionals in India this factor as privatization, flexibilization, body shopping, individualization and off-shoring. Consequently, the study established that these elements collectively affect the IT sector in a positive and enhance the quality of work by increasing safety, income assurance, skills, and innovative food for thought.

This in turn leads to provision of decent work and sustainable economic development. These trends are yet another area that is understudied in terms of their long-term impact on workers' welfare and on socio-economic consequences in other industries aside from information technology [19].

The present research focused towards understanding the impact concerning the FDI on China and India from 1993 to 2009 with special reference to structural shifts. The OLS method of regression analysis in the modified form of the growth model where GDP was used as dependent variable and independent variable as human capital, labor force, FDI, and gross capital formation also gave the same results that any percentage increase in FDI leads to 0. 8% increasing of China's GDP for the current year. According to recent statistics it has been causing a rise equivalent to 02% of India's GDP. The results revealed that; though India is growing rapidly, it seems that China is the country that is more affected by FDI. The paper also found out some causes for China to outperform the world in FDI and proffered some preaching for India to enhance its FDI outcome. Another limitation of published studies is that other possible variables that could affect FDI are not yet considered although the efficient literature review is to expand the investigation on the effect of FDI on the growth of other variables beyond the existing analysis and include other years following the current studies [20].

In this paper, the effects of the labor cost on the FDI in India is analyzed with a focus on the issue of the foreign-owned firms paying higher wages than local firms. Employing the OLS technique, it is found that lower average wages tend to attract FDI, evidence for India's comparative advantage in international lines for low-cost wages thereby improving its competitiveness internationally. Further, it was established that foreign owned firms in India offered better wages than local firms and that the firms with higher proportion of foreign ownership paid better wages.

For the uninitiated, the geographical splitting is particularly intriguing but the research question which is not answered by existing literature is when and how this differential wages structure is sustainable in nurturing domestic employment market and productivity level and how changing labor laws and structures will influence future FDI flows [21].

2.2.6 Trade Openness and Integration

This exploratory study pointed out the understanding of the economic factors on FDI in Pakistan, India and Indonesia over a period 1971-2005. Using skill level ordinary least square (OLS), which is the log-linear regression, it found out that market size, external debt, domestic investment, trade openness and physical infrastructure are some of the key exogenous variables that determine FDI. The results obtained in this study were similar to the findings under India, Pakistan but did not match in terms of Trade openness & Government consumption which were the distinguishing parameters and Indonesia. Accordingly, to increase the FDI inflows, the study suggested the following strategies: improved economic and political stability, physical development, security, higher internal investment, and good money fiscals. Existing research lacks more current data collection compared to the mid-2000s, as well as other factors such as technology integrated in portfolio and human capital building [22].

Foreign Direct Investment or FDI has greatly benefited India's economy concerning the creation of new marketing outlets, low-cost manufacturing sites, and technical expertise and capital. Thanks to globalization and governmental support, the Indian authority has actively solicited the participation of the world's leading corporations; liberalization measures in 1998 and 1999 have been conducive to doing business. FDI in India comprises of foreign institutional investors, private

equity, venture capital, overseas invested ADRs and GDRs, and NRIs/PIOs. This paper then and with the backdrop of the empirical analysis of the findings discussed here provides a view on FDI and its role for the dynamics of the Indian economy since the reform period. However limited literature exists with regards to the long-term characteristics of various forms of FDI on sectors and regions; or concerning possible tweaking the FDI instruments towards the enhanced longer-term balanced economic development [23].

2.2.7 Technological Advancement and Innovation

This paper analyzed the correlation of innovation, the environment and economic growth in India for the period 1985-2017 with specifics to technological innovation, FDI, trade openness, energy use and the impact of growth in economy over carbon emissions. It explored the long-run relationship between these factors with the help of bound testing in ARDL and VECM and established co-integration among them. In this regard, trade openings, energy usage, economic growth facilitated the CO2 emissions meanwhile technology advancement and FDI complied the opposite. The selected variables of FDI, innovation, trade openness, and energy use all influenced each other and were influenced by GDP but not carbon emissions. With respect to the short-run dynamics, FDI, innovation, and energy demand impacted carbon emission; however, the relationship from trade openness was two-way. It was also recommended that organizations embark on an innovation process in order to environmental degradation. The present study also highlights the research gap of carrying out sector-wise and specific technological innovation analysis of the FDI and its consequent effect on the environment in India [24].

Sustainable economic development of the BRIC nations in the perceived period 1990-2019 was studied in this paper with emphasis on the influence of innovation-

led FDI based on two predictors: spatial adequacy and capital formation. The structural break and the long run relationship between innovation and FDI are established through unit root tests, co-integration test and causality test. Hence it established that regardless of an innovation being technological, financial and environmental, positive shocks tend to have a positive effect on FDI inflows in the long-run and the short-run periods more than negative shocks. According to the study, effort should be made in order to encourage a favorable environment that will encourage innovation as this was said to be important in the attraction of FDI. Another issue that has remained uninvestigated is how the impact of innovation differs depending on the sector on the FDI inflows within the BRIC nations [25].

2.2.8 Ease of Doing Business

Though both China and India have similar records of growth and similar market size indices, the FDI has not been the same with China getting more. The study employs Porter's competitiveness framework and concludes that the early linkages of China to the East Asia production networks in 1980s, establishment of the special economic zones was a significant favor. This historical and geographical chance factor in combination with government support is the reason why China has had a higher FDI particularly in manufacturing than the other South East Asian countries. India, for example, failed to undergo this phase and as a result it requires to look for other ways of FDI attraction. The research gap revolves around finding these strategies, which will boost India's FDI inflows [26].

Therefore, this study sought to determine the effect of FDI on the economic growth of China and India for the period between the year 1993 and 2009 through the use of a modified growth model that comprised of total GDP, human capital, size of labor force, FDI and gross capital formation. In the OLS regression analysis, it

was found out that for every one percent FDI there was a 0. 7 percent of the China's Gross Domestic Product and a nil rise in its basic capital adequacy ratio reflected by a 02% higher GDP growth rate in India in these categories than China; and the fact that FDI was more integral in China. It also provided the causes of success for China in attracting FDI and also provided pointers for India to improve its FDI efficiency. The existing research question is complemented by another research question – to identify the strategies and policies that would complement the Indian policies in order to produce the maximum advantageous effects of FDI [27].

2.3 Interconnection and Integration Methodologies

This study examined the effect of FDI on the economic growth of China and India between 1993 and 2009 using a modified growth model comprising of the GDP, human capital, labor force, FDI, and gross capital formation. An analysis of variance for regression using the ordinary least square was conducted to test the link between FDI and other variables, where it was revealed that 1% change in FDI negatively affected the exports by 0. A kind of 07% shortage in China's GDP, and a zero. 0.02 percent higher within a year to India's Gross Domestic Product, pointing towards FDI having a better influence with China. The study also described some of the drivers of China's success in FDI attraction, and some recommendations to India about how to increase the effectiveness of its FDI attraction. Therefore, the present research deficit is in examining the contextual nature of the recommendations and analyzing the other related strategies and policies, which could be employed by India to harness the potential of FDI [28].

The study aimed at exploring the FDI inflows to both China and India during 1980-2013 employing the econometric models. Therefore, the study was able to determine that market size is significant in the determination of FDI attraction in the

two countries. In China factor such as lower wage rates have way a huge influence in the FDI attraction while in India it's the policy reforms. The study also applied the linear regression analysis with market size, infrastructural development, market openness, and inflation rate variables. The research void is to understand how a particular change in policies in India and wage rate policies in China could entail further improvements in FDI arrivals [28].

2.4 Theoretical Framework

The International Business Theory and the Eclectic Paradigm (OLI Framework) forms the theoretical underpinning of this research proposing factors that affect FDI in India. It discusses all the necessary theories for understanding the factors influencing FDI and relevance of their application to the case of India.

2.4.1 International Business Theory

International Business Theory aims at studying the reasons and processes of firms' internationalization, it pays attention to firm-specific factors such as technology, experience, and skills of the managing team and the factors within the host country such as size of the market, market infrastructure and qualities of institutions. A few of them include: This theory assists in explaining the reasons as to why MNCs invest in India bearing in mind the market potential, competitive advantage as well as risk.

2.4.2 Electic Paradigm (OLI Framework)

The **Eclectic Paradigm**, or OLI Framework, developed by John Dunning, posits that FDI is influenced by three key determinants:

- **Ownership (O)** Competitive assets of the firm including technology Brand and managerial competence.
- **Location (L)** Market size, parental and host country resources and the level of support infrastructure.
- **Internalization (I)** The reasoning for internal control in operations instead of partnering or licensing as the means of control.

When apply the above conditions to the case of India, the OLI Framework assists in understanding how firms from different countries decide to invest in India because of ownership advantages possessed by MNEs, location advantages that have emerged from economic liberalization and potential market demand and internalization advantages derived from investing in another country.

2.4.3 Application to India

Using the theories presented above, this framework analyzes the FDI inflows in India bearing the changes in the economic policies, infrastructure facilities, political stability, and the market setting. It sets the precursors for analyzing how global business strategies and domestic factors reveal India's FDI policy.

The following theoretical framework is applied for the assessment of FDI determinants and provides an understanding on how these factors impact investment in the country.

2.5 Policy Integration and Stakeholder Participation

Policy Integration is one of the activities where many economic and regulatory policies are set and coordinated to ensure that they encourage FDI. It thus requires syncing all policies of the different areas in India such as to promote the ease of the

business, reduce the bureaucratic measures, and stability of the market, which aids in encouraging the foreign investors.

Stakeholder Participation means that various persons, ranging from governmental agencies, business organizations, and investors, have a say on policies to be established. This way the existing investment challenges are solved and the policies in relation to investors needs become more welcoming and inviting for investors and hence investors get a better investment climate.

In that sense, policy integration and stakeholder participation are interrelated actions that improve the outcomes of FDI policies and the attractiveness of investment climate.

2.6 Adaptive Governance

Adaptive Governance is one of the flexible styles of handling problems that are encountered in management. It consists of policy changes for new information and changes in conditions of the environment. This is particularly the case for FDI in India which requires development of policies which can effectively respond to new trends and requirements of the investors and secure and steadfast functioning of FDI attraction and management frameworks. Stakeholder involvement and feedback reception are among the components of adaptive governance, such important factors that help India transform into a favorable investment climate.

2.7 Application to India's FDI Context

Combining policy integration and adaptive governance is crucial in the case of FDI in India. Policy integration therefore implies coordination in aiming to ensure that policies support the investment environment for sectors of the economy, while adaptive governance seeks to ensure that policies reflect changes in trends and

investors' wishes. Utilizing these strategies assists India in improving on the conditions necessary for bringing and hosting FDI making the investment environment more stable and responsive.

2.8 Conclusion

The analysis of the factors that impact FDI in India reestablishes the integration of a coordinated policy and responsive policy making mechanisms. Policy coherence in economic and regulatory polices means that numerous plans facilitate FDI and the environment is congenial for the policy. On the other hand, adaptive governance enables the ongoing update and better celebration of dynamic trends and investors' requirements. When these principles are applied India will be able to become an even more favorable country for investments and it will be able to develop the necessary strategies to successfully face the dynamic and complex nature of the international investment environment. These approaches have actions and reactions that sustain the economy and stand affirmative to Establish India's position in the global market.

3. Methods and Materials

To conduct this analysis, the study applied annual time series data covering the year range of 1990 to 2021 with the aim of trying to determine the effect of Foreign Direct Investment (FDI) on the Indian economy. The macroeconomic variables studied were log of Foreign Direct Investment Inflows, log of Official Exchange Rates, log of Gross Domestic Product Per Capita, log of Inflation rate, and the log Natural Resources. The secondary data was obtained from the World Development Indicators (WDI) data base. Several econometric methods were used to accomplish study's aims. First, the time-series data was subjected to unit root tests to check if

data is stationary or not. For this purpose, the Augmented Dickey-Fuller (ADF) test and Phillips-Perron test were used. After that, a Granger causality test was used to check the causation between variables as well as the effect of time. Furthermore, a Cointegration test was conducted with a view to finding out whether there exists long-run equilibrium of relationship among the variables. After relationships were found to cointegrate, a vector error correction model (VECM) was used to investigate the effects of the exogenous variables on prices in terms of short run, long run and even cointegrated relationships.

Model Specification

To investigate the long-run relationship between the variables, the study utilized the following functional model:

$$LFDI = f(LEXR, LGDPPC, LINF, LNR) \quad (1)$$

The econometric form of the equation is thus stated as;

$$LFDI_t = \alpha_1 + \beta_1 LEXR_t + \beta_2 LGDPPC_t + \beta_3 LINF_t + \beta_4 LNR_t + \varepsilon_t \quad (2)$$

Wherein;

Log of Foreign Direct Investment Inflows, denoted as LFDI

Log of Official Exchange Rates, denoted as LEXR

Log of GDP Per Capita, denoted as GDPPC

Log of Inflation denoted as LINF and

Log of Natural Resources, denoted as LNR

Also, the model's coefficient β_1 and β_4 and the error term ε_t are included.

3.2Unit Root Test

Every aspect of time series analysis requires an understanding of the stationarity properties of the underlying datasets in order to eliminate spurious regressions that may cause errors in the analysis. In this study, we used the ADF as well the Phillips-Perron Unit Root Test to examine the stationarity of the time series data. The ADF is thus stated as:

$$\Delta y_t = \alpha + \beta_t + \gamma y_{t-1} + \sum_{i=1}^{p} \delta_i \Delta y_{t-1} + \varepsilon_t \quad (3)$$

Where Δy_t denotes the first difference of y at time t, α is constant term and β_t is the component of time trend. Also, γy_{t-1} is the lagged level of the variable, $\delta_i \Delta y_{t-1}$ represents the lagged differences and ε_t is the error term. The null hypothesis (H_0) of the ADF test is that the series has a unit root, indicating non-stationarity. The alternative hypothesis (H_1) is that the series is stationary.

3.3Granger Causality Test

We further make used of the Granger Causality Test to help determine the casual relationship that exist between one variable to another used in the study. This test is very useful in ascertaining the predictive power of one variable to another and as well hep to determine whether a particular variable is useful in forecasting another

underlying macroeconomic variable. To estimate the Granger Causality test it requires estimating the following VAR models:

$$LFDI_t = \alpha_1 + \sum_{i=1}^{p} \beta_{1i} LFDI_{t-i} + \sum_{i=1}^{p} \gamma_{1i} LEXR_{t-1} + \sum_{i=1}^{p} \delta_{1i} LGDPPC_{t-1} + \sum_{i=1}^{p} \theta_{1i} LINF_{t-i} + \sum_{i=1}^{p} \lambda_{1i} LNR_{t-1} + \varepsilon_{1t} \quad (4)$$

$$LEXR_t = \alpha_2 + \sum_{i=1}^{p} \beta_{2i} LEXR_{t-i} + \sum_{i=1}^{p} \gamma_{2i} LFDI_{t-1} + \sum_{i=1}^{p} \delta_{2i} LGDPPC_{t-1} + \sum_{i=1}^{p} \theta_{2i} LINF_{t-i} + \sum_{i=1}^{p} \lambda_{2i} LNR_{t-1} + \varepsilon_{2t} \quad (5)$$

$$LGDPPC_t = \alpha_3 + \sum_{i=1}^{p} \beta_{3i} LGDPPC_{t-i} + \sum_{i=1}^{p} \gamma_{3i} LFDI_{t-1} + \sum_{i=1}^{p} \delta_{3i} LEXR_{t-1} + \sum_{i=1}^{p} \theta_{3i} LINF_{t-i} + \sum_{i=1}^{p} \lambda_{3i} LNR_{t-1} + \varepsilon_{3t} \quad (6)$$

$$LINF_t = \alpha_4 + \sum_{i=1}^{p} \beta_{4i} LINF_{t-i} + \sum_{i=1}^{p} \gamma_{4i} LFDI_{t-1} + \sum_{i=1}^{p} \delta_{4i} LEXR_{t-1} + \sum_{i=1}^{p} \theta_{4i} LGDPPC_{t-i} + \sum_{i=1}^{p} \lambda_{4i} LNR_{t-1} + \varepsilon_{4t} \quad (7)$$

$$LNR_t = \alpha_5 + \sum_{i=1}^{p} \beta_{5i} LLNR_{t-i} + \sum_{i=1}^{p} \gamma_{5i} LFDI_{t-1} + \sum_{i=1}^{p} \delta_{5i} LEXR_{t-1} + \sum_{i=1}^{p} \theta_{5i} LGDPPC_{t-i} + \sum_{i=1}^{p} \lambda_{5i} LINF_{t-1} + \varepsilon_{5t} \quad (8)$$

Where;

$\alpha_1, \alpha_2 \ldots\ldots \alpha_5$ *are the constants.*

β_{1i}, β_{2i}, *and*…… β_{5i} are the coefficients of the lagged dependent variables.

γ_{1i}, γ_{2i}, *and…* γ_{5i}, δ_{1i}, δ_{2i}, *and….* δ_{5i} θ_{1i} θ_{2i} …… θ_{5i} λ_{1i}, λ_{2i},…λ_{5i}*are the coefficients of the other variables' lagged values.*

are the coefficients of the remaining variables' lagged values.

ε_{1t}, ε_{2t}, and…… ε_{5t} are the error terms.

p is the number of lags determined by criteria such as the Akaike Information Criterion (AIC).

3.4Cointegration Approach

The study uses the Johansen cointegration tests to check whether a long-term equilibrium relationship exists between the variables. The Johansen cointegration test is based on the following Vector Autoregressive (VAR) model of order p;

The Johansen cointegration test is based on the following Vector Autoregressive (VAR) model of order p;

$$\Delta X_t = \prod X_{t-1} + \sum_{i-1}^{p-1} \Gamma_i \, \Delta X_{t-1} + \epsilon_t \quad (7)$$

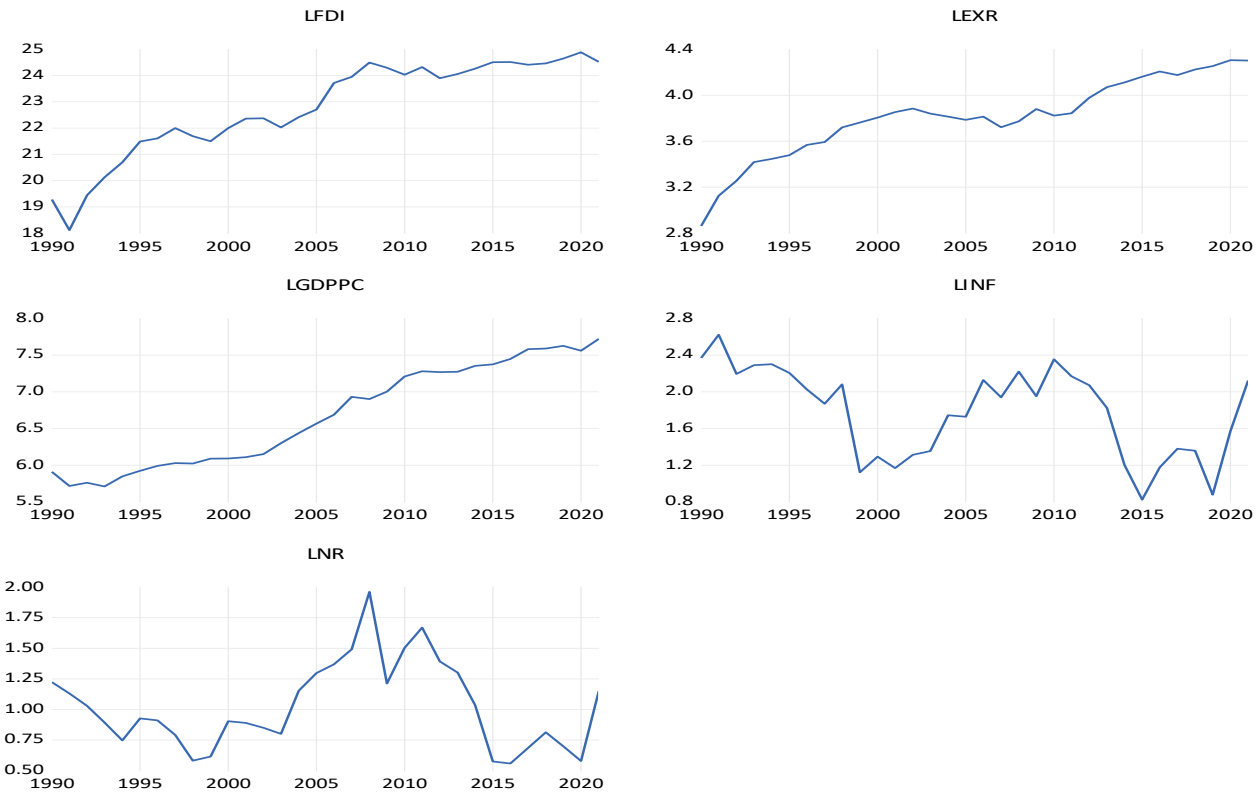
Where Δ denotes the first difference operator. Also, $\prod = \alpha\beta'$ is the long-run impact matrix, where α represents the speed of adjustment and β represents the cointegration vectors. While Γ_i are short-run coefficient matrices and ϵ_t is a vector of white noise error terms.

4. Empirical Results

4.1 Data Visualization

The graphs in Fig 1 below depicts the trends for certain macroeconomic indicators in India, in this case, in the years from 1990 to 2021. The log of FDI Inflows (LFDI) and the log of GDP per capita (LGDPPC) both curves upward throughout the analysis period. These trends showed that there were more inflows of foreign investments and that the income levels also increased over the period. The log of Official Exchange Rates (LEXR) also increased over the period. The Indian Rupee has been on a depreciation trend, which is represented in this variable Pegging of the Indian Rupee with other currencies through decreasing exchange rates, The log of Inflation (LINF) fluctuated over the time frame highlighting phases of high and low inflation. The log of Natural resources (LNR) does not show any appreciable trend suggesting the dynamics in resource value, use in India are erratic.

Fig 1: Trend Analysis of Macroeconomic Variables used in the Study



Source: World Development Indicators (WDI)

4.2Unit Root Test

The results from the Unit root tests are presented in Table 1 and 2 below

Table 1: Augmented Dickey Fuller (ADF) Test

Unit Root Test

Augmented Dickey Fuller (ADF) Test						
	Level		First Difference			
Variables	Test Statistics	Prob Value	Test Statistics	Prob Value	Level of Significance	Order of Integration
LFDI	-1.759479	0.3927	-6.52098	0.0000	5%	I (1)
LEXR	3.277012	0.9994	-4.326364	0.0001	5%	I (1)
LGDPPC	3.778787	0.9999	-3.701192	0.0006	5%	I (1)
LINF	-0.682108	0.4133	-6.009086	0.0000	5%	I (1)
LNR	-0.715158	0.3987	-5.857541	0.0000	5%	I (1)

Table 2:

Phillips-Perron Unit Root Test

	Level		First Difference			
Variables	Test Statistics	Prob Value	Test Statistics	Prob Value	Level of Significance	Order of Integration
LFDI	-2.266808	0.1885	-6.295759	0.0000	5%	I (1)
LEXR	2.507668	0.996	-4.347162	0.0001	5%	I (1)
LGDPPC	3.74537	0.9998	-4.032309	0.0002	5%	I (1)
LINF	-0.655691	0.4249	-6.003034	0.0000	5%	I (1)
LNR	-0.673239	0.4172	-5.857731	0.0000	5%	I (1)

Source: Author Computation, 2024

LFDI represents the Log of Foreign Direct Investment Inflows

LEXR represents the Log of Official Exchange Rates

LGDPPC represents the Log of GDP Per Capita

LINF represents the Log of Inflation

LNR represents the Log of Natural Resources

The Augmented Dickey-Fuller (ADF) Test and Phillip Perron's (PP) Unit Root Test were also employed to find out the presence of unit root in the time series which means non-stationarity of the series. In the case of the ADF test, the levels of all variables (LFDI, LEXR, LGDPPC, LINF and LNR) were found to be nonstationary which implied the presence of unit roots, since, at the level, the p-values for the variable were all found to be greater than 5% level of significance. But the moment the first difference is considered the p-values drop below the 5 percent level threshold, showing stationarity. This constant result across variables suggests that they are integrated of order one, I (1).

The Augmented Dickey-Fuller (ADF) Test and the Phillips-Perron (PP) Unit Root Test are both employed to determine the presence of a unit root in a time series, which implies non-stationarity. For the ADF test, the results indicate that at the level, all variables (LFDI, LEXR, LGDPPC, LINF, and LNR) have high p-values above the 5% significance level, suggesting the presence of a unit root. However, at the first difference, the p-values drop significantly below the 5% threshold, indicating stationarity. This consistent result across variables implies they are integrated of order one, I (1).

The Phillips- Perron test further confirms these findings. At the level, the test statistics have high p values for each of the variables implying the presence of a unit root. Again, at the first difference p values fall below the 5 percent significance level confirming stationarity. These tests were enjoined in that they showed a consistent outcome indicating that the variables were nonstationary in levels but after first differencing it became stationary. With regards to the application of the Vector Error Correction Model (VECM), these findings justify the use of VECM since the

variables being I (1) and potentially cointegrated require a model that accounts for both short-term dynamics and long-term equilibrium relationships.

4.3Lag Length

When estimating the VAR model, it is critical to choose the maximum number of lags to be employed in the analysis. This can be accomplished using a variety of criteria, including the Akaike Information Criteria (AIC), Schwarz Besiayan Criteria (SBC), Final Prediction Error (FPE), Bayesian Information Criteria (BIC), and Hannan-Quinn Criteria (HQC). Table 2 presents the estimated lag duration criteria results.

Table 3: VAR Lag Lenth Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-24.7579	NA	5.36E-06	2.052267	2.288008	2.126098
1	114.9588	221.6196	2.02E-09	-5.859228	-4.444784*	-5.416241
2	155.0664	49.78876*	8.46e-10*	-6.901132	-4.307985	-6.088990*
3	181.9846	24.13359	1.21E-09	-7.033424*	-3.261573	-5.852127

Source: Author Computation, 2024

From Table 3, the exogenous variables selection criteria and VAR Lag Order Selection Criteria state the optimum lag for the VAR model as expressed by the following; LogL (Log Likelihood), LR (Likelihood Ratio), FPE (Final Prediction Error), AIC (Akaike Information Criterion), SC (Schwarz Criterion) and HQ (Hannan-Quinn Criterion) Andrew and Sennik (2015). As in the case of table 3, most criteria lean towards a lag order of 2. LR (49.78876), FPE (8.46e-10), and HQ (-6.088990). However, the AIC criterion suggests a lag of 3 (-7.033424) whereas, the

SC criterion favors a lag of 1 (-4.444784). In situations where these criteria coincide and the lag length of 2 is a compromise between overfitting and simplicity, It is reasonable to select a lag order of 2 for the VAR model as this captures the interactions between the endogenous variables of LFDI, LEXR, LGDPPC, LINF and LNR and at the same time ensures efficiency and accuracy of the model.

4.4Diagnostic Test

To validate the study's model, we performed diagnostic tests such as stability, heteroskedasticity, normalcy, and serial correlation to ensure its applicability.

4.5Stability Test

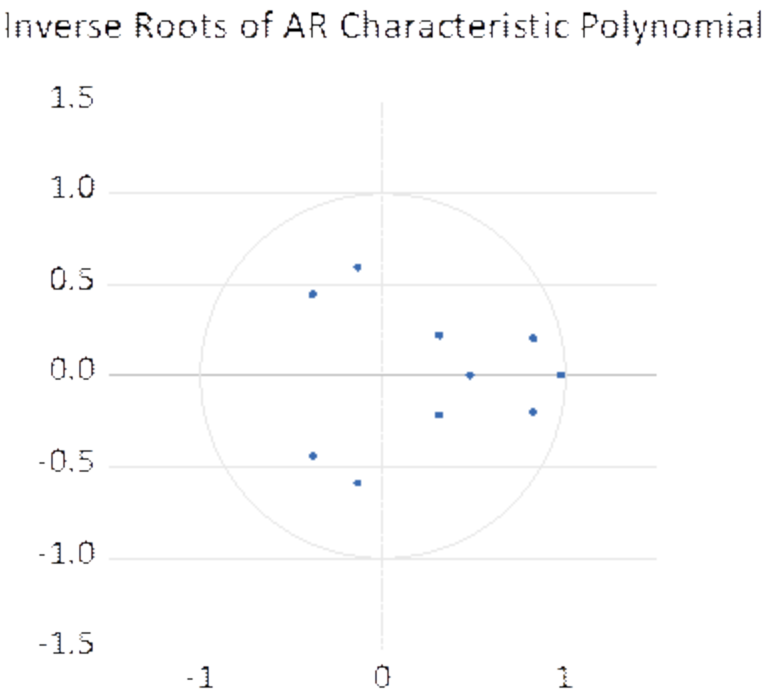
The result from the model stability tests are present in Table 4 and Figure 2 below;

Table 4: AR Roots Table

Root	Modulus
0.979352	0.979352
0.828966 - 0.201873i	0.853192
0.828966 + 0.201873i	0.853192
-0.134601 - 0.590691i	0.605833
-0.134601 + 0.590691i	0.605833
-0.381197 - 0.442232i	0.583849
-0.381197 + 0.442232i	0.583849
0.482243	0.482243
0.312355 - 0.219297i	0.38165
0.312355 + 0.219297i	0.38165

Source: Author Computation, 2024

Figure 2: Inverse Roots of AR Characteristics Polynomial



Source: Author Computation, 2024

The results of Table 4 and Figure 2 demonstrate model stability. The graph showed that all of the inverse AR roots are within the circle, indicating that the model is highly stable and adequate. The model's stability demonstrates that it is appropriate for capturing the dynamic relationships among endogenous variables (LFDI, LEXR, LGDPPC, LINF, and LNR) while retaining model efficiency and accuracy.

4.6Serial Correlation LM Test

We afterwards used the Serial Correlation LM Tests to check for the presence of serial correlation in the model, assuming that it is free of serial correlation. When this assumption is violated, it shows that serial correlation exists in the model's residual. Table 5 below displays the results of the Serial Correlation LM Tests.

Table 5: Serial Correlation LM Test

Null hypothesis: No serial correlation at lag h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	27.34878	25	0.3387	1.12115	(25, 38.7)	0.3670
2	24.14176	25	0.5112	0.955929	(25, 38.7)	0.5386
Null hypothesis: No serial correlation at lags 1 to h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	27.34878	25	0.3387	1.12115	(25, 38.7)	0.3670
2	56.32443	50	0.2503	1.085023	(50, 26.2)	0.4204

Source: Author Computation, 2024

The VAR Residual Serial Correlation LM Tests determine whether there is serial correlation in a VAR model's residuals for the sample period of 1990 to 2021, which includes thirty observations. The null hypothesis (no serial correlation at lag *h*) is tested for lags 1 and 2. At lag 1, the LRE* statistic (27.34878) with 25 degrees of freedom produces a p-value of 0.3387, while the Rao F-statistic (1.121150) with degrees of freedom (25, 38.7) produces a p-value of 0.3670. Similarly, at lag 2, the LRE* statistic (24.14176) with 25 degrees of freedom yields a p-value of 0.5112, while the Rao F-statistic (0.955929) with degrees of freedom (25, 38.7) yields a p-value of 0.5386. When lags 1–2 are taken together, the LRE* statistic (56.32443) with 50 degrees of freedom has a p-value of 0.2503, while the Rao F-statistic (1.085023) with degrees of freedom (50, 26.2) has a p-value of 0.4204. All p-values exceed typical significance standards (e.g., 0.05), indicating that we cannot reject

the null hypothesis of no serial connection at these lags. This shows that the VAR model's residuals do not show any meaningful indication of serial correlation.

Normality and Heteroskedasticity Tests (Levels and Squares)

To assess volatility in the model residual, we used the Normality and Heteroskedasticity Tests, assuming that the error terms are homoscedastic and the variables are normally distributed. Table 6 shows the results of the heteroskedasticity tests.

Table 6: Normality and Heteroskedasticity Tests (Levels and Squares)

	Joint test:			
	Chi-sq	**Jarque-Bera**	**df**	**Prob.**
Heteroskedasticity Tests (Levels and Squares)	303.0248	-	300	0.4403
Normality	1.847301	3.86255	10	0.9533

Source: Author Computation, 2024

The results in Table 6 include tests for heteroskedasticity and normalcy. In the heteroskedasticity test, a chi-squared statistic of 303.0248 with 300 degrees of freedom produces a probability (p-value) of 0.4403. This high p-value suggests that we do not reject the null hypothesis of homoskedasticity at common significance levels (e.g., 0.05). In other words, there is no compelling evidence that the variance of the errors varies with the levels and squares of the independent variables, meaning that the model errors have constant variance, which is desirable in regression analysis.

For the normality test, the Jarque-Bera statistic is 1.847301 with a p-value of 0.9533. The Jarque-Bera test determines if the sample data has the skewness and kurtosis of

a normal distribution. Given the extremely high p-value, we do not reject the null hypothesis that the error terms are regularly distributed. This result lends support to the assumption of residual normality, which is required for valid inference in many statistical models.

4.7 Granger Causality Test

We performed the Granger causality tests to investigate the causal relationship between the macroeconomic variables included in the study. The results are shown in Table 7;

Table 7: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
LEXR does not Granger Cause LFDI	30	0.58543	0.5643
LFDI does not Granger Cause LEXR		0.43908	0.6495
LGDPPC does not Granger Cause LFDI	30	7.85446	0.0023
LFDI does not Granger Cause LGDPPC		1.7591	0.1929
LINF does not Granger Cause LFDI	30	0.29866	0.7444
LFDI does not Granger Cause LINF		0.48419	0.6219
LNR does not Granger Cause LFDI	30	0.81005	0.4562
LFDI does not Granger Cause LNR		0.43015	0.6551
LGDPPC does not Granger Cause LEXR	30	7.69992	0.0025
LEXR does not Granger Cause LGDPPC		1.03738	0.3691
LINF does not Granger Cause LEXR	30	2.37286	0.1139
LEXR does not Granger Cause LINF		1.59761	0.2224
LNR does not Granger Cause LEXR	30	0.92746	0.4087
LEXR does not Granger Cause LNR		4.3304	0.0243
LINF does not Granger Cause LGDPPC	30	5.76503	0.0087
LGDPPC does not Granger Cause LINF		0.88535	0.4251
LNR does not Granger Cause LGDPPC	30	0.35336	0.7058
LGDPPC does not Granger Cause LNR		4.42345	0.0227
LNR does not Granger Cause LINF	30	0.3585	0.7023
LINF does not Granger Cause LNR		1.1816	0.3233

Source: Author Computation, 2024

The Pairwise Granger Causality tests in Table 7 show substantial unidirectional causal links between major economic indicators from 1990 to 2021. Notably, LGDPPC (GDP per capita) Granger-causes LFDI (foreign direct investment) and LEXR (exchange rate) with substantial p-values (0.0023 and 0.0025, respectively), implying that GDP per capita has predictive ability over these variables. Furthermore, LINF (inflation) Granger-causes LGDPPC (p-value = 0.0087), whereas LEXR Granger-causes LNR (natural resources) with a p-value of 0.0243. However, there is no significant Granger causality between LFDI and LEXR, LINF, or LNR, nor between LNR and LGDPPC. These findings emphasize significant predictive dynamics, particularly the influence of GDP per capita on other economic indicators. They provide valuable insights for policymakers and economists.

4.8 Johansen Cointegration Test

The result from the Johansen Cointegration Test is presented in Table 8 below

Table 8: **Johansen Cointegration Test**

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.813715	95.55064	69.81889	0.0001
At most 1	0.50999	45.13627	47.85613	0.0881
At most 2	0.383598	23.73642	29.79707	0.2118
At most 3	0.204103	9.220759	15.49471	0.3454
At most 4	0.076027	2.372179	3.841466	0.1235
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.813715	50.41437	33.87687	0.0002

At most 1	0.50999	21.39986	27.58434	0.2528
At most 2	0.383598	14.51566	21.13162	0.3243
At most 3	0.204103	6.84858	14.2646	0.5072
At most 4	0.076027	2.372179	3.841466	0.1235

Both the Trace test and Max-eigenvalue test indicate 1 cointegrating at the 0.05 level

Source: Author Computation, 2024

The results of the Johansen Cointegration Test in Table 8 above indicate that the variables have a long-term equilibrium association. At a significance threshold of 0.05, both the Trace and Maximum Eigenvalue tests reliably indicate one cointegrating vector. The Trace test reveals strong cointegration, with a test statistic of 95.55064 exceeding the critical value of 69.81889, and the Maximum Eigenvalue test verifies this, with a statistic of 50.41437 exceeding the critical value of 33.87687. For higher rankings, neither test uncovers new cointegrating links. Thus, the variables show a steady long-term association, despite short-term volatility.

4.9Vector Error Correction Model (VEC)

4.9.1 Long Run Dynamics

Once the variables have reached a long-term equilibrium, we use the VEC model to analyze both the short and long-term relationships between them. Table 9 shows the long-term impact results.

The cointegrating equation (CointEq1) captures the long-term equilibrium relationship among the variables:

$$LFDI\ (-1) = \ 30.40905\ X\ LEXR\ (-1) - 11.09597\ X\ LGDPPC\ (-1) + \ 3.024457\ X\ LINF\ (-1) + \ 1.540569\ X\ LNR\ (-1) - 72.46265$$

Table 9: Long Run Dynamics

Cointegrating Eq:	**CointEq1**
LFDI (-1)	1

LEXR (-1)	30.40905
	-4.53562
	[6.70449]
LGDPPC (-1)	-11.096
	-1.29614
	[-8.56078]
LINF (-1)	3.024457
	-1.5753
	[1.91992]
LNR (-1)	1.540569
	-1.02679
	[1.50038]
C	-72.4627

Source: Author Computation, 2024

According to the Vector Error Correction Model (VECM) research, exchange rates (LEXR) and GDP per capita (LGDPPC) have a considerable long-term impact on foreign direct investment (LFDI). A unit increase in the exchange rate (LEXR) results in a huge increase in LFDI, with a coefficient of 30.40905 and a highly significant t-statistic of 6.70449. Higher GDP per capita (LGDPPC) is connected with a drop in LFDI, as demonstrated by a coefficient of -11.09597 and a significant t-statistic of -8.56078. Furthermore, inflation (LINF) and natural resources (LNR) have a positive impact on LFDI, with coefficients of 3.024457 and 1.540569, respectively, while their impacts are less statistically significant, as evidenced by t-statistics of 1.91992 and 1.50038. The constant term is -72.46265, which adjusts the equilibrium relationship. Overall, currency rates and GDP per capita are the most important long-term factors of foreign direct investment.

4.9.2 Short Term Dynamics

The short-run dynamics of the Vector Error Correction Model (VECM) in Table 10 show how changes in foreign direct investment (LFDI) and its determinants—exchange rates (LEXR), GDP per capita (LGDPPC), inflation (LINF), and natural resources (LNR)—influence one another. The error correction term (CointEq1) for D(LFDI) is -0.014732, indicating a small and statistically negligible adjustment toward long-run equilibrium. In contrast, LEXR and LGDPPC show stronger changes, with coefficients of -0.018033 and 0.020919, respectively, which are also

statistically significant. Past LFDI values (D (LFDI (-1)) and D (LFDI (-2)) have a limited and mixed impact on present LFDI changes.

Exchange rates (D (LEXR (-1)) have a positive but statistically insignificant effect on current LFDI, whereas D (LGDPPC (-1)) greatly increases LFDI. Changes in inflation (D (LINF (-1) and D (LINF (-2)) have a negative, although not substantial, impact on LFDI. Notably, natural resources (D (LNR (-1)) have a positive and significant impact on LFDI, implying that recent increases in natural resources will attract more foreign investment in the short run. The constant term, while statistically insignificant, suggests a modest negative baseline influence on D(LFDI). Thus, currency rates, GDP per capita, and natural resources are key short-term drivers of foreign direct investment, whereas other factors have varying and less immediate effects.

Table 10: **Short Term Dynamics**

Error Correction:	D(LFDI)	D(LEXR)	D(LGDPPC)	D(LINF)	D(LNR)
CointEq1	-0.0147	-0.018	0.020919	-0.07597	0.00128
	-0.0419	-0.0042	-0.00676	-0.03894	-0.03099
	[-0.35128]	[-4.27634]	[3.09501]	[-1.95072]	[0.04132]
D (LFDI (-1))	0.01886	-0.042	0.094864	-0.00294	-0.08626
	-0.216	-0.0217	-0.03482	-0.20061	-0.15964
	[0.08732]	[-1.93163]	[2.72469]	[-0.01463]	[-0.54037]
D (LFDI (-2))	0.18343	-0.0182	0.000501	0.139588	0.087731
	-0.1644	-0.0165	-0.02649	-0.15264	-0.12146
	[1.11590]	[-1.10215]	[0.01892]	[0.91448]	[0.72229]
D (LEXR (-1))	1.32071	-0.5942	0.87597	-9.14356	-2.16307
	-2.446	-0.246	-0.3942	-2.27141	-1.80744

	[0.53994]	[-2.41580]	[2.22214]	[-4.02551]	[-1.19676]
D (LEXR (-2))	0.98968	0.11488	0.313437	-3.60947	-0.4235
	-3.5394	-0.3559	-0.5704	-3.28668	-2.61533
	[0.27962]	[0.32280]	[0.54950]	[-1.09821]	[-0.16193]
D (LGDPPC (-1))	2.67202	-0.8292	0.782799	-4.3387	0.350248
	-1.9951	-0.2006	-0.32153	-1.85265	-1.47422
	[1.33930]	[-4.13346]	[2.43464]	[-2.34189]	[0.23758]
D (LGDPPC (-2))	-1.5826	0.08025	0.581058	-4.49108	-1.71311
	-2.747	-0.2762	-0.4427	-2.55083	-2.02979
	[-0.57615]	[0.29054]	[1.31255]	[-1.76063]	[-0.84399]
D (LINF (-1))	-0.2649	-0.0334	0.113376	0.008035	0.301523
	-0.242	-0.0243	-0.039	-0.2247	-0.1788
	[-1.09477]	[-1.37250]	[2.90733]	[0.03576]	[1.68636]
D (LINF (-2))	-0.252	-0.0085	0.060063	-0.22845	0.102146
	-0.3076	-0.0309	-0.04956	-0.28559	-0.22726
	[-0.81951]	[-0.27603]	[1.21181]	[-0.79991]	[0.44947]
D (LNR (-1))	0.93007	0.03825	-0.165481	-0.54898	-0.27659
	-0.4448	-0.0447	-0.07168	-0.413	-0.32864
	[2.09118]	[0.85535]	[-2.30872]	[-1.32922]	[-0.84160]
D (LNR (-2))	0.34098	0.04129	-0.062277	0.278204	-0.06626
	-0.4829	-0.0486	-0.07782	-0.44841	-0.35681
	[0.70613]	[0.85027]	[-0.80026]	[0.62043]	[-0.18569]

R-squared	0.51536	0.8048	0.712758	0.572193	0.521769
Adj. R-squared	0.20177	0.6785	0.526896	0.295376	0.212325

Source: Author Computation, 2024

5. Conclusions and Policy Recommendations

5.1 Conclusions

The study looks at the dynamic interactions between important economic variables such Foreign Direct Investment (LFDI), Exchange Rate (LEXR), Gross Domestic Product per Capita (LGDPPC), Inflation (LINF), and Natural Resources (LNR). Using the Johansen Cointegration Test, the analysis discovers a long-term equilibrium relationship between the variables. The trace and maximum eigenvalue tests consistently show one cointegrating vector at the 0.05 significance level, showing a steady long-term association despite short-term variations.

The Vector Error Correction Model (VECM) confirms the existence of both short-term and long-term dynamics. The long-term equation emphasizes the strong positive and negative effects of LEXR, LGDPPC, LINF, and LNR on LFDI, demonstrating the economy's complex interdependence. The stability tests support the model's reliability, with all roots lying within the unit circle, indicating that the model is adequately representing the dynamic interactions among the variables.

Granger Causality experiments show that LGDPPC causes LFDI and LEXR, but LINF causes LGDPPC. These findings highlight the predictive value of GDP per capita over foreign direct investment and exchange rates, as well as the role of inflation in economic growth. The tests for heteroskedasticity and normality validate the regression model's assumptions, confirming the robustness of the analysis.

5.2 Policy Recommendations

Based on the findings, various policy proposals are made to improve economic stability and growth. Prioritizing economic growth is crucial since GDP per capita influences both foreign direct investment (FDI) and exchange rates. To sustain and expand economic growth, countries should invest in infrastructure, improve education, and encourage innovation to promote productivity and output. This strong

foundation can make countries more appealing to international investors, resulting in long-term success.

Furthermore, maintaining currency rates and controlling inflation are critical to economic stability. Stable and competitive exchange rate regulations can reduce excessive volatility, resulting in a more predictable investment climate and lower risks connected with foreign investments. Meanwhile, maintaining low and steady inflation through prudent fiscal and monetary policy helps protect consumer purchasing power, foster economic confidence, and support long-term growth..

Promoting FDI and efficient resource management improves economic attractiveness. Countries with abundant natural resources should establish clear and reliable regulatory frameworks to attract foreign investment. Efficient natural resource management and sustainable exploitation can increase FDI while also providing long-term economic advantages and environmental protection. Integrated economic policies that take into account the interdependence of multiple economic variables are critical for developing coherent plans that promote overall economic stability and growth. Following these ideas can lead to a more resilient and prosperous economic future.

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