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# Analysis of FDI Determinants Using Autoregressive Distributive Lag Model: Evidence from India

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## ABSTRACT

The significance of foreign direct investment (FDI) for the expansion and advancement of emerging economies has long been recognized. Yet, research on the factors that influence FDI inflows is still developing. This study focuses on examining the long- and short-term association between FDI inflows and its determinants, employing ARDL bounds testing approach and Error Correction Model to understand the relationship between the variables under study. The findings evidence the existence long- and short-term association between FDI and domestic investment, inflation, infrastructure, and trade openness. However, market size is observed to be insignificant in influencing FDI inflows. The coefficients of domestic investment, infrastructure and Trade Openness are observed to be significantly positive. The influence of inflation is found to be negative. The study suggests that the Indian economy should accelerate the process of integration with the world economy along with the enhancement of domestic investment and infrastructure facilities to attain higher FDI.

***Keywords:*** foreign direct investment; determinants; ARDL; error correction model

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ОРИГИНАЛЬНАЯ СТАТЬЯ

# Анализ детерминант ПИИ с помощью модели авторегрессии с распределенным лагом: данные по Индии

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## АННОТАЦИЯ

Значение прямых иностранных инвестиций (ПИИ) для расширения и развития развивающихся экономик признано давно. Тем не менее исследования факторов, влияющих на приток ПИИ, все еще находятся в стадии развития. Данное исследование посвящено изучению долгосрочной и краткосрочной связи между притоком ПИИ и его детерминантами с использованием метода тестирования границ ARDL и модели коррекции ошибок для понимания взаимосвязи между исследуемыми переменными. Полученные результаты свидетельствуют о существовании долгосрочной и краткосрочной связи между ПИИ и внутренними инвестициями, инфляцией, инфраструктурой и открытостью торговли. Вместе с тем размер рынка оказывает незначительное влияние на приток ПИИ. Коэффициенты внутренних инвестиций, инфраструктуры и открытости торговли оказались положительными. Влияние инфляции оказалось отрицательным. Исследование показывает, что индийская экономика должна ускорить процесс интеграции с мировой экономикой наряду с увеличением внутренних инвестиций и развитием инфраструктуры для достижения более высокого уровня ПИИ.

***Ключевые слова:*** прямые иностранные инвестиции; детерминанты; ARDL; модель коррекции ошибок

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## INTRODUCTION

Over the period of time, the amount of literature on FDI has developed to provide coherent justifications for the intentions behind pursuing foreign direct investment, as it tends to be the most expensive route than licensing and exports for a corporation to gain access to international markets. The factor endowment theory and the theory of comparative advantage offered plausible justifications for world trade, however, they failed to account for cross-national investment flows in production [1, 2]. R.E. Caves considerably enhanced the literature by explaining the host economy's industry structure in influencing direct investments [3]. The key characteristics that drew FDI inflows were having access to knowledge or technology that was superior to that of a direct investor, integrating vertically to reduce uncertainty in the market with limited suppliers, and raising barriers of entry. J.H. Dunning proposed the OLI framework, by combining the "Ownership", "Localisation" and "Internalisation" theories [4]. This framework is extensively employed to comprehend the phenomena of FDI. The OLI framework asserts that before making a direct investment ownership, localization and internalisation are the three required but insufficient preconditions that need to be met simultaneously. Research on foreign direct investment has drawn the attention of academicians since Dunning's pioneering work and that of several other researchers in succeeding years [5, 6]. FDI has emerged as the driving force behind globalisation. It is widely acknowledged that this kind of investment has a positive impact on the host nation in terms of development, economic expansion, job creation, the transfer of managerial know-how, and technical advancement. The advantages of these investment inflows have driven national and provincial governments to develop benevolent policies to entice FDI to their territories. Due to their technical and financial exploitation, developing nations have started to recognize FDI as an extra source of funding for their economic initiatives (UNCTAD, 2013). As a result, several nations have structured their economic strategies to encourage inflows of FDI [7]. For instance, in China, foreign-owned firms were not authorized to operate unless they adopted advanced technology and equipment or exported majority of their products. However, in 2001, after being inducted as a member of the WTO, China withdrew these restrictions. Similarly, in India, the liberalization of FDI began with the introduction of the 1980 and 1982 Industrial Policy Statements, followed by the Technological Policy Statement of 1983. This period marked a reduction in tariffs and the shifting of several import items from the shackles of the licensing system to an open general license. The foreign investment policy was heavily affected by the 1995 Uruguay Agreement, which prohibited foreign enterprises from being treated unfairly [8]. According to the World Investment Report 2020 by UNCTAD, India stood among the top ten FDI recipients in 2019. FDI inflows have seen a tremendous improvement from 103 679.78 million rupees in 2000–2001 to 4 371 880 million rupees in 2021–2022. The fiscal year 2020 marks the highest ever FDI received by India, which is 25.18% more than what was received in the year before. The surge in FDI inflow recorded in the fiscal year 2021 against the backdrop of several policy changes made to facilitate ease of doing business, encourage investments into domestic manufacturing capacity, and support an ambitious pipeline of infrastructure projects. Despite rising FDI inflows to emerging nations, the greatest recipients of foreign capital in recent years, according to data on global FDI flows, have continued to be industrialised economies, namely the US, Hungary, Germany, Hong Kong etc. The factors influencing the flow of foreign investment have been the subject of several researchers, but the elements that draw FDI and, therefore, the best promotional strategies have not been agreed upon. A number of variables, including market size, trade openness, human capital, etc., have an impact on the quantity of FDI that enters a country [9]. However, the connections vary depending on the level of development from one country to another. The study examines the factors influencing direct investment inflows into India using the ARDL model with variables integrated at I(0) and I(1) from 2000 to 2021. The research holds significant importance owing to the noticeable growth in the flow of foreign capital in the world economy over the past twenty-two years. Moreover, this study analyses the determinants of FDI flows to India from the fiscal year 2000, which not only includes the global recession period (2008–2009) but also incorporates the years impacted by COVID-19 pandemic, making the results of the study more robust.

### FDI in India

Foreign investment in India is governed by the FDI policy announced by the Government of India (GOI) & the provisions of Foreign Exchange Management Act, 1999. A substantial rise in FDI inflows to India from 2000 to 2021 prompted several ambitious policy initiatives taken by the government to improve economic competitiveness and ease of doing business. The liberalisation of the FDI policy pertaining to vital sectors has contributed to improving the nation's

*Table 1*

**FDI Policy of India (2012–2020)**

| Sector | FDI Policy 2012 | | FDI Policy 2013 | | FDI Policy 2015 | | FDI Policy 2016 | | FDI Policy 2017 | | FDI Policy 2020 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Entry Route | Investment Cap | Entry Route | Investment Cap | Entry Route | Investment Cap | Entry Route | Investment Cap | Entry Route | Investment Cap | Entry Route | Investment Cap |
| Defence | Government | 26% | Government | 26% | Government | 49% | Automatic | 49% | Automatic up to 49% | 100% | Automatic up to 74% | 100% |
| Telecom services | Automatic up to 49% | 74% | Automatic up to 49% | 74% | Automatic up to 49% | 100% | Automatic up to 49% | 100% | Automatic up to 49% | 100% | Automatic up to 49% | 100% |
| Single Brand product retail trading | Government | 100% | Government | 100% | Automatic up to 49% | 100% | Automatic up to 49% | 100% | Automatic up to 49% | 100% | Automatic | 100% |
| Multi- Brand product retail trading | - | - | Government | 51% | Government | 51% | Government | 51% | Government | 51% | Government | 51% |
| Asset Reconstruction Companies (ARC) | Government | 49% of paid-up capital of ARC | Government | 74% of paid-up capital of ARC | Automatic up to 49% | 100% of paid-up capital of ARC | Automatic | 100% | Automatic | 100% | Automatic | 100% |
| Infrastructure Company | Government | 26% of the paid-up capital | Government | 26% of the paid-up capital | Automatic | 26% of the paid-up capital | Automatic | 49% | Automatic | 49% | Automatic | 49% |
| Insurance Company | Automatic | 26% | Automatic | 26% | Automatic up to 26% | 49% (FDI+FPI) | Automatic | 49% | Automatic | 49% | Automatic | 49% |
| Insurance Intermediaries | Automatic | 26% | Automatic | 26% | Automatic | 49% (FDI+FPI) | Automatic | 49% | Automatic | 49% | Automatic | 100% |
| NBFC | Automatic | 100% | Automatic | 100% | Automatic | 100% | Automatic | 100% | Automatic | 100% | Automatic | 100% |
| Pharmaceutical (Existing companies) | Government | 100% | Government | 100% | Government | 100% | Government | 100% | Automatic up to 74% | 100% | Automatic up to 74% | 100% |
| Oil & Natural Gas Exploration | Automatic | 100% | Automatic | 100% | Automatic | 100% | Automatic | 100% | Automatic | 100% | Automatic | 100% |
| Broadcasting Services (Carriage) | Government | 49% (FDI & FII) | Automatic | 49% | Automatic up to 49% | 74% | Automatic up to 49% | 100% | Automatic | 100% | Automatic | 100% |

*Source:* Department for Promotion of Industry and Internal Trade, India.

overall investment climate. *Table 1* highlights the changes in FDI policy adopted by GOI in view of liberalising various sectors.

The remainder of the study is structured. Section 2 provides a brief discussion of the empirical review of literature on FDI. Section 3 mentions the objective of the study undertaken. Section 4 presents the research methodology, the variables undertaken for the study and the data sources. The presentation and interpretation of the empirical results are carried out in Section 5. Section 6 provides conclusion to the results of the study. Section 7 details the implications and recommendations based on empirical results. The limitations and future scope of the study are provided in Section 8.

## REVIEW OF LITERATURE

### Market Size

The two major factors that encourage FDI are the size of the host economy and the anticipated demands that result from the projected growth rate of the host market. The gross domestic product (GDP) is the total market value of all finished products and services produced in a country over a certain time period. Market size, proxied by GDP, has been widely used as a significant determinant of FDI. In a study by R. Sharma, short-term upside movements in GDP were found to be insignificant in influencing the flow of FDI [10]. However, it was noticed that downfall in GDP led to a decline in FDI inflows in India. In a panel study based on FDI inflows in SAARC countries (Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka), it was observed that there existed a long-term association between market size & FDI [11]. Market size was the primary factor influencing FDI inflows into emerging nations [12, 13].

### Trade Openness

A liberalised trade policy can either stimulate or limit investment. More trade restrictions mean higher transaction costs when FDI is export-oriented, while MNCs may adopt imported intermediate inputs if FDI is vertical in character. In both circumstances, trade openness significantly influences FDI activities. Some of the WTO principles forming the core of the multilateral trading system promoting trade openness are elimination of most favoured nation treatment, equitable treatment of imported and domestically produced goods/services, and the reduction of trade barriers. India's WTO membership has significantly increased its trading partners, which has further

*Table 2*

**Description of Variables**

| Name of Variable | Definition | Source of data |
|---|---|---|
| FDI Inflows (FDI) | FDI refers to the net inflows of investment as the sum of equity capital and investment of earnings | DPIIT |
| Market Size (MS) | Market size, measured by GDP directly influences the return on investment. It the market value of all final goods and services produced within a country in a given period of time | RBI |
| Inflation Rate (IR) | Inflation, as proxied by the consumer price index, is the annual percentage change in the consumer's cost of purchasing a basket of goods and services (CPI) | World Bank |
| Trade Openness (OPEN) | Trade openness refers to the ratio of total of Exports & Imports as a percentage of country's GDP annually | World Bank |
| Infrastructure (INF) | Being the cheapest source of transportation, infrastructure has been proxied by freight carried by railways in million-ton km annually. Along with the transport infrastructure, tele- density has also been undertaken as a proxy to infrastructure | World Bank |
| Domestic Investment (INV) | Investment, proxied by gross fixed capital formation is the aggregate of gross additions to fixed assets (that is fixed capital formation) plus change in stocks during the financial year | RBI |

*Source:* Author's compilation.

resulted in boosting output, employment, living standards and the opportunity to use world resources. Trade openness is observed to have a considerable positive influence on FDI inflows [14–17].

### Domestic Investment

There have been many studies in the literature on how FDI influences growth and investment in the host nation, but relatively little is known about how domestic investment affects FDI inflows. In an empirical study on the determinants of FDI in Nigeria by [18], it was observed that Gross Fixed Capital Formation (GFCF) of Nigeria had an inverse effect on FDI inflows. Also, on the basis of correlation matrix, GFCF had a weak relationship with FDI.

### Infrastructure

The broad category of infrastructure includes everything needed for business, including power and energy, road and rail infrastructure, telecommunications infrastructure, and institutional growth. Infrastructure facilities have a beneficial effect on FDI inflows [19]. Poor infrastructure can be viewed as a barrier, and in that case, there is a negative impact, but it can also be viewed as an opportunity, according to.[1] By offering incentives for infrastructure-related projects, nations with inadequate infrastructure strive to draw more and more FDI into the construction industry. In that situation, FDI and infrastructure may not be positively correlated.

### Inflation Rate

Increased inflation may lower a foreign investor's net worth of investment. Inflation in the host nation has a detrimental effect on FDI inflows in the Pacific area and East Asia, according to research by [20]. Similarly, in a study by [19], it was observed that there existed an inverse association between inflation and FDI inflows. Lower levels of inflation were among the primary drivers of attracting FDI inflows, according to research [21] focused on the factors important for drawing FDI to Africa.

There is no reliable collection of explanatory variables that can be regarded as the core or "genuine"

[1] Foreign direct investment flows to low-income countries: A review of the evidence. ODI Briefing Paper. 1997;(3). URL: https://odi.cdn.ngo/media/documents/2626.pdf (accessed on 12.01.2023).

FDI determinants, despite the fact that several studies have been undertaken to determine the factors that influence FDI attractiveness. The literature's results lack robustness since they are very susceptible to sample size and technique [22].

## OBJECTIVE

The primary objectives of this research are:

- To study the existing literature and identify the significant factors influencing the flow of FDI.
- To examine the influence of the variables on the foreign direct investment inflows to India.

## RESEARCH METHODOLOGY

### Description of Variables

Key determinants, namely market size, infrastructure, inflation rate, trade openness, and domestic investment, have been identified as significant drivers of foreign direct investment inflows based on a study of the literature. *Table 2* provides a detailed explanation of the factors undertaken in the study, their definition, and the sources from which data has been obtained.

### Data Source and Data Period

The yearly statistics of the variables have been obtained from the Department for Promotion of Industry & International Trade (DPIIT), World Development, the Reserve Bank of India (RBI) and the World Bank. The study is based on data obtained for the financial years 2000–2021.

### Empirical Model

Based on the existing literature, the potential determinants of FDI are examined in a linear framework [23, 24]. Preliminary results at a 95% confidence level indicate that FDI in India is determined by the level of investment in the country; however, at a 90% confidence level, Trade Openness & domestic investment hold significance. The linear regression model of factors determining direct investment from abroad in India is constructed as follows:

$$lnFDI_t = \alpha_0 + \beta_1 lnMS_t + \beta_2 lnIR_t + \beta_3 lnOPEN_t + \\ + \beta_4 lnINF_t + \beta_5 lnINV_t + \mu_t,$$

where, *ln* stands for logarithm natural.

$lnFDI_t$ — Log of total inward FDI in period of *t*.

*lnMS* — Log of Market Size proxied by GDP.

*IR* — Log of Inflation Rate.

*lnOPEN* — Log of Trade Openness (Trade openness index = (Exports + Imports)/GDP *100).

*lnINF* — Log of Infrastructure proxied by railway routes and tele-density.

*lnINV* — Log of Investments.

$\mu_t$ — Error term of the equation.

Estimating Methodology

*Fig. 1* entails the econometric methodology adopted for the analysis of time-series data. The time series analysis begins with the testing of presence of a unit root in each of the variables. The unit root determines the stationarity of the series and its order of integration. Further, the cointegration test is conducted to inspect the long-term relationship between the variables and identify the econometric model to be employed. Based on the prevailing literature, there are different co-integration tests followed by unit root tests. However, the applicability of a certain approach depends on the test equation at the core of the problem and the series' order of integration.

### Cointegration Test

Since the time series variables are stationary at the order of integration $I(0)$ and $I(1)$, the ARDL model of cointegration is employed in this study (*Table 2* and *3*). The ARDL model is based on ordinary least squares regression. The ARDL model gained popularity with the work of [9] and [25] as a methodology to examine the cointegration association between variables in time series analysis. This model includes an adequate number of lags to accurately portray the data generation process, which minimizes the problems of endogenity and autocorrelation. The model examines the association between variables in long-term. The F-tests are used for analysing the level of cointegration. The following equation represents the ARDL framework used in this study:

$$\Delta \ln FDI_t = \alpha_1 + \alpha_{FDI} \ln FDI_{t-1} + \alpha_{MS} \ln MS_{t-1} + \alpha_{IR} IR_{t-1} + \\ + \alpha_{OPEN} \ln OPEN_{t-1} + \alpha_{INF} \ln INF_{t-1} + \alpha_{INV} \ln INV_{t-1} + \\ + \sum_{i=1}^{p} \alpha_i \Delta \ln FDI_{t-i} + \sum_{j=0}^{q} \alpha_j \Delta \ln MS_{t-j} + \sum_{x=0}^{y} \alpha_x \Delta IR_{t-x} + \\ + \sum_{l=0}^{m} \alpha_l \Delta \ln OPEN_{t-l} + \sum_{c=0}^{d} \alpha_c \Delta \ln INF_{t-c} + \sum_{u=0}^{v} \alpha_u \Delta \ln INV_{t-u} + \varepsilon_{1t}.$$

The $\alpha_1$ constant is a drift element and $\varepsilon_1$ depicts error term, which is considered to be white noise. Residual errors being white noise indicates that there is no autocorrelation, residuals are not heteroscedastic, and the residual has a mean of zero. A lag length of 1 has been undertaken for the variables under study.

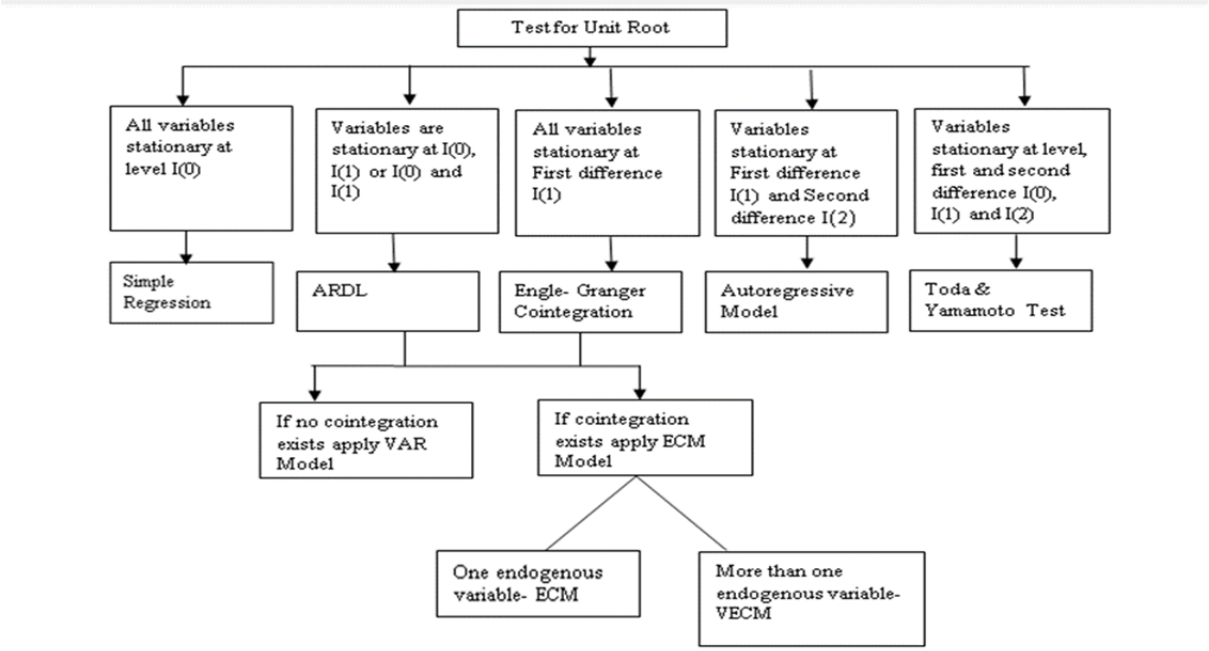


*Fig. 1*. **Econometric Methodology for Analysis of Time-Series**
*Source:* Author's compilation.

### Stability Estimates

CUSUM and CUSUMSQ tests have been applied to assess the model's stability. CUSUM tests are often used in econometrics and statistics to determine if a regression equation of interest has structural changes (or structural breaks). Structural changes are major shifts in the regression model's parameter values that might make the model unreliable and skew forecasts and estimations. The power of the CUSUM test is higher if the break occurs in the intercept of the regression model. The CUSUMSQ test, however, has greater power if the structural break involves a slope coefficient or the variance of the error term.

### Error Correction Model

An error correction model is a form of time series model with multiple variables that is extensively applied to data where the underlying variables exhibit cointegration, a long-term common stochastic tendency. The model has been employed to understand the factors influencing FDI inflows in short-term. The error correction model is a theoretically based method for assessing the influence of one time series on another over a short period of time. Error-correction is a concept that describes how a change from a long-term equilibrium influences the system's short-term behaviour. Therefore, error correction models accurately predict how quickly a dependent variable would reach equilibrium following a change in other factors.

## EMPIRICAL FINDINGS

### Time-Series Unit Root Tests

Unit root tests have been employed to ascertain the stationarity of various factors under study and determine their order of integration. Unit root testing is applied to decide if data with trends needs to be differenced at the first order of integration or projected on stochastic effects of time to make data stationary since non-stationary data might produce false findings. It has been observed in the empirical works that the Phillip-Perron (PP) test and Augmented Dickey Fuller (ADF) test have been extensively applied to check stationarity. This study employs the ADF test supplemented with the Ng-Perron test, which is an advanced version of the Dickey-Fuller Generalized Least Squares (DF-GLS) test and PP test. The null hypothesis for MZa and MZt of Ng- Perron test is the presence of a unit root whereas for MSB and MPT, the null hypothesis is the absence of a unit root. The findings of unit root tests have been presented in *Table 3 and 4*. The stationarity of the variables has been examined at constant as well as constant with a trend. It is observed that most of the variables become stationary at the first order of integration, i.e., $I(1)$ with a few variables stationary at level, i.e., $I(0)$.

## ARDL ESTIMATION

### Autoregressive Distributive Lag Bound Test Analysis

*Table 5* demonstrates that the model passed all requirements for the best fit. For the purpose of

*Table 3*

**Augmented-Dickey Fuller Test Results**

| Variables | Stationary at Level I(0) | | Stationary at First Difference I(1) | | Result |
|---|---|---|---|---|---|
| | Constant | Constant and Trend | Constant | Constant and Trend | |
| FDI | 2.8987*** | 0.8351 | −1.6906 | −2.5579 | Stationary at I(0) |
| Market Size | −0.3505 | −2.9837 | −4.8884* | −4.7807* | Stationary at I(1) |
| Inflation | −3.6962** | −1.3694 | −3.8991* | −3.6584** | Stationary at I(0) & I(1) |
| Infrastructure (railways) | −2.6887* | −0.2853 | −2.9362*** | −4.0573** | Stationary at I(0) & I(1) |
| Infrastructure (tele-density) | −1.3477 | −2.0129 | −2.0377 | −2.7362 | |
| Investment | −0.7050 | −3.7591** | −2.9607*** | −2.4200 | Stationary at I(0) & I(1) |
| Openness | −1.8195 | −1.1124 | −3.7527** | −4.6611* | Stationary at I(1) |

*Source:* Author's calculation.

*Note:* *, **, and *** denote acceptance of the alternate hypothesis for absence of unit root at 1, 5, and 10%, level respectively.

*Table 4*

**Ng- Perron Test Results**

| | Variable | MZa | MZt | MSB | MPT | Result |
|---|---|---|---|---|---|---|
| **Level I(0)** | FDI | −2.2527 | 0.5442 | 0.2415* | 7.7846 | Stationary at I(0) |
| | Market Size | 0.3631 | 0.2240 | 0.6168 | 27.1757 | – |
| | Inflation | −3.2894 | −1.2794 | 0.3889 | 7.4445 | – |
| | Infrastructure (railways) | −0.9613 | −0.5435 | 0.5654 | 18.2396 | – |
| | Infrastructure (tele−density) | −7.4042*** | −1.9523** | 0.2750*** | 4.3287*** | Stationary at I(0) |
| | Investment | −6.5842*** | −1.6687*** | 0.2534*** | 4.1772*** | Stationary at I(0) |
| | Openness | −1.8123 | −2.5800 | 0.1740 | 1.7800 | – |
| **Level I(1)** | FDI | −7.6300*** | −1.3830 | 0.1812** | 4.9339 | Stationary at I(1) |
| | Market Size | −9.5413** | 2.1125** | 0.2214** | 2.8321** | Stationary at I(1) |
| | Inflation | −9.9390** | −2.1891** | 0.2202** | 2.6147** | Stationary at I(1) |
| | Infrastructure (railways) | −8.8267** | −2.0719** | 0.2347*** | 2.8819** | Stationary at I(1) |
| | Infrastructure (tele−density) | −8.8330** | −2.1755** | 0.2209** | 2.5841** | Stationary at I(1) |
| | Investment | −8.0344*** | −1.4257 | 0.1774** | 4.8361 | Stationary at I(1) |
| | Openness | −9.7922** | −2.2127** | 0.2259** | 2.5020** | Stationary at I(1) |

*Source:* Author's calculation.

*Note:* *, **, and *** denote acceptance of the alternate hypothesis for absence of unit root at 1, 5, and 10%, level respectively.

*Table 5*

**Cointegration Test Results**

| Level of significance | Lower Limit | Upper Limit | Wald Test-F statistics |
|---|---|---|---|
| 10% | 2.08 | 3 | 3.5270 |
| 5% | 2.39 | 3.38 | |
| 2.5% | 2.7 | 3.73 | |
| 1% | 3.06 | 4.15 | |

*Source:* Author's calculation.

*Table 6*

**Findings of Normalized Long-Term Coefficients**

| Dependent Variable: LFDI | | | | |
|---|---|---|---|---|
| **Variables** | **Coefficient** | **t-Statistics** | **Probability (p–values)** | **Significance** |
| ln Market Size | –1.0709 | –0.7390 | 0.4787 | Not Significant |
| ln Investment | 4.9364 | 3.0744 | 0.0133** | Significant & Positive |
| Inflation Rate | –0.5991 | –1.6119 | 0.1014*** | Significant & Negative |
| ln Infrastructure (railways) | 6.0166 | 0.6510 | 0.5615 | Not Significant |
| ln Infrastructure (tele-density) | 1.2663 | 3.0730 | 0.0069* | Significant & Positive |
| ln Trade Openness | 2.9462 | 3.0286 | 0.0096* | Significant & Positive |

*Source:* Author's calculation.

*Note:* *, **, and *** denotes that variables are statistically significant at 1, 5 and 10%.

assessing if there are long-term linkages between the variables, the ARDL bound testing method [25] has been used. The test findings reveal that the computed F-statistic is 3.5270, which is significant and greater than the upper limit value for the 10%, 5% statistical significance and lies between the lower limit and upper limit values at 2.5% and 1%, as specified by [25]. The F-test statistic's being greater than the test's upper bound values indicates that the various factors under study are linked over the long-term. The lag of the estimated model is one (1). The study contends that the variables have a long-term cointegration relationship.

## ARDL MODEL LONG-TERM ESTIMATES

*Table 6* presents the long-term coefficients of the ARDL cointegration model. Market size is observed to not be statistically significant in influencing the flow of foreign investment in long-term. Over time, domestic investment, as measured by gross fixed capital formation, has been observed to significantly favour FDI. The p-value and the coefficient value indicate that a 5% increase in domestic investment would lead to a 4.93% increase in FDI inflows. The level of inflation is observed to have a significant adverse effect on direct investment inflows. A 10% increase in the inflation rate would lead to a decline in foreign investment inflows by 0.59%. Trade openness has a significant positive influence on FDI inflows. Trade openness is found to be significant at one percent. It is observed that a percent increase in trade openness would lead to 2.94% increase in FDI to India. Infrastructure proxied by railways is observed to be insignificant in influencing direct investment inflows, however, tele-density is observed

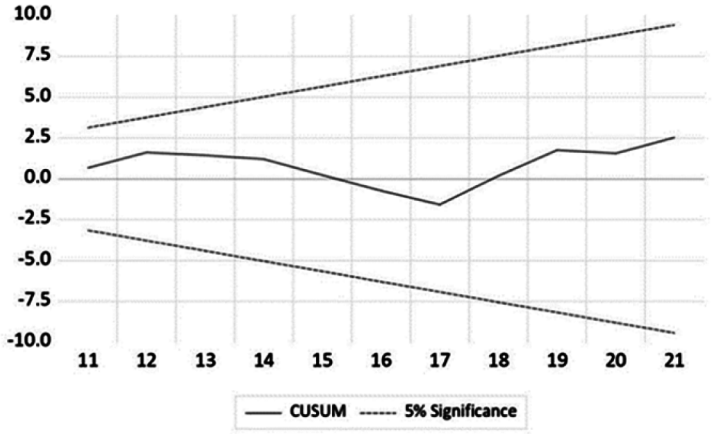


*Fig. 2*. **Stability Test (CUSUM)**
*Source:* Author's calculations.

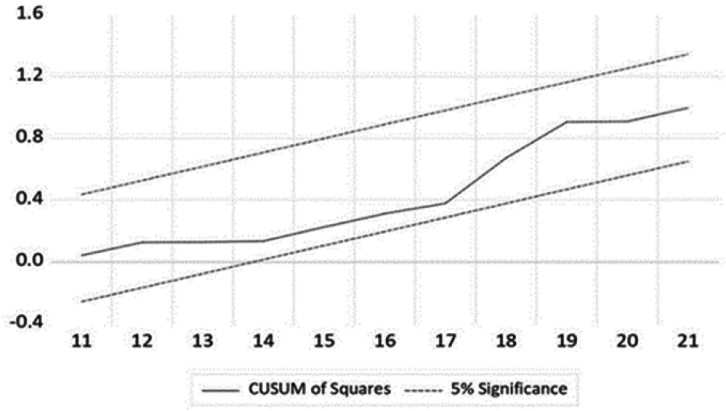


*Fig. 3*. **Stability Test (CUSUMQ)**
*Source:* Author's calculations.

to significantly influence direct investment inflows to India in the long-term.

*Fig. 2* and *3* depict the results of the CUSUM and CUSUMQ tests advanced by [26] to assess whether the regression model is stable or not. The ARDL methodology structured on ECM validates that the regression model is free from structural changes. The plots of CUSUM and CUSUMQ lines did not surpass the dotted line denoting 5% significance, which is the significant value line and determines the stability of the estimated methodology. The model emphasizes that it produces robust results.

### Error Correction Model (ECM)

The ECM helps understand the short-term interactions. It also analyses whether the model is capable of adjusting to long-term equilibrium after facing some shock. *Table 7* depicts the reported results for the ECM model. Here, the CointEq denotes error correction term in the regression equation. The coefficient of error correction term is highly significant and negative, which indicates that there is a long-term causal association among the factors undertaken in this study.

Findings presented in *Table 7* exhibit that size of the market is indeterministic in influencing the flow of foreign direct investment in India. Inflation is observed to have a significant adverse effect on the flow of FDI in India. It is observed that an increase in 10% inflation would lead to a decline in investment inflows by 0.57%. Domestic investment is observed to be significant and positive, which indicates that a percent rise in domestic investment would lead to 2.60% increase in FDI. Trade Openness is also observed to be significantly associated with FDI inflows. A 5% boost in trade openness is supposed to enhance FDI inflows by 1.45%. Infrastructure proxied by freight carried by railways and tele-density is noted to have

*Table 7*

**Results of Error Correction Model**

| Variables | Coefficient | t-Statistic | Probability (p-values) | Significance |
|---|---|---|---|---|
| D(Market size) | −0.6298 | −1.6283 | 0.1379 | Not Significant |
| D(Inflation) | −0.5771 | −3.0026 | 0.0149** | Significant & Negative |
| D(Infrastructure railways) | 3.1458 | 2.9742 | 0.0589*** | Significant & Positive |
| D(Infrastructure tele-density) | 0.8974 | 0.2838 | 0.0057* | Significant & Positive |
| D(Investment) | 2.6043 | 6.1705 | 0.0002* | Significant & Positive |
| D(Trade Openness) | 1.4535 | 2.7690 | 0.0218** | Significant & Positive |
| CointEq(−1) | −1.1611 | −6.4147 | 0.0001* | |
| Diagnostic Tests | t-Statistic | Probability (p-values) | Range | Outcome |
| R-squared | 0.7679 | | 0 to 1 | High correlation |
| Adjusted R-squared | 0.6905 | | 0 to 1 | High correlation |
| Durbin Watson stat | 1.9691 | | 0 to 4 | No first order autocorrelation |
| Heteroscedasticity Test (ARCH) | 0.3947 | 0.5377 | | Regression model is free from heteroscedasticity |
| Ramsey RESET Test | 1.4776 | 0.1778 | | Regression model is correctly specified |
| Normality Test | 0.9164 | 0.6324 | | Data is normally distributed |

*Source:* Author's calculations.

*Note:* *, **, and *** denotes that variables are statistically significant at 1, 5, and 10%.

a considerable positive effect on direct investment inflows. The estimated model's normal distribution, serial correlation, heteroscedasticity, specification form, and other factors are also tested in the study. The findings demonstrate that the model is accurately defined, normally distributed, and free of autocorrelation and heteroscedasticity.

## CONCLUSION

This study examines the long- and short-term causal linkages between FDI and its key determinants in India for a period of twenty-two years. Direct investment from abroad has been contemplated as the crux of economic growth; therefore, a study on the factors driving foreign inflows would offer some insight into how to attract an influx of FDI. Based on findings, four key factors have been identified that significantly impact the flow of FDI in long-term i.e., domestic investment, level of inflation, infrastructure development, and trade openness. The results show that market size, as measured by GDP, does not appear to be significant driver of FDI inflows, as the coefficient for this variable is observed to be insignificant in long-term. This implies that FDI inflows to India are vertical in nature, i.e., the foreign inflows are not domestic market seeking and therefore not driven by the size of host nation. The possible reason for insignificant relation between market size and FDI could also be the lacklustre performance of other indices, such as economic policies, the socio-political environment, and labour and capital markets, which accounts for the positive fluctuations in GDP [27]. While exploring the influence of domestic investment on direct investment, it was observed that domestic investment has a significant positive influence on attracting FDI in the long-term. Similar outcomes have been reported by [28, 29], where the authors observed that domestic investment served as a catalyst for enticing FDI inflows to developing economies. The results indicate that the Indian economy will benefit from initiatives

designed to encourage domestic investment and that the viability of domestic investment will effectively drive FDI inflows. Further, the findings suggest that the rate of inflation, which depicts macroeconomic stability, has an adverse impact on the inflow of foreign investment. Due to its impact on the real effective exchange rate, inflation can be perceived to be a deterrent to international investment. Therefore, to create an investor-friendly environment, the government needs to keep a check on the level of inflation in the economy. These findings are in line with the prevailing research [14, 20, 21]. The coefficient of infrastructure proxied by railways and tele-density is observed to be positive and significantly correlated with FDI in the short-term. However, infrastructure proxied by railways tends to become insignificant in attracting FDI in India in long-term. Complementing with the existing literature, trade openness is observed to have a substantial positive influence on FDI inflows in India. Similar findings have been reported by [15, 16, 30].

The Error Correction Model is used in the research to further investigate the statistical interaction between FDI & its important short-term drivers. Market size is found to be insignificant in influencing foreign investment in short-term as well. The level of inflation and infrastructure is observed to be significant at 5% having an inverse relationship with flow of foreign direct investment in short-term. Trade Openness and domestic investment are observed to be statistically significant at 5% and 1% in short-term as well. The empirical findings of this study advocate that market size is an insignificant factor in influencing FDI, whereas inflation, Trade Openness, infrastructure and domestic investment are significant in determining the flow of FDI in long- and short-term. Theoretically, increased trade liberalisation has a significant impact on FDI inflows. The empirical analysis is in line with existing literature suggesting that increased trade sector liberalisation may encourage FDI into India. The infrastructure variable though observed to be positively associated with FDI inflows in short-term only, is highly sensitive to the proxy being adopted. The tenacity of direct investment inflows to India during the Global Recession of 2008–2009 and the pandemic period (COVID-19) has strengthened the confidence and poise of global investors in the Indian economy.

## IMPLICATIONS

In terms of academic contribution, the study suggests that there is a significant long-term association between FDI and domestic investment, inflation, level of infrastructure development and Trade Openness. For policymakers, the study recommends that although market size as measured by gross domestic product is found to be insignificant in the long-term, there needs to be improvement in various economic performance indexes and the socio- political environment, which can lead to enhanced GDP and positive influence on FDI. Furthermore, the study recommends that domestic investments should be enhanced to make the economy an attractive FDI destination. Also, the level of inflation needs to be kept in check, as it deters the inflow of foreign investment. Trade openness is observed to have a significant role in attracting FDI. In addition to economic cooperation, long-term strengthening of socio-political ties with other nations is necessary in order to increase the country's competitiveness in the global market. A healthy economic climate and enhanced worldwide standing may naturally draw foreign investment, which is ideal for a growing economy like India.

## LIMITATIONS AND RECOMMENDATION FOR FUTURE RESEARCH

The limitation of this research is that the focus of the study has been confined to the location dimension of FDI. This is because the primary goal of this research was to advance a perspective on the factors influencing FDI inflows to India. The study also limits with the choice of infrastructure variables selected. Future research might concentrate on cross-sectional analyses of factors affecting the flow of FDI in developing nations. To comprehend how regional institutional and economic variations might conflict with and counterbalance the national economic and institutional drivers, the regional approach to FDI can be investigated.

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