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FOREIGN DIRECT INVESTMENT, FOREIGN PORTFOLIO INVESTMENT, AND CHANGES IN DOLLAR RUPEE EXCHANGE RATE IN INDIA: A STUDY OF RECENT TRENDS

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ABSTRACT

Foreign investment has been considered to be an important source of investment in developed economies which are deprived of necessary avenues for mobilising funds internally. But, the flow of foreign investment is circumscribed by many factors. Technically speaking, changes in exchange rate influences the flow of foreign investment to a country. Exchange rate movements and FDI inflows in India exhibit a long-run relationship, although short-run causal effects are weak. Johansen test confirms a long-run relationship between the variables. Granger causality results show no strong short-run causal link. The VECM results indicate a significant long-run adjustment mechanism. Exchange rate movements play an important role in shaping foreign direct investment dynamics in the long run. While short-run causal effects are limited, impulse response analysis indicates that exchange rate shocks can temporarily stimulate FDI inflows. Augmented Dickey–Fuller (ADF) test, Johansen Cointegration Test, Impulse Response Function (IRF), Grange Causality Test (GCT), Vector Error Correction Model (VECM), are used in this paper.

KEYWORDS: *FDI, Net FDI, FPI, Underinvestment, Volatility, Foreign Trade Balance, Exports and Imports, Dollar-Rupee Exchange Rate*

INTRODUCTION

It has well been recognised that investment is crucial for economic growth. We can hardly notice any economic theory devoid of prescribing the necessity of having sufficient investment to enable the economy to have a take-off (Ponthiere , 2022). Different models in economics starting with the much renowned classical models (Salehi, 2025) and neo classical models emphasize the importance of capital in bringing about a desirable rate of growth in the economy. Nonetheless, the real question is about the inability of developing economies to obtain a desirable or optimal quantum of investment that will help the economy to be on the track of development (Naeher & Narayanan, 2023). This is often referred to as 'underinvestment problem'. This problem emanates from multiple reasons like saving gap and imperfect financial market to channelize saving into capital. Logically, capital should have flown from capital abundant advanced nations where interest rate is low to capital scare developing countries where interest rate is high (Downhill Capital Flow). In contrast to what the theory upholds, the capital appears to have been shy of moving to the developing parts of the world as they are grappled with structural and financial market imperfections (Ovtchinnikov & McConnell , 2019). Simply speaking, capital fails to flow to high return nations from low return nations, which is often called the Lucas Paradox (Herrmann & Kleinert, 2014).

It is true that developing economies are trapped in a vicious circle where they find it difficult to embark on a development process with a meagre level of income (Nurkse, 1953). Their income is low, so is their saving capacity, and capital formation. Hence it is necessary for these countries to obtain an optimal level of capital so that it can break the vicious circle and can take the economy to the track of development (Hamilton & Svensson, 2014). It is true that vicious circle of poverty can work both on the supply side and the demand side. The supply side vicious circle often occurs because of the problems of lack of capital which can be easily addressed by way of finding avenues for investment (Gla˘van, 2008). It is obvious that there are methods by which a developing economy can find the sources from within but these internal resource generation attempts are often restrained by certain inherent problems of developing economies.

In this background it is advisable to rely on the external sources of financing new investment projects in developing economies, although it entails a lot of other intricacies which can be addressed through well designed safeguard measures. Nonetheless, the real question lies in issues which are tied to the external borrowings and many developing countries find this tide borrowing a permanent liability, and a handicap of future development initiatives. Left with these issues, we need to ponder over other sources of investment: one of such ways is the methods of attracting foreign investment in the form both foreign direct investment and foreign portfolio investment. These two investments come to the economy through the market and therefore it is the responsibility of the government to create a market conducive for attracting foreign capital in the form of direct investment and portfolio investment.

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The growth story of China stands as a testimony to the influence of. foreign direct investment in growth process. The famous 'Export-Led Growth' strategy championed by China over the last years has chiefly been driven by the indomitable influence of foreign direct investment (Han & Wu, 2024). Having said this, however, it needs to be reiterated here that in recent times this above said relation has faced a slight set back. FDI as a percentage of GDP in China nosedived to less than one percent of GDP in 2024 from 6.2 percent of GDP in 1993. In recent times, China's outward FDI has been exceeding its inward FDI. In this background, the present study intends to focus on the recent trends in the foreign direct and foreign portfolio investment in India. Besides, the study also delves deep into relationship between FDI and exchange rate movements in India.

Objectives of the study and methodology

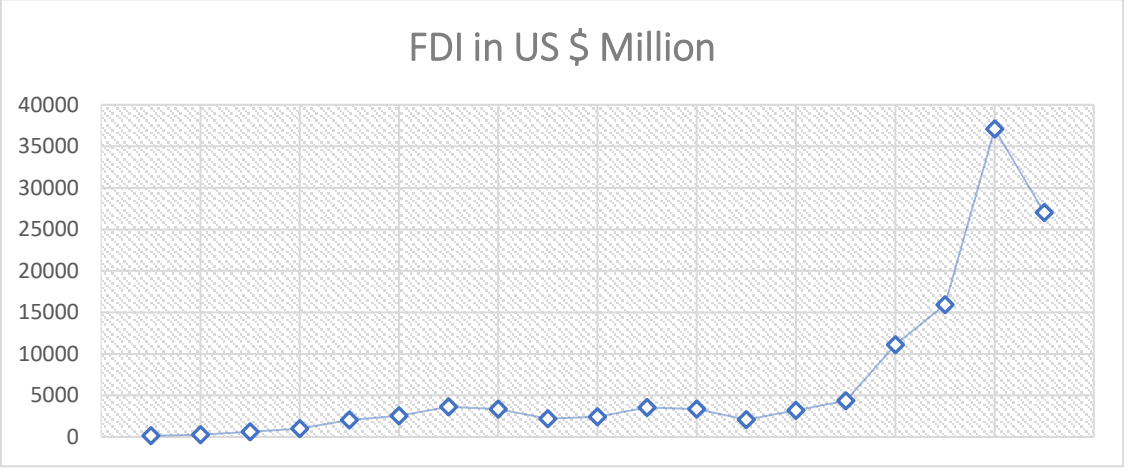
This study intends to look into the flow of foreign direct and portfolio investment in India over a period of 2017 to 2025. This study also analyses the foreign direct investment in relation to the changes in the exchange rate of India. The dollar rupee exchange rate is considered as an explanatory variable and a model is constructed to analyse the effect of dollar rupee exchange rate on the inflow of net foreign direct investment to India. The makes use of data obtained from the database of RBI on foreign direct and portfolio investment during the period 2017 to 2025. Augmented Dickey–Fuller (ADF) test, Johansen Cointegration Test, Impulse Response Function (IRF), Grange Causality Test (GCT), Vector Error Correction Model (VECM), are used in the model. The study also uses monthly data for analysing the trend in FDI and portfolio investment in India.

Previous Studies

There are different forms of foreign capital like foreign direct investment and foreign portfolio investment. In the case of foreign direct investment companies with headquarters in foreign countries can start their subsidiary offices or branches and affiliate in India. Foreign in investors can also subscribe to stocks and debentures of existing enterprises in India through capital market. This is called foreign portfolio investment. There can be the inflow of foreign capital to our country through the mode of foreign collaboration. Foreign collaboration can take place between our government and foreign governments and between an Indian company and the and foreign companies. Inter Government loans have become an important vehicle through which governments across the world receive funds from different sources. Apart from all the sources, loans from international lending organisations like IMF and the World Bank also play an important role in building the availability of foreign capital in a country.

By and large India has never been shy of accepting the capital. But its policy towards foreign capital has been built very consciously without disturbing its domestic policy apparatus. Studies have focused on analysing the trend and pattern of foreign direct investment in India during the post-liberalization period (Maurya, 2015). It is indeed true that in the post-liberalization period, India has witnessed a quantum jump in foreign direct investment (Figure No.1). Needless to say, several factors influence the flow of foreign direct investment to India like the political environment and the regulatory ecosystem prevailing in an economy. Many studies have examined the prominent factors determining the flow of foreign direct investment to India (Kothari, Singhal, & Hoang, 2023). Studies have also pointed out that economic growth determines the flow of FDI to India, by way of enhancing the market for goods and services (Chakraborty & Basu, 2002). Market size and per capita income also have been found to be determining FDI in India (Bhasin & Murthy, 2017)

Figure 1 FDI in India in US $ Million in the immediate post-liberalization period



ANALYSIS AND DISCUSSION

It is obvious that an analysis of FDI in a country has to be based on a thorough examination of FDI by the country in other countries and FDI to that country, the difference between the two is often called the Net FDI. A trend of FDI by India in other nations in US $ million has been shown the following figure (Figure 1). Although it clearly shows oscillations over time, compared to other variables of the same features, it is less volatile (Table No. 1). It is worth mentioning that since 2019, there has been a relatively slight decline in FDI by India in other nations. Since 2022, the FDI by India in other nations has become almost stagnant (Figure No.2).

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Figure 1 Foreign Direct Investment by India (in US $ Million)

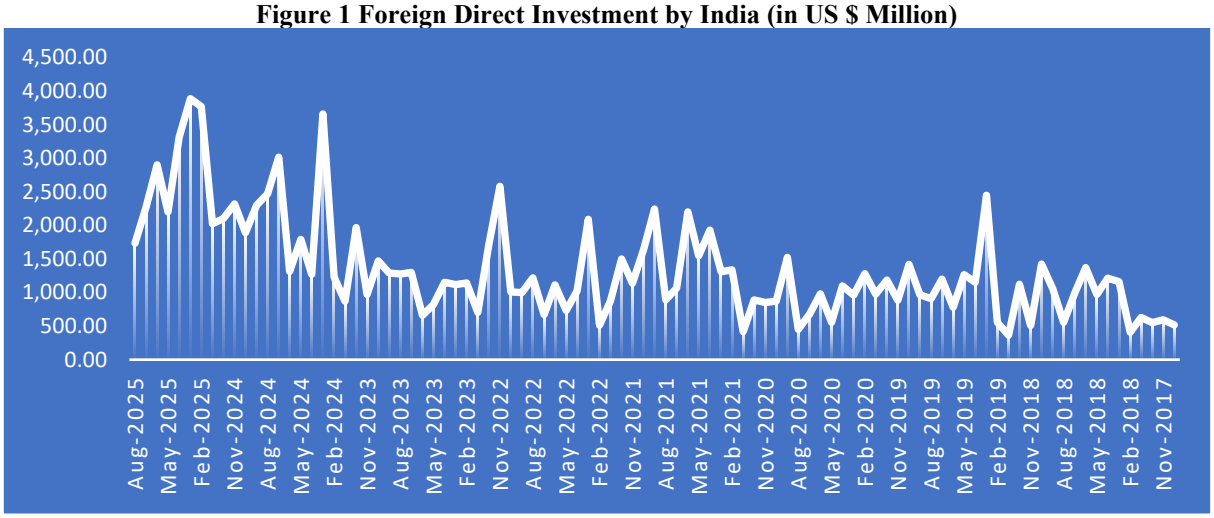

Figure 2 Foreign Direct Investment by India (smoothed)

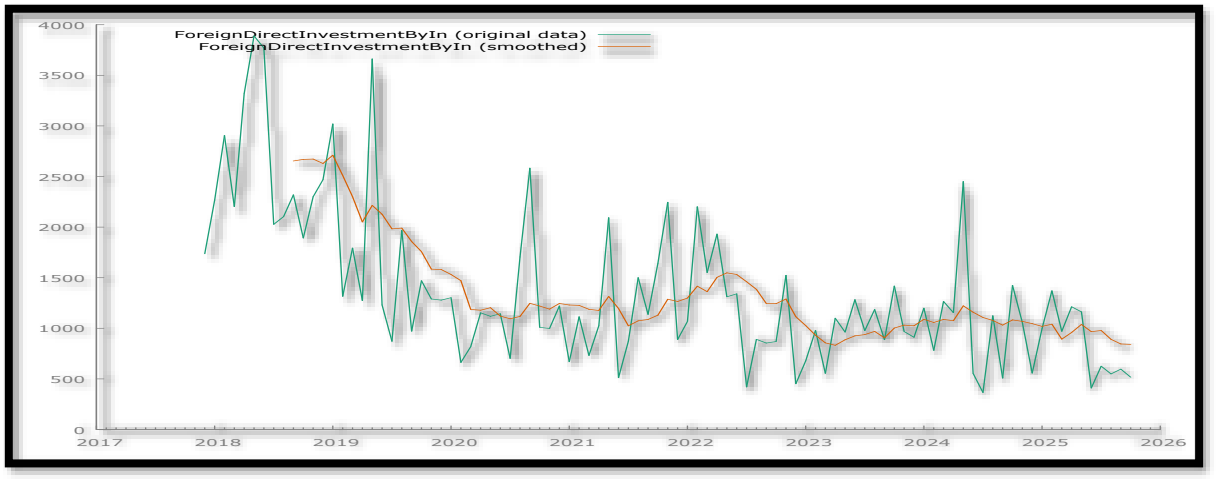

Table 1 Coefficient Variation in major Variables

SL No	Variable	Coefficient of Variation
1	Foreign Direct Investment by India	56
2	Net Foreign Direct Investment by India	117
3	Net Foreign Portfolio Investment	606

Foreign direct investment to India has almost been less volatile compared to FDI by India. But in 2020 it skyrocketed followed by a steep decline in 2021(Figure No.3). The trend in Net FDI, the difference between FDI by India and FDI to India, has also been presented in the figure No.4.

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Figure 3 Foreign Direct Investment to India (in US $ Million)

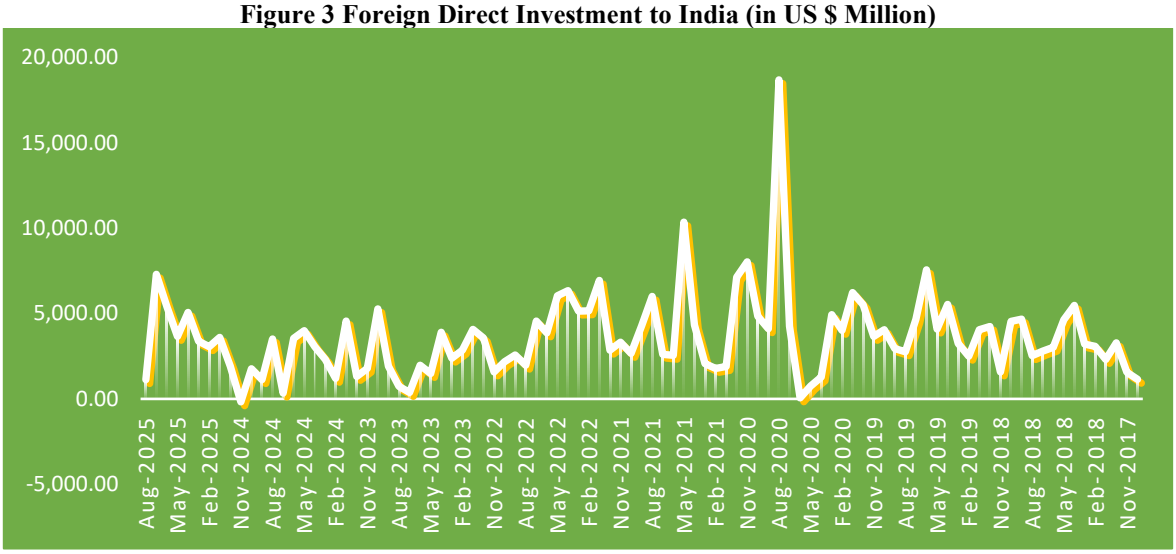
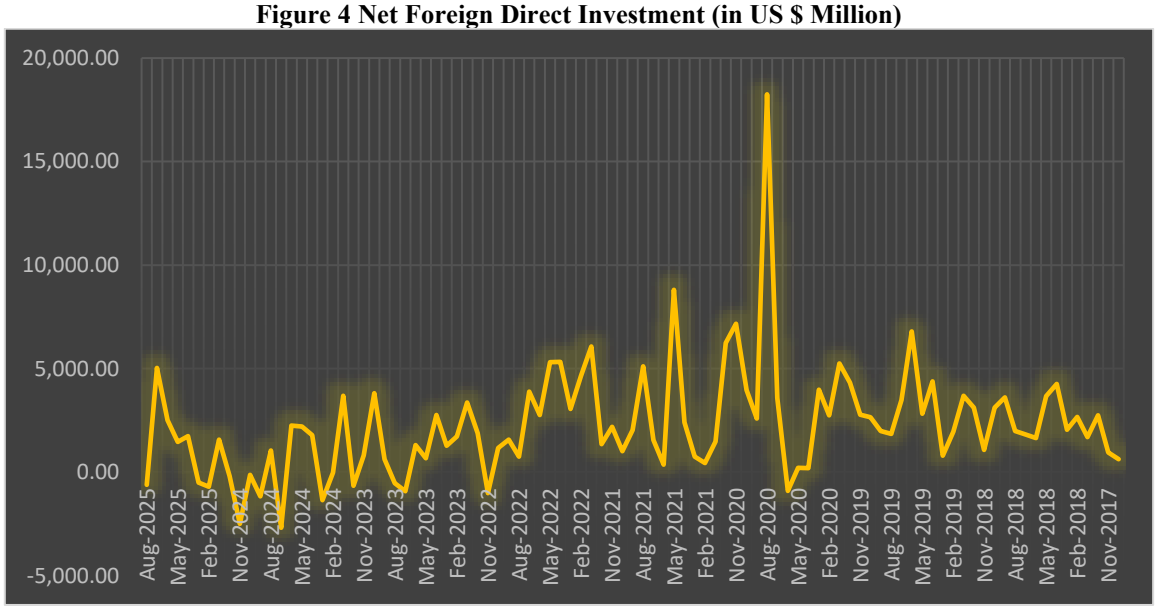
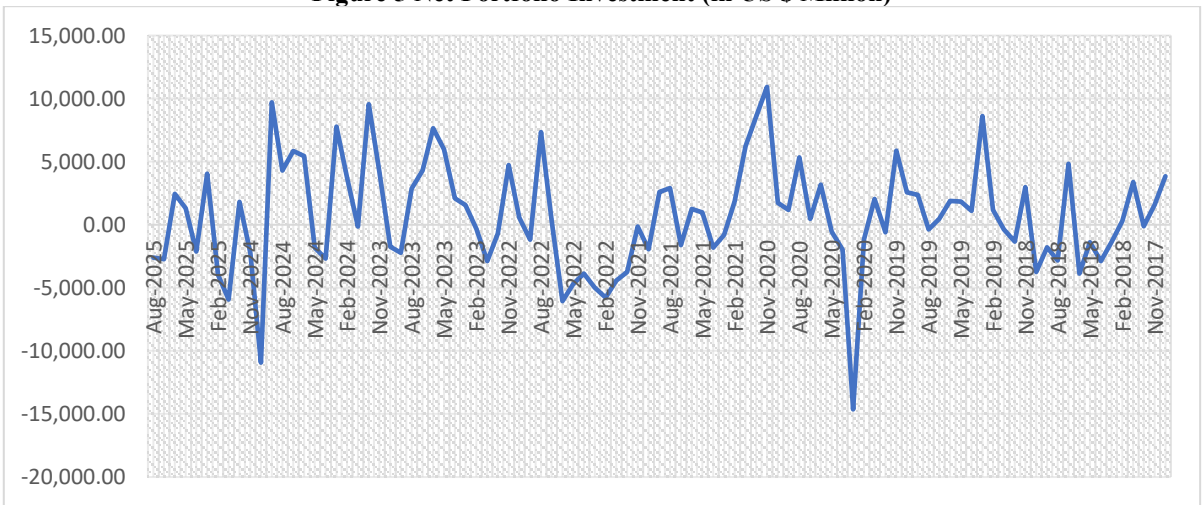


Figure 4 Net Foreign Direct Investment (in US $ Million)



It is quite interesting to note that the Net Portfolio Investment has shown the highest volatility during the period 2017 to 2025 (Table No.1 and Figure No.5)

Figure 5 Net Portfolio Investment (in US $ Million)



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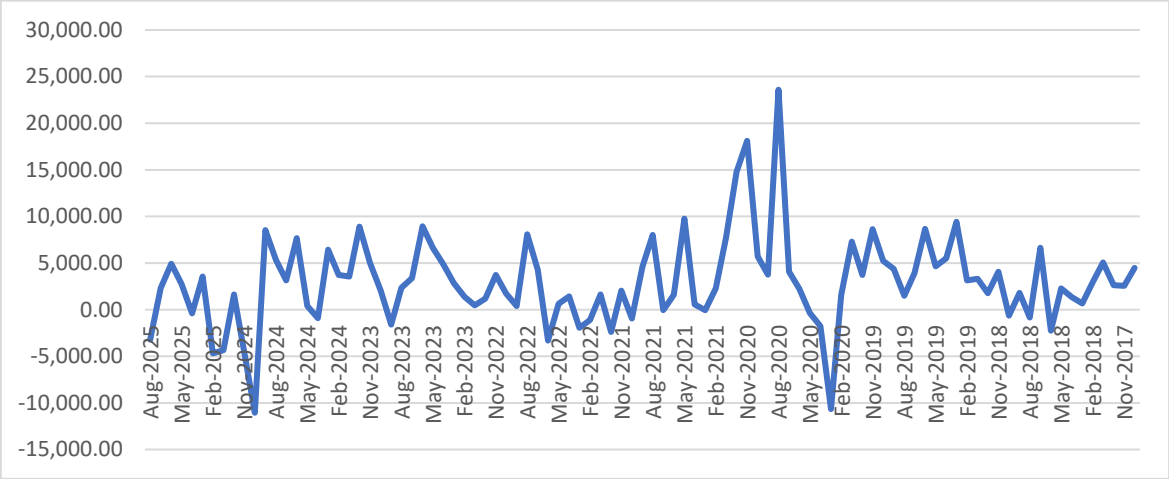
Total investment (FDI plus FPI) has also shown volatility over the period (Figure No.6).

Figure 6 Total Investment Inflows (in US $ Million)



India's trends in foreign trade exports and foreign trade imports need special mention at this juncture. It is worthwhile to note that India's foreign import has been quite high compared to foreign trade exports over the period (Figure No 7). As a consequence, naturally, total foreign trade balance of India has not been so encouraging during the period that comes under this study (Figure No.8).

Figure 7 Foreign Trade Exports and Foreign Trade Imports in US $ Million

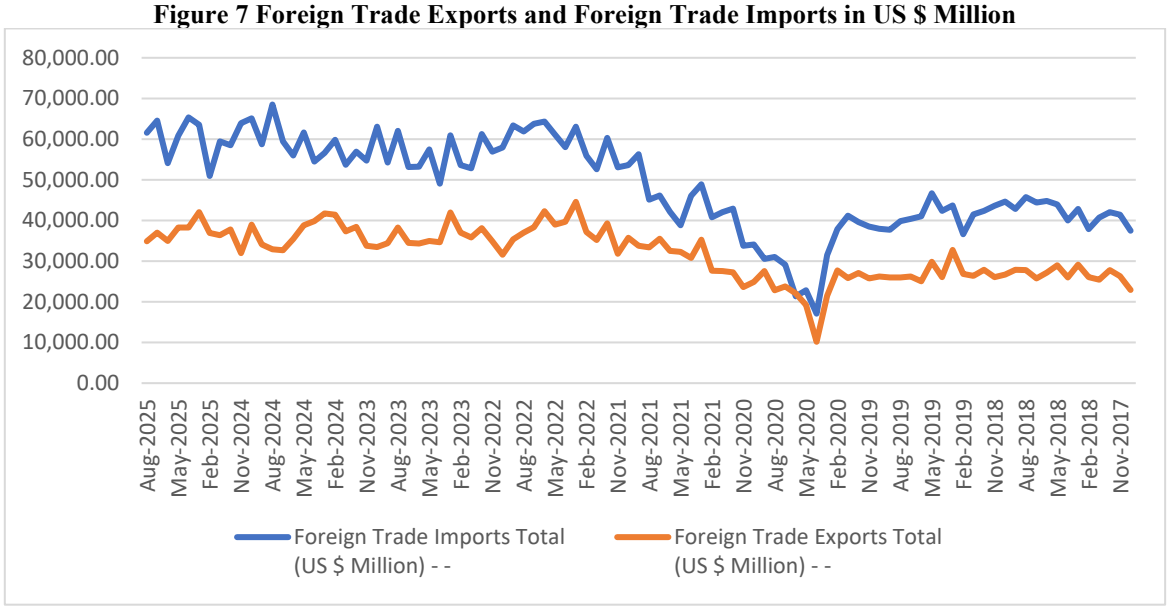


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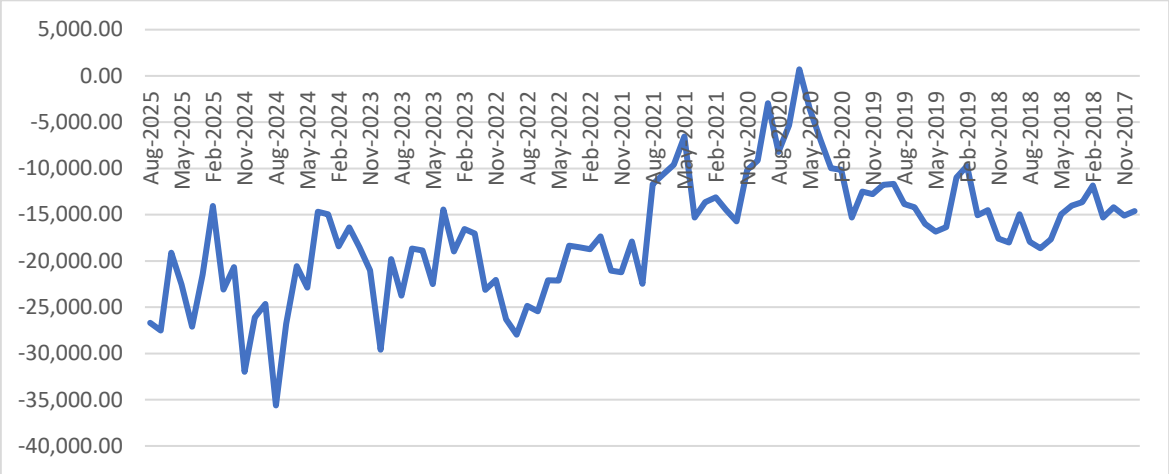
Figure 8 Total Foreign Trade Balance in US $ Million



Econometric Analysis

Although this paper attempts to present an overall picture of FDI flows, FPIs, Trends in Net Exports and Foreign Exchange rate volatility over the years from 2017 to 2025, our main analytical concern is to unearth the fundamental connection between the FDI inflows to India and the Exchange Rate (INR/USD). To undertake this analytical exercise, we proceed as follows. First of all, we need to gauge into the basic descriptive statistics pertaining to FDI inflow and the exchange rate movement during the period of 2017 to 2025. It appears to be unsurprising that FDI inflow has shown large variability over the period, revealing that FDI inflow has been more circumscribed to multiple factors covering economic and political, not alone related to exchange rate movement, while exchange rate movement has shown only moderate volatility, and it also shows a depreciating currency against dollar over the years (Table No.2). The correlation coefficient between FDI inflow and Exchange rate movement (correlation coefficient being 0.34) also suggests that both are moderately but positively related to each other. Precisely speaking, the positive correlation clearly underlines the fact the FDI inflow tends to have been increased in response to depreciation in the value of Indian currency over the years, and, of course, there is nothing surprising in this case.

Table 2 Descriptive Statistics

Variable	Mean	Std. Dev	Minimum	Maximum
FDI Inflows (US$ Million)	3125.4	1842.6	520	7420
Exchange Rate (INR/USD)	73.82	5.94	63.21	83.12

Having observed the descriptive statistics in detail, we need to check whether the time-series variables pertaining to FDI inflow and Exchange Rate (INR/USD) are stationary or not for which we intend to apply the Augmented Dickey–Fuller (ADF) test.

Stationarity Test (ADF Test)

Using ADF, we intend to test the stationarity of the variables under consideration. We use the following model for this.

$\Delta Y_t = \alpha + \beta Y_{t-1} + \Sigma \gamma_i \Delta Y_{t-i} + \varepsilon_t$

Table 2 ADF between FDI inflows and Exchange Rate at Level

ADF Results at Level			
Variable	**ADF Statistic**	**5% Critical Value**	**Result**
Exchange Rate	-1.87	-2.89	Non-stationary
FDI Inflows	-2.01	-2.89	Non-stationary

Table 3 ADF between FDI inflows and Exchange Rate at Level

ADF Results at First Difference			
Variable	**ADF Statistic**	**5% Critical Value**	**Result**
ΔExchange Rate	-4.72	-2.89	Stationary
ΔFDI Inflows	-5.11	-2.89	Stationary

It is evident from the above ADF analysis that the variables FDI inflow to India and the exchange rate become only stationary after taking the first order difference which obviously shows that they are integrated of order one (Table No.3 and 4). Now, to understand the possibility of a long run equilibrium relationship between the two, the Johansen Cointegration Test has been done (Table No.5), and the results clearly show that there exists a long equilibrium relationship between the two variables.

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Table 4 Johansen Cointegration Test

Hypothesis	Trace Statistic	Critical Value (5%)	Result
r = 0	18.42	15.49	Reject
r ≤ 1	3.12	3.84	Do not reject

Now, we need to know the possibility of a strong short-run causality between FDI inflow and exchange rate movements. For this, we use the Grange Causality Test (GCT). We make two null hypotheses: (1) Exchange rate does not granger cause FDI inflow and, (2) FDI inflow does not granger cause movement in exchange rate. Since the p-values pertaining to both do not fall below .05, we cannot reject the null hypotheses, and therefore it is pertinent to conclude that there exists no short run causality between FDI inflows and exchange rate movements in India (Table No.6).

Table 5 Granger Causality Test

Null Hypothesis	F-statistic	p-value	Result
Exchange Rate does not Granger-cause FDI	2.65	0.107	Not significant
FDI does not Granger-cause Exchange Rate	1.94	0.148	Not significant

Vector Error Correction Model (VECM)

Now, we need to know whether FDI inflow and foreign exchange rate movements converge to a long run equilibrium albeit there is no short run causality between FDI inflow and exchange rate movement in India. For this we intend to do Vector Error Correction Model (VECM) which helps to estimate long run equilibrium relationships. Sometimes it is likely that variables move away from equilibrium in the short run. However, they may show a tendency to come back to equilibrium in the long run. VECM is used to understand how quickly they adjust to equilibrium in the long run. It uses an Error Correction Term to measure the speed of adjustment. VECM can be applied when either variables are non-stationary or they are stationary after first order differencing. In our study, both variables viz. FDI inflow and exchange rate movements are stationary after first order differencing. This model can also be applied when there is a cointegration between the variables under consideration using the Johansen Test. In our study, the results of Johansen Test clearly shows that there is cointegration between the variables FDI inflow and foreign exchange rate movement. The VECM model is written as follows:

The short-run adjustment model:

$\Delta FDI_t = \alpha + \beta ECT_{t-1} + \Sigma \gamma_i \Delta FDI_{t-i} + \Sigma \delta_i \Delta EXR_{t-i} + \varepsilon_t$

Table 6 Error Correction Term

Variable	Coefficient	p-value
ECT (-1)	-0.42	0.01

The ECT has been estimated to be negative (-42) and significant (P value is 0.01). Hence, it shows that 42 percent of disequilibrium is adjusted in each period, showing that there is the possibility of a convergence to long run equilibrium (Table No.7).

Having analysed the possibility of adjustment and convergence to the long run equilibrium, it is important to move further to understand how a shock to one variable influence or affects other variables over time. Here, we need to know how a shock in FDI inflow has its impact on exchange rate movements and vice versa. For this purpose, we usually rely on the Impulse Response Function (IRF).

Impulse Response Function (IRF).

The IRF function is based on a VAR/VECM dynamic system, and it follows the following functional form in our analysis.

$Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \ldots + A_p Y_{t-p} + \varepsilon_t$

Where

- Y_t= vector of variables (FDI inflows, Exchange rate)
- ε_t= shock or innovation

Table 7 IRF Results: Exchange Rate Shock to FDI Inflows

Period	Response of FDI
1	0.12
2	0.28
3	0.35
4	0.29
5	0.18
6	0.07

It is evident from the above analysis that a positive exchange rate shock (rupee depreciation) initially increases FDI inflows. The effect peaks around the period 3, but after several periods, the impact of the change in Exchange rate on FDI inflow gradually slows down, suggesting that currency deprecation has temporarily attract FDI inflows to India (Table No.8). Contrary

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to this, a rise in FDI inflow only slightly appreciates the domestic currency, showing that the effect of FDI on exchange rate is small and short lived (Table No.9).

Table 8 Impulse Response: FDI Shock → Exchange Rate

Period	Response of Exchange Rate
1	-0.05
2	-0.11
3	-0.09
4	-0.04
5	-0.01

Concluding Remarks

This study has made an attempt to understand trends in Net FDI, Net FPI, and Exchange rate movements in over the period 2017 to 2025. The study reveals that exchange rate movements and FDI inflows in India exhibit a long-run equilibrium relationship, although short-run causal effects are weak. Johansen test confirms a long-run relationship between the variables. Granger causality results show no strong short-run causal link. The VECM results indicate a significant long-run adjustment mechanism. Exchange rate movements play an important role in shaping foreign direct investment dynamics in the long run. While short-run causal effects are limited, impulse response analysis indicates that exchange rate shocks can temporarily stimulate FDI inflows.

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