

Impact of Foreign Direct Investment on India's Forex Reserves: An Empirical Study

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Abstract: This paper empirically explores the dynamic relationship between FDI inflow and Forex reserves in India based upon 25 years of data on annual time-series from 2000–01 to 2025–26. The study uses secondary data from the Reserve Bank of India (RBI) and Department for Promotion of Industry and Internal Trade (DPIIT) to assess the long-run trends, dynamics, and short-run fluctuations using descriptive statistics, trend analysis and Augmented Dickey-Fuller (ADF) approach to measure stationarity. The empirical results show significant growth of both macroeconomic aggregates, Forex reserves from USD 42,281 million to USD 691,108 million and FDI inflows from USD 2,463 million to USD 58,846 million during the study period. Importantly, FDI recorded a higher Compound Annual Growth Rate (CAGR) of 13.54% compared to 11.82% recorded by Forex reserves, and was also more volatile and had a higher level of variance in the short run. The structural insights reflect important policy implications, underscoring the strategic relevance of policy and institutional measures to drive foreign capital inflows to the economy, in terms of their stability and quality of investment, in order to ensure macroeconomic stability in India and strengthen its external sector.

Keywords: Foreign Direct Investment, Foreign Exchange Reserves, India, Trend Analysis, Growth rate, Stationarity, Augmented Dickey Fuller Test, Macroeconomic stability, External sector

Introduction

The era of globalization and financial liberalization has brought about the importance of Foreign Direct Investment (FDI) as a source of capital in developing economies and it has become a major instrument to foster economic growth and global economic integration. FDI not only complements domestic investment but also aids in technology transfer, employment creation, productivity improvement, managerial skills and access to international markets in an emerging country like India. Since the economic liberalization in 1991, India has taken a series of steps to liberalize its foreign investment regime and implement various measures to lure foreign investment. Consequently, FDI inflows have gained significance in India's external sector in recent years. Another important measure of a country's external financial strength and macro-economic stability is foreign exchange reserves. Having sufficient foreign exchange reserves allows a country to pay its foreign debts, cover its necessary imports, avoid excessive fluctuations in exchange rates and resist external economic and financial shocks. In the last few decades India has seen a significant increase in its foreign exchange

reserves. The improvement has been facilitated through export earnings as well as foreign investment, remittances, external borrowings, and other elements of the balance of payment. The economic significance of the relationship between FDI and foreign exchange reserves. Foreign capital inflows due to FDI can lead to greater foreign currency availability in the domestic economy; keeping other factors unchanged, this can result in a rise in foreign exchange reserves. In addition, FDI may also boost productive capacity, increase competitiveness and even lead to exports, thus boosting foreign currency earning capacity of the nation. But the effect of FDI on foreign exchange reserves can sometimes be negative and indirect. FDI can also result in foreign exchange leakage due to foreign exchange imports of capital goods and intermediate goods, repatriation of profits and dividends, foreign exchange payments for royalty and other external transactions. The net effect on foreign exchange reserves of FDI thus is a resultant of the different components of the external sector. The combined rise in FDI inflows and in India's foreign exchange reserves poses an interesting empirical question whether FDI plays a significant role in building up India's foreign exchange reserves. The trends they make in this observation can infer a positive association but cannot determine its strength, significance, or direction. Therefore, an empirical investigation is required to see whether the changes in FDI inflows have caused a significant effect on the foreign exchange reserves and whether a causal relationship exists between the foreign exchange reserves and foreign direct investment inflows. The present study, therefore, empirically investigates the causal relationship between FDI inflows and foreign exchange reserves in India from 2000 to 2024. The study mainly aims to evaluate how FDI affects India's foreign exchange reserves and to find the causal relationship between FDI and foreign exchange reserves. The study tries to analyse this relationship over a long period of time to gain insight into the significance of foreign investment in determining the external financial position of India. The study results are likely to be of relevance to policy. They can offer valuable inputs to policy makers on the contribution of FDI to enhance the foreign exchange position and ensuring financial stability abroad of India. The study could also help in the development of suitable policies for attracting sustainable FDI, in a way that it could be maximised for India's foreign exchange reserves as well as external sector strength and stability.

Objectives

1. To examine the trend of FDI inflows and Forex reserves in India.
2. To analyze the impact of FDI inflows on India's Forex reserves.
3. To assess the long run relationship between FDI inflows and Forex reserves.
4. To suggest policy recommendations for promoting sustainable FDI inflows to strengthen India's Forex reserves.

Hypotheses

H₀₁: There is no significant relationship between volume of FDI and India's Forex reserves.

Review of Literature

Review of Literature is an in-depth, critical and systematic analysis of literature, theories and concepts and empirical studies on a particular research problem. It assists the researcher in comprehending previous studies, the primary findings of the studies, the limitations of the previous studies and identifying the research gap that this study will fill.

Wenkai and Song (2009) studied the impact of Foreign Direct Investment (FDI) on foreign exchange reserves of the Chinese economy. They isolated the impact of FDI on FER into direct and indirect impact, and examined empirically the real impact of FDI on FER growth. Their findings revealed that FDI was an important factor contributing to the growth of China's foreign exchange reserves. The study also revealed that the actual impact of FDI was higher during the time of high growth of foreign exchange reserves.

Huang, Qian and Zhong (2011) studied the relationship between Foreign Direct Investment (FDI) and foreign exchange reserves in China. The data analysed were annual data spanning from 1982 to 2008 and the methodology used to analyse the data was cointegration analysis and Granger causality test. Empirical results showed that there is a long run equilibrium relationship between FDI and Foreign Exchange Reserves. It was also observed that there exists strong bidirectional Granger causality between China's foreign exchange reserves and FDI, which indicates that FDI and foreign exchange reserves could affect each other in the long run. The authors also argued that it was due to capital flow linkages and financing mechanisms of the U.S. current account.

Yasir, Shehzad, Ahmed, Sehrish and Saleem (2012) found that there was a relationship between FDI, foreign exchange reserves and nominal exchange rate for Pakistan with annual data available from 1980 to 2010. This study used the ADF unit-root test, Johansen cointegration test and the Vector Error Correction Method. The results indicated that there is a long run relationship between the variables, while the short-run relationship of foreign exchange reserves to FDI variables was insignificant.

Osigwe and Uzonwanne (2015) investigated the causal relationship between foreign exchange reserves, exchange rates and FDI in Nigeria. The tests implemented in the study were Augmented Dickey-Fuller (ADF) test, Phillips-Perron (PP) test for stationarity and Johansen co-integration test and Granger causality test. It was found that there is long run relationship between FDI, exchange rate and foreign exchange reserves. The Granger causality results have shown that FDI has a unidirectional causal relationship with foreign exchange reserves at lag one and two respectively, but has a bidirectional causal relationship with the foreign exchange reserves at lag three.

Rahman and Bristy (2015) studied the macroeconomic effect of Foreign Direct Investment (FDI) in the countries of South Asian Association of Regional Cooperation (SAARC). The result of the study indicated that using correlation and simple regression analysis a strong positive relationship was established between FDI and foreign exchange reserves. The results indicate that increase in FDI inflows may help to improve the foreign exchange reserve position of the developing economies.

Murthy (2016) in his study “A Study of Currency Fluctuations along with FDI & FII Flows Impact on Foreign Reserves – India” studied the relationship between Foreign Direct Investment (FDI), Foreign Institutional Investment (FII), exchange rate fluctuations and India's foreign exchange reserves. Data for 2001-2015 were used for the study and bi-variate correlation, linear regression and Granger causality tests were performed. The study revealed that there is a high positive correlation between FDI, FII and exchange rate of rupee with dollar. It also observed that there was an effect on FDI and FII due to exchange-rate fluctuation. However, the Granger causality test indicated that FDI did not have a significant impact on India's foreign exchange reserves, whereas FII had an impact on foreign exchange reserves.

Kotishwar (2016) studied the effect of external fund flows on foreign exchange reserves of India from 2001 to 2015. Foreign Direct Investment (FDI), Foreign Institutional Investment (FII) and exchange rate of the rupee and dollar were taken as important factors to affect foreign exchange reserves. The study sought to determine the relationship between FDI and FII with India foreign exchange reserves using correlation, regression and Granger causality methods and it has been concluded that FDI and FII were significantly influencing India foreign exchange reserves. The study emphasized the need for inflow of foreign capital to boost the country's external financial position and to help build foreign exchange reserves.

Poonam and Dalal (2019) studied the relationship between Foreign Direct Investment (FDI) and Foreign Exchange Reserves (FOREX) for India. For this study, data were gathered from secondary sources and the period of 2001-2018 was used, and correlation analysis was conducted to analyse the correlation between FDI and FOREX reserves. The study revealed a positive correlation between FDI and foreign exchange reserves, and emphasized that a greater inflow of FDI can support the external sector in India. The authors found that foreign exchange reserve accumulation is associated with FDI, but on the other hand, there are several other economic factors that determine FDI and foreign exchange reserve accumulation.

Jacob (2020) studied the macroeconomic factors affecting Foreign Exchange Reserves of India for the time period 1995 to 2018. The study used Vector Error Correction Model (VECM) approach to study the effect of FDI, FPI, exports, imports and exchange-rate volatility on foreign exchange reserves. The result indicated that in long run FDI has positive and significant effect on India's foreign exchange reserves. The ability to explain short run variations in foreign exchange reserves through FDI was also statistically significant.

Sreeram and Sayed (2023), discussed the factors effecting short- and long-term growth of international reserves of India. The study employed the Vector Error Correction Model (VECM) that was used to examine the relationship between international reserves and seven macroeconomic variables. Johansen Cointegration test results showed that the international reserves and broad money (M3) had a positive long-run relationship, whereas foreign direct investment (FDI) inflows had a negative long-run relationship with the international reserves. The external debt had a negative relationship with international reserves. This further showed through the Granger causality test that the rise in FDI inflows and increase in broad money supply caused the growth of international reserves of India in the long period.

In the study of **Jayathilaka et al. 2025** the effect of Foreign Direct Investment (FDI) on Foreign Exchange Reserves (FEX) of 110 countries was investigated in the period of 2002–2022. Wavelet coherence analysis and Granger causality tests were used in the study to explore the relationship between FDI and foreign reserves. This revealed a different relationship between the two variables in the various countries at different times. The study showed that in the Indian context, there was a bi-directional causality relationship between FDI and foreign reserves in that FDI inflows can impact the process of foreign reserves accumulation and foreign reserves accumulation can also impact the process of FDI inflows. The findings provide the most up-to-date empirical evidence of the FDI–foreign reserves nexus in India.

Research Gap

Although there are many studies on the determinants of foreign exchange reserves in India, there is very limited research specifically analysing the direct recent and causal effect of FDI inflows on the foreign exchange reserves of India.

Justification of the present study

The present study is justified because FDI is one of the major sources of foreign capital and the foreign exchange reserves are also important to keep external sector stability in India. Both the variables are important but few empirical studies have directly analysed the effect of the FDI on India's foreign exchange reserves with recent data. Hence the study aims to contribute to the research gap and offer useful information to policy-makers on FDI policy and management of foreign exchange reserves.

Method and Methodology

Method refers to the systematic and scientific approach used by the researcher in conducting a study of research while Methodology is the scientific process used by the researcher in conducting a study of research. It describes the processes, approaches, techniques, and tools employed in collecting, analysing, and interpreting data and the reasons for using specific methods. Methodology is the broad, general framework of the research and methods are the specific techniques employed in conducting the research. The study is based on secondary data and the data is reliable for analysis a majority portion of the data have been obtained from the “Handbook of Statistics on the Indian Economy, 2025-26, is published by the Reserves bank of India. Website of RBI is www.rbi.org.in and Department for Promotion of Industry and Internal Trade (DPIIT), Government of India, Foreign Direct Investment in India: Annual Issue 2025. Website of DPIIT is <https://dpiit.gov.in>. It is an annual publication that provides detailed time series data. The duration in which data has been analysed is 25 years annual data between the periods of 2000 to 2025. Econometrics analyses in this study were conducted using EViews 9. Descriptive analysis, Augmented Dickey-Fuller test for stationarity, trend analysis and growth rate analysis have been used.

Empirical analysis

Table:1.1

Trend Analysis of Forex reserves and FDI in India

Financial Year	Forex reserves in USD million	FDI in USD million
2000-01	42281	2463
2001-02	54106	4065
2002-03	76100	2705
2003-04	112959	2188
2004-05	141514	3219
2005-06	151622	5540
2006-07	199179	12492
2007-08	309723	24575
2008-09	251985	31396
2009-10	279057	25834
2010-11	304818	21383
2011-12	294397	35121
2012-13	292046	22423
2013-14	304223	24299
2014-15	341638	29737
2015-16	360176	40001
2016-17	369955	43478
2017-18	424545	44857
2018-19	412871	44366
2019-20	477807	49977
2020-21	576984	59636
2021-22	607309	58773
2022-23	578449	46034
2023-24	646419	44423
2024-25	668326	50018
2025-26	691108	58846

Source: Department for Promotion of Industry and Internal Trade (DPIIT), Government of India, Foreign Direct Investment in India: Annual Issue 2025. Handbook of Statistics on the Indian Economy 2025-26. (Reserves Bank of India)

The above table:1.1 of trend analysis indicates that FDI and Forex reserves in India have generally increased during 2000-01 to 2025-26. Forex reserves increased from 42,281 USD million in 2000-01 to 691,108 USD

million in 2025-26 while FDI increased from 2,463 USD million to 58,846 USD million during the same period. Forex reserves and FDI indicated an increasing trend in the initial part of the study period, but with varying magnitudes. Forex reserves increased considerably from 42,281 USD million in 2000-01 to 3,09,723 USD million in 2007-08. The same trend was observed for FDI, which grew from 2,463 USD million to 24,575 USD million during the specified time frame. But there were some year-to-year variations in the following years. For instance, Forex reserves declined in 2008-09 whereas FDI remained on the rise. During the later period, both variables had an overall increasing tendency once more. Forex reserves increased from 3,04,223 USD million in 2013-14 to 477,807 USD million in 2019-20 and further to 691,108 USD million in 2025-26. FDI increased from 24,299 USD million in 2013-14 to 49,977 USD million in 2019-20 and stood at 58,846 USD million in 2025-26, despite some intervening fluctuation.

Table:1.2

Growth Analysis of Forex reserves and FDI in India

Financial Year	Growth rate of Forex reserves	Growth rate of FDI
2000-01	-	-
2001-02	28%	65%
2002-03	41%	-33%
2003-04	48%	-19%
2004-05	25%	47%
2005-06	7%	72%
2006-07	31%	125%
2007-08	55%	97%
2008-09	-19%	28%
2009-10	11%	-18%
2010-11	9%	-17%
2011-12	-3%	64%
2012-13	-1%	-36%
2013-14	4%	8%
2014-15	12%	22%
2015-16	5%	35%
2016-17	3%	9%
2017-18	15%	3%
2018-19	-3%	-1%
2019-20	16%	13%
2020-21	21%	19%

2021-22	5%	-1%
2022-23	-5%	-22%
2023-24	12%	-3%
2024-25	3%	13%
2025-26	3%	18%
CAGR	11.82%	13.54%

Source: Growth rate calculated by the researcher.

The above table:1.2 reveals that there has been a significant long-term growth in Foreign Exchange Reserves and Foreign Direct Investment for India in the study period with the annual growth rates varying greatly for both. Forex reserves increased at a decent pace during the early 2000s period, recording 55% of growth in 2007–08, and the FDI growth was high, at 125% in 2006–07 and 97% in 2007–08 respectively. Both variables showed negative growth but especially in 2008-09 and 2022-23. However, the overall CAGR (Compound Annual Growth Rate) indicates that the rate of increase of FDI was higher (13.54%) than that of Forex reserves (11.82%). This indicates that there was substantial increase in FDI and Forex reserves in India during the study period with comparatively high volatility of FDI and slightly higher growth rate of FDI during the long-term period.

Figure: 1.1

Graphical Representation of Time Series of Forex Reserves and FDI in India

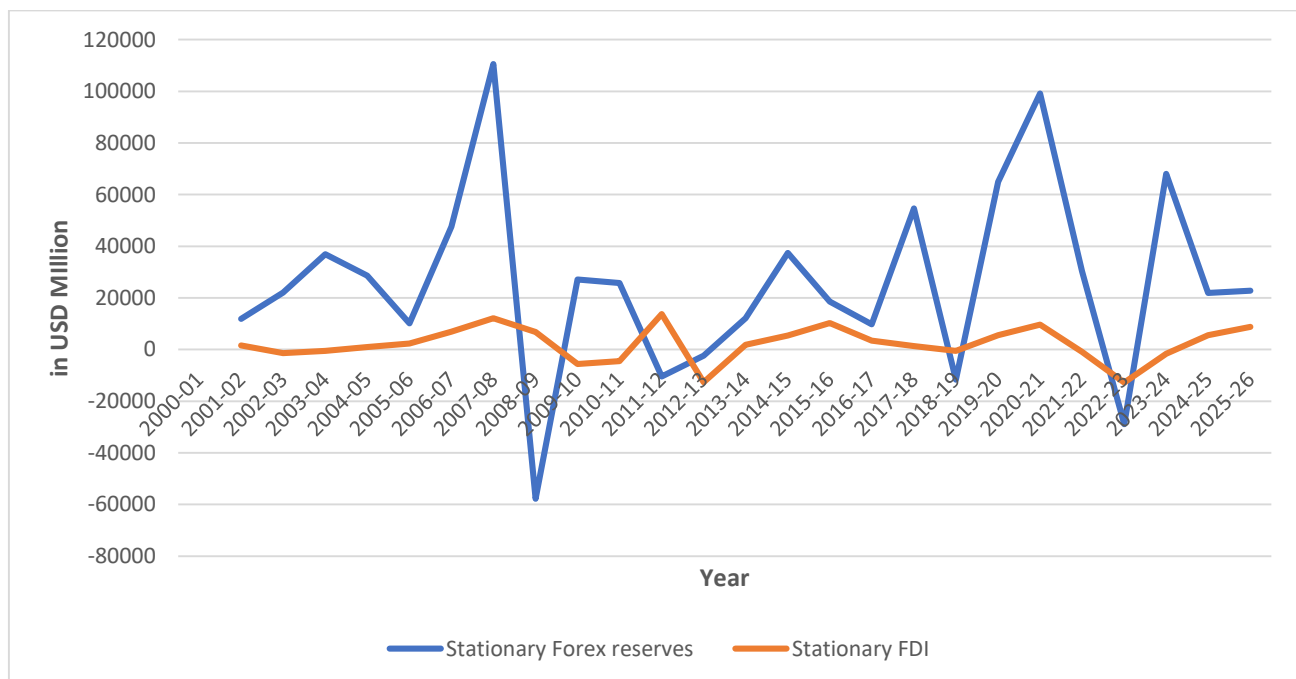


Figure:1.1 indicates movement of the Forex Reserves and FDI in India in the study period 2000 - 01 to 2025 - 26. There is large short-run variation in both variables shown on the graph. The volatility of the stationary Forex Reserves is relatively more than that of stationary FDI, as there were very sharp positive and negative movements of the stationary Forex Reserves during the study period. The positive change in Forex Reserves

is the highest in 2007–08 and 2020–21, and the negative change is the highest in 2008–09 and 2022–23. Likewise, there are also some fluctuations in FDI, with relatively high positive movements in 2007–08, 2011–12 and 2020–21, followed by some negative movements in the following years. Overall, the graph shows that both stationary series have high short-run fluctuations, Forex Reserves having higher fluctuations than FDI.

Policy Implications

The study's empirical results have a number of policy implications for India. First, in case Foreign Direct Investment is identified to be positively and significantly affecting foreign exchange reserves, there is a need for the Government to continue encouraging the flow of FDI in a stable and long-term basis. Second, export-oriented, productive FDI, and foreign exchange earnings and employment and domestic value addition, has to be the focus of attention. Third, additional efforts in improving the ease of doing business, regulatory transparency, infrastructure and investment facilitation would help to attract sustainable foreign investment. The last but not the least, FDI policy should not only be targeting the volume of FDI inflow but also quality of FDI inflow, sectoral diversification, technology transfer and export contribution dimension. Lastly, FDI policy should be harmonised with other foreign exchange and external-sector policy measures and integrated into a consistent external-sector stability framework to boost India's external-sector stability. The current FDI regime applies to India's existing FDI framework which is administered by DPIIT and foreign investment falls under the FEMA regime along with the rules and regulations.

Conclusion

The present study aimed to empirically analyse the trend, growth pattern and relationship between Foreign Direct Investment (FDI) inflows and foreign exchange reserves of India over the last 25 years (2000-01 to 2025-26) using secondary and tertiary data collected from the Handbook of Statistics on the Indian Economy and Annual FDI Report published by the Reserve Bank of India (RBI) and Department for Promotion of Industry and Internal Trade (DPIIT) respectively. The trend analysis showed that there has been a significant increase in both FDI inflows and foreign exchange reserves during the study period, FDI increased from USD 2,463 million in 2000-01 to USD 58,846 million in 2025-26 and Forex reserves from USD 42,281 million in 2000-01 increased to USD 691,108 million in 2025-26. The analysis of growth rate showed that both the variables were volatile over the years with significant drop during the global financial crisis of 2008-09 and correction phase of 2022-23, but the overall Compound Annual Growth Rate (CAGR) of FDI (13.54%) is also found a bit higher than Forex reserves (11.82%), implying a relatively stronger long period momentum in accumulation of FDI. Similarly, stationarity and graphical analysis suggested that Forex reserves have had more short run fluctuations than FDI during the study period. The results of the study generally support the idea that the inflow of FDI has consistently tracked the trend of increase in India's foreign exchange reserves, thereby reinforcing the need for a stable and sustainable FDI regime to enhance India's external financial position. But the study also points out that foreign exchange reserves are affected by several macroeconomic factors, apart from FDI, and therefore cannot be taken as a

standalone. Given these results it is recommended that the policymakers should pay attention to not only expanding the flow of capital into India from abroad, but also improve the quality of FDI inflows, diversify it by sectors and make it more export oriented. Moreover, FDI policy should be tightly coupled with overall policies relating to the external sector and foreign exchange management so that the policy is sustainable in the long term.

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