



Foreign Direct Investment and Macroeconomic Performance in India: An Empirical Analysis of GDP, Unemployment Rate, and USD/INR Exchange Rate Dynamics (2005–2024)

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Abstract

Foreign Direct Investment (FDI) has played an increasingly important role in the economic development of developing countries by bringing in capital, technology, and business expertise. Over the years, India has emerged as one of the leading destinations for FDI among emerging economies, attracting investments across sectors such as manufacturing, services, infrastructure, and technology. This study examines the impact of FDI on three key macroeconomic indicators in India-Gross Domestic Product (GDP), the unemployment rate, and the USD/INR exchange rate-during the period from 2005 to 2024. The analysis is based on secondary data obtained from the World Bank database and employs correlation and regression techniques using Microsoft Excel. The objective is to assess the extent to which FDI has influenced economic growth, employment levels, and exchange rate movements in India. The findings of the study contribute to a better understanding of the role of foreign investment in India's economy and provide insights that may assist policymakers in formulating strategies for sustainable economic development.

Keywords: Foreign Direct Investment, GDP, Unemployment Rate, Exchange Rate, USD/INR, India, Economic Growth, Regression Analysis, Correlation Analysis.



Introduction

Foreign Direct Investment (FDI) occurs when a company or investor from one country invests in a business located in another country with the intention of maintaining a long-term interest and some degree of control over its operations. Over time, FDI has become a key feature of globalization, helping countries attract capital, technology, and expertise. It plays an important role in supporting economic growth and development, especially in emerging economies such as India.

India's economic reforms and liberalization policies have made the country an increasingly attractive destination for foreign investors. As a result, FDI inflows have grown substantially over the years, contributing to industrial growth, technology transfer, infrastructure development, and overall economic progress. By bringing in additional capital and advanced technologies, FDI can enhance productivity and support economic expansion. It can also affect employment levels and exchange rate movements through increased investment and foreign currency inflows. Several studies on India have highlighted a positive long-term relationship between FDI and economic growth, emphasizing its important role in the country's macroeconomic development.

With foreign investment playing an increasingly important role in India's economic development, it is essential to understand how FDI influences key macroeconomic indicators. Examining its relationship with GDP, the unemployment rate, and the USD/INR exchange rate can provide valuable insights into the extent to which foreign investment contributes to economic growth, employment outcomes, and exchange rate movements in the country.

Statement of the Problem

Despite the significant increase in Foreign Direct Investment (FDI) inflows into India over the past two decades, its overall impact on key macroeconomic indicators remains a subject of debate. While numerous studies highlight the positive role of FDI in promoting economic growth, creating employment opportunities, and strengthening external stability, others argue that these benefits are not uniform and may depend on factors such as economic conditions, policy frameworks, and the sectors receiving investment. Given these differing perspectives, a comprehensive empirical examination is necessary to evaluate the actual influence of FDI on India's economic growth, employment generation, and exchange rate stability.

Objectives of the Study

The study aims to:

1. Examine the relationship between FDI and GDP in India.
2. Analyze the relationship between FDI and unemployment rate.
3. Analyze the relationship between FDI and USD/INR exchange rate.
4. Evaluate the impact of FDI on GDP through regression analysis.
5. Assess the impact of FDI on unemployment rate and exchange rate.

Review of Literature

The relationship between Foreign Direct Investment (FDI) and economic growth has been widely examined in recent years. Most studies indicate that FDI plays an important role in supporting economic development by increasing investment, improving productivity, and promoting the transfer of technology and managerial expertise. Through these channels, FDI can contribute to higher levels of economic growth and enhance the overall efficiency of the host economy.



A study by Rakesh Shahani and Aayushi found a positive long-term relationship between FDI and India's economic growth, indicating that foreign capital contributes significantly to GDP expansion.

The study by Dikshita Kakoti emphasized the importance of macroeconomic factors, particularly GDP growth and exchange rate movements, in shaping foreign investment inflows. The findings also revealed a close relationship between FDI and overall economic performance, suggesting that changes in economic conditions can influence investment decisions while foreign investment, in turn, contributes to economic development.

Recent studies by international development organizations indicate that Foreign Direct Investment (FDI) continues to play a vital role in the economic progress of developing countries. Other than, providing capital, FDI contributes to job creation, supports infrastructure development, and promotes sustainable long-term economic growth. These benefits make foreign investment an important driver of development and economic transformation.

Although several studies have explored the relationship between FDI and economic growth, fewer studies have simultaneously examined GDP, unemployment, and exchange rate effects using recent Indian data extending to 2024. This study attempts to address that gap.

Research Hypotheses

H01-There is no significant relationship between FDI and GDP.

H02-There is no significant relationship between FDI and Unemployment Rate.

H03-There is no significant relationship between FDI and USD/INR Exchange Rate.

Research Methodology

Research Design

The study adopts a quantitative and descriptive research design.

Data Source

The study is based entirely on secondary data obtained from the World Bank's World Development Indicators database. The dataset covers the period from 2005 to 2024.

Variables Used

Variable	Unit of Measurement
FDI	Billion US Dollars
GDP	Trillion US Dollars
Unemployment Rate	Percentage (%)
USD/INR Exchange Rate	Indian Rupees per US Dollar

Statistical Tools

The analysis is conducted using Microsoft Excel.

Correlation Analysis

Pearson's correlation coefficient is used to measure the degree and direction of association between FDI and the selected macroeconomic variables.



Regression Analysis

Three simple linear regression models are estimated.

Data Analysis and findings

Year	FDI (in billion USD)	GDP (in trillion USD)	Unemployment Rate %	USD to INR
2005	7.27	0.82	7.55	43.62
2006	20.03	0.94	7.55	44.48
2007	25.23	1.22	7.56	43.47
2008	43.41	1.2	7.66	40.02
2009	35.58	1.34	7.66	50.7
2010	27.4	1.68	7.65	44.9
2011	36.5	1.82	7.62	44.65
2012	24	1.83	7.67	50.88
2013	28.15	1.86	7.71	54.28
2014	34.58	2.04	7.67	59.94
2015	44.01	2.1	7.63	62.4
2016	44.46	2.29	7.6	66.25
2017	39.97	2.65	7.62	64.84
2018	42.12	2.7	7.65	65.04
2019	50.61	2.84	6.51	69.17
2020	64.36	2.67	7.86	75.39
2021	44.73	3.17	6.38	73.5
2022	49.94	3.35	4.82	75.79
2023	28.09	3.64	4.17	82.19
2024	27.14	3.91	4.2	83.43

FDI grew at an average of 14.6% from 2005 to 2020, from 2021 onwards till 2024 it fell at an average of 11.74%. GDP grew at an average of 8.12% from 2005 to 2020. Unemployment reduced at an average of 2.89%. USD to INR grew at an average of 3.3%.

(Source- World Bank's World Development Indicators database)

Correlation Analysis

Correlation between FDI and Selected Variables

Variables	Correlation Coefficient (r)
FDI and GDP	0.458
FDI and Unemployment Rate	-0.002
FDI and USD/INR	0.489

Relationship between FDI and GDP

The correlation coefficient between FDI and GDP is 0.458, which indicates a moderate positive relationship between the two variables. This implies that, in general, higher FDI inflows tend to be associated with higher



GDP levels in India. Such a relationship suggests that foreign investment may support economic growth through channels such as capital formation, technological progress, productivity gains, and employment generation. However, since the coefficient is below 0.50, the relationship is not particularly strong, indicating that GDP growth is also influenced by several other important factors beyond FDI.

Relationship between FDI and Unemployment Rate

The correlation coefficient between FDI and the unemployment rate is -0.002, which is effectively close to zero. This suggests that there is no meaningful linear relationship between FDI inflows and unemployment during the study period. Although the coefficient is slightly negative, its magnitude is too small to indicate any significant association. As a result, changes in FDI do not appear to have had a direct influence on unemployment levels in India over the period considered. Instead, employment outcomes are likely shaped by a wider set of factors, including demographic trends, structural changes in the economy, and broader macroeconomic conditions.

Relationship between FDI and USD/INR Exchange Rate

The correlation between FDI and the USD/INR exchange rate is 0.489, showing a moderate positive relationship. This means that, in general, higher FDI inflows are linked with a rise in the exchange rate during the study period. However, since the relationship is only moderate, it also suggests that changes in the exchange rate are affected by several other economic factors apart from FDI.

Regression Analysis

Regression Analysis of FDI and GDP

<i>Regression Statistics</i>								
Multiple R	0.457785919							
R Square	0.209567948							
Adjusted Square	0.165655056							
Standard Error	0.818250263							
Observations	20							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance</i>			
Regression	1	3.195252	3.195252	4.772356	0.04239			
Residual	18	12.0516	0.669533					
Total	19	15.24686						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	1.061036074	0.554052	1.915048	0.071515	-0.10298	2.225056	-0.10298	2.225056
FDI (billions)	0.031842134	0.014576	2.184572	0.04239	0.001219	0.062465	0.001219	0.062465



Regression Equation

$$GDP=1.061+0.0318(FDI)$$

The coefficient of determination (R^2) is **0.2096**, indicating that approximately **20.96% of the variation in GDP can be explained by FDI inflows**, while the remaining **79.04%** is explained by other factors such as domestic investment, government expenditure, exports, consumption, technological advancement, and policy changes. The coefficient of FDI is **0.03184**, which means that for every additional **USD 1 billion increase in FDI inflows**, India's GDP is expected to increase by approximately **USD 0.0318 trillion (or about USD 31.8 billion)**, assuming other factors remain constant. The p-value for FDI (**0.04239**) is less than 0.05, indicating that the coefficient is statistically significant. Hence, null hypothesis (H_0) is rejected.

Regression Analysis of FDI and Unemployment Rate

Regression Statistics								
Multiple R	0.00195069							
R Square	0.000004							
Adjusted Square	-0.05555153							
Standard Error	1.236040168							
Observations	20							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	0.00010464	0.000105	6.85E-05	0.993488			
Residual	18	27.50031536	1.527795					
Total	19	27.50042						
Coefficients								
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	7.043538048	0.836944808	8.415774	1.18E-07	5.285182	8.801894	5.285182	8.801894
FDI (billions)	-0.00018222	0.022018219	-0.00828	0.993488	-0.04644	0.046076	-0.04644	0.046076

Regression Equation

$$\text{Unemployment Rate}=7.0435-0.000182(FDI)$$

The regression results show a very small negative relationship between FDI and unemployment, but this relationship is not statistically significant ($p = 0.993$). The model also explains almost none of the changes in unemployment rates ($R^2 = 0.000004$). Overall, the results suggest that FDI inflows did not have any meaningful impact on unemployment during the study period. Hence, we fail to reject null hypothesis (H_0).



Reasons for the statistically insignificant impact of FDI on the unemployment rate.

1. Capital-Intensive Investments

Many foreign companies invest in sectors such as telecommunications, petroleum, automobiles, and infrastructure. These industries depend more on machines and technology than on human labour, so they tend to create relatively fewer jobs compared to the level of investment.

2. Focus on Skilled Workers

FDI often creates jobs mainly for highly skilled and educated workers. However, since a large share of India's workforce is low-skilled, many people do not fully benefit from these employment opportunities.

3. Investment in Services Rather Than Manufacturing

A large portion of FDI goes into service sectors such as finance, IT, and e-commerce. These industries usually generate fewer jobs compared to labour-intensive manufacturing sectors.

4. Automation and Advanced Technology

Foreign firms often introduce modern technology and automated production methods, which reduces the need for a large workforce.

5. Regional Concentration

FDI is mainly concentrated in a few states and urban areas that have better infrastructure. This limits job opportunities in rural and less-developed regions.

6. Limited Linkages with Local Industries

Some foreign companies rely on imported components and raw materials instead of sourcing them locally. This reduces the creation of indirect jobs in supporting industries.

Regression Analysis of FDI and USD/INR

Regression Statistics								
Multiple R	0.488525							
R Square	0.238657							
Adjusted Square	0.19636							
Standard Error	12.56708							
Observations	20							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance</i>			
Regression	1	891.1156	891.1156	5.642422	0.028846			
Residual	18	2842.765	157.9314					
Total	19	3733.881						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	40.66794	8.509391	4.779184	0.00015	22.79037	58.54551	22.79037	58.54551
FDI (billions)	0.531761	0.223864	2.375378	0.028846	0.061441	1.002082	0.061441	1.002082



Regression Equation

$$\text{USD/INR} = 40.668 + 0.532(\text{FDI})$$

The coefficient of determination (R^2) is **0.238657**, which means that about **23.86%** of the variation in USD/INR can be explained by FDI inflows. The remaining **76.14%** is influenced by other factors such as inflation, interest rates, trade deficits, oil prices, foreign reserves, current account deficits, foreign portfolio investment, monetary policy, and global economic conditions, including US Federal Reserve policy. The FDI coefficient is **0.5318 and positive**, suggesting that a **1 billion USD increase** in FDI is associated with an increase of about **0.53 rupees** in the USD/INR exchange rate, assuming other factors remain constant. Since the USD/INR rate shows how many rupees are needed to buy one US dollar, this rise indicates a depreciation of the Indian rupee against the US dollar. In addition, the p-value of FDI (**0.0288**) is below 0.05, which means the result is statistically significant. Hence, we reject null hypothesis (H_0).

Reasons for the continued depreciation of the Indian Rupee despite increasing FDI inflows

Although FDI inflows increased during the study period, the Indian rupee still continued to depreciate against the US dollar due to several economic factors. India has regularly faced trade and current account deficits, as imports of crude oil, electronics, and machinery have been higher than exports, increasing the demand for US dollars. In addition, periods of a strong US dollar, supported by higher interest rates and global economic uncertainty, have also put pressure on the rupee. The positive effect of FDI was likely reduced by other capital outflows such as foreign portfolio investment withdrawals, repayment of external debt, and profit repatriation by foreign firms. Many FDI projects also depend on imported machinery and technology, which further increases demand for foreign currency. Differences in inflation rates between India and its trading partners may have added to the depreciation over time. As foreign investment in India grew, higher payments in the form of profits, dividends, and royalties to overseas investors also increased dollar demand. Overall, despite rising FDI inflows, these inflows were not enough to offset the combined impact of imports, capital outflows, debt repayments, and global financial conditions, leading to a continued weakening of the rupee.

Conclusion

This study analyzed the impact of Foreign Direct Investment on GDP, unemployment, and the USD/INR exchange rate in India over the period 2005–2024, using World Bank data along with statistical tools such as correlation and regression analysis. The results suggest that FDI has supported economic growth in India, but its effect on job creation has been limited. Its relationship with exchange rate movements is also shaped by several domestic and global economic factors.

Overall, the findings indicate that simply increasing FDI inflows is not enough. Policymakers should also encourage investment in labour-intensive sectors, improve linkages with domestic industries, develop workforce skills, and ensure macroeconomic stability in order to fully benefit from foreign investment.

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