



Examining the Relationship Between Government Finances and Foreign Exchange Reserves in India

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Abstract: This study examines the relationship between India's central government financial indicators and foreign exchange reserves over the past decades. Using regression analysis, we investigate how government receipts and expenditures influence forex reserves, a crucial indicator of economic stability. Descriptive analysis and data visualization techniques are used to identify key trends before applying regression modelling. The findings seek to shed light on how fiscal policy decisions impact foreign exchange reserves, providing implications for economic policymakers. Government revenue and spending influence trade balances, inflation, and foreign capital flows, which impact forex reserves. A fiscal deficit can lead to increased borrowing, currency depreciation, and reserve depletion. Studying the relationship between government receipts, expenditure, and foreign exchange reserves is crucial for understanding a country's macroeconomic stability and policy effectiveness. The results can help policymakers optimize fiscal strategies to maintain adequate foreign reserves, ensuring economic stability and growth.

Index Terms: Government Receipts, Government Expenditure, Forex Reserves, Regression tool

I. INTRODUCTION

India's economic stability is influenced by a variety of financial factors, with government fiscal policies playing a crucial role in shaping foreign exchange reserves. These reserves act as a foundation for the economy, providing financial security, currency stability and trade support. The relationship between government revenue, expenditure, and trading services and forex reserves has been a key area of focus in economic analysis and policy discussions.

This study examines how the financial indicators of India's central government - specifically its receipts, FDI, and trading services - impact foreign exchange reserves over recent decades. By using regression analysis, we aim to understand how fiscal and trade-related decisions contribute to the accumulation and depletion of these reserves. Additionally, data visualization techniques will be utilised to identify key trends before applying statistical models to explore these relationships in greater detail.

Effective fiscal policy and trade performance play a vital role in strengthening foreign reserves. Maintaining a trade balance, controlling inflation, and attracting foreign investments can enhance reserves. On the other hand, fiscal deficits and weak trade performance may lead to increased borrowing, currency depreciation, and declining reserves, which can threaten economic stability. Understanding this dynamic is essential for policymakers to create strategies that optimize fiscal management, trade policies, and foreign reserve accumulation.

II. LITERATURE REVIEW

This paper analyzes the impact of foreign exchange rates on the foreign exchange reserves and the real Gross Domestic Product in India. Empirical evidence, as highlighted in this study, shows that currency depreciation causes an increase in foreign exchange reserves and economic growth. ("(PDF) Analysing the Impact of Foreign Exchange Rate on Macroeconomic Variables in India," 2024)

As highlighted in the study, the Reserve Bank of India has intervened occasionally to maintain orderly conditions and curb excessive volatility in the foreign exchange market. (*Intervention in Foreign Exchange Markets: The Approach of the Reserve Bank of India*, n.d.)

A study on India's BALANCE OF PAYMENTS is obtained primarily as a by-product of ITRS, i.e., the system of reporting of foreign exchange transactions undertaken by banks in fortnightly returns to the RBI. (*JETIR2012380.Pdf*, n.d.)

Another study emphasizes that the accumulation of foreign exchange reserves in India is best explained as a function of exchange rate volatility and the degree of economic openness. (Romero, n.d.)

Additionally, research suggests that an increase in government purchases causes real exchange rates to appreciate and increases consumption significantly in developing countries; it causes real exchange rates to depreciate and decreases consumption in advanced countries. (Miyamoto et al., 2019)

One study finds that government spending has a positive but insignificant effect on the exchange rate, suggesting that government spending is not a reliable policy instrument for exchange rate stability. The government should invest in capital expenditures on infrastructure and human capital development. (*(PDF) Does Government Expenditure Has Any Impact on Exchange Rate in Nigeria*, 2025a)

Scholars in one of the papers have identified two transmission mechanisms: the cost channel, by which wage government spending and labor taxes raise the real wage firms must pay, and the exchange rate channel, by which the nominal exchange rate shifts induced by fiscal policy have real effects if (some) prices and wages are sticky. (Lane & Perotti, 2003)

Theoretical and empirical studies of aggregate import behavior generally show the flow of imports to be determined chiefly by aggregate economic activity and by import prices relative to prices of domestically produced substitutes. (Hemphill, 1974)

One research study highlights that high-frequency cross-asset correlations, especially with the futures market, have become more important. (Chaboud et al., n.d.)

Another study finds that an increase in government purchases leads to an expansion in output and private consumption, a deterioration in the trade balance, and a depreciation of the real exchange rate however, this study notes that an increase in government spending consumption and wages fail to increase on impact, which is consistent with the empirical evidence stemming from the narrative identification approach. ((PDF) Does Government Expenditure Has Any Impact on Exchange Rate in Nigeria, 2025b)

Research on Globalization and economic integration has an impact on increasing trade volume and economic growth in various countries. The study emphasizes that exchange rates and inflation also affect export growth, imports, and economic growth. The results show that foreign direct investment and government spending can significantly increase the rate of exports and imports. Meanwhile, the depreciating rupiah against the US dollar cannot encourage an increase in both exports and imports. Furthermore, foreign direct investment, government spending, and economic openness can significantly increase economic growth. (Hidayat et al., 2024)

Furthermore, another study has examined the impact of high government expenditure and an increase in foreign borrowing on FX reserves. Findings suggest that developments in government expenditure may hinder monetary policy effectiveness. It is important to ensure macroeconomic balance and appropriate coordination between fiscal and monetary policies. (Manuel et al., 2023)

III. RESEARCH OBJECTIVES

- Examine how foreign direct investment (FDI), government receipts, and trade in services influence foreign exchange reserves using correlation and regression analysis.
- To visualize the trends in foreign exchange reserves, fiscal indicators, and trade in services
- To provide policy recommendations based on the findings of the paper

IV. METHODOLOGY

This study uses quantitative research to analyze the impact of government receipts, expenditures, and trade in securities on foreign exchange reserves in India. Secondary data is used from government websites, international organization reports, and previous studies to analyze the relationship. This study focuses on the data of 54 years, i.e., from 1970 to 2024

IV.1 Variables

FOREIGN EXCHANGE RESERVES: Foreign exchange reserves are assets a country's central bank holds to manage its currency and economy. These assets are also known as forex reserves.

FOREIGN DIRECT INVESTMENT: Foreign direct investment (FDI) is an investment made by a company or an individual in one country into business interests located in another country. FDI is an important driver of economic growth.

GOVERNMENT RECEIPTS: Government receipts are the money a government receives from various sources, including taxes, fees, and other sources. These receipts are used to fund government spending.

TRADE IN SERVICES OF GDP: Trade in services as a percentage of GDP is the sum of a country's service exports and imports divided by its GDP. The World Bank and OECD provide data on trade in services.

IV.2 Analytical Tools:

In this research paper, various tools were used to measure the interdependence of Gross Domestic Product (GDP) on agricultural income. The tools used are

i. **Graphs and Charts** - Visual aids like graphs and charts are invaluable tools for illustrating complex relationships, trends, and patterns. When studying the relationship between government indicators and forex reserves, graphs and charts will serve multiple purposes, like they help to clarify concepts, providing a quick visual representation of trends, supporting hypothesis testing, and enabling better understanding of the data for the people.

ii. **Regression analysis:** This tool is used to examine relationships between a dependent variable and one or more independent variables. This paper analyzes how forex reserves (dependent variable) are influenced by government receipts, expenditures, and trade in services (independent variable). Here is an example of equation regression analysis.

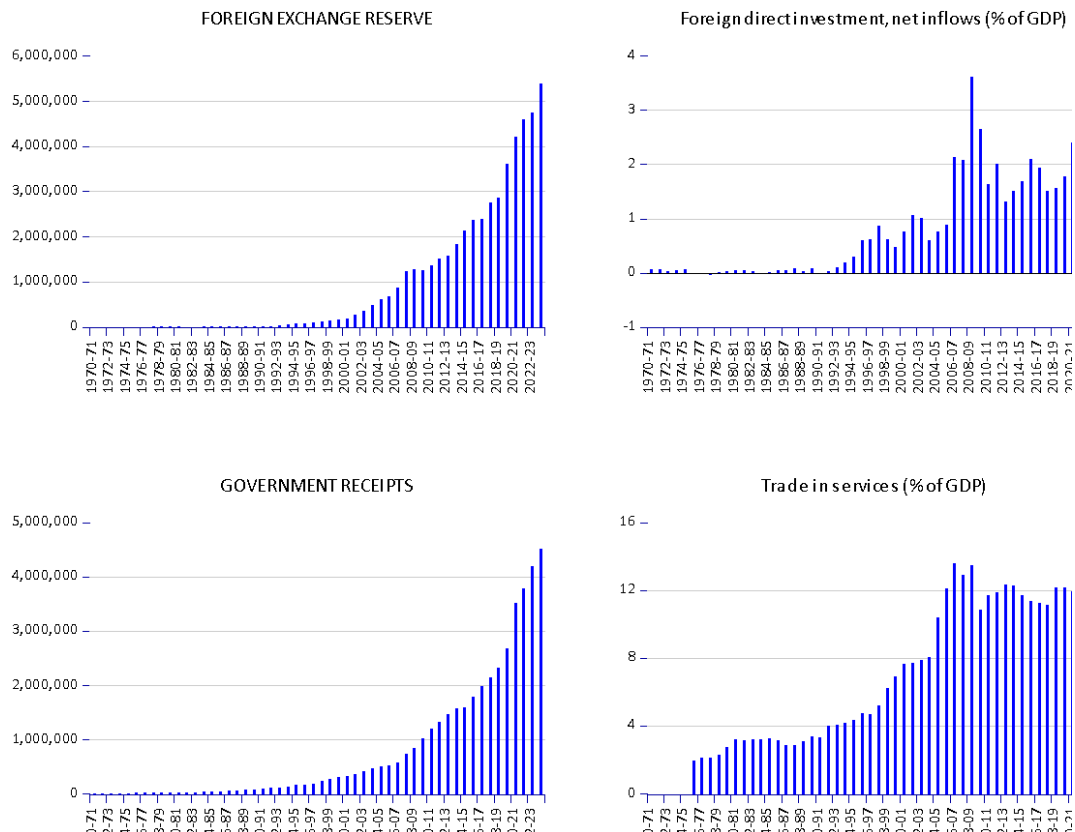
$$\text{EQUATION: } Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where α = intercept, β_1 = slope of the Foreign Direct Investment, β_2 = slope of the government receipts, β_3 = slope of trade in services, Y = Forex Reserves, X_1 = Foreign Direct Investment, X_2 = government receipts, X_3 = trade in services, ϵ = error

iii. **Correlation:** It is used to examine the strength and direction of relationships between the dependent and independent variables, as mentioned above.

V. DATA ANALYSIS AND INTERPRETATION

Graph 1.1



The four bar charts in Graph 1.1 depict trends in **Foreign Exchange Reserves**, **Foreign Direct Investment (FDI) Net Inflows (% of GDP)**, **Government Receipts**, and **Trade in Services (% of GDP)** over time. The **Foreign Exchange Reserves** and **Government Receipts** show a strong upward trajectory, indicating rising fiscal strength and accumulation of reserves. **FDI inflows exhibit volatility**, with periods of sharp spikes and dips, suggesting fluctuating investor confidence. **Trade in Services (% of GDP)** has shown a steady increase, reflecting growth in the services sector's contribution to the economy. The overall trends align with increasing economic openness and global integration.

V.1. DESCRIPTIVE ANALYSIS

Table 1.1_Descriptive Analysis Results

	FOREIGN_EX CHANGE_RES ERVE	FOREIGN_DI RECT_INVEST MENT_NET_I NFWLWS____O F_GDP_	GOVERNMEN T_RECEIPTS	TRADE_IN_SE RVICES____OF _GDP_
Mean	917127.2	0.799680	781336.9	7.460435
Median	105418.5	0.600437	210393.0	6.926508
Maximum	5391256.	3.620523	4517137.	14.49888
Minimum	733.0000	-0.029682	5339.000	1.924416
Std. Dev.	1419841.	0.883736	1153330.	4.284138
Skewness	1.679793	0.997356	1.810045	0.182655
Kurtosis	4.871750	3.327057	5.463146	1.380968
Sum	49524871	43.18275	42192193	365.5613
Sum Sq. Dev.	1.07E+14	41.39244	7.05E+13	880.9844
Observations	54	54	54	49

As per the results shown in Table 1.1, the data's wide standard deviations and positive skewness indicate that government receipts and foreign exchange reserves are highly variable, with the potential for substantial expansion over time. As seen by its high standard deviation (0.88) and kurtosis (3.33), which show sporadic spikes, FDI Net Inflows (as a percentage of GDP) typically have a mean of 0.8%. The trajectory of trade in services as a percentage of GDP is comparatively stable, and its distribution is close to normal and its standard deviation is smaller. whereas the minimum FDI value is negative, it reflects sporadic periods of disinvestment, whereas the positive skewness in reserves and revenues indicates strong economic expansion.

V.2. CORRELATION ANALYSIS

Table 1.2_Correlation Analysis Test Results

	FOREIGN_EXCHANGE_RESERVE	FOREIGN_DIRECT_INVESTMENT__NET__INFLOWS____OF_GDP__	GOVERNMENT_RECEIPTS	TRADE_IN_SERVICES____OF_GDP__
FOREIGN_EXCHANGE_RESERVE	1.0000	0.6066	0.9956	0.7833
FOREIGN_DIRECT_INVESTMENT__NET__INFLOWS____OF_GDP__	0.6066	1.0000	0.5721	0.8654
GOVERNMENT_RECEIPTS	0.9956	0.5721	1.0000	0.7651
TRADE_IN_SERVICES____OF_GDP__	0.7833	0.8654	0.7651	1.0000

Results given in Table 1.2 show that Foreign exchange reserves and government receipts have a strong positive association (0.9956), according to the correlation matrix, suggesting that higher government revenue is linked to bigger foreign reserves. Additionally, FDI inflows (0.6066) and service trade (0.7833) have a moderate connection with foreign exchange reserves, indicating that both external investments and service exports play a role in reserve accumulation. Trade in services and FDI inflows show a substantial association (0.8654), suggesting that economies that draw FDI also typically have robust services trade sectors. In general, these correlations demonstrate how commerce, external investments, and fiscal strength are all interrelated in affecting foreign reserves.

V.3 REGRESSION ANALYSIS

Table 1.3_Regression Analysis Test Results

Dependent Variable: FOREIGN_EXCHANGE_RESERVE				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FOREIGN_DIRECT_INVESTMENT__NET__INFLOWS____OF_GDP__	103708.0	41500.91	2.498933	0.0162
GOVERNMENT_RECEIPTS	1.195797	0.024392	49.02490	0.0000
TRADE_IN_SERVICES____OF_GDP__	-4572.460	11025.85	-0.414704	0.6803
C	-74876.89	46422.07	-1.612959	0.1137

Regression statistic	
R-squared	0.993271
Adjusted R-squared	0.992822
S.E. of regression	123634.9
Mean dependent variable	1010620.
SD dependent variable	1459306

$$FER = -74,876.89 + (103,708 \times X_1) + (1.1958 \times X_2) + (-4,572.46 \times X_3) + \epsilon$$

The R² value is 0.9933, indicating that 99.33% of the variation in Foreign Exchange Reserves is explained by the independent variables, confirming a strong model fit. The regression equation shows that with every 1% increase in FDI Net Inflows, Foreign Exchange Reserves increase by 103,708 units, assuming that other control variables remain constant. The equation also shows that every one-unit increase in Government Receipts leads to a 1.1958 increase in Foreign Exchange Reserves, emphasizing the crucial role of government revenue in reserve accumulation. The model indicates that with every one-unit increase in Trade in Services (% of GDP), Foreign Exchange Reserves decrease by 4,572.46 units, though this result is statistically insignificant. The intercept (-74,876.89) suggests that if all independent variables were zero, the foreign exchange reserves would be negative, though this has no practical interpretation.

VI. CONCLUSION

This study analysed the relationship between India's foreign exchange reserves and three key financial indicators: government receipts, foreign direct investment (FDI), and trade in services. By utilizing regression and correlation analysis, the research aimed to identify how these factors contribute to the accumulation or depletion of foreign reserves over the past five decades.

As of December 2024, India's foreign exchange reserves stood at approximately **\$547.5 billion**, reflecting a decline from **\$570.0 billion** in the previous month. The reserves had reached an all-time high of **\$617.1 billion** in September 2024, demonstrating their dynamic nature influenced by economic policies and global market conditions. FDI inflows into India also showed significant growth, with an inflow of **\$6.838 billion** in December 2024. Over the period from 1998 to 2025, the average monthly FDI stood at **\$2.758 billion**, indicating an increasing trend in foreign investment. Furthermore, the services sector played a crucial role in India's economic growth, contributing significantly to trade balances and boosting foreign exchange reserves.

The correlation analysis revealed a strong positive relationship between government receipts and foreign exchange reserves, indicating that increased government revenue strengthens reserve accumulation. Similarly, a moderate positive correlation was observed between FDI and foreign exchange reserves, suggesting that higher FDI inflows contribute to reserve growth. Trade in services also exhibited a positive correlation, emphasizing the importance of the services sector in maintaining India's foreign exchange stability.

In conclusion, the study provides empirical evidence that government receipts, FDI, and trade in services are key determinants of India's foreign exchange reserves. Strengthening these areas through strategic economic policies will ensure stability, enhance financial resilience, and promote sustainable economic development.

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