

“A Study on Factors Affecting Foreign Exchange Rate of India (Trade balance & Government Debt)”

Dr. Komal P Patel

Associate Professor, MBA Department, Sunshine Group of Institutions Rajkot

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Abstract: In simple terms, the exchange rate represents the value of one nation's currency in relation to another. It determines how much of one currency be exchanged for another and plays a crucial role in international trade and finance. Often referred to as the foreign exchange rate or forex rate, it influences economic stability, trade competitiveness, and investment flows between countries. Exchange rates are determined in the forex market, a global marketplace where various participants engage in continuous currency trading, operating 24 hours a day except on weekends. The spot exchange rate represents the current value at which currencies are exchanged. In contrast, the forward exchange rate is an agreed-upon rate set today for a transaction that will be executed on a future date. In both developed and developing nations, various stakeholders such as foreign exchange investors, exporters, importers, banks, businesses, financial institutions, and travelers base their decisions on exchange rate fluctuations. Changes in exchange rates affect the value of international reserves, influence the competitiveness of exports and imports, determines the cost of repaying foreign debts, and impact travel expenses by altering the purchasing power of a currency. Therefore, fluctuations in exchange rates greatly influence the business cycle, trade dynamics, and capital movements within an economy. Understanding these changes is vital for analyzing financial trends and evaluating shifts in economic policy.

Key Words: Currency, Forex Market, Export & Import, Exchange Rates

I. Introduction:

Mainly there are two types of exchange rates:

1. Fixed
2. Floating

In fixed exchange rate system, the central bank or financial regulatory authorities of a country determine and maintain the currency's value at a set rate. On the other hand, floating exchange rates are influenced by market forces, primarily supply and demand dynamics, without direct government intervention. When the **rupee appreciates** its value increases relative to other currencies. In the result of that, export becomes expensive and import becomes cheaper. On the other hand, when the **rupee depreciates** its value decreases relative to other currencies, which results the export becomes cheaper and import becomes expensive.

(Shah & Modi, A Study on factors affecting exchange rate in foreign exchange market, June, 2020)The foreign exchange market in India began in 1978 when banks were allowed to engage in intraday currency trading. However, significant transformation that shaped the modern foreign exchange market occurred during the 1990s. Up until 1992-1993, the Indian government maintained full control over the foreign exchange rates, import-export policies, foreign direct investment (FDI), foreign institutional investment (FII) among other aspects.

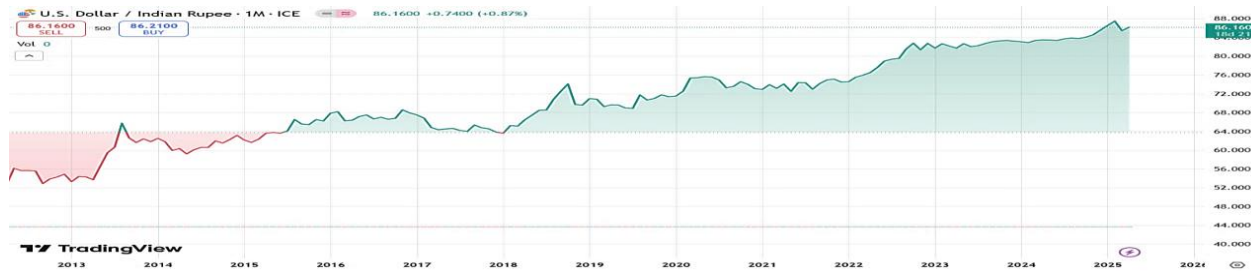
To facilitate government regulation of exchange rates, the Foreign Exchange Regulation Act (FERA), was enacted in 1973. However, following the economic reforms of 1991, the Indian government adopted a more liberal approach, leading to the introduction of the Foreign Exchange Management Act (FEMA) in 1999. This act eased restrictions on foreign exchange trading and streamlined import-export procedures, fostering a more open economy.

Despite these liberalizations, the Reserve bank of India (RBI) retains the authority to regulate exchange rates and oversee foreign exchange transactions. Since May 2013, the Indian foreign exchange market has experienced periods of significant volatility. To mitigate the depreciation of the Indian Rupee, policies have included adjustments to the Cash Reserve Ratio (CRR), trading restrictions, and market interventions.

The Indian foreign exchange market primarily operates with four major currency pairs, which account for a significant portion of transactions in the Multi Commodity Exchange. These pairs include USD/INR (Us Dollar/Indian Rupee), EUR/INR (Euro/Indian Rupee), JPY/INR (Japanese Yen/Indian Rupee), and GBP/INR (British Pound/Indian Rupee). Additionally, various other currencies can be traded in the international market.

Here are the historical data of Indian Rupee with four major currencies of last 10 years

USD/INR



EUR/INR



JPY/INR



GBP/INR



II. Literature Review:

(Soni, 2025) This study aims to explore the relationship between trade and exchange rate fluctuations in India. It offers an empirical addition to the existing body of literature that has been analyzed to date. The study focuses on variables such as exports, imports of goods and services, and the exchange rate in India. While all components of foreign trade are considered explanatory variables, the nominal exchange rate of the Indian rupee against the US dollar serves as the dependent variable. The analysis relies predominantly on secondary data sourced from the Reserve Bank of India, covering a span of 32 years, from 1991 to 2022. A Multiple Regression model is employed to assess the extent of the relationship among these variables. The study's findings indicate that exports and imports are key factors in explaining fluctuations in the exchange rate. Notably, many previous studies have concentrated on understanding the impact of exchange rates on foreign trade in both developing and emerging economies, as highlighted in the literature review. However, this research emphasizes the significance of foreign trade's influence on the nominal exchange rate in India. It contributes to the existing literature by demonstrating that an increase in exports can lead to an appreciation of the exchange rate, and vice versa. Therefore, the Indian government should consider implementing measures to boost exports, which would help stabilize the nominal exchange rate.

(Savani, 2024) This study examines the issue of foreign exchange rate exposure in the Indian information technology (IT) sector. Foreign exchange exposure is particularly important for firms in the Indian IT sector, as a major part of their revenue is derived from exports.

Dash and Madhava (2009) found positive foreign exchange exposure for the sector in the period 2005-07, and alarmingly high level of exposure for some small-cap IT companies. Since then, in the aftermath of the global financial crisis, the nature of the IT sector has dramatically changed, with lower dependence on the US market in particular. The present study assesses whether there is still significant positive foreign exchange exposure in the Indian IT sector, and whether there is still a significant difference in foreign exchange exposure

(Shah M. S., 2024) The study gives an overview of the various determinants of the exchange rate movements in India. Out of the multiple factors affecting the Rupee-Dollar value the impact of Interest rate differential, Trade deficit of India, Foreign Net investment inflows to India, Oil prices, and Gold prices (in the short term) on the exchange rate has been studied using Regression analysis and correlation and the role they played by the above mentioned variables in determining the exchange rate during the Global Financial Crisis of 2008-2010 and during the Covid-19 Period from 2020-2023.

(Joshi, Kulakarni, Pimplapure, Baral, & Gharpure, 2023) This paper attempts to explore the effects of the exchange rate movement in India and its impact on Indian trade and economy. The circumstances which have been created for the economy due to the depreciation of the rupee against the dollar reveal that there has been a strong and significant negative impact of this currency volatility on many sectors.

(Shah & Modi, A Study on factors affecting exchange rate in foreign exchange market, June, 2020) The research focuses over factors that influence foreign exchange rate with increased focus over impact of crude oil prices over exchange rate and impact of NSE (Nifty 50) equity investment on share prices. For conducting analysis, the historical data of past 10 years is taken into consideration and results are derived by conducting univariate analysis, correlation analysis, regression, and R-square analysis. Upon analysis of the data collected findings suggest that crude oil prices have significantly less impact as compared to the impact caused by the price and investment in Nifty 50. Since the past 10 years Indian rupee has faced depreciation. The continuous fall in Indian rupee is warning signal for the Indian economy and all its sectors.

(Venkatesan & Ponnammam, March 2017) The Indian Rupee is launching its foot print in global market, which can be characterized by the fact that Bhutan and Nepal peg their currencies to Indian Rupee. In this context, the research focuses to find and evaluate the various macroeconomic factors affecting the exchange rate and to model the factors using Auto Regressive Distributive Lag, to enable to forecast rate. The research focuses on finding the significant factors influencing the volatility of the exchange rate.

Objectives of The Study:

General

1. To study the relationship of each individual independent variable with exchange rate.
2. To formulate a statistically significant regression model depicting the impact of significant variables on exchange rate changes.
3. To study the statistically significance of each independent variable in determination on exchange rate individually.

Research:

1. To know Trade balance (Trade surplus) influences the exchange rate
2. To know Government debt influences the exchange rate

Research Statement:

“A Study on Factors Affecting Foreign Exchange Rate of India (Trade balance & Government Debt)”

Research Methodology

Research Design:

The research design for this research is descriptive and casual.

Sources of Data:

The data used in this research report are secondary data which are collected from Statista websites. Other data for literature review and industry overview etc. are collected from the various sources like other research papers and various websites.

Data Collection Method:

For this report the secondary data collection method is used which are collected from the internet.

Sample Design:

In this research report the past 10 years data of foreign exchange rate and other factors which affects foreign exchange rate are taken for the study. So, this is retrospective study where we use data from past events.

Data Analysis Technique:

Here in this research, we have used the regression analysis model to know the relationship of various factors with the foreign exchange rate.

Hypothesis

H1: Trade balance (Trade surplus) positively influences the exchange rate

H2: Government negatively influences the exchange rate

Analysis & Interpretation

Trade balance

H5: Trade balance (Trade surplus) positively influences the exchange rate

Calculation:

Regression Statistics	
Multiple R	0.439568
R Square	0.19322
Adjusted R Square	0.103577
Standard Error	0.099943
Observations	11

ANOVA:

	df	SS	MS	F	Significance F
Regression	1	0.02153	0.02153	2.155454	0.176125
Residual	9	0.089897	0.009989		
Total	10	0.111427			

Coefficient:

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	4.366262	0.093644	46.6263	4.81E-12	4.154425	4.578099
TB	-0.03625	0.02469	-1.4681	0.176125	-0.0921	0.019604

Interpretation:

- The Multiple R value is 0.4396 which shows moderate positive relationship between these two variables.
- As indicated in above table of regression analysis, the R-Square value is 0.1932, which indicates that the independent variable trade balance causes 19.32% change in the dependent variable exchange rate.
- The ANOVA table shows that P-value is 0.1761 which is higher than 0.10, hence there is no significance relationship between trade balance and exchange rate.
- As per coefficient table, the coefficient is -0.0363 which means one unit change in independent variable inflation rate will bring -0.0363-unit change in dependent variable.

Hence the hypothesis,

H5: Trade balance (Trade surplus) positively influences the exchange rate

Is not accepted here in this case.

Government debt

H7: Government negatively influences the exchange rate

Calculation:

Regression Statistics	
Multiple R	0.971309
R Square	0.943441
Adjusted R Square	0.937156
Standard Error	0.026462
Observations	11

ANOVA:

	df	SS	MS	F	Significance F
Regression	1	0.105125	0.105125	150.1253	6.45E-07
Residual	9	0.006302	0.0007		
Total	10	0.111427			

Coefficient:

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	1.465976	0.226225	6.480159	0.000114	0.954219	1.977734
G. Debt	0.388637	0.031719	12.25256	6.45E-07	0.316884	0.46039

Interpretation:

- The Multiple R value is 0.9713 which shows highly positive relationship between these two variables.
- As indicated in above table of regression analysis, the R-Square value is 0.9434, which indicates that the independent variable government debt causes 94.34% change in the dependent variable exchange rate.
- The ANOVA table shows that P-value is 6.45 which is higher than 0.10, hence there is no significance relationship between government debt and exchange rate.
- As per coefficient table, the coefficient is -0.0363 which means one unit change in independent variable inflation rate will bring -0.0363-unit change in dependent variable.

Hence the hypothesis,

H7: Government negatively influences the exchange rate

is not accepted here in this case.

III. Findings:

- Among all the factors studied, interest rate had the most visible impact on the value of the Indian Rupee. When interest rates change, it affects how investors move their money, which in turn impacts the exchange rate.
- Other factors like GDP, inflation, trade balance, foreign exchange reserves, and government debt were also analyzed, but their effect on the exchange rate was not strong enough to be considered significant in this study.
- Even though some of these factors showed a relationship with the exchange rate, the results were not consistent or strong enough to confirm that they directly cause the currency to rise or fall.
- The overall conclusion is that the exchange rate is not controlled by a single factor. It is influenced by many things happening together in the economy.
- Therefore, managing just one economic indicator won't be enough. A combined and balanced approach is needed when it comes to keeping the rupee stable.

Limitations of The Study:

- The study used only 10 years of annual data, which may not fully capture long-term trends or the effects of sudden economic shocks.
- The research focused on a limited set of macroeconomic indicators, excluding several key factors like capital flows, investor sentiment, and global financial conditions.
- The analytical model used was simple linear regression, which may not fully reflect the dynamic and non-linear interactions that typically influence foreign exchange rates.
- The findings are specific to India's exchange rate behavior in relation to the US dollar and may not be applicable to other currency pairs or economies without further contextual analysis.

IV. Conclusion

This study aimed to understand the key factors that influence the foreign exchange rate of India, with a special focus on the INR/USD currency pair. Through a detailed analysis of variables such as interest rate, GDP, inflation, foreign exchange reserves, trade balance, and government debt, we found that the exchange rate is shaped by a combination of many economic elements.

Among all the factors studied, interest rate showed the most significant impact on the exchange rate. While other variables like GDP and trade balance did show some level of relationship, they were not statistically strong enough to be considered major influencers on their own in this study. This highlights the complex and interconnected nature of currency movements.

The findings also show that no single factor can fully explain exchange rate fluctuations. Instead, it requires a broader understanding of the overall economic environment. For policymakers and economists, this means focusing on maintaining balanced growth, managing inflation, and ensuring financial stability to support a stronger and more stable currency.

Although the study has some limitations, such as the use of only 10 years of data and basic regression methods, it still offers valuable insights. Future research using more advanced tools and a wider range of variables could help build on these findings for better understanding and decision-making.

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Annexure

Trade balance

Year	Trade balance
2013	\$-55.38B
2014	\$-60.89B
2015	\$-48.31B
2016	\$-40.53B
2017	\$-83.76B
2018	\$-101.67B
2019	\$-73.07B
2020	\$-10.52B
2021	\$-83.13B
2022	\$-119.53B

Government Debt

2023	\$-73.51B
Year	Government Debt
2013	855.7
2014	939
2015	972.7
2016	1,038.70
2017	1,160.90
2018	1,206.10
2019	1,302.70
2020	1,421.00
2021	1,648.20
2022	1,709.60
2023	1,897.10