An Empirical Study on the Impact of Foreign Trade Capital on India's Nominal Exchange Rate

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***Abstract*:** 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.

Keywords: *Foreign Trade, Nominal Exchange Rate, Import, Export.*

1. INTRODUCTION

1.1 Background of the Study

International trade brings benefits to all countries globally. By engaging in specialization and division of labor, nations can capitalize on their comparative advantages. This process fosters free trade and open markets, leading to significant gains. As a result, international trade has become essential and highly valued around the world. Every country, regardless of its size, wealth, or level of development, benefits from international trade.

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The extent of these gains, however, can vary significantly. Adam Smith, in his Theory of International Trade, emphasizes that global trade fosters international specialization and division of labor. Similarly, Ricardo highlights the comparative advantage nations enjoy through this exchange. Each nation can focus on producing goods for which it has a comparative advantage, best suited to its geography and natural resources. Even countries with limited resources or raw materials can profit by specializing in specific products. Moreover, the trade of goods and services shapes the relative exchange rates between nations, further influencing economic dynamics. International trade primarily deals with the movement of goods and services across borders. At its core, it revolves around the export and import of key commodities and services to and from various countries. When a country's exports exceed its imports, it gains foreign exchange, boosting its foreign exchange reserves and strengthening its currency. Conversely, if imports surpass exports, the currency's value depreciates relative to others. Against this backdrop, the researcher aims to explore how foreign trade affects India's exchange rate dynamics. Given that since 1991, India's exports have consistently fallen short of its imports, the rupee has steadily depreciated over this period.

1.2 Significance of Study

The exploration of exchange rate dynamics and their interplay with various factors has gained immense significance over the past few decades. This topic has become crucial for both experts and researchers, especially in developing nations, since 1972. During this period, many of these countries transitioned from fixed to floating exchange rate systems. Numerous studies have been conducted to examine the correlation between exchange rates and trade, yielding mixed results. The examination in this area is still somewhat unclear. However, there is a general consensus among experts that, over time, the trade balance is influenced by the exchange rate. Rose (1991) characterized the real exchange rate as an insignificant factor in determining the trade balance for five OECD countries. On the other hand, Mckenzie and Brooks (1997) identified a strong positive correlation between exchange rate volatility and trade flows between Germany and the United States. Similarly, Arize (1998) showed that exchange rate volatility and import flows are cointegrated, indicating a long-term equilibrium relationship and close association in their short-term dynamics for the United States. In contrast, Ariccia (1998) explored the effect of exchange rate uncertainty on bilateral trade flows in Western Europe, finding a small but significant negative impact on foreign trade. Meanwhile, Siddiqui and Akhtar (1999) found no significant relation between exchange rate fluctuations and domestic prices. Lastly, Vergil (2002) documented a notable negative effect of exchange rate instability on real exports in Turkey. Wilson and Tat (2001) uncovered that real exchange rate variations had a minimal impact on the actual balance of trade between Singapore and the United States, with scant evidence supporting the J-curve effect. The notion of cointegration between exports and imports has been explored by several researchers. Baharumshah (2001) noted a stable and positive correlation between the exchange rate and trade balance over a long period, specifically in the cases of Malaysia and Thailand's bilateral trade with the United States and Japan. Meanwhile, Baak (2008) documented a long-term relationship between exchange rates and export volumes between China and the United States, although no significant short-term correlation was detected. Bahmani-

Oskooee and Cheema (2009) found a strong positive correlation between real exchange rates and the trade balance for nearly half of the countries trading bilaterally with Pakistan. Some studies, however, indicate that exchange rates have no significant effect on the trade balance. Jayachandran (2013) explored the influence of exchange rates on international trade in India over more than a decade, concluding that exchange rates play a crucial role in explaining foreign trade dynamics. Furthermore, Bahmani-Oskooee et al. (2016, 2017) and Arize et al. (2017) highlighted an asymmetric relationship between exchange rates and international trade. Despite the extensive examination of how exchange rates affect foreign trade, the reverse—how foreign trade impacts exchange rates—remains underexplored, particularly in emerging markets like India. This gap in the literature has prompted the researcher to investigate this relationship further.

2. OBJECTIVE OF THE STUDY

- To analyze how foreign trade influences the exchange rate in India, specifically through exports and imports.
- To identify the nature of the relation between the explanatory and dependent variables involved.

To fulfil the following objectives, the following hypothesis has been formulated-

- H_0: Foreign trade, including exports and imports, has no significant effect on the exchange rate in India.
- H_0: There is no significant relation between the explanatory variables and the dependent variable.

3. METHODOLGY OF THE STUDY

The annual exchange rate data for imports, exports, and exchange rates have been collected from the RBI's Database on the Indian Economy. This study spans from 1991 to 2022 and utilizes an empirical approach through a multiple regression model. Import and export figures serve as explanatory variables, while the exchange rate is the dependent variable. Specifically, the focus is on the Indian rupee's exchange rate against the US dollar. Import and export data, measured in US dollars, are sourced from the Handbook of Statistics, Database on the Indian Economy, while the annual exchange rates are compiled from the Reserve Bank of India's website for the specified period. To meet the study's objectives, various statistical tools have been applied, including multiple regression models, the augmented Dickey-Fuller test, descriptive statistics, and normality tests. The nominal exchange rate between India and the USA is analyzed to address the relevant objectives and hypotheses.

4. RESULT AND ANALYSIS

Table No.1 provides an overview of the summary statistics for both dependent and explanatory variables across 32 optical discernments. The computed mean and standard deviation of the exchange rate are 48.602 and 12.684, respectively. Notably, the mean value of exports falls short of imports, suggesting that imports have consistently exceeded exports during these years.

Table No. 1 Summary Statistics

Variable	Observations	Minimum	Maximum	Mean	Std. Deviation
Exchange Rate	32	31.226	74.020	48.602	12.684
Export	32	17865.4	330078.1	142850	120215.8
Import	32	19410.5	514078.4	210840	187538.2

Source: Author's own Construction

Table No. 2 outlines the degree of relationship between the listed variables. A positive correlation exists among exports, exchange rates, and imports. Specifically, a change in exports results in a 93% corresponding shift in the exchange rate, while an alteration in imports leads to a 91% change in the dependent variable.

Table No. 2 Correlation Matrix

Variable	Export	Import	Exchange Rate
Exchange Rate	0.930	0.916	1
Export	1	0.997	0.930
Import	0.997	1	0.916

Source: Author's Calculations

Table No. 3 demonstrates the fit of this study's model. With an R-squared value of 0.885, it indicates a robust fit, suggesting that about 88% of the data supports this model. This implies that approximately 88% of the variation in the exchange rate is explained by the explanatory variables.

Table No. 3 Goodness of Fit Statistics

Observations	32
Sum of weights	32
Df	29
R2	0.885
Adjusted R2	0.877
MSE	19.883
RMSE	4.453
MAPE	7.757
DW	0.643

Source: Author's Calculations

Table No. 4 illustrates that the exchange rate does not show a significant difference, as the p-value falls below 0.05, leading to the rejection of the null hypothesis.

Table No. 4 Analysis of Variance (Exchange Rate)

Source	DF	Sum of squares	Mean squares	F	Pr > F
Model	2	4130.024	2065.012	104.120	<0.0001
Error	29	535.492	19.833		
Corrected Total	31	4665.516			
Computed against model Y=Mean(Y)					

Source: Author's Calculations

Moving to *Table No. 5*, it details the model parameters related to the exchange rate across various variables. In both scenarios analyzed, the null hypothesis is dismissed due to the p-value being under 0.05. Export and import are crucial factors in explaining the exchange rate fluctuations in India.

Table No. 5 Model Parameters (Exchange Rate)

| Source	Value	Standard error	t	Pr > |t|	The lower bound (95%)	Upper bound (95%)
Intercept	33.231	1.421	23.382	<0.0001	30.315	36.147
Export	0.000	0.000	3.280	0.003	0.000	0.000
Import	0.000	0.000	2.153	0.040	0.000	0.000

Source: Author's Calculations

Table No. 6 reveals a coefficient value of -1.765, indicating that an increase in imports leads to a decrease in the exchange rate, and conversely, a decrease in imports results in a higher exchange rate.

Table No. 6 Standardized Coefficient (Exchange Rate)

Source	Value	Standard error	t	Pr > |t|	The lower bound (95%)	Upper bound (95%)
Export	2.690	0.820	3.280	0.003	1.007	4.373
Import	-1.765	0.820	-2.153	0.040	-3.448	-0.083

Source: Author's Calculations

Figure No. 1 illustrates a positive correlation between exchange rates and peregrine trade in India. Conversely, it highlights a negative correlation between exchange rates and import levels.

Figure No. 1 Standardized Coefficients
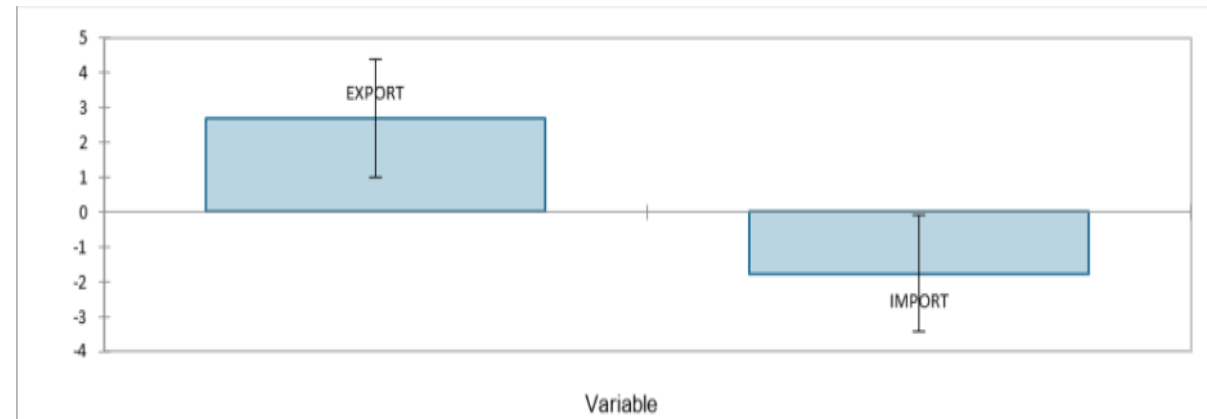
Source:

Author's

Constructions

Table No. 7 presents data on peregrine trade and exchange rates in India spanning three decades. The table clearly indicates that exports are lower than imports and that the Indian rupee has depreciated over time.

Table No. 7 Foreign Trade and Exchange Rate

Year	Export ($)	Import ($)	Exchange Rate
1991	18145.2	24072.5	31.2256
1992	17865.4	19410.5	31.2354
1993	18537.2	21881.6	31.3725
1994	22238.3	23306.2	31.495
1995	31794.9	36675.3	34.35
1996	33469.7	39132.4	35.915
1997	35006.4	41484.5	39.495
1998	33218.7	42388.7	39.985
1999	36822.4	49670.7	42.435
2000	44560.3	50536.5	43.445
2001	43826.7	51413.3	43.595
2002	52719.4	61412.1	43.605
2003	63842.6	78149.1	43.755
2004	83535.9	111517.4	44.605
2005	103090.5	149166.0	44.645
2006	126414.1	185735.2	45.135
2007	162904.3	251439.2	46.64
2008	182799.5	298833.9	47.505
2009	178751.4	288372.9	48.8

2010	254402.1	352575.0	50.945
2011	305963.9	489319.5	51.16
2012	300400.7	490736.7	54.2323
2013	314415.7	450213.7	60.0998
2014	310352.0	448033.4	62.5908
2015	262290.1	381006.6	64.8386
2016	276547.0	382740.9	65.0441
2017	303526.1	465581.0	66.3329
2018	330078.2	514078.4	69.1713
2019	313361.0	474709.3	70.4
2020	291808.5	394435.9	74.0996
2021	422004.4	613052.1	73.9180
2022	450958.4	714042.4	78.6045

Source: RBI Database of Indian Economy

5. CONCLUSION

The study reveals a crucial connection between the exchange rate and exports in India, contrasting with the relationship between the exchange rate and imports. Since 1991, India has been grappling with a trade deficit, and the rupee has been steadily depreciating. Throughout this period, exports have never outpaced imports, raising concerns for emerging economies like India. When imports rise, foreign exchange reserves diminish, which exacerbates the rupee's depreciation. The negative coefficient value associated with imports suggests a significant inverse relationship—when imports increase, the exchange rate tends to decrease substantially, reflecting their negative correlation.

6. RECOMMENDATION

The study suggests that export activities should be prioritized to stabilize exchange rates and increase foreign exchange reserves. The Indian government needs to introduce and enforce various measures to boost exports to other countries. Such actions would lead to a favourable trade balance, improving India's Balance of Payments position.

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