



## **AN ANALYSIS OF MACRO- ECONOMIC DETERMINANTS OF EXCHANGE RATE VOLATILITY IN INDIA**

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### **Abstract:**

*The price of one currency in terms of another currency i.e., exchange rate is a very important variable for an open economy in the global market, because it affects the overall economic performance and growth of the economy. So, the relationship between the related macro-economic factor and exchange rate causing fluctuation in the value of the former carries a high degree of impact for any open economy. This paper empirically investigates the impact between macro-economic factors that affect the price of Indian currency (Rupee) and their inter-relationship with the latter. The OLS regression result indicates that Inflation, Trade balance, Current account, Money supply and Interest rate jointly affect 92.4% of dependent variable i.e., Exchange rate.*

**Key Words:** Exchange Rate, Inflation, Trade Balance, Current Account, Money Supply and Interest Rate & OLS Regression

### **Introduction:**

Price for any currency is determined by its supply and demand in the global market. The currency value will fall if the supply increases. The opposite holds true when demand for currency increases. The Currency price is affected by several of factors prevailing at a given time in an economy. Some of the most important factors affecting currency price generally include GDP, interest rates, inflation, international trade, political stability, and the like. Jorion found that Currency exchange rates are typically 4 times as volatile as interest rates and 10 times as volatile as inflation cited by (Patel, Krishnamoorthy, Shetterly & Maheshwari, 2012).

India has recently witnessed high levels of volatility leading to sharp depreciation of the Indian Rupee against the US Dollar. In 2016, the Indian Rupee breached the 67 per dollar. The government is trying to narrow the current account deficit by making use of certain structural measures.

Volatility in exchange rate increases, will cause difficulty in making investment and international business decisions will indicate a higher exchange rate risk. Thus, it becomes vital for major participants in the global market to know about such risks and make a choice between the two alternatives available i.e., either to invest in the domestic market to earn a specific return or to invest in international market with higher level of uncertainty where they can reduce their risk through various hedging mechanisms available.

### **Literature Review:**

Anita Mirchandani (2013) analyzed the impact of macro- economic determinants of exchange rate volatility in India. Interest rate, balance of trade, inflation, FDI and GD were considered as independent over the exchange rate as dependent variable. The study found a positive relationship between interest rate, inflation, GDP and FDI over Exchange rate.

Krishna Murali and Rajesh Sharma (2014) examined OLS modelling for Indian rupee fluctuations again US dollar. The study covers a yearly data for the period 2001-

2013. Variables such as forex reserve, FII, Money supply, inflation and interest rate was considered an independent variable and exchange rate (INR/USD) as dependent variable. The result shows 94.8% of the dependent variable is explained with independent variable. Only 5.2% of currency rate is because of other factors.

Kanika Khera (2015) studied the effects of macro-economic factors on rupee value. Yearly data has been considered and the variables used in this study are inflation, lending interest rate, FDI, GDP and current account deficit over exchange rate (INR/USD). The author found a positive relationship between FDI, GDP over exchange rate.

Dr. Mita H. Suthar (2015) examined the dynamics of exchange rate in India. The author considered bank rate, government securities, broad money, foreign exchange reserve as independent variable and exchange rate (USD/INR) as dependent variable. 59% of the independent variables cause impact over depended variable. Bank rate, broad money has significant impact on the exchange rate.

### **Research Methodology:**

The nature of research is Analytical in nature. Secondary sources were referred for data collection for the analysis. The study covers yearly data for a period of 10 years i.e., 2005 -2015. The required data for the study were collected and compiled from the RBI and World Bank website/Bulletin. As for variable tested in this paper, Exchange rate is considered as dependent variable and Inflation, Trade balance, Current account, Money supply and Interest rate as independent variable.

### **Analysis and Interpretation:**

The exchange rate of any currency gets affected by many factors (variables) that have positive or negative impact. The main variables of exchange rate as:

- ✓ Inflation
- ✓ Trade balance
- ✓ Current account
- ✓ Money supply
- ✓ Interest rate

**Inflation:** Inflation means rise in price level which affect the country's export by decreased demand from various counties, resulting in decreased demand for the rupee. Inflation arises due to increase in demand for goods/services and decrease in supply for goods/services.

Table 1: Correlation of Inflation with Exchange rate

		ex	inf
ex	Pearson Correlation	1	-.002
	Sig. (2-tailed)		.996
	N	11	11
inf	Pearson Correlation	-.002	1
	Sig. (2-tailed)	.996	
	N	11	11

**Result:** Inflation has negative correlation with exchange rate of an India currency since the value of r is -0.002.

**Trade Balance:** The trade balance is generally measures through current account. If a country's export increases than its import, this would result in appreciation of the domestic currency against other. A negative trade balance occurs when imports are more than exports. One of the main reasons behind the Indian government to control the fall of national currency is imbalance of imports and exports.

Table 2: Correlation of Trade balance with Exchange rate

Correlations			
		ex	trabal
ex	Pearson Correlation	1	.782**
	Sig. (2-tailed)		.004
	N	11	11
trabal	Pearson Correlation	.782**	1
	Sig. (2-tailed)	.004	
	N	11	11

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Result:** Trade balance has strong positive correlation with exchange rate of an India currency since the value of r is 7.82 an it is significant at 0.01 level.

**Current Account:** when country's income is greater than expenses then it leads to current account deficit. To manage this situation, a country takes foreign loans which impact the exchange rate by increasing the demand for foreign currency. In case of current account surplus, the opposite happens.

Table 3: Correlation of Current account with Exchange rate

Correlations			
		ex	current
ex	Pearson Correlation	1	-.106
	Sig. (2-tailed)		.756
	N	11	11
current	Pearson Correlation	-.106	1
	Sig. (2-tailed)	.756	
	N	11	11

**Result:** Current account has negative correlation with exchange rate of an India currency since the value of r is -0.106.

**Money supply:** Money supply is the total amount of money in circulation or exists in a country. In a layman terms, supply of money is less, resulting in higher value of rupees.

Table 4: Correlation of money supply with Exchange rate

Correlations			
		ex	ms
ex	Pearson Correlation	1	.909**
	Sig. (2-tailed)		.000
	N	11	11
ms	Pearson Correlation	.909**	1
	Sig. (2-tailed)	.000	
	N	11	11

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Result:** Money supply has strong positive correlation with exchange rate of an India currency since the value of r is .909 an it is significant at 0.01 level.

**Lending Interest Rate:** when exchange rate is more volatile or exchange rate depreciates, government increases interest rate to maintain the situation. A high interest rate attracts foreign investors to gain out of this situation.

Table 5: Correlation of Interest with Exchange rate

Correlations			
		ex	int
ex	Pearson Correlation	1	.311
	Sig. (2-tailed)		.033
	N	11	11
int	Pearson Correlation	.311	1
	Sig. (2-tailed)	.033	
	N	11	11

\*\* Correlation is significant at the 0.01 level (2-tailed).

**Result:** Interest rate has positive correlation with exchange rate of an India currency since the value of r is 0.311 and it is significant at 0.01 level.

**Regression:**

Table 6: Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.961 <sup>a</sup>	.924	.848	3.05480
a. Predictors: (Constant), ms, inf, int, current, tribal				
b. Dependent variable: ex				

**Result:** Based on the above table, it is found that R<sup>2</sup> score is 0.924. It indicates that the determined independent variables i.e., Inflation, Trade balance, Current account, Money supply and Interest rate jointly affect 92.4% of dependent variable i.e., Exchange rate. The remaining 7.6% is probably affected by other macro-economic factors which cause fluctuation in exchange rates.

Table 7: Anova<sup>b</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	566.136	5	113.227	12.134	.008 <sup>a</sup>
	Residual	46.659	5	9.332		
	Total	612.795	10			
a. Predictors: (Constant), ms, inf, int, current, trabal						
b. Dependent Variable: ex						

**Result:** Based on the above table, the F value is 12.13 with significant value of 0.008. Therefore, the significant value is lesser than the significance level(0.05), it can be concluded that the predicted variables i.e., Money supply, inflation, interest rate, current account, trade balance simultaneously affect dependent variable i.e., exchange rate.

**Conclusion:**

Currently, Indian rupee is losing its value to the Dollar which could be seen to affect the Indian economy. Appreciation and depreciation of rupee is not a permanent criterion because of various reasons. This paper list out various factors which influence the fluctuation of Indian rupee against dollar. The result of analysis shows that these variables can explain the exchange rate dynamics to the extent of 92.4%. Since there are various internal as well as external reasons behind rupee appreciation and depreciation to a larger extent, it takes time to bring back the situation to normal state.

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