

Determinates of Exchange Rate Fluctuations – Selected Macroeconomics Financial Indicators

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Abstract:

The Indian economy faces higher unpredictability affected significantly by exogenous stuns. Every single foreign transaction is influenced concerning variances in the exchange rate. This has caused expanded vulnerabilities in rupee deterioration against the international currency, which under study adversely affects Indian economy. The main aim of the paper is to investigate the macroeconomic components influencing the significant exchange rate USD/Rupee. The Exchange rate is dependent variable and the independent variable are GDP is real GDP (%), IR (CPI %) Inflation rate, RM is reserve money; EXP is exports growth, and IMP is imports, CAB is current account balance, DSR is debt service ratio, external debt outstanding, FDI is Foreign direct investment. To test the hypothesis ANOVA is used in the study. Regression analysis is used to find the relationship between the Exchange rate and the variable selected in the study. It is found that out of nine free factors, seven factors affect the exchange rate these are GDP, Exports, Imports, FDI, CAB, DSR and External debt. The R square in the model fit is 99.99, which show that exchange rate scale to 99.99 % to the above autonomous variable mentioned above. The study show that inflation and Reserve money don't affect the Exchange rate.

Keywords: Exchange rate, GDP, Inflation, FDI, Export, Import.

INTRODUCTION:

The Indian rupee is dominantly relied upon the market powers and the RBI exchanges effectively in the cash market to continue and keep up low unpredictability in dealing with the conversion standard. At the point when rupee acknowledges, it makes imports less expensive and exports costly. The importers would pay less for the merchandise which expands their net revenue. Correspondingly, the devaluation of the INR makes exports less expensive and imports costly. The devaluation makes Indian merchandise and enterprises less expensive which builds demand and produces higher income.

The implementation of the floating Exchange Rate system since the mid-1970s has increased the enthusiasm of MNCs in creating methods and methodologies for managing foreign exchange exposure. The introduction of floating exchange rate system is a significant issue in foreign fund, the chiefs of MNCs, foreign investors, the importers, and the exporters. There are a few macroeconomic variables which influence the swapping currency. The components that impact the conversion scale are inflation rate, GDP, Reserve money, export, imports, CAB, debt service ratio, FDI and so on. The reason for this investigation is to incorporate all full-scale monetary pointers, to recognize the variables that influence the rupee esteem and to

show the components influencing altogether to empower in controlling the Exchange rate. The auxiliary information utilized for the investigation was acquired from RBI Bulletin, just the information with coordinating timespans were utilized for examination.

II. REVIEW OF LITERATURE:

K. Fernandes (2017) utilized different regression analysis to confirm the effect of inflation, forex rate and interest cost on Exchange pace of the Indian rupee and Granger causality to examine if there exists a causal connection between the factors. The investigation was led utilizing yearly information of 6 factors viz. Total national output (GDP), interest rates, foreign exchange reserve, imports, exports and interest rates for a time of 26 years for example from 1990-2016. Results demonstrated a uni-directional causal connection among GDP and exports, GDP and Inflation rate and among Imports and inflation rate. The aftereffects of the Johansen Co-Integration test demonstrated that all the picked factors were exceptionally co-incorporated over the long haul. Chandan Sharma and Rajat Setia (2015) utilized the completely changed common least square, Wald's coefficient limitation and motivation reaction capacities (IRF) to evaluate the money related model in the long-and short-run skylines. The IRF represented the significance of financing cost in controlling exchange scale unpredictability. Gautam Kamble and Parmeshwar Honrao (2014) utilized Generalized Autoregressive Conditional Heteroskedastic (GARCH 1,1) model to set up the level of exchange rate conversion scale instability somewhere in the range of 2011 and 2013 in India. Saritha (2016) inferred that residential intrigue differentials and intrigue yield differentials, and the pace of progress of foreign trade holds significantly affect the month to month normal of the USDINR exchange swapping scale. A month to month time arrangement from June 2007 to May 2012 was utilized for the reason. It proposed that present moment and long run relationship of NYSE ACRA,

FOREX hold, imports and fares of India exists with trade paces of India. Raju, J. V. R., et al; (2014), broke down the relationship of exchange rate, inflation and interest cost. They saw that inflation and interest rate had a momentary relationship whereas they didn't watch any since quite a while long run effect on the exchange rate. Ramasamy, R., et al; (2015), found that relationship of ER of three unique nations with their macroeconomic factors utilizing bootstrapping strategy. They recognized that physiological components like financial specialist certainty commanded monetary factors in impacting the exchange rates. Khera, K., et al; (2015), in his study observed the impact of different macroeconomic variables affecting the exchange rate post globalization. The investigation proposed to consolidate imports and to elevate FDI to improve the exchange rate scale. Wan MohdYaseerMohdAbdoh, et al., (2016), thought about the relationship of exports, loan fee interest rate and inflation on exchange rate scale of select ASEAN nations. They saw that exports had a noteworthy job on the exchange rate fluctuations. Vidyavathi, B., et al; (2016), assessed the main macroeconomic pointers that impacted the exchange rate. They watched negative relationship GDP and ER scale, inflation and ER, interest cost and ER scale, debt and ER, and a feeble positive connection among FDI and Exchange rate. Yaminikarmarkar et al., (2012) considered the impact of exchange rate swapping scale unpredictability on the Sensex. The expansion in the instability of trade rates applied a huge negative impact on Sensex over the long run. They recognized multicollinearity among the three factors for example exchange reserve , Sensex, and RBI open market activities (net). They found a bi-directional causality among the two factors i.e., Sensex and foreign trade reserves.

III. METHODOLOGY:

Need for the study.

The Indian economy faces higher unpredictability affected significantly by exogenous stuns. Every

single foreign transaction are influenced concerning variances in the exchange rate. This has caused expanded vulnerabilities in rupee deterioration against the international currency, which understudy adversely affects Indian economy. The deterioration of the exchange rate scale has a higher impact regarding the Indian economy as we become increasingly subject to imports versus the exports. The exchange rate scale is the most essential pointer of a nation's quality or shortcoming. In this way, it gets relevant to comprehend and need to study the components that impact the conversion standard and take suitable measures to contain them.

Objectives:

1. To investigate the macroeconomic components influencing the significant exchange rate USDRS.
2. To analyse the connection between the exchange rate and macroeconomic financial indicators.
3. To build up a regression model to foresee and gauge foreign exchange rate.

Data collections methods:

The information for the examination was gathered through secondary sources. The sample utilized reading was for the time of 12 years from 2007-08 to 2018-2019.

So as to dissect the elements influencing the exchange rate scale changeability a basic simple linear regression model has been utilized that clarifies the impact of one variable on the other and its noteworthiness.

$$Y = \alpha + \beta_1(\text{GDP}) + \beta_2(\text{IR}) + \beta_3(\text{RM}) + \beta_4(\text{EXP}) + \beta_5(\text{IMP}) + \beta_6(\text{CAB}) + \beta_7(\text{DSR}) + \beta_8(\text{ExD}) + \beta_9(\text{FDI})$$

Where Y is exchange rate scale variability,

GDP is real GDP (%), IR (CPI %) Inflation rate, RM is reserve money; EXP is exports growth, and IMP is imports, CAB is current account balance, DSR is debt service ratio, ExD external debt

outstanding, FDI is Foreign direct investment. To additionally examine the factors and explore their connection relationship has been discovered which tells about the relationship and the quality of the connection between the factors. Regression examination and relationship have been utilized as the expository devices required for the investigation of the variables influencing the exchange rate conversion standard changeability.

Hypothesis Development:

To examine the relationship with exchange rate and selected parameters in Indian context the following hypothesis have been created in the light of above conversation and survey:

H₁: There is a noteworthy connection among Real GDP and Exchange rate fluctuation.

H₂: There is a noteworthy connection between Inflation rate and Exchange rate changeability.

H₃: There is a noteworthy connection between Reserve money and Exchange rate fluctuation.

H₄: There is a noteworthy connection among Imports and Exchange rate fluctuation.

H₅: There is a noteworthy connection among Exports and Exchange rate fluctuation.

H₆: There is a noteworthy connection between Current account balance and Exchange rate changeability.

H₇: There is a noteworthy connection between Debt service ratio and Exchange rate fluctuation.

H₈: There is a noteworthy connection among External debt and Exchange rate fluctuation.

H₉: There is a noteworthy connection among Foreign direct investments and Exchange rate fluctuation.

4. RESULT & DISCUSSION:

Table 4.1 showing Exchange rate (dependent) and macroeconomic financial indicators(independent variables) for the period of 2007-08 to 2018-2019.

Year	ER (Rs./US\$)	Real GDP (%)	IR (CPI) %	Reserve Money	Export growth US \$ Billion (% Change	Import growth US \$ Billion (% Change	Current account balance /GDP US\$ Billion (% of GDP)	Debt service ratio (% of exports)	External debt Outstanding US\$ million	FDI (US \$ Million)
2007-08	40.2	9.2	6.2	31	28.9	35.4	-1.3	4.7	224	19425
2008-09	45.9	6.7	9.1	6.4	13.7	20.8	-2.4	4.4	225	22697
2009-10	47.4	8.6	12.4	17	-3.6	-5.6	-2.8	5.8	260.9	22464
2010-11	45.6	9.3	10.4	19.1	40.4	27.6	-2.8	4.4	305.9	14939
2011-12	47.9	6.2	8.4	3.6	20.9	30.3	-4.2	6	345.5	23473
2012-13	54.4	5.1	10.4	6.2	-1	0.5	-4.8	5.9	390	18286
2013-14	60.5	6.9	10.2	14.4	3.9	-7.2	-1.7	5.9	446.2	16054
2014-15	61.1	7.5	9.5	11.3	-0.6	-1	-1.3	7.6	475	24748
2015-16	65.5	8	4.9	13.1	-15.9	-14.1	-1.1	8.8	485.6	36068
2016-17	67.1	8.2	4.5	12.9	5.2	-1	-0.6	8.3	471	36317
2017-18	64.5	7.2	3.6	27.3	10.3	19.5	-1.8	7.5	529.3	37366
2018-19	69.9	6.8	3.4	14.5	9.1	10.3	-2.1	6.4	543	38744

The rupee deterioration influences the Indian economy in a few different ways. The economy is influenced emphatically just as contrarily however the negative effect are so much that they spread all the positive focuses and therefore just the negative impacts are seen on the economy. A portion of the focuses demonstrating effect of rupee devaluation are as per the following:

Encourage trades: The deterioration in Indian money is a positive sign for the Indian exporters and fare organizations. Because of decrease in the rupee esteem the fare of a nation gets modest. Therefore the organization can improve its fare to get balance current record. The businesses like materials, pharmaceuticals, force and manures and a few

associated with trades are advantageous because of decrease in rupee esteem. Additionally the frail rupee improve the intensity of India in worldwide market.

Demoralize imports: The deterioration in Indian cash is negative sign for the Indian merchants. Because of devaluation in rupee esteem the import of a nation gets costlier thus the organization relying on the substantial import like oil organizations, medicate organizations, building products organizations and other bringing in organizations needs to confront issue and a decrease in their pay. The explanation is that the organizations need to pay more for the imported merchandise subsequently the overall revenue decreases. Likewise government

force a few limitations on import to spare the rupee esteem from further decrease.

Higher Inflation: Due to decrease in the rupee esteem the buying intensity of the cash decay and this outcomes in higher expansion. Because of the decrease in rupee the vital products which must be imported becomes costlier which at last influences the pocket of basic man adversely. Because of decrease in rupee esteem the remote visits got costlier. The RBI report shows that outward settlements by Indian over the most recent five years has expanded because of the decrease in rupee esteem. The all-out outward settlement by Indians in 2017-18 towards voyaging, concentrating abroad and on upkeep was 11.33 billion \$ which was 8.170 in 2016-17. Additionally, the costs of important things like petroleum, diesel and so forth is rising constantly.

Increment in cost of debts: Decline in rupee esteem makes issue in obtaining moreover. Because of decrease in rupee esteem the expense of remote credits increments subsequently more dollars required. This become an obstacle for the Indian ventures' borrowings and Indian economy at such time when Indian banks are excessively wary towards loaning. **Increment in financial weight:** The decrease in rupee worth will expand the monetary weight in two different ways. Right off the bat, because of decrease in rupee shortage import become dearer. It bring about ascent in import bill. The ascent in import charge upgrades the present record shortage. Also, decrease in rupee worth will upgrade the swelling. Accordingly government needs to spend abundance sum on appropriation to

stabilize the buying intensity of individuals. Along these lines financial weight increments from rupee variances.

Others: Decline in rupee esteem influence all the ventures in the economy antagonistically. We can consider the falling rupee an immediate assault on the pocket of normal man. The rupee decay makes immense instability in share market and speculators are losing their confidence in financial exchange. The need things have gotten costlier. There is no expansion in the fares and little scope ventures are additionally confronting colossal loses. Consequently, we can say that the rupee decay unfavorably influence the entire economy.

To break down this information, regression equation was run utilizing Ms-Excel. The ANOVA yield is utilized to check importance of the effect of the chose independent factors on the reliant variable in totality. The model synopsis gives the R square, which implies the degree to which the exchange rate scale relies upon the elements chose, according to the example taken. The regression examination likewise gives the hugeness of the effect of every individual free factor on the reliant variable in the model made. At last the regression is run on the information for the period 2007-08 to 2018-2019. The R square of the sample information speaking to the period 12 years is contrasted with the R square. This gives an understanding on the degree to which they chose factors assumed a job in deciding the exchange rate during the period selected in the study. Regression technique is used to establish relationship between the factors selected in the study and exchange rate.

Table no. 4.2 Correlation Coefficient values

Factors	Real GDP	IR	RM	Export	Import	CAB	DSR	ExD	FDI
ER	- 0.25285	-0.59865	-0.09391	-0.58794	-0.60067	0.424735	0.817686	0.959126	0.762291

The coefficient correlation values between dependent variable (ER) and independent variables, which are positively significant to exchange rate are

CAB(0.424735) , DSR(0.817686), ExD(0.959126), FDI(0.762291). Whereas factors which are inversely related are GDP(-0.25285), IR(-0.59865), RM(-

0.09391), Export(-0.58794) and Import(-0.58794). Among the variables which are positively correlated, the highly correlated variable is ExD (External debt) followed by DSR(Debt service ratio) and FDI (Foreign direct investment). It is found from the study that the variables, IR(inflation rate) and

Import are negatively related to exchange rate. Thus, from the above coefficient values the study indicate that the many factors have significant correlation with exchange rate.

Table 4.3 Output of the Regression model:

SUMMARY OUTPUT					
<i>Regression Statistics</i>					
Multiple R	0.999816693				
R Square	0.999633419				
Adjusted R Square	0.997983804				
Standard Error	0.45445503				
Observations	12				
ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig. F</i>
Regression	9	1126.38	125.152	605.9	0.00169
Residual	2	0.414	0.20652		
Total	11	1126.72			

	<i>Coeff.</i>	<i>S.E</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	49.008	2.934	16.699	0.00356
Real GDP (%)	-2.1171	0.42	4.9904	0.0378
Inflation rate (CPI) %	-0.0236	0.153	0.1540	0.8917
Reserve money	0.01716	0.038	0.4416	0.7018
Export growth US \$ Billion (% Change	0.3017	0.053	5.590	0.0305
Import growth US \$ Billion (% Change	-0.3859	0.041	-9.227	0.01154
Current account balance/GDP US\$ Billion (% of GDP)	1.3995	0.220	6.3596	0.0238
Debt service ratio (% of exports)	-0.39509	0.320	-1.234	0.3423
External debt Outstanding US\$ million	0.0445	0.004	9.816	0.0102
FDI (US \$ Million)	0.0004	5.56E	8.098	0.0149

As per the model including just the autonomous factors that had huge effect on the conversion standard – GDP, Exports, Imports, FDI, CAB, DSR

and External debt the R square is 99.99%. This implies the exchange rate scale is 99.99% subject to the seven autonomous factors referenced above. The

regression equation got from the model will foresee the exchange rate fundamentally well as the p estimation of the F measurement is less than our degree of significance at 5% level. From the model fit it was discovered that inflation rate and reserve money didn't significantly- affect assurance of the

exchange rate variability. The below result shows that seven factors out of nine taken in the study has a noteworthy connect with exchange rate variability. Thus, the two factors are inflation rate and reserve money which don't have noteworthy connect with exchange rate.

Table 4.4 Testing the hypotheses:

Hypothesis	t Static	Significance P value	Accept/Reject criteria
H ₁ : There is a noteworthy connection among Real GDP and Exchange rate fluctuation.	-4.9904	0.0378	Accept
H ₂ : There is a noteworthy connection between Inflation rate and Exchange rate changeability.	-0.1540	0.8917	Reject
H ₃ : There is a noteworthy connection between Reserve money and Exchange rate fluctuation.	0.4416	0.7018	Reject
H ₄ : There is a noteworthy connection among Imports and Exchange rate fluctuation.	5.590	0.0305	Accept
H ₅ : There is a noteworthy connection among Exports and Exchange rate fluctuation.	-9.227	0.01154	Accept
H ₆ : There is a noteworthy connection between Current account balance and Exchange rate changeability.	6.3596	0.0238	Accept
H ₇ : There is a noteworthy connection between Debt service ratio and Exchange rate fluctuation.	-1.234	0.3423	Accept
H ₈ : There is a noteworthy connection among External debt and Exchange rate fluctuation.	9.816	0.0102	Accept
H ₉ : There is a noteworthy connection among Foreign direct investments and Exchange rate fluctuation.	8.098	0.0149	Accept

Among the nine free variables, four factors found to have inverse relationship. The output of the regression shown above shows that there is a negative relationship between the exchange rate Rupee/USD and the variables such as Real GDP, Inflation, Import, DSR. The rest of the factors found to be positively related to exchange rate.

From the regression output above, the regression equation is formed as below

$$ER = 49.008 - 2.1171 (GDP) - 0.0236 (IR) + 0.01716 (RM) + 0.3017 (EXP) - 0.3859(IMP) + 1.3995 (CAB) - 0.39509 (DSR) + 0.0445 (ExD) + 0.0004 (FDI)$$

From this equation, the static reveals that many of the variables have significant relationship with exchange rate. Some are negatively related. The factors which has direct relationship are RM(0.01716), EXP(0.3017), CAB(1.3995), ExD(0.0445) and FDI(0.0004).

The output of t static is shown above in table 4.4. factors which are significant at $p=0.05$ are accepted. These factors which are accepted show a significant relationship with exchange rate. This implies that seven out of nine parameters are proved. The Alternative hypothesis is rejected where the $p=0.05$ is not significant. Two macroeconomic factors are found to be insignificant these are inflation and reserve money.

CONCLUSION:

According to this paper sample taken, the exploration study directed had the option to demonstrate that out of nine free factors, seven factors affect the exchange rate these are GDP, Exports, Imports, FDI, CAB, DSR and External debt. The R square in the model fit is 99.99, which show that exchange rate scale to 99.99 % to the above autonomous variable mentioned above. The analyse shows that Inflation rate and Reserve money don't affect the exchange rate. Additionally, the investigation shows that there is no connection between inflation rate and reserve money with exchange rate. Thus, both the variables have less significance impact on exchange rate during the period of the study. The result of such examinations will definitely be important to both Indian and worldwide specialists, who need to concentrate consideration on assembling driven improvement drives.

Taking into account that India is a net importing in country, a devaluing rupee is destructive for the economy. While the devaluing rupee is good for exports, imports become progressively costly, thus prompting more extensive exchange shortages for India. There is most extreme need to deal with the rising import bills caused essentially by flooding rough costs. Likewise the fiscal strategies actualized by RBI, controlling cash supply in the economy, will be essential in keeping up the estimation of rupee against the greenback. As watched, the foreign direct investments inflows impact the rupee esteem. The legislature should in this manner take activities
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to empower FIIs and speculation through the course of FDI. A few areas stayed undiscovered by the FDI as in the year 2016, as per a report by World Bank, India didn't come among the main 100 nations positioned based on simplicity of working together. The ongoing political situation and government in the U.S.A. alongside the ace development monetary procedures of the Modi government, including demonetization and execution of the hotly anticipated Goods and Service Tax Act, have prompted transient unpredictability in the rupee-dollar development. Anyway, impermanent changes that lead to rupee gratefulness in the momentary won't help any longer, what is required at this phase the Indian Government, with RBI's help and conference, executes solid financial changes and money related approaches that will enable the rupee to continue its incentive over the long run. This examination paper identifies factors, which are significant to exchange rate, all the free variables are tested exclusively and found that inflation and reserve money is not significant at $p=0.05$ static. This analysis may be critical to RBI and other financial institution in Indian context. This exploration work, in this way, makes an important commitment for the two academicians and professionals in Indian and worldwide setting. The examination has opened many research roads on the interfacial parts of Exchange rate and macroeconomic variables.

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