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FLUCTUATING EXCHANGE RATES AND BALANCE OF TRADE IN INDIA: AN EMPIRICAL STUDY

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Exchange rate—the price of a currency in terms of another currency— is arguably the single most important variable in determining the economic environment for trade sectors. Appreciation or depreciation of currency affects the economic performance of a country. Any government at any point in time seek the stability of the exchange rate because it provides economic agents to plan ahead of varying costs and prices of goods and services. An exchange rate depreciation can make a country's exports cheaper and imports more expensive. Exchange rates in India are prone to high fluctuations, which are pegged against a strong currency, usually the U.S. dollar .This study examines the impact of fluctuations of Indian currency on foreign trading in India .Monthly data for the period of April 1997 – December2012 will be used to estimates the dollar rate fluctuation in accordance with foreign trading with the help of regression model. Model testing procedure will include augmented dickey fuller test and Ordinary least square method.

Keywords: Exchange rate, trade, BOT, trade deficit.

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INTRODUCTION

The effect of exchange rate fluctuations on real activity has been subject to an extensive debate. The experimental investigations indicate that exchange rate fluctuations show asymmetric effects. It means that depreciation of exchange rate effects on macroeconomic variables, such as GDP, are different from appreciation exchange rate effects. With the depreciation of a currency, products in the developing countries whose currencies are pegged to the dollar will become more competitive against third country products. This can increase their exports, reduce imports and improve their trade balances with countries other than the US. The opposite is likely to be true when there is appreciation of a currency in developing countries with floating exchange rates. Currency depreciation has negative effects on economic performance in developing countries. According to Guitian (1976) and Dornbusch (1988) exchange rate depreciation diverts spending from foreign goods to domestic goods.

Exchange rate changes affect firms within a given country differently. Firms face a number of risks when engaging in international trade, in particular economic and commercial risks that are determined by macroeconomic conditions over which they have little control, such as exchange rates and their volatility. Since the beginning of floating exchange rate regimes in 1973, many papers, both theoretical and empirical, have analysed the effects of exchange rates and exchange rate volatility on trade. No consensus has been reached regarding the effect of exchange rate volatility on trade in the large body of literature. As regards the level of the exchange rate, empirical studies find somewhat differing results as to their impacts on trade although there is a common understanding as to the direction of the impact of the exchange rate on exports and imports. To date, therefore, relevant research does not suggest a clear-cut relationship. Despite this lack of consensus, the present economic situation seems to justify revisiting the question of the impacts of exchange rates and their volatility on trade flows While it is generally accepted that change in the real value of the dollar is an important determinant of exports, this paper is an attempt to clarify the role of exchange rate in international trade i.e. to what extent do the fluctuation in Indian currency with respect to US dollar impacts trade flow in India.

REVIEW OF LITERATURE

Most research has presumed a negative relationship between exchange rate volatility and international trade and empirical studies have tried to estimate the size of this drag effect on trade. However, neither theory nor empirical evidence has been able to establish a clear link in this regard. McKenzie (1999) and Cote (1994) provide surveys of the relationship between exchange rate volatility and trade that try to explain this apparent paradox. Early models deriving this relationship include Ethier (1973) and Clark (1973). Even at this early stage an important distinction is made between uncertainty about the exchange rate and uncertainty about profitability. Ethier's model includes hedging in the forward exchange market and uncertainty about the exchange rate determines the demand for forward cover but does not necessarily affect the level of trade. The level of imports is affected negatively only if it is assumed that the firm is unable to determine its profitability at different exchange rates. Hooper and Kohlhagen (1978) also develop a model in which a portion of trade is hedged in the forward exchange market such that volatility in the exchange rate only affects the portion of trade that is unhedged. Their model implies the standard negative relationship between exchange rate risk and the volume of trade.

De Grauwe (1988) shows that the assumption of risk aversion is not sufficient to establish the negative relationship between changes in the exchange rate and trade. He demonstrates that the results obtained by Hooper and Kohlhagen (1978) depend on the assumption of constant absolute risk aversion. De Grauwe constructs a utility function which depends on the degree of risk aversion by exporters. Mildly risk-averse traders reduce their supply of exports as exchange rate risk increases, as in the standard models. However, very risk-averse firms want to avoid a collapse in revenues from the worst possible exchange rate outcome and thus their desired supply of exports increases as exchange rate risk increases. In other words, changes in exchange rate risk have both a substitution and an income effect on the volume of trade. The net result depends on the degree of risk aversion of the traders populating the utility function. Other papers showing how the effect of exchange rate variability on trade depends on the risk aversion properties of the traders in the model include Dellas and Zilberfarb (1993) and Giovannini (1988).Various researchers have pointed out that exchange rate volatility presents the opportunity to make profits as well as the risk

of losses. This is the case if one relaxes the standard model assumptions of disallowing production and exports to vary in response to changes in the exchange rate.

Cushman (1983) used a model similar to that of Hooper and Kohlhagen (1978) but extended the sample size and used real as opposed to nominal exchange rates. Of fourteen sets of bilateral trade flows between industrial countries, he found a negative and significant effect of volatility for sixcases. Finally, the IMF (1984) used a simplified version of Cushman's model to estimate bilateral exports between the G-7 countries from the first quarter of 1969 to the fourth quarter of 1982, with real GNP, the real bilateral exchange rate, relative capacity utilization, and variability measured as the standard deviation of the percentage changes in the exchange rate over the preceding five quarters. In only two cases did variability have a significantly negative coefficient, while positive coefficients were significant in several cases. A number of recent studies (De Grauwe (1987), Rose (2000), Dell'Ariccia (1999), Andersen, Torben., et al., (2001), Arize (1998) and Fountas and Aristotelous (1999)) which find a negative link, but these effects are not very large: complete elimination of volatility would raise trade by a maximum of 15 percent, compared to the consensus estimate of the effect as typically less than ten percent.

OBJECTIVE

To establish the relationship between exchange rate fluctuations and balance of trade of India

RESEARCH METHODOLOGY

Using the time period, April 1997 to December 2012 for India, this study aims to examine impact of Currency fluctuation on foreign trading in India. Secondary data was used for the analysis and sources from which these are collected are mainly Handbook of Statistics on Indian Economy(several issues)available at www.rbi.org.in, Import Export data bank(www.commerce.nic.in)

TOOLS OF DATA ANALYSIS

The following test were applied using econometric views (e-views 5) and statistical package for the social sciences(spss 16).

1.The Stationarity Test (Unit Root Test):

It is suggested that when dealing with time series data, a number of econometric issues can influence the estimation of parameters using OLS. Regressing a time series variable on another time series variable using the Ordinary Least Squares (OLS) estimation can obtain a very high R2, although there is no meaningful relationship between the variables.Therefore, prior to testing Cointegration and regression econometric methodology needs to examine the stationarity.Most macro economic data are non stationary, i.e. they tend to exhibit a deterministic and/or stochastic trend. Therefore, it is recommended that a stationarity (unit root) test be carried out to test for the order of integration. A series is said to be stationary if the mean and variance are time-invariant. Data said to be stationary simply implies that the mean [(E(Yt)] and the variance [Var(Yt)] of Y remain constant over time for all t, and the covariance [covar(Yt, Ys)] and hence the correlation between any two values of Y taken from different time periods depends on the difference apart in time between the two values for all $t \neq s$. Since standard regression analysis requires that data series be stationary , we use the Augmented Dickey Fuller (ADF) test which is mostly used to test for unit root.If the ADF test-statistic (t-statistic) is less (in the absolute value) than the Mackinnon critical t-values,the null hypothesis of a unit root can not be rejected for the time series and hence, one can conclude that the series is non-stationary at their levels .

Ordinary Least Square Technique

After the data is stationary we used ordinary least square regression model.

The Regression model of the study is of form :

$BOT = \alpha + \beta ER + \varepsilon$

α and $\beta > 0$ where,

BOT: Balance of Trade

ER: Effective exchange Rate

HYPOTHSES

H01:Balance of trade has unit root.

H02:Exchange rate has a unit root.

RESULT ANALYSIS

Results of ADF Test:

Table 1 highlighted the finding of ADF (Augmented Dickey Fuller) test / unit root test. The null hypothesis H01 and H02 were accepted which indicates that given variables were found to be non stationary at level. Consequently at first difference ,ADF test shows that given variables are stationary. The value in parenthesis shows the lag length of different variables. All the given variables are integrated at order one i.e. I (1).

Ordinary Least Square Technique:

Analysis of the regression results indicates that the slope parameter is significantly different from zero (p=.002)at the 0.01% level. It indicates that there is a significant relationship between balance of trade and exchange rate fluctuations in India. But intercept is not significantly different from zero. Table 4 presents the results of our regression analysis. From table 4 the regression equation is as follows:

dBOT(-) = -307.790 +(-2127.589) dER ……(1)

The β is negative, showing that currency depreciation (increase in the exchange rate) worsens the trade balance for India .Frankel and Wei (1993), Wei (1999), Dell'Ariccia (1999), Rose (2000), and Tenreyro(2003) also worked on this topic employing the gravity model and found some significant evidence of a negative relationship between exchange rate variability and trade

The regression equation indicates that if rupee value raise by 1 with respect to dollar the trade of balance decreases by Rs 2127. R^2, the **coefficient of determination**, gives the greatest indication of the strength of the relationship. Here, R^2=0.254, means that 25.4% of the variation in response variable can be explained a linear relationship with the predictor. .

CONCLUSION

The unit root test clarified that all variables under our study are non-stationary at the level but found stationary at the first differences. The variables of our consideration- Exchange rate and balance of trade found to be integrated of order one i.e I(1)one using the ADF tests for unit root It was found that exchange rate fluctuations have significant negative impact on balance of trade In this paper we particularly studied the relation between Ruppe fluctuation vis-a-vis US dollar and International trade Here, we see that an appreciation of the domestic currency makes domestic exports dearer to foreigners but foreign imports cheaper to us. This causes the exports to fall and imports to rise. The opposite is true for depreciation. Therefore, theory suggests that currency appreciation causes a fall in the trade balance (a lessening of the current account surplus or a deepening of the deficit) and vice versa.

TABLE NO-1: Augmented Dickey Fuller

Augmented Dickey Fuller test results		
	t-value	p-VALUE
EXPORT	1.011652	0.99661
D(EXPORT)	-6.934	0
IMPORT	0.331813	0.9793
D(IMPORT)	-14.9108	0
EX-RATE	-1.96839	0.3006
D(ex-rate)	-10.996	0
BOT	-1.97073	0.2995
D(BOT)	-13.9999	0
t- CRITICAL VALUES	1% -3.474874	
	5% -2.880987	
	10% -2.577219	

Table 2: Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.254[a]	.064	.058	12004.167	2.305
a. Predictors: (Constant), level diff.exchange					
b. Dependent Variable: d(export-import					

Table3: ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.477E9	1	1.477E9	10.251	.002[a]
	Residual	2.147E10	149	1.441E8		
	Total	2.295E10	150			

a. Predictors: (Constant), level diff.exchange

b. Dependent Variable: d(export-import)

Table 4: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-307.790	977.770		-.315	.753
	level diff.exchange	-2127.589	664.522	-.254	-3.202	.002

Table 4: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-307.790	977.770		-.315	.753
	level diff.exchange	-2127.589	664.522	-.254	-3.202	.002

a. Dependent Variable: d(export-import)

REFERENCES

Andersen, Torben., et al., (2001) The Distribution of Realized Exchange Rate Volatility, *Journal of the American Statistical Association*, 96 , 42-55.

Arize, A.C., (1998)The Long-Run Relationship between Import Flows and Real Exchange- Rate Volatility: the Experience of Eight European Economies, *International Review of Economics and Finance* 7(4), 187-205.

Cote A. (1994)Exchange Rate Volatility and Trade: A Survey, Bank of Canada Working Paper 94-5; 1-28.

Clark P B. 1973. Uncertainty, Exchange Risk, and the Level of International Trade , *Western Economic Journal* 11,302-13.

Cushman, David O., (1983), The Effects of Real Exchange Rate Risk on International Trade, *Journal of International Economics* 15, 43-63.

De Grauwe P. (1988). Exchange Rate Variability and the Slowdown in International Trade, *IMF Staff Papers* No.35, 63-84.

Dellas H and Zilberfarb B-Z. (1993). Real Exchange Rate Volatility and International Trade: A Re-examination of the Theory, *Southern Economic Journal* ,59,641-47.

De Grauwe ,(1987)International Trade and Economic Growth in the European Monetary System, *European Economic Review* 31.

Dell'Ariccia, G., (1999)Exchange Rate Fluctuations and Trade Flows: Evidence from the European Union*, IMF Staff Papers* 46(3), 315-334

Dornbusch, R. (1988), Open Economy Macroeconomics, 2nd Edition, New York

Ethier, W., (1973) International Trade and the Forward Exchange Market, *American Economic Review* 63, 494-503.

Fountas, S. and Aristotelous, K., (1999)Has the European Monetary System led to More Exports? Evidence from Four European Union Countries*, Economic Letters* 62, 357-363.

Frankel, Jeffrey A., and S. J. Wei, (1993), Trade Blocs and Currency Blocks, Working Paper No. 4335, (*Cambridge, Massachusetts: National Bureau of Economic Research*).

Giovannini A. (1988). Exchange Rates and Traded Goods Prices , *Journal of International Economics* .24,45-68.

Guitian, M. (1976), The Effects of Changes in the Exchange Rate on Output, Prices and the Balance of Payments*, Journal of International Economics*, 6, 65-74.

Hooper, Peter, and Kohlhagen,S.(1978), The Effect of Exchange Rate Uncertainty on the Prices and Volume of International Trade, *Journal of International Economics*, 8 , 483-494

IMF, 1984, The Exchange Rate System: Lessons of the Past and Options for the Future,IMF Occasional Paper No. 30 (Washington: IMF). the Value of Exporting Firms, *Journal of Banking and Finance* 16: 155-82-511.

McKenzie M D. (1999) The Impact of Exchange Rate Volatility on International Trade Flows , *Journal of Economic Surveys* 13, No.1, 71-106.

Rose ,2000, One Money, One Market: The Effect of Common Currencies on Trade, *Economic Policy*, April, 9-45.

Tenreyro, Silvana, 2003, On the Trade Impact of Nominal Exchange Rate Volatility, *Federal Reserve Bank of Boston Journal of Economic Surveys,* 13, 71-106.

Wei, Shang-Jin, (1999)Currency Hedging and Goods Trade, *European Economic Review*, 43 , 1371-1394.