Transmission Effects of Exchange Rate on Foreign Institutional Investments in India

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Abstract-**The ever increasing number of FIIs (Foreign Institutional Investors) and their investments from various countries in various denominations in the last ten years has drawn the attention of policy makers and investors. This paper attempts to investigate the direction and dynamic interaction between four major exchange rates viz. Dollar, Euro, Pound and Yen and net FII flows in India using daily data of exchange rates and net FII flows. The direction of relationship is also computed by using Granger Causality Test and the dynamic interaction is quantified by VAR results and Impulse Response Function at six lags. Results show that dollar exhibit bi-directional relationship whereas pound and yen have one sided influence on net foreign institutional investments. Further it is also evident from Impulse Response Function that exchange rate shocks die out in two days whereas net FII flows contain it for five to six days. On the other hand regression results validate that the net FII flows are positively correlated to rupee appreciation in dollar and yen and negatively correlated to rupee appreciation in pound and euro, but euro have insignificant influence in Indian economy.**

Key Words: Impulse Response Function, VAR, FII, Exchange Rate

JEL Codes: G11, G15

I. INTRODUCTION

The increased spread of globalization of economies has opened up their doors for overseas capital flows world over. This phenomenon has resulted in the in depth participation of foreign institutional investments in the stock market. It provided much needed capital at firms and sectoral levels to make their presence felt in overseas market destinations. Due to this continuous shift in the economic structure of scope and area of business, exchange rates gained attention and became an important determinant for sustainable business operations. This growing significance has made FII's and exchange rates, two very important variables for economy. With a shift of exchange rate, profitability margin keeps changing as well as changes take place in foreign exchange reserves valuation and it results in to the FII's inward /outward movement in stock market. Similarly, FII's inflows in the stock market enhance the foreign exchange reserve resulting in to the exchange rate movement and vice versa. This cause/effect relationship between FIIs and exchange rates has been the focus area of research across the globe and any consensus about the nature of relationship is yet to be established. This research work has been an effort to identify the transmission effect of FII's in Indian stock market upon exchange rates.

FIIs in stock market and exchange rates have become important variables for any economy more specifically in post liberalization era. Cause effect linkage between these two variables has been the subject of extensive research for the last decade. Badhani (2005) studies the relationship among stock prices, Dollar –Rupee exchange rate and net FII investment in India and finds long term relationship between FII capital flow and stock prices as well as between FII investment flow and exchange rate. Kumar (2009) studies the relationship between Exchange rate and FII with stock returns in India and finds that there is no long-run equilibrium relationship between stock returns and exchange

rate at a significance level of 5 per cent as well as no causality from nominal exchange rate to stock returns. Transmission of effect also varies with countries; Stavarek (2005) studies long-run and short-run dynamics between stock prices and exchange rates in a group of nine countries and suggests that no long-run relationships between variables during the first analyzed period covering the years 1970–1992. The period from 1993 to 2003 when liberalization speeds up, study shows much stronger long-run more specifically in case of developed countries. Rahman and Jashimuddin (2009) explore interactions between stock prices and exchange rates in three south Asian emerging economies. The Study reveals no co-integration as well as causal relationship between exchange rates and stock prices. Transmission effect is also found out by Mishra et.al. (2007), in their study volatility spillovers between the Indian stock and foreign exchange markets. The findings indicate existence of a bi-directional volatility spillover between the Indian stock market and the foreign exchange market though it is not applicable to S&P CNX NIFTY and S&P CNX 500. Results also suggest that both the markets move in tandem with each other showing long run relationship between these two markets. The results of significant bidirectional volatility are due to the transmission effect between these two indices.

II. Objective

We conduct the comprehensive study to detect the direction of relationship and also to quantify the interdependence of FII flows to the lagged values of exchange rate and vice versa.

III. Database and Methodology

The net daily FII purchases and exchange rate of four major currencies have been obtained from January 2000 to March 2010 from the monthly bulletin of Money Control and the official website of Reserve Bank of India respectively.

We explore the direction of relationship between NFIIP and exchange rate by Granger Causality test and then further test the stationarity and normality of underlying variables by Augmented Dickey Fuller Test and JB statistics respectively. Then we use unrestricted vector auto regression to detect the dynamic relationship with lagged variables at six lags.

$$NFIIP_t = NFIIP_{t-1} + NFIIP_{t-2+}.......NFIIP_{t-n} + DE_{t-1} + DE_{t-2+}...............DE_{t-n} + \epsilon_1$$

$$DE_t = DE_{t-1} + DE_{t-2}...............DE_{t-n} + NFIIP_{t-1} + NFIIP_{t-2}.................NFIIP_{t-n} + \epsilon_2$$

Where $NFIIP_t$ is the net FII purchases at time t and DE_t is the first difference in the exchange rate at time t. Thus, DE_t is computed for four major currencies viz. dollar, euro, pound and yen in Eviews and subsequently named as ddollar, deuro, dpound and dyen to make the exchange rate stationary and fit for further analysis.

IV. Results and Discussion

Results (Table1) depict the descriptive statistics of NFIIP, DDOLLAR, DEURO, DPOUND, and DYEN indicating very small change in the value of rupee with respect to various currencies. However, the unconditional standard deviations in all the currencies are large enough as compared to their mean value indicating the higher volatilities of exchange rates. We further test the presence of unit root in all the five variables and find (Table 2) that NFIIP, DDOLLAR, DEURO, DPOUND, and DYEN are stationary at levels and fit for further time series analysis. Then to analysis the direction of relationship among five variables we use Granger Causality Test and observe that DDOLLAR, DPOUND and DYEN granger cause NFIIP at 5 per cent level of significance (Table 3) in Indian context whereas the DEURO has negligible influence on NFIIP. On the other hand NFIIP only affects the DDOLLAR out of four major currencies. Thus the value of rupee in dollar and NFIIP exhibit bi-directional relationship whereas value of rupee in pound and yen has unidirectional influence on net FII flows. Moreover the VAR Results indicate that NFIIP is dependent on its lagged values for five to six days and also depends on lagged values of DDOLLAR, DPOUND and DYEN except DEURO for two to three days. The effects of shocks persist for a longer duration as long as five to six days in NFIIP as compared to short lived impact on almost all the currencies indicating the faster adjustment in currency market. The adjusted R square is also sixteen to seventeen per cent in all currencies indicating the one sixth variances is explained by the lagged values of the exchange rate and net FII flows. Further the Table 2 shows regression results that the net FII investments are directly related to DDOLLAR and DYEN but negatively related to DPOUND and DEURO but the DEURO has insignificant influence on NFIIP. Thus in terms of exchange rate we observe the mixed results. It is evident that the NFIIP has insignificant exposure in euro and it may be attributed to negligible number of FIIs registered from euro zone. On the other hand rupee appreciation with respect to dollar is positively related to NFIIP indicating the strong inflows and outflows in dollar denomination leading to unidirectional movement. Most probably it is due to highest number of FIIs from USA registered with SEBI. The yen also exhibit the same feature leading to balanced movement of Yen in and outside the country, whereas the rupee appreciation with respect to pound is negatively correlated to net FII investments.

V. Conclusion

The study concludes that the rupee appreciation with respect to dollar and yen has positive relation with net FII flows, whereas the rupee appreciation with respect to pound has negative relation to net FII flows leading to balanced flows in dollar and yen denomination but unbalanced flows in pound denomination. Moreover the foreign equity flows has insignificant exposure in euro as currency. Thus this paper has profound importance for the regulators, investors and portfolio managers in the wake of sudden surge of FIIs flows in Indian context.

TABLE I.   RESULTS OF DESCRIPTIVE STATISTICS, STATIONARY TESTS AND NORMALITY TESTS

Particulars	Descriptive Statistics		Stationary Tests		Jerque Bera Test Statistic
	Mean	SD	Augmented Dickey Fuller TestStatistic	Phillip Perron Test Statistic	Normality Test
NFIIP	98.56	559.43	-13.77*	-37.46	37904.8*
DDOLLAR	-8.61E-07	-0.00005	-19.20*	-46.69	8428*
DEURO	-3.38E-06	0.0001	-20.50*	-51.03	388.18*
DPOUND	-7.00E-07	8.47E-05	-21.19*	-48.02	2977.6*
DYEN	-1.84E-06	0.0001	-21.32*	-50.41	2648.9*

* refers to significant at 5% level of significance

TABLE II.   GRANGER CAUSALITY, VAR AND REGRESSION RESULTS

Granger Causality Results	Independent Variable	Number of significant lags of dependent variable at 5 % level of significance					Adjusted. R Square
		NFIIP	DDOLLAR	DEURO	DPOUND	DYEN	
Bidirectional influence	NFIIP	6	2	-	-	-	0.168
	DDOLLAR	-	-	-	-	-	0.009
No influence	NFIIP	6	-	-	-	-	0.159
	DEURO	-	-	1	-	-	0.002
DPOUND affects NFIIP	NFIIP	6	-		1	-	0.158
	DPOUND	-	-	-	-	-	0.003
DYEN affects NFIIP	NFIIP	6	-	-	-	1	0.161
	DYEN	-	-	-	-	1	0.004
Regression Results	NFIIP = 100.2103616 + 1384922.498*DDOLLAR - 11631.46071*DEURO - 332397.3453*DPOUND + 306588.1544*DYEN Where only DEURO is insignificant at 5% level of significance						

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