IMPACT OF FOREIGN EXCHANGE RESERVE ON SELECT INDICES OF NATIONAL STOCK EXCHANGE IN INDIA

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ABSTRACT

Reserve such as Foreign exchange reserve are to the large extent, coincide with proof of purchase and remittance all around, and combat periodic uncertain moves by the traders in the exchange market. One of the main functions of the regulation of foreign exchange reserves is the maintenance of specific currency stability. Forex reserves play an important role in the design of current and future macro policies in the economy. So, it does play a very important role in the Indian financial system. This paper is primarily concerned with analyzing the volatility with respect to foreign exchange reserves along with select indices of the National Stock Exchange. This concept is attempted to assess the foreign exchange reserve volatility effect on select indices of National Stock Exchange which is consideredto be most important for the price fluctuation in the stock market and indeed affect the growth factors. This study is based on the secondary data derived from the world bank report and, reserve bank of India report and, the data bank of the national stock exchange. Yearly data are taken for the analysis. Stationarity has been assessed with the help of the ADF test, further ARCH effect is tested with least squares, volatility clustering and heteroskedasticity testand the volatility test is beingdone with the ARCH and GARCH model.

Keywords: Foreign exchange reserve, Nifty 500, Nifty Large Mid Cap, Nifty Small Cap, Volatility etc.

INTRODUCTION

Refinements in 1990's, in execution of several initiatives in amount of anatomical and conventional replacement in different component of the monetary sectors. Next to globalization and financial sector reforms in India have made immense changes in the financial architecture in the economy. The whole of the institutional

reforms accompanying to the globalization Programme, introducing new instruments and changing procedures and widening the network of reexamination of relationship between stock market and foreign sector in India. The relationship of foreign sector and stock market must be kept in view in order to analysis the concept of introducing new reforms in the financial sector its effect how it has reflected in the performance of the particular sectors and also to focus on the growth how it has been impacted on the economy. The analysis of the stock market has been foreseen in this segment that country exposure to the outer world is most readily felt. This present study is focusing on how the foreign exchange reserve is impacting on the select indices of the National Stock Exchange. it would analyses the volatility effect caused due to the changes in the foreign exchange reserve in the economy. It would give an outlook of the exact changes happening in the financial sector.

REVIEW OF LITERATURE

Srivastava (2010) used Johnson's Cointegration analysis and the Vector Error Correction mechanism to examine the impact of macroeconomic factors on the return and volatility of the Indian Stock Market, including the Industrial Production Index, Whole Price Index, Interest Rate, Foreign Exchange Rate, and Morgon Stanley Capital International World Equity Index. The findings showed that the long-term influencing factors are the Industrial Production Index, WPI, and Interest Rate. Global influences on the performance of the stock market were less significant than domestic ones.

Singh, Dharmendra (2010) By employing correlation, the unit root stationarity test, and the Granger causality test, researchers examined the potential causal link between the BSE Sensex stock market index and three important macroeconomic factors. The results demonstrated that the stock market index, exchange rate, Index of Industrial Price, and Whole Price Index all included a unit root and were integrated of order one. Index of Industrial Price and Sensex's bilateral Granger causal relationship While Whole Price Index had a good association and unilateral causality with Sensex, suggesting that the Indian Stock Market was moving towards informational efficiency at least on two macroeconomic factors, namely currency rate and inflammation.

Arunachalam (2010) studies on development during a two-century period. In this study, an effort has been made to examine the two global economies that are seeing rapid growth in terms of their foreign exchange reserves. The primary sources for this study's data are secondary reports released by the relevant governments and other studies in the field. One of the paradoxes of India's enormously successful efforts since 1991 to bolster its reserves is that they are primarily in a basket of foreign currencies that are prone to volatility and disruptions.

Ali and Medhekar (2010) By using data from 1971 to 2010 in the context of

Bangladesh, a solid analysis regarding multiple effects on real monetary external sector determinants was produced. In the context of Bangladesh's economy, he discovered that foreign exchange reserve is directly tied to GDP and depends on export, import, foreign aid, and remittance.

Additionally, he noted that the reserves position cannot be completely predicted because it is affected by international commitments, commercial transportation, and transfer payments of the nations.

Corte and Tsiakas (2011) applied statistical and econometric methods to monthly observations from 1976 to 2010 to forecast the US dollar exchange rates for the Australian, New Zealand, Japanese, Canadian, Swiss, British, and Norwegian currencies. Two metrics, Mean Squared Error (MSE) and Root Mean Squared Error (RMSE), have been used to compare five models: Uncovered Interest Parity, Purchasing Power Parity, Monetary Fundamentals, Taylor Rule, and the Random Walk model. The study's conclusion demonstrates that the uncovered interest parity, Taylor rule, and purchasing power parity depicted better forecasts than the random walk model in out-of-sample forecasting. Additionally, the combined projections based on averaging techniques are superior.

Maria and Eva (2011)investigated the performance of the Auto-Regressive Moving Average model, Simple Exponential Smoothening, and Simple and Additive Holt Winters in forecasting exchange rates. In terms of Romanian Leu, they have taken into account six different currencies: US Dollar, Chinese Renminbi, Euro, Russian Ruble, British Pound, and Japanese Yen. The sample period was comprised of the daily exchange rates between 3 January 2011 and 22 April 2011.

STATEMENT OF PROBLEM

Foreign exchange reserve increases the wealth and confidence of the nation in case of handling the policy and exchange rate policy. The capacity of the central bank is to stabilize the foreign exchange market and to control the adverse movement in an enhanced form. And the crises forex reserve come to the rescue's mechanism of the country and to absorb the external shocks of the country. In this case, the domestic currency gets backed up by the external assets, and its accessible for the equity market so the country maintains as much as its funds as forex reserve to manage the external obligations. This study is focusing on identifying the effect and impact of change in foreign exchange reserves in select sectors of the National Stock Exchange. This will help us in attaining the true volatility effect of forex on NSE using various tests such as the ARCH, GARCH models.

The above research problem is discussed with the research problem:

Whether forex reserve is causing volatility in the select sectors of the National Stock Exchange?

OBJECTIVES OF THE STUDY

To study the volatility effect between foreign exchange reserves, Nifty 500, Nifty LMC, Nifty SC.

HYPOTHESIS OF THE STUDY

• There is no significant Arch effect between foreign exchange reserve and Nifty500, Nifty LMC, Nifty SC.
• There is no significant Garch Effect between foreign exchange reserve and Nifty 500, Nifty LMC, Nifty SC.

RESEARCH METHODOLOGY

The study has an analytical bent.

Source of Data

On secondary data, the study is built. The World Bank, the IMF, and the Reserve Bank of India all have official websites from which the data are gathered.

Methods and Tools

Utilizing statistical techniques like descriptive statistics, data are analyzed, ADF test, the further ARCH effect is tested with least squares, volatility clustering, and heteroskedasticity test. And the volatility test is been made with the ARCH and GARCH model.

ANALYSIS AND INTERPRETATION

1.1 Test for Stationarity

Table 1.1
Testing of stationarity for foreign exchange reserve in India for the period 2009-2019

Augmented Dickey Fuller (ADF) test – Intercept and Trend				
Data Series	At Level		At first order difference	
	t-statistics	prob	t-statistics	prob
Nifty 500	-1.302541	0.6272	-18.72331	0.0000
NiftyLMC	-1.175971	0.6836	-18.35371	0.0000
Nifty SC	-1.643563	0.4572	-12.49951	0.0000
FER	1.808533	0.9998	-8.007252	0.0000

Source: compiled and computed from secondary data through Eviews

The table 1.1 shows the results of unit root test for stationarity for Foreign exchange reserve using ADF test based on the "intercept". The results of the test shows that variable is not to be stationary at "level" and found to be stationary at "first difference" which rejects the null hypothesis saying there is stationarity among the variable with P value significant.

Table 1.2
Least Squares for Foreign Exchange Reserve and Nifty500 of NSE

Dependent Variable: FERM			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	190175.9	4664.528	40.77066	0.0000
NIFTY500	1.144330	0.034832	32.85263	0.0000
R-square	0.892499	Mean dependent var		334968.8
Adjusted R-square	0.891672	S.D. dependent var		53319.57
S.E. of regression	17549.15	Akaike info criterion		22.39843
Sum squared resid	4.00E+10	Schwarz criterion		22.44211
Log likelihood	-1476.297	Hannan-Quinn criter.		22.41618
F-statistic	1079.295	Durbin-Watson stat		0.882203
Prob(F-statistic)	0.000000			

Source: compiled and computed from secondary data through Eviews

The above table 1.2 shows the Simple least square regression for foreign exchange reserve along with nifty500 based on the past performance, the coefficient value which indicates a positive sign with 1.144 a positive relationship between foreign exchange reserve and nifty 500. t-stat is above 2 which is found satisfactory. The null hypothesis is rejected since the P value is below the 0.05 threshold for significance. It is determined that the share price of the Nifty 500 index and foreign exchange reserve have a favourable association. The R square value is 0.892 which shows variations given by the nifty 500 in the model.

Chart 1.1 Residual chart representing the clustering volatility for the period 2009-2019
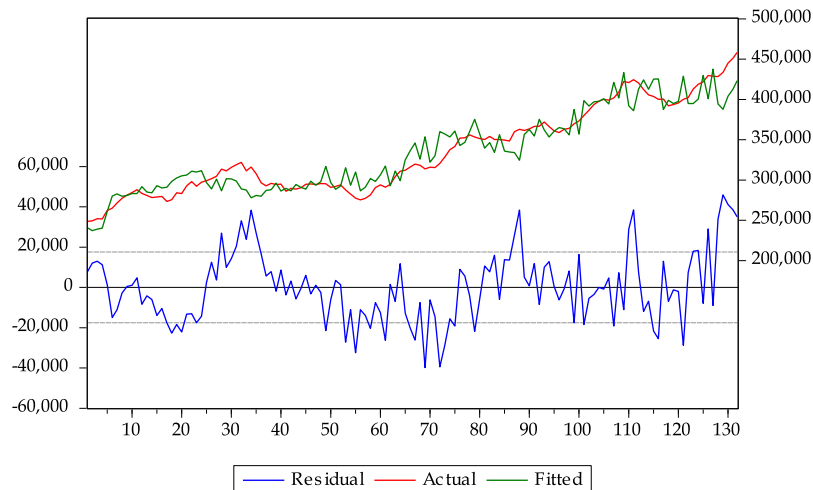
Source: compiled and computed from secondary data through Eviews

The chart 1.1 shows the clustering volatility which elucidates that the low volatility is followed by high volatility and high volatility is followed by low volatility which fulfills the condition for ARCH effect test further. There is low volatility in case of first 20 months and found a high volatility in the period of 20 – 30 months.

H_0 = There is no ARCH effect among the Foreign Exchange Reserve and stock prices of Nifty 500 indices

Table 1.3
Testing for ARCH effect using Heteros kedasticity test

Heteroskedasticity Test: ARCH				
F-statistic	25.39079	Prob. F (1,129)		0.0000
Obs*R-square	21.54399	Prob. Chi-Square (1)		0.0000
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.83E+08	42162641	4.341525	0.0000
RESID^2(-1)	0.411680	0.081700	5.038927	0.0000
R-square	0.164458	Mean dependent var		3.05E+08
Adjusted R-square	0.157981	S.D. dependent var		4.30E+08
S.E. of regression	3.95E+08	Akaike info criterion		42.44130
Sum squared resid	2.01E+19	Schwarz criterion		42.48519
Log likelihood	-2777.905	Hannan-Quinn criter.		42.45913
F-statistic	25.39079	Durbin-Watson stat		2.122252
Prob(F-statistic)	0.000002			

Source: compiled and computed from secondary data through Eviews

The table 1.3 explains the ARCH effect using the heteroskedasticity test, the observed R-square value is 21.543, where the p chi square value is 0.00 This is below than the 0.05 threshold for significance, rejecting the null hypothesis and indicating the presence of an arch effect in the model.

1.3 Test for Auto Regression Conditional Heteroskedasticity Test between Foreign Exchange Reserve and stock prices of Nifty 500 indices of NSE India for the period 2009-2019

Table 1.4
Test for ARCH model in between Foreign Exchange Reserve and Nifty 500 of NSE

GARCH = C(4) + C(5)*RESID(-1)^2				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
@SQRT(GARCH)	0.813035	0.708334	1.147814	0.2510
C	176316.8	11098.63	15.88635	0.0000
NIFTY500	1.135224	0.030567	37.13876	0.0000
Variance Equation				
C	1.87E+08	39411569	4.747658	0.0000
RESID (-1)^2	0.350707	0.226911	1.545570	0.1222
R-square	0.899192	Mean dependent var		334968.8
Adjusted R-square	0.897629	S.D. dependent var		53319.57
S.E. of regression	17059.82	Akaike info criterion		22.29839
Sum squared resid	3.75E+10	Schwarz criterion		22.40759
Log likelihood	-1466.694	Hannan-Quinn criter.		22.34277
Durbin-Watson stat	0.937803			

Source: compiled and computed from secondary data through Eviews

The above table 1.4 exhibits that the standard deviation of the model is positive with 0.813 and the P value 0.2510 which is above the significant value of 0.05 indicating the risk and volatility involved in the variable which shows that it is less risky and there is slow volatility in the variable in the ARCH model. When standard deviation goes up risk factor also goes up. RESID (-1) is coefficient value is 0.350 ARCH is the internal effect of foreign exchange reserve of the previous month's volatility.

And the P value is above the significant value 0.05 which explains that there is less ARCH effect of volatility on foreign exchange reserve since ARCH effect can influence the volatility of foreign exchange rate.

H_0 = There is no GARCH effect between Foreign Exchange Reserve and Stock prices of Nifty500 indices

Table 1.5
Test for Garch effect between Foreign Exchange Reserve and Nifty 500 of NSE

GARCH = C (3) + C (4) *GARCH (-1)				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	193068.3	3928.906	49.14048	0.0000
NIFTY500	1.113749	0.035850	31.06731	0.0000
Variance Equation				
C	5589222.	3420840.	1.633874	0.1023
GARCH(-1)	0.990937	0.013480	73.51073	0.0000
R-squared	0.891524	Mean dependent var		334968.8
Adjusted R-squared	0.890689	S.D. dependent var		53319.57
S.E. of regression	17628.61	Akaike info criterion		22.36566
Sum squared resid	4.04E+10	Schwarz criterion		22.45302
Log likelihood	-1472.133	Hannan-Quinn criter.		22.40116
Durbin-Watson stat	0.831728			

Source: compiled and computed from secondary data through Eviews

The table 1.5 above shows the GARCH effect for the above model for foreign exchange reserve. GARCH is also the internal cause of the volatility on foreign exchange reserve. the GARCH (-1) coefficient shows a .999 and the P value for the above GARCH shows below significant value 0.05.and the P value for Nifty 500 also has a significance at five percent level which shows an positive. Which rejects the null hypothesis by concluding that there is a GARCH effect in the model

1.4 Analysis of relationship between Foreign Exchange Reserve and Nifty Large Mid Cap indices of NSE for the period 2009-2019

Table 1.6
Least Squares for Foreign Exchange Reserve and Nifty Large Mid Cap

Dependent Variable: FERM			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	207359.4	3963.091	52.32265	0.0000
NIFTYLMC	1.692062	0.048869	34.62472	0.0000
R-square	0.902173	Mean dependent var		334968.8
Adjusted R-square	0.901420	S.D. dependent var		53319.57
S.E. of regression	16740.98	Akaike info criterion		22.30414
Sum squared resid	3.64E+10	Schwarz criterion		22.34782
Log likelihood	-1470.073	Hannan-Quinn criter.		22.32189
F-statistic	1198.872	Durbin-Watson stat		0.792768
Prob(F-statistic)	0.000000			

Source: compiled and computed from secondary data through Eviews

The above table 1.6 shows the Simple least square regression for foreign exchange reserve along with nifty500 based on the past performance, the coefficient value which indicates a positive sign with 1.692 a positive relationship between foreign exchange reserve and nifty 500. t-stat is above 2 which is found satisfactory. P value is less than significant value of 0.05. Hence, the null hypotheses is rejected. It is concluded that there is positive relationship among the share price of Nifty large mid cap and foreign exchange reserve. The R square value is 0.892 which shows variations given by the nifty 500 in the model.

Chart 1.2 Residual chart representing the clustering volatility for the period 2009-2019
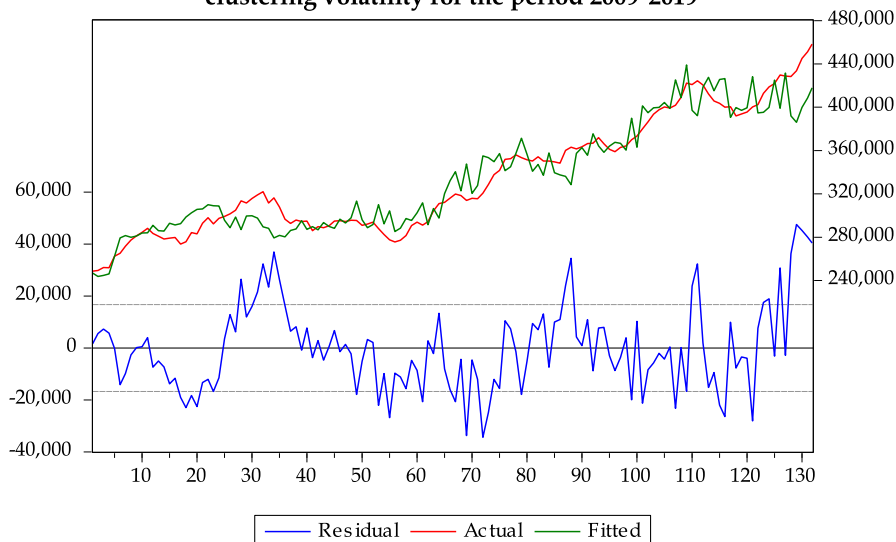
Source: compiled and computed from secondary data through Eviews

The chart 1.2 shows the clustering volatility which elucidates that the low volatility is followed by high volatility and high volatility is followed by low volatility which fulfills the condition for ARCH effect test further. There is low volatility in case of first 20 months and found a high volatility in the period of 20 – 30 months.

H_0 = There is no ARCH effect between Foreign Exchange Reserve and stock price of Nifty Large Mid Cap indices

Table 1.7
Testing for ARCH effect using Heteroskedasticity test

Heteroskedasticity Test: ARCH				
F-statistic	56.09388	Prob. F(1,129)		0.0000
Obs*R-squared	39.70038	Prob. Chi-Square(1)		0.0000
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.26E+08	37247701	3.389002	0.0009
RESID^2(-1)	0.570983	0.076237	7.489585	0.0000
R-squared	0.303056	Mean dependent var		2.78E+08
Adjusted R-squared	0.297654	S.D. dependent var		4.27E+08
S.E. of regression	3.58E+08	Akaike info criterion		42.24294
Sum squared resid	1.65E+19	Schwarz criterion		42.28684
Log likelihood	-2764.913	Hannan-Quinn criter.		42.26078
F-statistic	56.09388	Durbin-Watson stat		2.253785
Prob(F-statistic)	0.000000			

Source: compiled and computed from secondary data through Eviews

The table 1.7 explains the ARCH effect using the heteroskedasticity test, the observed R-square value is 21.543, where the p chi square value is 0.00 which is below the significant value of 0.05 which rejects the null hypothesis and concludes that there is ARCH effect in the model.

Table 1.8
Test for ARCH Model of foreign exchange reserve and Nifty Large Mid Cap 250 of NSE

GARCH = C (3) + C (4) *RESID (-1) ^2				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	210656.9	4361.943	48.29429	0.0000
NIFTYLMC	1.611755	0.049463	32.58537	0.0000
Variance Equation				
C	1.52E+08	21647307	7.031253	0.0000
RESID(-1)^2	0.437345	0.210794	2.074747	0.0380
R-squared	0.897443	Mean dependent var		334968.8
Adjusted R-squared	0.896654	S.D. dependent var		53319.57
S.E. of regression	17140.92	Akaike info criterion		22.15000
Sum squared resid	3.82E+10	Schwarz criterion		22.23735
Log likelihood	-1457.900	Hannan-Quinn criter.		22.18549
Durbin-Watson stat	0.692663			

Source: compiled and computed from secondary data through Eviews

The above table 1.8 reveals that standard deviation of the model doesn't exist, which means there is no volatility between the variables in this model. When standard deviation goes up risk factor. RESID (-1) is coefficient value is 0.437 ARCH is the internal effect of foreign exchange reserve of the previous month's volatility. And the P value is above the significant value 0.05 which explains that there is less ARCH effect of volatility on foreign exchange reserve since ARCH effect can influence the volatility of foreign exchange rate

Table 1.9

Test for Garch Model of Foreign Exchange Reserve and Nifty Large Mid Cap 250 of NSE

GARCH = C (3) + C (4) *GARCH (-1)				
Variable	**Coefficient**	**Std. Error**	**z-Statistic**	**Prob.**
C	208738.8	3177.884	65.68484	0.0000
NIFTYLMC	1.660797	0.050807	32.68813	0.0000
Variance Equation				
C	7391035.	2777247.	2.661281	0.0078
GARCH (-1)	0.983627	0.011783	83.47984	0.0000
R-square	0.901525	Mean dependent var		334968.8
Adjusted R-square	0.900768	S.D. dependent var		53319.57
S.E. of regression	16796.27	Akaike info criterion		22.24155
Sum squared resid	3.67E+10	Schwarz criterion		22.32891
Log likelihood	-1463.943	Hannan-Quinn criter.		22.27705
Durbin-Watson stat	0.761400			

Source: compiled and computed from secondary data through Eviews

The above table 1.9 show the GARCH effect for the above model for foreign exchange reserve and Nifty LMC. GARCH (-1) has a positive coefficient value is 0.983 and the P value which is found to be below the significant value 0.05 which indicates that there is an internal cause of the volatility on foreign exchange reserve on Nifty LMC. And that concludes that there is an GARCH effect in the variables and the GARCH model is positive.

1.5 Analysis of relationship between Foreign Exchange Reserve and Nifty Small Mid Cap indices of NSE for the period 2009-2019

Table 1.10

**Least Squares for Foreign Exchange Reserve and Nifty Large Mid Cap 250 of NSE**

Dependent Variable: FERM				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	250066.3	4294.668	58.22716	0.0000
NIFTYSC	0.868379	0.043472	19.97581	0.0000
R-square	0.771775	Mean dependent var		325690.4
Adjusted R-square	0.769841	S.D. dependent var		46302.43
S.E. of regression	22213.56	Akaike info criterion		22.87132
Sum squared resid	5.82E+10	Schwarz criterion		22.91778
Log likelihood	-1370.279	Hannan-Quinn criter.		22.89019
F-statistic	399.0328	Durbin-Watson stat		0.389625
Prob(F-statistic)	0.000000			

Source: compiled and computed from secondary data through Eviews

The above table 1.10 shows the Simple least square regression for foreign exchange reserve along with nifty500 based on the past performance, the coefficient value which indicates a positive sign with 1.144 a positive relationship between foreign exchange reserve and nifty small cap. t-stat is above 2 which is found satisfactory.

P value is less than significant value of 0.05. Hence, the null hypotheses is rejected. It is concluded that there is positive relationship among the Nifty Large Mid cap and Foreign exchange reserve. The R square value is 0.892 which shows variations given by the nifty 500 in the model.

Chart 1.3 Residual representing the clustering volatility for the period 2009-2019
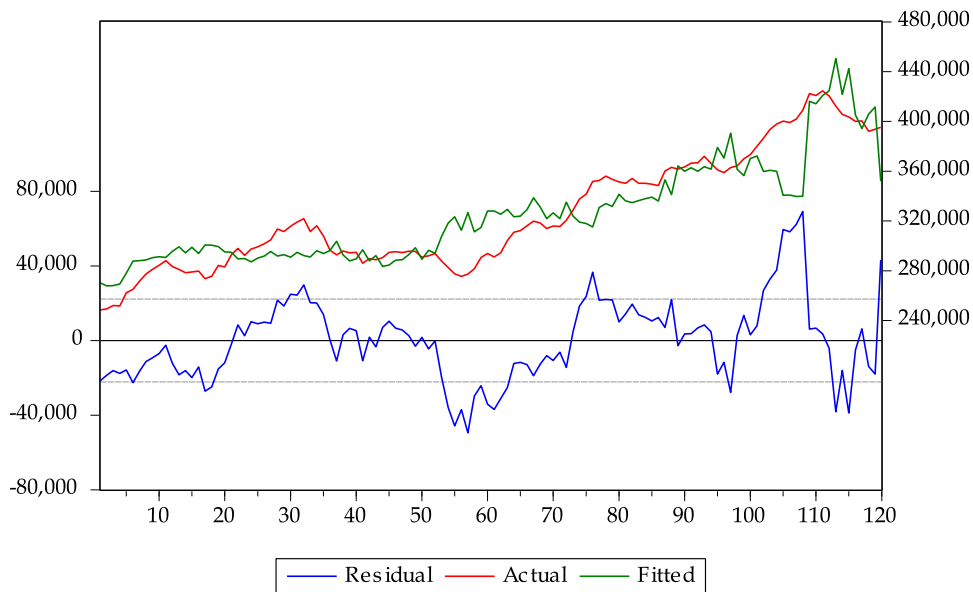
Source: compiled and computed from secondary data through Eviews

The chart 1.3 shows the clustering volatility which elucidates that the low volatility is followed by high volatility and high volatility is followed by low volatility which fulfills the condition for ARCH effect test further. There is low volatility in case of first 20 months and found a high volatility in the period of 20 – 30 months

H0 = There is no ARCH effect between Foreign Exchange Reserve and Nifty Small Cap

Table 1.11

Testing for ARCH effect using Heteroskedasticity test

Heteroskedasticity Test: ARCH				
F-statistic	82.30463	Prob. F(1,117)		0.0000
Obs*R-square	49.14211	Prob. Chi-Square(1)		0.0000
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.74E+08	67467521	2.586067	0.0109
RESID^2(-1)	0.670077	0.073861	9.072190	0.0000
R-square	0.412959	Mean dependent var		4.85E+08
Adjusted R-square	0.407941	S.D. dependent var		8.24E+08
S.E. of regression	6.34E+08	Akaike info criterion		43.38953
Sum squared resid	4.70E+19	Schwarz criterion		43.43624
Log likelihood	-2579.677	Hannan-Quinn criter.		43.40850
F-statistic	82.30463	Durbin-Watson stat		1.953859
Prob(F-statistic)	0.000000			

Source: compiled and computed from secondary data through Eviews

The table 1.11 explains the ARCH effect using the heteroskedasticity test, the observed R-square value is 21.543, where the p chi square value is 0.00 which is below the significant value of 0.05 which rejects the null hypothesis and concludes that there is ARCH effect in the model.

Table 1.12

Test for ARCH Model of foreign exchange reserve and Nifty Large Mid Cap 250 of NSE

GARCH = C(3) + C(4)*RESID(-1)^2				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	250279.4	4805.753	52.07912	0.0000
NIFTYSC	0.862468	0.040874	21.10049	0.0000
	Variance Equation			
C	3.02E+08	91195033	3.315503	0.0009
RESID(-1)^2	0.496926	0.314661	1.579244	0.1143
R-squared	0.771696	Mean dependent var		325690.4
Adjusted R-squared	0.769761	S.D. dependent var		46302.43
S.E. of regression	22217.39	Akaike info criterion		22.61399
Sum squared resid	5.82E+10	Schwarz criterion		22.70691
Log likelihood	-1352.839	Hannan-Quinn criter.		22.65172
Durbin-Watson stat	0.384717			

Source: compiled and computed from secondary data through Eviews

The above table 1.12 depicts that standard deviation of the model is positive with 0.813 and the P value 0.2510 which is above the significant value of 0.05 indicating the risk and volatility involved in the variable which shows that it is less risky and there is slow volatility in the variable in the ARCH model. When standard deviation goes up risk factor also goes up. RESID (-1) is coefficient value is 0.350 ARCH is the internal effect of foreign exchange reserve of the previous month's volatility. And the P value is above the significant value 0.05 which explains that there is less arch effect of volatility on foreign exchange reserve since ARCH effect can influence the volatility of foreign exchange rate.

Table 1.13

Test for Garch Model of Foreign Exchange Reserve and Nifty Small Cap 250 of NSE

GARCH = C (3) + C (4) *GARCH (-1)				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	249903.9	5299.685	47.15448	0.0000
NIFTYSC	0.869717	0.049548	17.55314	0.0000
Variance Equation				
C	2.91E+08	9.61E+09	0.030295	0.9758
GARCH (-1)	0.401624	19.75282	0.020333	0.9838
R-square	0.771772	Mean dependent var		325690.4
Adjusted R-square	0.769838	S.D. dependent var		46302.43
S.E. of regression	22213.70	Akaike info criterion		22.90444
Sum squared resid	5.82E+10	Schwarz criterion		22.99736
Log likelihood	-1370.267	Hannan-Quinn criter.		22.94218
Durbin-Watson stat	0.390706			

Source: compiled and computed from secondary data through Eviews

The table 1.13 shows the GARCH effect for the above model for foreign exchange reserve and Nifty SC. GARCH (-1) has a positive coefficient value with 0.983 and the P value which is found to be above the significant value 0.05 which indicates that there is no an internal cause of the volatility of foreign exchange reserve on Nifty SC. And that concludes that there is no GARCH effect in the variables and the GARCH model doesn't exist.

FINDINGS AND SUGGESTIONS

Findings based on ADF Test

- The ADF test reveals stationarity at level and further shows stationarity at the first-order difference for nifty500, nifty large mid-cap, nifty small mid cap and foreign exchange reserve.

Findings based on the Least-Squares

- The results of least square show a positive relationship among the foreign exchange reserve and nifty 500
- The least-square for foreign exchange reserve and nifty large mid-cap indices shows that there is a high positive relationship between them.
- The least-square for foreign exchange reserve and nifty small-cap indicates a high positive relationship.

Findings based on Volatility Clustering

- The volatility clustering explains low volatility followed by high volatility which fulfills the condition for an ARCH test.
- The volatility clustering is found satisfactory among nifty large mid-cap and foreign exchange reserves.
- Volatility clustering fulfills the condition to run the ARCH effect.

Findings based on heteroscedasticity test

- The heteroskedasticity test shows a significant value below 0.05 means that there is an ARCH effect among FER and Nifty 500
- The heteroskedasticity test for the foreign exchange reserve and nifty large mid-cap, value is below 0.05 concludes that there is an ARCH effect.
- The heteroskedasticity test for foreign exchange reserve and small-cap concludes that there is the ARCH effect.

Findings based on arch model

- The P-value of the model is below a significant level, which is found that foreign exchange reserve and nifty500 have low risk and slow volatility in the ARCH model.
- And there is a less ARCH effect of foreign exchange reserve since the ARCH effect can influence the volatility of foreign exchange reserve.
- The ARCH model concludes that there is no volatility among the variables.
- The P-value of an ARCH model is above the significant level of 0.05, there is a less arch effect of volatility, which means the ARCH effect can influence the volatility of the foreign exchange rate.

Findings based on GARCH Test

- The Garch model shows a GARCH effect and internal cause of the volatility on foreign exchange reserve on the nifty large mid-cap.
- There is no GARCH effect in between foreign exchange reserve and nifty small-cap.

Suggestions

- For the investors in investing in the share market with low risk can of Nifty 500 and Nifty large Mid Cap 250 indices which shows low risk and low volatile effect due to foreign exchange movements. Which will boost their return in short with less risk.

- The reserve maintained in excess can also be used in agricultural activities by increasing the subsidy provision. And poverty eradication problems can be launched and also solve the socio-economic problems in underdeveloped areas.

CONCLUSION

From this study, it can be concluded that the data shows stationarity and foreign exchange reserve select indices of the national stock exchange have a strong positive relationship with each other and there is an internal cause of volatility between foreign exchange reserve which means that forex reserve causes internal fluctuation in the price of select indices of National Stock Exchange. This means that implication of globalization and reforms in the financial sector has surely brought changes in the financial sector, which the foreign funds have played a major role in the growth and expansion of the financial sector of our country, similarly, the forex has played a vital part over the time and changed over years. Noticed high volatility in certain indices whereas it is truly a major factor that brings changes or fluctuations in the stock market when there is a hike or slows down in the forex reserve maintenance.

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