A STUDY OF EXCHANGE RATES MOVEMENT AND STOCK MARKET VOLATILITY

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ABSTRACT

In this paper we have analyzed the relationship between Indian rupees-USdollar exchange rate and Nifty returns. This research is based on dynamic behavior between stock markets movement and volatility of stock market for this purpose; we have applied several statistical tests. we have taken the data from period of October 2008, to march, 2010. It study has proved that exchange rate and Nifty returns are non-normally disturbed. Unit root tests have proved that Nifty returns and exchange rate are stationary and they are stationary at level form. There is negative relationship between exchange rate and Nifty returns exchange rate. For testing the causal relationship between these variables we have used Granger causality test. This test has shown that there is unidirectional relationship between exchange rate and Nifty returns. This study is trying to attempt that stock market is crucial for the economy. Different researchers have proved from their research that exchange rate is the main determinates of business profitability. This study has provided such type of information, which would favorable for the gaudiness of management decision about the risk and investment. This information will beneficial for government policies. The maintained of foreign exchange would motive the foreign investors.

Keywords:  
Unit root, Granger causality, Nifty returns, unidirectional.


1. INTRODUCTION

Stock market has a crucial role for the development of country. This thing is seen that stock market has main role in the improvement of economy; we can say stock market is channel between surplus funds and lender. Many economists have been proving that volatility has also impact on the economy of any country. Now a day to understand the origin of volatility of stock market is very interesting topic for financial analysts. Policy makers are doing working about the determining factor of stock volatility. Stock market volatility is a tool to assess the risk. The
financial position of any developing and under developing country can assess from its foreign exchange volatility. According to Benita and Lauterbach (2004) have shown that real economy of country is affected by exchange rate volatility. However, they have been conducted different surveys related to stock market efficiency; according to that survey it has seen that volatility has impact on stock exchange. However, different empirical evidence related to impact of stock exchange volatility on stock market performance has shown that stock market is inconsistence condition. Therefore, it is interesting to study that Indian exchange rate volatility on her stock exchange. According to (kurihara, 2008:p.378) different factors like exchange rate, interest rate, domestic product, have impact of daily stock exchange prices. The relationship between stock exchange and stock returns are huge issues now a days, this issues has preoccupied the minds of the researchers. Different researchers have proved from their research that exchange rate is the main determinates of business profitability. According to (Joseph, 2002) there is influence of exchange rate volatility on the firm competitiveness. In the case of appreciates the exchange rate, the exporters lose their competitiveness in all over the international market. on the second side, in the domestic markets there is chances to increase competitiveness. Different studies have proved the deprecation of exchange rate have adverse impact on importers and exporters of any country. According to nieh, 2006 currency appreciation have both negative and positive impact on domestic stock market. It have also studied that changes in economic value of firm then also changes the foreign operations.

VALUE OF THE STUDY

This study has provided such type of information for the gaudiness of management decision about the risk and investment. This information will beneficial for government policies. According to this study stable exchange rate promotes a strong economy.

2. LITERATURE REVIEW

According to Mishra et al., 2007 it is seen that devaluation of currency have influenced on both importers and exporters. These results are also supportive for prediction of future trends. Globalization has vital role for the development of any country’s economy. In the present of contemporary scenario there is a significant relationship between financial market and real sector.

In 1990 s various reform measures have come into existence for the development of economy. In 1991, floating exchange rate developed. There is significant relationship between stock returns and exchange rate. In 1997, financial crisis is caused of fall stock prices.

According to Joseph, changes in exchange rate related to expect stock returns.

The basic purpose of this study is to endeavor the relationship between stock prices volatility and exchange rate. The results are showing that stock market is more sensitive segment. This study explored that how stock market and stock prices are related to each other.

Stock market is acting a financial intermediation for both developed and underdeveloped country. Under Developing country need a more resources then developing country. According
to Alile(1984) large capital resources can pool through issuing shares. However, all over the world development is depend on the robust stock market. Empirical evidence has proved that stock market is backbone of any developing country. Arbitrage pricing theory has been based on logic that impact of exchange rate on stock market is different from different countries.

Aggarwal,R.(2003) have investigated about the stock exchange and stock market performance. He has viewed interaction of these variables in the economy of Bangladesh. He has taken the monthly data of different currencies. His empirical results has shown that exchange rate and stock prices series are found non-stationary and integrated at order 1. he used Johansen procedure for checking that possibility of the integration relationship. After applying the test he concluded that there is no co-integration relationship between the variables. Finally granger causality test has shown stock price granger has reason of exchange rate of US dollar and Japanese yen and there is no any relationship between exchange rate of euro and pond.

Babu,M.S and Prabheesh,k.(2007) causal relationship between foreign institutional investment and stock returns in India. In this study they have viewed the dynamic relationship between FLLs and Indian stock market returns. For this purpose they have used cross correlation function, granger causality test and VAR. The CCF test has given the results that there is bi directional causality between FLLs and Nifty returns, on other side Granger causality and VAR analysis shown that there is un-directional causality between Nifty returns and Flls.

Ajayi,R.A Frideman ,J.(1989)they have investigated the interaction between three emerging countries. For checking the co-integration they have applied the Johansen procedure. Their results have shown that there is not integration between stock prices and exchange rate. For checking the causal relationship between variables we have used the Granger causality, outcomes has shown that there is no causal relationship between exchange rate and stock prices.

Joseph,N.(2002) has examined that exchange rate volatility on the stock market of south Africa. For this purpose GARCH model was used to check the relationship between exchange rate and stock market performance. Their results have shown that there is very puny relationship between both variables.

Doong,s-c,yang(2005) examined that causal relationship of exchange rate and stock returns of Colombo stock exchange. ADF was used to find out the stationary of the data series and for checking the causality a regression was used. The regression results have shown that there is significant relationship between exchange rate and stock prices. There are contradictory results between regression and granger causality.

YAH,H,Y and Niehc(2006) investigated about the relationship of the stock prices and exchange rate in Kenya. The economic theory has determined that stock prices and exchange rate have no proper direction. They have used Pearson product moment correlation coefficient method. They used this method for this purpose of determine the degree of correlation between them. This method shows the results that there is positive relationship between exchange rate and stock prices.
Wu, Y. (2000) in this paper he used the error correction model to analyze the impact of the stock exchange on the four countries.

Takeshi, I. (2008) he examined the relationship between macroeconomic parameters and stock returns in India. For this purpose he has used Engle Granger co-integration test. According to his results there is no longer equilibrium between stock returns and exchange rate and there is no causality relationship between stock returns and exchange rate.

Parkinson, J. M. (1987) in his paper he showed that stock market of the south Asian is feeble. For this analyzed he has used the unit root test ,which have proved that stock market has both negative and positive relationship with the stock exchange.

Naeem, M. Abdul (2002) explained in his paper that after financial crisis the exchange rate has affected. Due to this reason the impact of exchange rate on the stock market is different. For this purpose he has used the unit root test and examined that exchange rate and stock market are integrated at level (1).

C. M. Ma and Kao, G. W. T. (1990) in their paper they examined the exchange rate on the stock prices in Iran. For this purpose they have used the GARCH and this model has given the superior results. GARCH model has shown the positive relationship between exchange rate and stock prices.

Chakrabarti, R. (2001) in his paper he viewed the dynamic behavior between stock market and exchange rate of India .he has used VAR model. He concluded the results that stock market and exchange rate have negative relationship.

Chouy, Y. C. (1996) in his paper he examined the relationship between time varying macroeconomic conditions and stock prices in India. For this purpose he used GARCH model and taken the results that time varying has been affected the conditional volatiles of the macroeconomic factors.

Najang and Seifert (1992) analyzed that dynamic relationship between stock returns and exchange rate volatility of Pakistan and China. For this purpose they have used the GARCH model. The Johnson co-integration and Granger causality is also used to investigate the relationship between them. The granger causality test has also confirmed that there is no relationship between them.
Theoretical framework:

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Exchange Rate System
  What is exchange rate regime?
  Why does exchange rate fluctuate?
Foreign Exchange Risk
  What is foreign exchange risk for corporations caused by fluctuation of exchange rate?
Foreign Exchange Risk Exposure Management
  Facing exchange rate risk, how do corporations manage foreign exchange rate exposure?
Efficient Market Hypothesis
  What are three levels of efficiency? Does the level of efficiency relate to the relationship we study?
Asset Pricing Models
  Main asset pricing models are introduced, most of which capture foreign exchange risk.
Previous Empirical Evidence
  What researches have been done on this topic? Is there any help for constructing our study?
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3. DATA AND METHODOLOGY

The basic purpose of this study is to see the relationship between stock rate movements and stock returns volatility. We study is focusing towards Indian rupees dollar and exchange rate movement. The daily data is more useful to find out the relationship between exchange rate and Nifty index. We have also lined plots of two series 1) nifty returns 2) exchange rate.

We have calculated daily returns by the using of natural logarithm of the daily closing price relatives, i.e.

\[ r = \ln \frac{P(t)}{P(t-1)} \]

**HYPOTHESIS**

After viewing the different study we have obtained some hypothesis
- Hypothesis 1: there is no normally disturbing between exchange rate and stock returns.
- Hypothesis2: unit root exists between both series.
- Hypothesis3: there is correlation between two variables.
- Hypothesis4: there is no causality between stock exchange and stock returns.
**NORMALITY TEST**

In Gujarati (2003) the JB test used to stock returns and exchange rate individually. The JB test is known as large sample test. This is used to captures the Sleekness and Kurtosis.

$$JB = n \left[ \frac{S^2}{6} + \frac{(K-3)^2}{24} \right]$$

**UNIT ROOT TEST**

According to Gujarati (2003) Unit root test is used to review that data is stationary or not. Stationary condition is tested by using the Augmented Dickey fuller test. ADF is the well-known test which is used for large sample. According to empirical study a data series is consider time series if it’s mean and variance are constant over time when the data is non-stationary then we used the autoregressive model.

<table>
<thead>
<tr>
<th></th>
<th>Stock Returns</th>
<th>Exchange Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations</td>
<td>347</td>
<td>347</td>
</tr>
<tr>
<td>Mean</td>
<td>-0.002167</td>
<td>0.000826</td>
</tr>
<tr>
<td>Median</td>
<td>-0.000717</td>
<td>0.000217</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.067575</td>
<td>0.037869</td>
</tr>
<tr>
<td>Minimum</td>
<td>-0.130133</td>
<td>-0.031867</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.026267</td>
<td>0.007347</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.295288</td>
<td>0.297428</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>4.712688</td>
<td>9.096538</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>47.31657</td>
<td>540.9371</td>
</tr>
<tr>
<td>Probability</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>Sum</td>
<td>-0.749534</td>
<td>0.285488</td>
</tr>
<tr>
<td>Sum Sq Dev.</td>
<td>0.238026</td>
<td>0.018618</td>
</tr>
<tr>
<td>Result</td>
<td>Not Normal</td>
<td>Not Normal</td>
</tr>
</tbody>
</table>

ADF Test Statistic -9.522365  
1% Critical Value* -3.9888  
5% Critical Value -3.4247  
10% Critical Value -3.1352

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation Dependent Variable: D(RETURN)
Method: Least Squares Date: 09/01/09 Time: 13:298
Sample(adjusted): 6 347
Table 2: ADF On NIFTY Return series

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RETURN(-1)</td>
<td>-1.151235</td>
<td>0.120898</td>
<td>-9.522363</td>
<td>0.0000</td>
</tr>
<tr>
<td>D(RETURN(-1))</td>
<td>0.203933</td>
<td>0.104897</td>
<td>1.944132</td>
<td>0.0527</td>
</tr>
<tr>
<td>D(RETURN(-2))</td>
<td>0.187599</td>
<td>0.090458</td>
<td>2.073898</td>
<td>0.0389</td>
</tr>
<tr>
<td>D(RETURN(-3))</td>
<td>0.158127</td>
<td>0.074294</td>
<td>2.128408</td>
<td>0.0340</td>
</tr>
<tr>
<td>D(RETURN(-4))</td>
<td>0.040234</td>
<td>0.054396</td>
<td>0.739638</td>
<td>0.4600</td>
</tr>
<tr>
<td>C</td>
<td>0.000114</td>
<td>0.002891</td>
<td>0.039038</td>
<td>0.9689</td>
</tr>
<tr>
<td>@TREND(1)</td>
<td>-1.45E-06</td>
<td>1.44E-06</td>
<td>-1.003109</td>
<td>0.3165</td>
</tr>
</tbody>
</table>

R-squared 0.479672  Mean dependent var 5.87E-06  
Adjusted R 0.470325  S.D. dependent var 0.035938  

<table>
<thead>
<tr>
<th></th>
<th>S.E. of regression</th>
<th>Akaike info criterion</th>
<th>Schwarz criterion</th>
<th>Log likelihood</th>
<th>5Durbin-Watson</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>0.026157</td>
<td>4.442917</td>
<td>4.350511</td>
<td>762.1738</td>
<td>2.009119</td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>0.228498</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>762.1738</td>
<td>F-statistic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.D. dependent var</td>
<td>0.035938</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EMPIRICAL ANALYSIS

In methodology data was collected from four different stages. In the first step the normality test was applied to find out the nature of data. For this purpose we have used Jarque-Bera statistics test for the purpose of view the disturbing in table 4 with two series. Swenessness and Kurtosis value have shown that variables are normally disturbed. The low and high kurtosis value indicates the extreme platykurtic. After this test it has shown that both variables are non-normally distributed. Skewness values of variables are as fellow -0.295288 and 0.297429 respectively and kurtosis values are as fellow 4.7126888 and 9.096538 respectively. Second stage is to check that data is stationary or not, for this purpose the simple way to plot time series graph and observe the trend in mean, variance and autocorrelation. A series are time series if it mean and variance constant over time. And results have shown that data are in series in their level form. We have also used ADF for checking the stationary of the data. The results of ADF are -9.522363 and -8.078592 respectively, which are showing that both at stationary at level form. If variable are stationary at level form then we applied Johansencou integration test for checking that long run relationship between them or not.
Figure 1: Line Plot of Nifty Indices Data

Figure 2: Line Plot of Exchange Rates Data
4. CONCLUSION

This research is based on dynamic relationship between stock markets movement and volatility of stock market. We have started from absolute value of data for checking the normality which was converted to log. Statistics was yielded the application of Jarque-Bera test, and our next step was stationary of both series for this purpose we have used ADF test and results have shown that stationary is at level form in both data series. Then, we observed the coefficient of correlation between these variables and taken the results that there is negative correlation. This is the way to make direction of influence between these variables. Hence, Granger causality test was used which has proved that there is unidirectional causality between stock returns and exchange rate. If there we increase the returns of Nifty then there will decline the exchange rate.

5. POLICY RECOMMENDATION

1) First of all policy makers should make policy related to the effect of stock market movement and its impact on the performance of economy
2) The monetary committee should maintain the foreign exchange. The maintained of foreign exchange rate would motive the foreign investors.

6. REFERENCES