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INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESIS (ES)

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

LIMITATIONS

SCOPE FOR FURTHER RESEARCH

REFERENCES

APPENDIX/ANNEXURE

The manuscript should preferably range from *2000* to *5000 WORDS*.

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BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.

- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–23

UNPUBLISHED DISSERTATIONS

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

ONLINE RESOURCES

- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

WEBSITES

- Garg, Bhavet (2011): Towards a New Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

ANALYSING THE GLOBAL IMPACT OF VOLATILITY ON THE INDIAN STOCK MARKET

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ABSTRACT

In this research paper, researchers investigate the impact of volatility of various major global stock markets on Indian stock market. Researchers studied volatility of each indices of market of India, Brazil, England, United States and, Hong Kong from 01st April 1997 to 31st March 2015. It is observed that developed markets seem to be less volatile compared to the emerging markets. One can easily understand that any fractional change in developed markets will have an impact on developing markets as well. This happens because of presence of conditional variance. As per the findings, since the last decade Indian market especially National stock exchange has shown high volatility. Obviously, there are impacts of both external and internal factors on the market; as a result there is asymmetric volatility. In this paper four indices which are the external factors have been taken into consideration to find out volatility impact on Indian market. Here in the paper researchers took ARCH test into consideration to estimate expected returns. In concluding remark after applying the ARCH test, researcher established there is less impact of volatility on Indian stock market. BOVESPA has little bit more impact compared to the remaining three markets. If it is asked to arrange maximum to minimum of impact of volatility on Indian market, the sequence will be BOVESPA, Hang Seng, NASDAQ Composiite and FTSE.

KEYWORDS

Indian stock market, global impact.

INTRODUCTION

When there is volatility in the market investors and associated panic, which should be avoided. Be relaxed and keep stocking up equity assets. The word risk is mainly considered as the probability of loss in an asset class and in financial terms risk is usually witnessed as volatility in an asset class in relation to volatility in other asset classes. Hence, the greater the volatility, the riskier the security will be.

According to many researchers, equity is considered to be the most risky asset class, but on the other hand it is the best method to generate returns in the long term. Why is equity market considered to be a risky asset class? The answer to this question lies in the understanding of volatility. As we are aware of the fact that equities are traded on daily basis in the stock market by millions of investors as well as by foreign and domestic institutions. These day-traders are very aggressive and thus generate movements in stock market.

Warren Buffett in his 2014 annual letter to shareholders has explained the concept of volatility and risk "Stock prices will always be far more volatile than cash equivalent holdings. Over the long-term, however currency-denominated instruments are riskier investments far riskier than widely diversified stock portfolios that are bought over time and that are owned in a manner invoking only token fees and commissions. That lesson has not customarily been taught in business school, where volatility is almost universally used as a proxy for risk. Though this pedagogic teaching, it is dead wrong: Volatility is far from synonymous with risk." Thus volatility is a characteristic of equity, but it does not mean risk as many people misunderstand it. The fact is, the investors can reduce risk in their portfolio by purchasing stocks at lower prices, at the time when volatility plays out in the market.

LITERATURE REVIEW

Batra Amita[1] (2004), conducted research on Stock return volatility pattern in India, by observing the time varying pattern of stock return volatility in India during 1979-2003. The study revealed that the stock market cycles had dampened in the recent past. Volatility had reduced in the post liberalization period for both the bull and bear phase of the stock market cycle.

Pandian & Jeyanthi[2] (2008) in their study on "Stock volatility in Indian stock exchange" concluded that "The outlook for India is remarkably good" & "In the bull phases volatilities were lower than bear phases".

Kumar Brajesh & Singh Priyanka[3] (2008) in their research on "Volatility modelling, seasonality and risk return market" found that Indian commodity and stock market returns show persistence in volatility, clustering and asymmetric properties.

Kumar Rakesh & Dhankar Raj S.[4] (2009) in their investigation on "Asymmetric Volatility and Cross Correlations in Stock Returns under Risk and Uncertainty" rejected the relationship between stock returns and expected volatility. However, the relationship was significant with unexpected volatility. It brought out that investors adjust their risk premium for expected variations in stock prices, but they expect extra risk premium for unexpected variations.

Mishra P. K.[5] (2009) conducted study on "Capital market volatility - An Econometric Analysis". The purpose of the paper was to examine the volatility of Indian capital market amidst scepticism of recession. The paper drew heavily on ARCH class models from the literature of time series econometrics to study fat tails, volatility clustering, leverage effects and persistence of stock market volatility in India. The results provided evidence of time varying volatility; it's asymmetric and leverage effects.

Joshi Prashant[6] (2010), in his study on "Modelling volatility in emerging stock markets of India and China" suggested that the volatility is more persistent in the Chinese stock market than the Indian stock market.

Venkatesh C. K. and Tyagi Madhu[7] (2010), in their research on "The use of fundamental and technical analysis by stock exchanges dealers: Indian evidence" concluded that the dilemma faced by the market participants in the secondary market so as to predict the movement of stock prices is well-managed using two approaches, Fundamental and Technical analysis. Due to high volatility in the stock markets, it is considered as a very rigorous job to predict the future movement of the stock prices. The paper tried to answer to the question as to which of the two tools should be used, fundamental or technical analysis.

Raunig Bukhard and Scharler Johan[8] (2010) in their investigation on "Stock market volatility and the business cycle" concluded that increased volatility would result in higher uncertainty about future economic conditions. The increase in uncertainty would lead to low consumption and investment spending and low demand as well. Empirical evidence suggested that this indirect channel through which Stock market developments feed back into the real economy is quantitatively important.

Mallikarjunappa T & Afsal E M[9] (2010) in their study "Price Discovery Process Volatility Spill-over in Spot & Futures Market: Evidences of Individual Stocks" concluded that Volatility spill-over from spot market to futures market is present in such a way that a decrease in spot volatility leads to a decrease in futures volatility. They also found that volatility shocks are asymmetric and persistent in both the markets.

Shobhana V. K. & Karpagavalli R.[10] (2011), in their study on "Volatility of Stock Return of the Select Banking Companies Listed at Bombay Stock Exchange" examined the volatility of stock return of each of the select banks and that of the groups with the market return and the riskiness of the securities.

RESEARCH METHODOLOGY

The purpose of research is to increase knowledge about a specific area by discovering answers to questions through the application of scientific procedures. The researcher finds out facts which were hidden and were not discovered.

1.   DATA COLLECTION

The data for the study will be collected from the official stock market websites of the five selected markets, which are India, USA, England, Hong Kong and Brazil. The study will be based on the major stock market indices of these five countries, viz S&P CNX Nifty, NASDAQ Composite, FTSE 100, Hang Seng and BOVESPA. The span of the study was around 216 months from 01st April 1997 to 31st March 2015, which comprises of a total of approximate 4,502 observations for each of the index. [11]To calculate the daily return value, the daily mean index value was generated from the four reported figures of the day, which were the daily open, high, low, close values. Further the natural log of daily mean index value will be used to generate the daily return. Following is the formula:

$R_t = \ln[I_t/I_{t-1}]$

Where R_t = return on day 't'

I_t = index mean value on day't'

I_{t-1} = index mean value on day't-1'

Volatility can be described as the degree of variation that takes place in the market price of a financial instrument. "The annualized volatility σ is the standard deviation of the instrument's yearly logarithmic returns."[12]

The generalized volatility σ_T for time period T in years is given below:

$$\sigma_T = \sigma\sqrt{T}.$$

2.   OBJECTIVES

a.   To analyse the global impact of volatility on NSE

b.   To verify stationarity using appropriate model.

c.   To frame appropriate volatility models using ARCH/GARCH framework

3.   HYPOTHESIS TO BE TESTED

H_{01} = Time series is stationary in case of NSE, NASDAQ, Hang Seng, FTSE, BOVESPA

H_{02} = There is no autocorrelation in the error variance

H_{03} = Volatility in the current period is related to its value in the previous period, plus a white noise error term i.e. impact of foreign markets.

4.   TOOLS & TECHNIQUES OF RESEARCH

The data will be tabulated and will be analysed using statistical software like Ms-Excel and E-VIEWS. The analysis will include calculating the stock index returns and volatility of the five stock indexes for the period of study. Further, it would involve a comparative analysis of the stock returns and volatility patterns of the five selected indexes. It will also include study on the forecasting ability of various volatility models using ARCH/GARCH framework. ARCH/GARCH is the statistical techniques.

4.1 ARCH (∝) model which was introduced by Robert Engle[13] (1982) means that volatility reacts quiet intensely to market moments if β+∝ is close to "1" then a shock at time t will persist for many future periods. A high value of it implies a long memory. The specification of an ARCH (q) model (Engle 1982) is given by[14]:

q

$\sigma_t^2 = \omega + \Sigma\ \alpha_i\ \varepsilon^2_{t-i}$

i=1

where,

$\omega, \alpha_1,..., \alpha_q$ = parameters to be estimated

σ_t^2 = conditional variance at period t

q = number of lags included in the model

ε_t = innovation in return at time t

In the ARCH (q) model, the volatility at time t is a function of q past squared returns. To describe the ARCH model clearly, the criterion are ω>0 and $\alpha_1 \geq 0,...,\alpha_q \geq 0$. The above equation gives the conditional variance equation.

4.2 GARCH (p, q) model which was introduced by Tim Bollerslev (1986) indicates shocks to conditional variance takes a long times to die out so volatility is persistent. GARCH coefficient reflects the impact of previous days forecast about volatility over current volatility, whereas coefficient of ARCH reflects impact of new information about volatility. The specification of a GARCH (p,q) is given by

$\sigma_t^2 = \omega + \Sigma\ \alpha_i\ \varepsilon^2_{t-i} + \Sigma\ \beta_j\ \sigma^2_{t-j}$

        i=1   j=1

where,

$\omega, \alpha_1,..., \alpha q, \beta_1,.., \beta_p$ = parameters to be estimated

q = number of return innovation lags included in the model

p = number of past volatility lags included in the model

The coefficients of the model should meet the criterion for the conditional variance in the GARCH (p,q) model. βj's in the model refers to GARCH coefficients, on the other hand αi's refers to ARCH coefficients. For the GARCH (1,1) model, the criterion are- ω>0, 0≤α, 0≤β, and α+β≤1.

ANALYSIS & DATA INTERPRETATION

Analysis & Interpretation of Data is basically a procedure for obtaining raw data in order to analyse it to obtain useful and usable information out of it. Statistician John Tukey[15] defined data analysis in 1961 as: "[P]rocedures for analyzing data, techniques for interpreting the results of such procedures, ways of planning the gathering of data to make its analysis easier, more precise or more accurate, and all the machinery and results of (mathematical) statistics which apply to analyzing data.

1.   CONCEPT OF STATIONARITY

In stationarity time series, shocks do not last long and over a span their influence will get eliminated, as the series returns back to its long term mean values. Whereas, the mean or the variance of non-stationary series does not have a long run mean value to which the series reverts back. Even the variance will subject to time, which will reach infinity as time goes to infinity. Before applying ARCH family models one has to identify stationarity of the series.

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2.   METHODS OF TESTING STATIONARITY
2.1   GRAPHICAL REPRESENTATION OF ORIGINAL SERIES

FIGURE-1: NSE GRAPHICAL REPRESENTATION OF ORIGINAL DATA
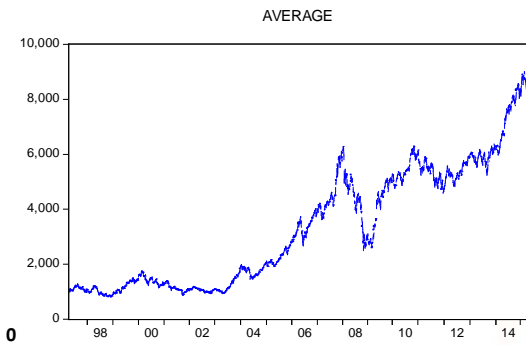
FIGURE-2: BOVESPA GRAPHICAL REPRESENTATION OF ORIGINAL DATA

FIGURE-3: FTSE GRAPHICAL REPRESENTATION OF ORIGINAL DATA

FIGURE-4: HENG SENG GRAPHICAL REPRESENTATION OF ORIGINAL DATA
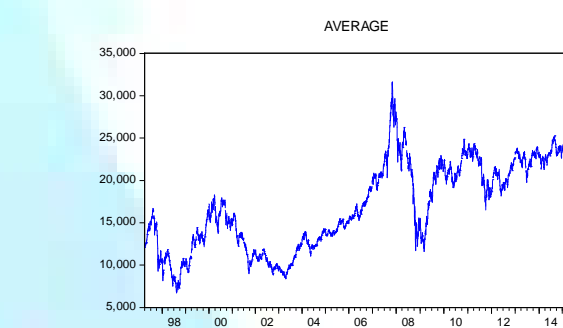
FIGURE-5: NASDAQ GRAPHICAL REPRESENTATION OF ORIGINAL DATA
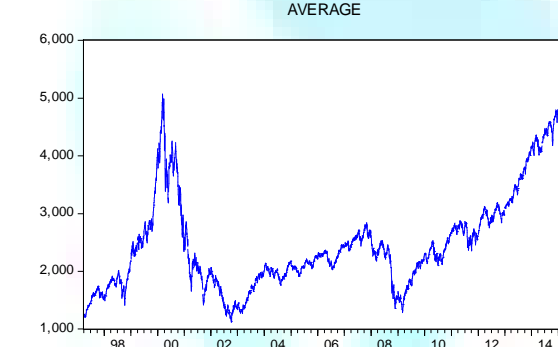
The Figures -1, 2, 3, 4, 5 have continuously changing mean and variance over time. This shift in the mean over time shoes heteroscedasticity of variance. Thus these graphs indicate the result of average of original data series and show that the series is non-stationary.

3.   HOW TO MAKE SERIES STATIONARY
In order to make the original series stationary one has to generate the average of the four series i.e. open, high, low, close. The formula is mentioned below:
Generate Average = (open+high+low+close)/4
After generating the average series one has to take log of the generated average series. The formula for the same is:
Generate return = dlog(average)*100

3.2   GRAPHICAL REPRESENTATION OF RETURN SERIES

FIGURE-6: NSE GRAPHICAL REPRESENTATION OF RETURN DATA

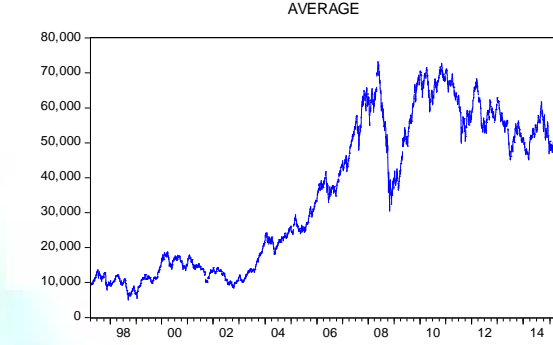**FIGURE-7: BOVESPA GRAPHICAL REPRESENTATION OF RETURN DATA**

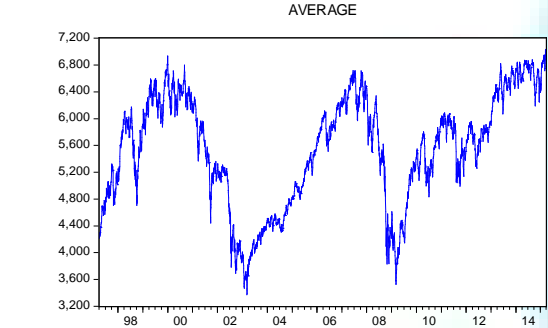**FIGURE-8: FTSE GRAPHICAL REPRESENTATION OF RETURN DATA**
RETURN

FIGURE-9: HENG SENG GRAPHICAL REPRESENTATION OF RETURN DATA
RETURN

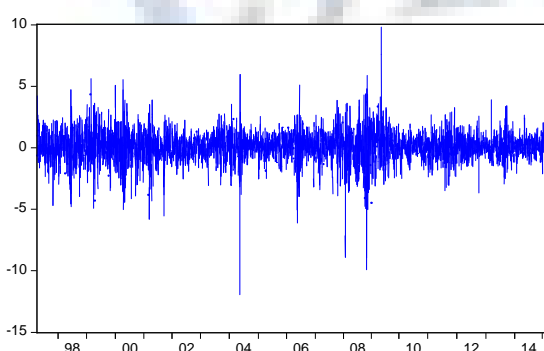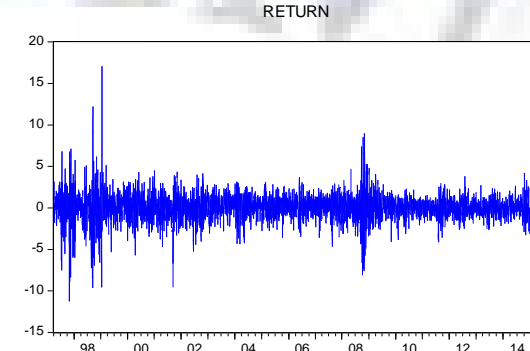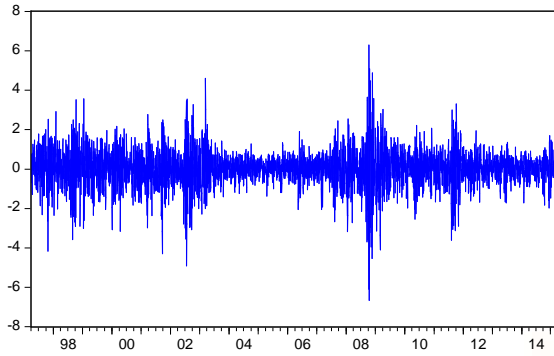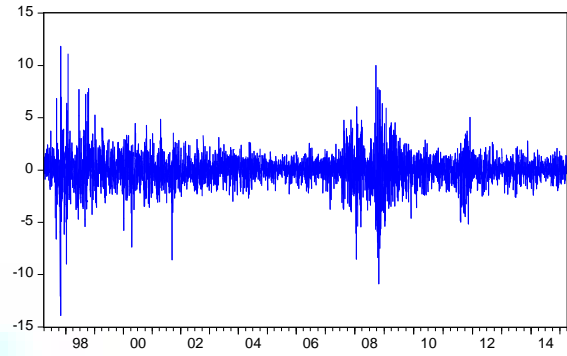**FIGURE-10: NASDAQ GRAPHICAL REPRESENTATION OF RETURN DATA**
RETURN
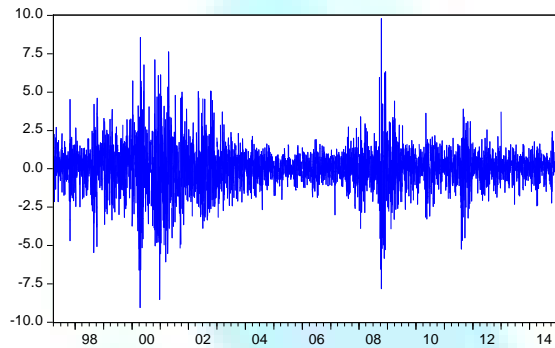
Figures - 6, 7, 8, 9, 10 there is mean reversion, which means that the graph returns back to zero and the mean remains constant. Thus representing the result of the calculated return data series, is depicting stationarity.

4.   ANALYSIS OF THE IMPACT OF FOREIGN MARKETS ON NATIONAL STOCK EXCHANGE BY USING GARCH FAMILY MODELS
National Stock Exchange of India is one of the leading exchanges of the world, as it has reached the global standards. In the analysis all the results have been explained in detail using NSE index and later on the impact of all the four indices only the final table has been displayed.

TABLE 1: ARCH-LM TEST AT LAG 2 USING RETURNS OF NSE

Heteroskedasticity Test: ARCH			
F-statistic	1059.309	Prob. F(2,5882)	0.0000
Obs*R-squared	1558.387	Prob. Chi-Square(2)	0.0000
Test Equation:			
Dependent Variable: RESID^2			
Method: Least Squares			
Date: 07/18/15 Time: 19:22			
Sample (adjusted): 1/09/1991 3/31/2015			
Included observations: 5885 after adjustments			
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.521782	0.181265	8.395347	0.0000
RESID^2(-1)	0.581230	0.012647	45.95844	0.0000
RESID^2(-2)	-0.243340	0.012647	-19.24112	0.0000
R-squared	0.264807	Mean dependent var		2.298363
Adjusted R-squared	0.264557	S.D. dependent var		15.99119
S.E. of regression	13.71372	Akaike info criterion		8.075181
Sum squared resid	1106205.	Schwarz criterion		8.078586
Log likelihood	-23758.22	Hannan-Quinn criter.		8.076364
F-statistic	1059.309	Durbin-Watson stat		1.908764
Prob(F-statistic)	0.000000			

Initially the ARCH-LM test was run with lag (1) and the results were significant showing presence of ARCH effect in the series but to confirm the order of ARCH effect lags were increased and it was found that for NSE test results were significant till lag (2). It confirms that NSE returns series has ARCH effect of order (2). Since ARCH effect has been confirmed, the series can be modelled using GARCH family model.
The ARCH-LM test on FTSE, NASDAQ, Hang Seng and BOVESPA return series using GARCH (1,2) and model which is the parsimonious model. Thus from the results it has been confirmed that heteroskedasticity has been removed, as p-value is more than 5%.
Below are the results the return series showing of FTSE, NASDAQ, Hang Seng and BOVESPA global impact on volatility of National stock exchange:

4.1 MEASURING THE IMPACT OF BOVESPA ON NSE BY APPLYING GARCH

TABLE 2: STUDYING THE IMPACT ON NSE OF BOESPA THROUGH GARCH (1, 2)

Dependent Variable: RETURN
Method: ML - ARCH (Marquardt) - Normal distribution
Convergence achieved after 14 iterations
Presample variance: backcast (parameter = 0.7)
GARCH = C(2) + C(3)*ARCH(-1)^2 + C(4)*ARCH(-2)^2 + C(5)*GARCH(-1)
    + C(6)*BRETURN

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.133639	0.013464	9.925450	0.0000
C	0.029341	0.003766	7.791518	0.0000
ARCH(1)	0.285002	0.022602	12.60956	0.0000
ARCH(2)	-0.187284	0.024233	-7.728418	0.0000
GARCH(1)	0.886457	0.010576	83.81856	0.0000
BRETURN	-0.035793	0.003951	-9.059349	0.0000

R-squared	-0.004422	Mean dependent var	0.049839	
Adjusted R-squared	-0.004422	S.D. dependent var	1.260335	
S.E. of regression	1.263118	Akaike info criterion	2.979637	
Sum squared ARCH	7134.931	Schwarz criterion	2.988230	
Log likelihood	-6657.958	Hannan-Quinn criter.	2.982666	
Durbin-Watson stat	1.236091			

4.2 MEASURING THE IMPACT OF HANG SENG ON NSE BY APPLYING GARCH

TABLE 3: STUDYING THE IMPACT ON NSE OF HANG SENG THROUGH GARCH (1, 2)

Dependent Variable: RETURN
Method: ML - ARCH (Marquardt) - Normal distribution
Convergence achieved after 15 iterations
Presample variance: backcast (parameter = 0.7)
GARCH = C(2) + C(3)*ARCH(-1)^2 + C(4)*ARCH(-2)^2 + C(5)*GARCH(-1)
    + C(6)*HRETURN

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.118028	0.013014	9.069382	0.0000
Variance Equation				
C	0.024605	0.003719	6.615501	0.0000
ARCH(1)	0.317737	0.020658	15.38083	0.0000
ARCH(2)	-0.212578	0.022751	-9.343640	0.0000
GARCH(1)	0.882519	0.011508	76.68715	0.0000
HRETURN	0.000657	0.001047	0.626950	0.5307

R-squared	-0.002970	Mean dependent var	0.049411	
Adjusted R-squared	-0.002970	S.D. dependent var	1.259257	
S.E. of regression	1.261125	Akaike info criterion	2.986998	
Sum squared ARCH	7133.112	Schwarz criterion	2.995570	
Log likelihood	-6693.837	Hannan-Quinn criter.	2.990019	
Durbin-Watson stat	1.237681			

4.3 MEASURING THE IMPACT OF NASDAQ ON NSE BY APPLYING GARCH

TABLE 4: STUDYING THE IMPACT ON NSE OF NASDAQ THROUGH GARCH (1, 2)

Dependent Variable: RETURN
Method: ML - ARCH (Marquardt) - Normal distribution
Convergence achieved after 19 iterations
Presample variance: backcast (parameter = 0.7)
GARCH = C(2) + C(3)*ARCH(-1)^2 + C(4)*ARCH(-2)^2 + C(5)*GARCH(-1)
    + C(6)*NRETURN

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.116033	0.013008	8.920047	0.0000

Variance Equation				
C	0.024736	0.003728	6.635589	0.0000
ARCH(1)	0.316517	0.020483	15.45260	0.0000
ARCH(2)	-0.211274	0.022596	-9.350011	0.0000
GARCH(1)	0.882211	0.011531	76.50442	0.0000
NRETURN	0.001300	0.001053	1.235405	0.2167

R-squared	-0.002869	Mean dependent var	0.048658
Adjusted R-squared	-0.002869	S.D. dependent var	1.257917
S.E. of regression	1.259720	Akaike info criterion	2.985175
Sum squared ARCH	7141.029	Schwarz criterion	2.993722
Log likelihood	-6712.135	Hannan-Quinn criter.	2.988186
Durbin-Watson stat	1.238250		

4.4 MEASURING THE IMPACT OF FTSE ON NSE BY APPLYING GARCH

TABLE 5: STUDYING THE IMPACT ON NSE OF FTSE THROUGH GARCH (1, 2)

Dependent Variable: RETURN
Method: ML - ARCH (Marquardt) - Normal distribution
Convergence achieved after 14 iterations
Presample variance: backcast (parameter = 0.7)
GARCH = C(2) + C(3)*ARCH(-1)^2 + C(4)*ARCH(-2)^2 + C(5)*GARCH(-1)
    + C(6)*FRETURN

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.116097	0.013012	8.922180	0.0000

Variance Equation				
C	0.024678	0.003716	6.640197	0.0000
ARCH(1)	0.316381	0.020493	15.43817	0.0000
ARCH(2)	-0.211358	0.022601	-9.351857	0.0000
GARCH(1)	0.882453	0.011487	76.82023	0.0000
FRETURN	0.001209	0.001061	1.139741	0.2544

R-squared	-0.002875	Mean dependent var	0.048658
Adjusted R-squared	-0.002875	S.D. dependent var	1.257917
S.E. of regression	1.259724	Akaike info criterion	2.985224
Sum squared ARCH	7141.067	Schwarz criterion	2.993771
Log likelihood	-6712.246	Hannan-Quinn criter.	2.988236
Durbin-Watson stat	1.238243		

CONCLUSION

The expected return of NSE depends on its own volatility of previous days. Apart from this foreign stock markets have some impact on NSE daily returns, which does not persist in the long run. Researchers tried to find out the foreign market impacts viz NASDAQ, FTSE, BOVESPA, Hang Seng. Best models of GARCH family are applied in order to study the impact of foreign markets on NSE. Individual correlation is established and impact of each market on NSE has been obtained. Though a very little impact is realised but somehow significant results have been obtained. Volatility of BOVESPA has high influence among the other three markets i.e. Hang Seng, NASDAQ and FTSE. It may be understood that BOVESPA and NSE are in emerging stages and showing some integration. While as volatility Hang Seng is the second index, which has significant impact on NSE. The reason may be it is one among the Asian countries and have a spillover impact on NSE. Volatility of NASDAQ and FTSE has shown least impact on NSE. The time gap daily volatility and difference of macro-economic variables there is less impact on NSE.

REFERENCES

1. Batra Amita (2004), "Stock return volatility pattern in India," Working Paper No. 124, Indian Council for Research on International Economic Relations.
2. Joshi Prashant (2010), "Modeling volatility in emerging stock markets of India and China", Journal of Quantitative Economics, Vol. 8, No.1, January.
3. Kumar Brajesh and Singh Priyanka, (2008), "Volatility Modeling, Seasonality and Risk Return Market", W.P. No.2008-04-04, April, IIM Ahmedabad, Research Papers.
4. Kumar Rakesh and Dhankar Raj S (2009), "Asymmetric Volatility and Cross Correlations in Stock Returns under Risk and Uncertainty", Vikalpa, Vol. 34, No. 4, October - December
5. Mallikarjunappa T. and Afsal E.M. (2010), "Price Discovery Process and Volatility Spillover in Spot and Futures Markets: Evidences of Individual Stocks", Vikalpa, Volume 35, No. 2, April-June.
6. Mishra P. K. (2009), "Capital market volatility - An Econometric Analysis", Institute of Technical Education and Research (ITER).
7. Modeling and Forecasting Volatility in Indian Capital Markets, Ajay Pandey
8. Pandian Punithavathy and Jeyanthi Queensler (2008), "Stock volatility in Indian Stock Exchange", www.indiastat.com, May–June, 2009.
9. Raunig Bukhard and Scharler Johan, (2010), "Stock market volatility and the business cycle", Monetary policy & the Economy, Q2.
10. Shobhana V. K. (2011), "Volatility of Stock Return of the Select Banking Companies Listed at Bombay Stock Exchange", Volume no. 1, Issue no. 8, December.
11. Venkatesh C. K. and Tyagi Madhu (2010), "The use of fundamental and technical analysis by stock exchanges dealers: Indian evidence", Middle Eastern Finance and Economics, ISSN: 1450-2889, Issue 14.

WEBSITES

12. http://en.wikipedia.org/wiki/Data_analysis#cite_note-3
13. http://www.vikalpa.com/pdf/articles/2004/2004_jul_sep_35_41.pdf, Stock Market Seasonality in an Emerging Market S N Sarma
14. https://en.wikipedia.org/wiki/Volatility_(finance)

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