A STUDY ON COMPARITIVE ANALYSIS OF VOLATILITY OF EQUITY SHARE PRICES FOR SELECTED STEEL COMPANIES IN INDIA

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ABSTRACT

This paper explain the stock market volatility at the individual script level and at the aggregate stock price level. The empirical analysis has been done by using Generalised Autoregressive Conditional Heteroscedasticity (GARCH) model. It is based on daily data for the time period from January 2015 to December 2015. The analysis reveals the same trend of volatility in the case of aggregate stock price and two different steel company. The GARCH (1, 1) model is persistent for the two company share price.

Key words: GARCH, Stock Market Volatility, Equity Share Price.

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1. INTRODUCTION

Volatility is a theoretical construct. Models for volatility often use an unobservable variable that controls the degree of fluctuations of the financial return process. This variable is usually called the volatility. Generally, two different volatility models, will lead to different concepts of volatility.

In finance, volatility is a measure for variation of price of a financial instrument over time. Historic volatility is derived from time series of past market prices. An implied volatility is derived from the market price of a market traded derivative (in particular an option). The symbol σ is used for volatility, and corresponds to standard deviation


To estimate the volatility and capture the stylized facts of fat-tail distribution, volatility clustering, leverage effect, and mean-reversion in futures returns, appropriate ARMA-generalized autoregressive conditional heteroscedastic (GARCH) and ARMA-EGARCH models with generalized error distribution have been used. The ARMA-EGARCH model is augmented by including

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contemporaneous and lagged trading volume to determine their contribution to time-varying conditional volatility. The paper finds evidence of leverage effect, which indicates that negative shocks increase the futures market volatility more than positive shocks of the same magnitude. In addition, the results indicate that inclusion of both contemporaneous and lagged trading volume in the GARCH model reduces the persistence in volatility, but contemporaneous volume provides a greater reduction than lagged volume. Nevertheless, the GARCH effect does not completely vanish. Research findings have important implications for the traders, regulatory bodies, and practitioners. A positive volume-price volatility relationship implies that a new futures contract will be successful only to the extent that there is enough price uncertainty associated with the underlying asset. Higher trading volume causes higher volatility; so, it suggests the need for greater regulatory restrictions. Equity derivatives are relatively new phenomena in Indian capital market. This paper extends and updates the existing empirical research on the relationship between futures price volatility and volume in the emerging Indian capital market using improved methodology and recent data set.


The purpose of this research is to determine whether the trading of equity index futures contracts on the South African Futures Exchange (SAFEX) results in an increase in the volatility of the underlying spot indices. Since equity index futures contracts were first listed in the USA in 1975, various studies have been undertaken to determine whether the volatility of shares in the underlying indices increases as a result of the trading of such futures contracts. These studies have led to the development of two schools of thought: [a] Trading activity in equity index futures contracts leads to an increase in the volatility of index shares. [b] Trading activity in equity index futures contracts does not lead to an increase in the volatility of the index shares and could in fact lead to greater stability in equity markets. Although some evidence of higher volatility in expiration periods was found, volatility in the expiration periods was not consistently higher than in the corresponding pre-expiration period.

1.3.”Return and Volatility Spillovers from Developed to Emerging Capital Markets: The Case of South Asia” by Yun Wang, Abeyratna Gunasekarage, David M. Power, Volume: 86, 2005

This study examines return and volatility spillovers from the US and Japanese stock markets to three South Asian capital markets – (i) the Bombay Stock Exchange, (ii) the Karachi Stock Exchange and (iii) the Colombo Stock Exchange. We construct a univariate EGARCH spillover model that allows the unexpected return of any particular South Asian market to be driven by a local shock, a regional shock from Japan and a global shock from the USA. The study discovers return spillovers in all three markets, and volatility spillovers from the US to the Indian and Sri Lankan markets, and from the Japanese to the Pakistani market. Regional factors seem to exert an influence on these three markets before the Asian financial crisis but the global factor becomes more important in the post-crisis period.


This is a market volatility study utilizing three measures of assessing volatility in the U.S stock markets prior to and after the month of September 2008 using three proxies. The first is the VIX index, the CBOE options volatility measure. The next two are bearish, or short position strategy, ETF’s based on stock indexes but designed to reflect and benefit from stock market movements in the downward direction. They are the Power Shares index, symbol SDS, and the Rydex Index, symbol RMS. This research evaluates and analyzes weekly movements in the three volatility variables mentioned above for a period of the last eight months of 2008. This includes the four months prior to and the four months after the beginning of September 2008. Specifically, the relative magnitude, volatility and degree of correlation between the three variables will be examined and compared to the movements in NYSE, NASDAQ and S&P stock indexes. The life span and volume of trading, one measure of liquidity, in each of the three variables will also be evaluated. Part of the analysis, and conclusions, will involve analyzing how similar or dissimilar the three behave and whether one may be a better indicator of current or future volatility in the stock market, or financial markets in general and how effective the bear market ETFs might be as hedging vehicles in a down market.

1.5. “Forecasting Volatility in the Singapore Stock Market” by SiewHoong, Apr 1992

Data from the Stock Exchange of Singapore (SES) are used to compare 3 methods of forecasting the volatility of derivative securities: 1. the naive method based on historical sample variance, 2. the exponentially weighted moving average (EWMA) method, and 3. The generalized autoregressive conditional heteroskedasticity (GARCH) model. The data used are the daily closing prices of 5 value-weighted SES indexes covering the period from March 19, 1975, to October 25, 1988. Study findings
indicate that the EWMA method is superior to the naive method and the GARCH model. The GARCH model, while the most sophisticated, is the poorest method, which can be partially attributed to the method's stringent data requirements. Therefore, the EWMA is particularly appealing in actual applications in the pricing of derivative securities, given its superior forecasts and simplicity.

2. RESEARCH OBJECTIVES

- To study the profile of selected steel company in India.
- To evaluate the distribution of equity share price of the selected company.
- To find out the normality of equity share price of the selected company.
- To compute the stationery position of equity share price of the selected company.
- To identify the Volatility position of equity share price of the selected company.
- To provide necessary finding and suggestion.

3. SCOPE

- The paper examines the stationery position and the volatility position of equity share price of the selected Companies. The scope of the research comprises of information derived from secondary data from various websites.
- This study can be used by investors, traders and other professionals as a supplement to their own research.
- This study can be used to individual who are at initial stage of investment in stock market.
- To different Organization who provides tips for Buying and Selling shares.
- To review market forecast provided by the organization about fluctuation in the market.

### Table 1 Distribution of the Equity share prices

<table>
<thead>
<tr>
<th>Variables</th>
<th>JSW</th>
<th>SAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>Mean</td>
<td>692.039</td>
<td>759.283</td>
</tr>
<tr>
<td>SD</td>
<td>47.4773</td>
<td>62.8447</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.215694</td>
<td>-0.0179353</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-0.549156</td>
<td>-0.463960</td>
</tr>
</tbody>
</table>

### Table 2 Test of Normality

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Doornik-Hansen test</th>
<th>Shapiro-Wilk test</th>
<th>Lilliefors test</th>
<th>Jarque-Bera test</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSW STEEL LTD</td>
<td>5.11342</td>
<td>0.0775597</td>
<td>0.981581</td>
<td>0.0008413</td>
</tr>
<tr>
<td>SAIL</td>
<td>83.3946</td>
<td>7.78205e-019</td>
<td>0.922708</td>
<td>3.94052e-0</td>
</tr>
</tbody>
</table>
Table 3 Maximum Lag Length and Test result for Augumented Dicky-Fuller test

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Minimum BIC</th>
<th>Lags</th>
<th>ADF Test statistic</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSW STEEL LTD</td>
<td>8.456320</td>
<td>1</td>
<td>0.5116</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>SAIL</td>
<td>3.865785</td>
<td>1</td>
<td>0.1304</td>
<td>&gt;0.05</td>
</tr>
</tbody>
</table>

Table 4 Univariate Volatility model Estimators of JSW Steel ltd and Steel Authority of India ltd price

<table>
<thead>
<tr>
<th>Company Name</th>
<th>JSW steel ltd</th>
<th>SAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent Variable</td>
<td>Coefficient</td>
<td>Std.Error</td>
</tr>
<tr>
<td>Constant</td>
<td>729.578</td>
<td>6.51601</td>
</tr>
<tr>
<td>U2t</td>
<td>199.250</td>
<td>53.5037</td>
</tr>
<tr>
<td>U2 t-1</td>
<td>0.905533</td>
<td>0.0591392</td>
</tr>
<tr>
<td>Y t-1</td>
<td>0.0276789</td>
<td>0.0423556</td>
</tr>
</tbody>
</table>

***-pvalue-1%

Chart 1 Share Price Movements of JSW Steel Ltd

Chart 2 Share Price Movements of Sail
4. FINDINGS

- It can be observed that in case of JSW steel ltd, the skewness and Kurtosis value (-0.215694, -0.0179353, -0.549156, -0.463960) has shown negative impact during the pre and post announcement and in case of STEEL also the skewness and Kurtosis value (-0.576539, -0.390066, -0.104548, -0.821593) has shown negative impact during the pre and post announcement. It is noted that both the company shows only negative impact for the announcement of equity share.

- The test of univariate normality for JSW steel ltd and SAIL price based on four different types of test namely Doornik-Hansen test, Shapiro-Wilk test, Lilliefors test, Jarque-Bera test is visualized. The results were performed for the JSW Steel ltd and SAIL. As far as analysis the JSW steel ltd and SAIL follows the normality at 1% level. Hence, we can conclude that the JSW steel ltd and SAIL in National Stock Exchange had followed the normal distribution.

- The maximum lag length for JSW steel ltd and SAIL is exhibited. By using the Schwarz Bayesian criterion the optimum lag length of company was finalized, the minimum BIC was achieved for the JSW steel ltd and SAIL equity price with a optimum lag length of 1.

- The results of the Augmented Dicky-fuller test (or) unit root test which helps to find out the stationerity for the JSW steel ltd and SAIL equity price in NSE. The ADF test confirms that the price JSW steel ltd and SAIL Company are stationery over a period of time.

- It is identified that the 90.55% and 107.57% are relates to alpha so the equity share price is affected with random stock of both the company. 2% and 10% are relates to beta so the new information affects the price of both the company. As the result the stock is volatile in nature for both the company.

5. SUGGESTIONS

It is suggested when there is normality in equity share prices it is safe to invest. The investment in short term leads to high risk. It is better to invest in long term period.

6. CONCLUSION

This paper in particular addresses the stock market volatility of selected company in National Stock Exchange of India using GARCH (1, 1) model. It can be observed that among the two company selected, SAIL company sector had got more volatility during the study period.

REFERENCE


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