Summary of Findings, Suggestions and Conclusions
CHAPTER VII

SUMMARY OF FINDINGS, SUGGESTIONS AND CONCLUSIONS

7.1 Introduction

Security markets in the past twenty years have seen the emergence of an astonishingly theoretical approach to valuation, market making, and arbitrage in complex market sectors. Many security firms now base their bid and offer prices for complex securities on detailed analytic or computer models built by scientists. In India, financial market liberalization since early 1990s has brought major changes in the financial system of our country. The creation and empowerment of Securities and Exchange Board of India (SEBI) has helped in providing higher level accountability in the market. New institutions like National Stock Exchange of India (NSE), National Securities Clearing Corporation Limited (NSCCL), and National Securities Depository Limited (NSDL) have been the change agents and help cleaning the system and provide safety to investing public at large.

In today’s scenario, volatility is calculated for various types of financial variables, such as stock return, interest rate, exchange rate, etc. Stock return volatility measures the variability of the stock return around the average value of the return. More specifically it is the standard deviation of the stock return. It is found that the volatility prevails in all the stock market around the world. Due to the arrival of the new information which are available publicly or privately the expected value of the stock change. This will result into either increase or decrease in the prices and thereby volatility enters in the stock return. Volatility is natural phenomenon in the stock market but excessive volatility is a matter of concern which arises due to the irrational behaviour of the trader, investor and lack of transparency in the operations of the stock market. The excessive volatility may lead to loss of the investor’s life time savings and market traders insolvent. The high level of volatility in the equity market is also matter of concern because this will create the low confidence among the investor regarding the capital market and decrease the flow of capital in the equity market. It is perceived as market inefficiency and a potential threat to the very integrity of the market mechanism. This concern in the marketplace has
underlined the importance of measuring and predicting the stock market volatility. Only then effective monitoring mechanism can be implemented and will help in the prevention of such scam.

7.2 Major Findings of the Study

7.2.1 Descriptive Statistics for Selected Companies

The selected Automobile companies are grouped under three categories are positively deviated from Normal Distribution. The selected companies have kurtosis value greater than 3 (Leptokurtic Distribution), which indicates unexpected return distributions are not normal. The Standard Deviations of all the companies are positive which are plotted normally from the mean. The mean returns are as follows:

High Market Capitalization Companies

The mean returns of the selected companies are majority negative and among them highest (0.002425) for Tata Motors Limited and lowest (-0.0006) for Maruti Suzuki India Limited. The Standard Deviation of returns is highest (0.127374) for Tata Motors Limited and lowest (0.014448) for Bosch Limited. This indicates the fact that selected high market capitalization companies are more volatile.

Medium Market Capitalization Companies

The mean returns of the selected companies are positive and among them highest (0.003904) for Ashok Leyland and lowest (-0.00071) for MRF Limited. In the first period the average returns are showing positive for 9 companies and negative for another 2 companies but during the second period which carries more fluctuation out of 11 companies 8 companies showing negative mean returns and only 3 companies produced positive mean returns. This negative return occurred due to economic slowdown and financial crisis during September 2008 effect. This negative mean returns clearly brought negative effect in the stock return. The Standard Deviation of returns is the highest (0.181333) for Ashok Leyland and lowest (0.022664) for SKF India Limited.

Low Market Capitalization Companies

The mean returns of the selected low market capitalization companies are positive and among them highest (0.00459) for Gabriel India Limited and lowest (-0.00303) for
Atul Auto Limited. In the first period the average returns are showing positive for 23 companies and negative for another 3 companies but during the second period which carries more fluctuation out of 31 companies 19 companies showing negative mean returns and remaining 12 produced positive mean returns. The Standard Deviation of returns is the highest (0.192556) for Gabriel India Limited and lowest (0.018225) for Wabco-TVS India Limited. This indicates the fact that selected low market capitalization companies are more volatile; the highest volatile company is Gabriel India Limited and least volatile company is Wabco-TVS India Limited during the study period.

7.2.2 Test of Normality for Selected Companies

In the case of all the selected companies the p-value of Jarque-bera test is between 0 and 1. The Jarque-bera test used to test normality showed that the series is not normally distributed for the selected companies. This shows that the return values are not normally distributed.

7.2.3 Test of Stationarity of Selected Companies

The stationarity test analyses the daily returns of all selected companies. It is found that the Test Statistic Values are satisfied at Level Difference itself and the selected companies are stationary at 1% significant level in the First Difference. The Test Statistic Values of First Difference are higher than the Test Critical Values of Level of Difference. But the returns are stationary in Level Difference itself (or) the Unit Root Test results identifies that the stock price return for the selected companies are stationary in Level and Intercept of I (0).

7.2.4 Measurement of Stock Price Volatility of Selected Companies

7.2.4.1 GARCH Model

The study attempted various combinations of ARCH and GARCH lags and the most appropriate models are selected for the consideration of results. The various results of different automobile companies are as follows:

High Market Capitalization Companies

The high market capitalization company’s values are closer than 1 except Tata Motors Limited (0.5981). This indicates greater effect of external shock in the market towards return. This clearly proves high volatility during the study period.
Medium Market Capitalization Companies

The average value of an ARCH and GARCH effect of all medium capitalized automobile companies is found to be closer than one except Amtek India Limited (0.5991) and TVS Motor Company Limited (0.6004). This clearly indicates greater persistence of external shocks towards return. This indicates there is volatility during the study period.

Low Market Capitalization Companies

The average value of an ARCH and GARCH effect of all low capitalized automobile companies under all three periods and is found to be more than one and closer to one for all companies. This clearly proves high volatility.

7.2.4.2 EGARCH Model

The study attempted various combinations of ARCH and GARCH lags and the most appropriate models are selected for the consideration of results. The various results of different automobile companies are as follows:

High Market Capitalization Companies

The average value of an ARCH and GARCH effect of all high market capitalization companies found to be less than one except for few companies. It is clearly indicate that the greater persistence of external shocks towards return. This clearly proves less volatility during the study period.

Medium Market Capitalization Companies

The average value of an ARCH and GARCH effect of all medium market capitalization companies found to be less than one. This clearly proves less volatility during the study period.

Low Market Capitalization Companies

It is found from the EGARCH table that the leverage effect for all the companies is significant. It is proved that positive shock makes high impact for all companies.
7.2.4.3 TGARCH Model

The study attempted various combinations of ARCH and GARCH lags and the most appropriate models are selected for the consideration of results. The various results of different automobile companies are as follows:

High Market Capitalization Companies

The ARCH effect is significant to all selected high market capitalization companies except Hero Motors and Tata Motors Limited. But the GARCH effect is significant for all the companies except for Tata motors limited. The results of TGARCH value suggested that there is a possibility of positive shock observed all companies which clearly indicates the reaction of good and bad news of the market is significant. This clearly proves that asymmetrical reaction of Bajaj auto is high towards good and bad news of the market. But for the remaining companies though it is statistically significant, the effect is low.

Medium Market Capitalization Companies

The insignificant results of TGARCH concluded that there is no presence of asymmetries effect for the Medium Market Capitalization companies.

Low Market Capitalization Companies

The ARCH effect is insignificant for majority selected low market capitalization companies. The coefficient for asymmetries $\delta$ values are insignificant for the Rico Auto Industries Limited, Subros Limited, Sundaram Clayton Limited and Wheels India Limited. The insignificant results concluded that there is no presence of asymmetries effect for the companies.

7.2.5 Forecasting the Volatility of Selected Companies

The result shows that among non linear models of forecasting, the EGARCH model has outperformed all the other models and provides the most accurate forecast in terms of RMSE, MAE and MAPE with lower level of errors. The various results of the different automobile companies are as follows:
High Market Capitalization Companies

It is found that the GARCH model dominates the forecasting performance and it is considered as the best model followed by TGARCH model. Despite its mathematical and statistical simplicity, EGARCH model outperformed all the other competing models in the study. Among the selected non linear models, EGARCH model performs the best fit in terms of forecasting ability.

Medium Market Capitalization Companies

The RMSE, MAE and MAPE are found to be lowest under EGARCH for 7 selected companies and GARCH for 3 companies and TGARCH for a company. EGARCH model outperformed all the other competing models in the study.

Low Market Capitalization Companies

It is found that the EGARCH model dominates the forecasting performance and its considered as the best model followed by GARCH and TGARCH. The RMSE, MAE and MAPE are found to be lowest under EGARCH for 17 selected companies and GARCH for 10 companies and TGARCH for 4 companies.

7.3 Suggestions of the Study

7.3.1 Research Based Suggestions

A. Analysis of Stock Price Volatility through Descriptive Measurements for the Select Companies

1. The result shows more volatility among selected automobile companies especially during second period. The highest volatility and the least volatility persisted during the study period. Hence, it is suggested that portfolio management should be made to insulate from sectoral effects.

2. The selected companies have kurtosis value greater than Leptokurtic Distribution, which indicates unexpected return distributions are not normal for all the selected companies. Therefore, the market regulator may take appropriate steps to stabilize the market for the benefits of long term and small investors.
B. Analysis of Stock Price Volatility through GARCH family models for the Selected Companies

1. From the GARCH model, it is observed that the return series have shown insignificance constant coefficient for all the companies in different sectors. The long term volatility level of return series is indicated through larger coefficient in GARCH equation. This suggests that investors should insulate from volatility by having keen on Macro level changes. This clearly proves the less volatility in the short run i.e. the change in return has less impact over the company which has value less than one.

2. From EGARCH model it is observed that there is a leverage effect for the selected companies. All the companies are found to be having significant leverage impact. It proved that a positive shock has high impact on conditional variance compared to the negative shock. Hence, it is suggested rural information network flow is one of the major factors in driving the Stock Market in the current scenario.

3. TGARCH models with high orders are usually tested to select the most appropriate model, which confines the properties of the daily return of companies. Hence, the study attempted various combinations of ARCH and GARCH lags and most appropriate models are selected for the consideration of results. So, it is suggested that there is no presence of asymmetries effect for the selected companies.

C. Modeling and Forecasting of Stock Price Volatility through Non Linear Models for the Selected Companies

Forecasting Stock Price Volatility in financial markets is one of the most important works in financial research. The study observed that among the non linear models, EGARCH model performs the best in terms of forecasting ability for the selected companies. Therefore, it is suggested that the investors should stick on the provision for positive and negative information flow towards the Stock Market.
7.3.2 General Suggestions to the Investors and Policy Makers

1. The lure of big money has always thrown investors into the lap of stock markets. However, making money in equities is not easy. It not only requires oodles of patience and discipline, but also a great deal of research and a sound understanding of the market.

2. It is necessary for the Indian Investors to carefully study the publicly available information, because it plays a major role in analyzing the Market Efficiency and Volatility in the Stock Market.

3. The typical investor’s decision is usually heavily influenced by the actions of his acquaintances, neighbors or relatives. Thus, if everybody around is investing in a particular stock, the tendency for potential investors is to do the same. But this strategy is bound to backfire in the long run.

4. The Market Regulators should closely observe the investors’ response regarding information transmission and its reliability or the trustworthiness of the information released by the Indian Companies.

5. It is to be noted that when compared with Developed Countries, Research in the area of Capital Market in general, and Investment Management in particular, is limited in India. Therefore, all possible steps may be taken to increase research in the area of Capital Market.

6. New Issue Market should be made more dynamic by making pricing of shares more credible, IPO rules less cumbersome, and disclosure norms more alert.

7. Historically it has been witnessed that even great bull runs have shown bouts of panic moments. The volatility witnessed in the markets has inevitably made investors lose money despite the great bull runs.

8. It is to be noted that, many investors have been losing money in stock markets due to their inability to control emotions, particularly fear and greed. In a bull market, the lure of quick wealth is difficult to resist. Greed augments when investors hear stories of fabulous returns being made in the stock market in a short period of time.
9. There is nothing wrong with hoping for the best from your investments, but you could be heading for trouble if your financial goals are based on unrealistic assumptions. For instance, lots of stocks have generated more than 50 per cent returns during the great bull run of recent years.

10. The regular identification of Seasonal Patterns in stock markets may help the investors to form appropriate trading strategies in the Stock Market. The study recommends that the investors may buy and sell the stocks using the best strategy.

11. To control the concentration of turnover and price volatility, benchmark indices like S&P Sensex and CNX Nifty should be broad based.

12. Integration of Stock Exchanges should be encouraged by giving incentives for establishing central trading system through interconnectivity.

13. Stock markets should be made more formal Financial Institutions by curbing excessive speculation and other fraudulent practices. For this, better disclosure norm, quality intermediation services, legal and accounting practices should be introduced. Listing of Government securities in stock exchanges can help in this regard.

14. Efforts should be made to increase the Investor Education and Investor Protection measures should be strengthened to bring more investors to the market, particularly the retail investors.

15. People are living in a global village; any important event happening in any part of the world has an impact on our financial markets. Hence we need to constantly monitor our portfolio and keep affecting the desired changes in it.

16. Investors are advised to analyse the performance of the selected company before investing. There are a number of sources like websites from where information about the company can be received.

17. Besides, SEBI provides EDIFAR (Electronic Data Information Filing and Retrieval System), which contains information about (i) Financial statements comprising of balance sheets, profit and loss account and full version of the annual report, half yearly financial statements, (ii) Corporate Governance Reports
(iii) Shareholding pattern and (iv) Action taken against the company by a Regulatory bodies. Apart from the above, the details of a company are also available with the various market participants and numerous public online sites. News magazines also carry out analysis of the companies periodically.

18. Finally, the verdicts of this study has a message for the market regulators that risk management practices should be further strengthened to take care of greater market volatility associated with an increase in the volume of trading.

7.4 Conclusion

The study threw light on the growth and development of the stock market and observed that the development of the stock market in India highly depends on volatility and forecasting is an important area of research in financial market. The study measured the extent of stock price volatility of selected Automobile companies and identified suitable model for forecasting the volatility of the share prices.

It evaluated the comparative ability of different econometric forecasting models in the context of Indian Stocks. Three different competing Non-Linear models were considered for the study and for forecasting performance of different models three forecasting error statistics Viz., Root Mean Square Error (RMSE), the Mean Absolute Error (MAE) and Mean Absolute Percent Error (MAPE) were used and the best model was suggested for each sector. The EGARCH model provides the most accurate forecast compared to other competing models in the study. The study also made few observations which may help the investors to understand better about the stock market.