APPLICATION OF VALUE-AT-RISK IN INDIAN STOCK MARKET

A Thesis Submitted in Partial Fulfillment of the Requirements for the Fellow Programme in Management

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Submitted in
September 2011

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ABSTRACT

Application of Value- at- Risk in Indian Stock Market

Understanding and managing risk is one of the major challenges in finance discipline. Existing literature considers Value-at-Risk (VaR) as an effective statistical approach for risk measurement. An exhaustive literature review reveals that there are only handful studies in the context of developing economies and the empirical evidences on VaR are mostly in the context of developed economies. Extending these findings for risk management in developing economies where financial markets are not as efficient as of developed economies, is debatable. Hence this dissertation identified the applicability of VaR for risk management in the context of developing economies as the potential research gap for further explorations.

The empirical analysis of this dissertation is based on Nifty 50 securities. Eight years panel data is primarily collected from publicly available database like Prowess maintained by CMIE and Reserve Bank of India's website.

In the First part of this dissertation VaR for equity portfolio has been applied and evaluated for Indian equity market. This study has applied all three methods for estimating VaR: Variance-Covariance, Historical Simulation and Monte Carlo Simulation at 99 percent, 95 percent and 90 percent confidence level. Distributions, such as Log-normal, Logistic and Student-t distribution, are assumed in addition to Historical distribution. The accuracy of VaR is estimated by Backtest measures like Kupiec's Point Of Failure test (POF), Kupiec's Time until First Failure test (TUFF), Christoffersen's Interval Forecast test (IFT) and Joint test. It was found that VaR estimates at 99 percent confidence level is more reasonable than for the 90 percent and 95 percent confidence level, except for Logistic distribution when performed on daily share returns.

In the Second part instead of simulating stock returns directly it was assumed stock returns to be function of more than one risk factor and risk factors were simulated using Monte Carlo simulation according to the distribution best fitting the historic data. A Linear regression analysis technique is applied to establish relation between the stock return and risk factors. VaR is estimated at 95 percent and 90 percent confidence level for actual return, returns estimated from actual risk factors and simulated risk factors. The Backtesting results showed comparatively better results than first part when performed for Multifactor risk model on monthly share returns.

Third Part of this dissertation has upgraded the VaR as decision variable in portfolio optimization when investors are more concerned with downside risk. Mean/Standard Deviation efficient frontier has been compared with Mean/VaR efficient frontier for Indian stock market and found that Mean/VaR efficient frontier for portfolio optimization is more appealing as it improved the skewness of the portfolio.

In conclusion, the findings confirm the lack of one best method for VaR estimation. Hence applying VaR techniques for risk management in the context of developing economies requires great caution. A larger sample with longer study period might give a more conclusive understanding about VaR.

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