Estimation of value at risk for stock prices in mobile phone industry

ABSTRACT

Risk management and market losses prediction played a vital role in the financial sector. Value-at-Risk (VaR) is one of the effective measures for financial risk management. This research studies three mobile phone companies which are Apple Inc, Google Inc and Microsoft Corporation. The stocks of these companies are listed under the National Association of Securities Dealers Automated Quotations stock exchange (NASDAQ). The Value-at-Risk is evaluated by using two non-parametric methods and four parametric methods. Two non-parametric methods used are the basic historical method and age-weighted historical method, while the four parametric methods are normal distribution, student's t-distribution, generalized extreme value distribution, and variance gamma distribution. Shapiro-Wilk normality test indicates that the return series of the selected companies are not normally distributed. This study found that, at 95% confidence level, the risks of the selected stocks are different for each method, and the stock of Microsoft Corporation is the least risky stock as it gives the lowest VaR. Through the conditional coverage test, this study founds that the age-weighted historical method overestimated the VaR. In addition, this study also concludes that the basic historical method, generalized extreme value distribution and variance gamma distribution are superior to other methods in the backtesting procedure.

Keyword: Value-at-Risk; Maximum likelihood; Conditional coverage test; Independence test; Christoffersen backtest