**Introduction**

Traditionally, Historical and Variance Covariance method is popular and easy way of quantifying risk in financial market. However, these two methods contain some drawbacks in capturing sudden changes and heavily based on the assumption of normal distribution. Furthermore, They basically can not capture the dependence amongst assets in portfolio. In reality, the financial returns do not totally follow the normal distributions and their tail distributions are highly dependent to each other, for instance, the plumet in stock prices can directly lead to the surge in gold price. Extreme Value theory (EVT), which is a branch of statistics that studies rare or extreme events is highly effective in term of describing the above-mentioned fat-tailed property. Nevertheless, it largely relies on the assumption that all the financial returns must be independent and identically distributed. In this article, we use the method called EVT-GARCH Copula which can effectively resolve the above stated problems. The key idea is that we will use the ARMA-GARCH model to estimate the standardized residuals and use the EVT method to generate the distribution including the extreme events. The Copula plays crucial role to estimate the dependence between the assets, and from that we easily simulate the financial returns and calculate VaR (value at risk) for investors’ portfolio. This article is basically divided into 5 sections, we will provide the background knowledge for readers from section 1 to section 3. Section 4 will provide detail steps of this method in VN stocks. The conclusion and result evaluation are described in the section 5.

**Abstract**

One of the most commonly used risk measures in risk management is Value at Risk (VaR). It is defined as the portfolio's worst loss over a given time horizon and at a given confidence level. We estimate portfolio VaR in this study using a method that combines Copula functions, Extreme Value Theory (EVT), and GARCH models. This method is applied to a portfolio of stock investments consisting of CTG, MSN, VIC and VNM. In this analysis, we use a method that combines Copula functions, Extreme Value Theory (EVT), and GARCH models to estimate portfolio VaR. This approach is used to analyze a portfolio of CTG, MSN, VIC, VNM stock investments. The portfolio VaR is then estimated using the Monte Carlo Simulation (MCS) approach. Backtesting approaches are used to determine the goodness of fit of an approach. We infer from the findings that the GARCH-EVT-Copula approach performs well in general, and that the GARCH-EVT-t Student and Clayton's Copula outperforms all other GARCH-EVT-Copulas as well as conventional methods like Historical Simulation (HS) and Variance Covariance (VC).

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