An Another Viewpoint to Estimate Value-at-Risk Based on Backtesting with Overlapping Data

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Abstract

According to the “backtesting-based correction" mentioned in the Lazar et al. (2019), which is obtained basically by try and error, we try to develop some corresponding theoretical results to modify the Value-at-Risk(VaR). In addition, we investigate the theoretical results by simulation studies and empirical studies. By simulation studies, through the comparison, shows that the feasibility of the backtesting-based correction used in the VaR. In practice, the backtesting-based correction of the VaR will face some difficulties, ex. use downward or upward modification before calculating VaR, so we propose a modification based on backtesting with overlapping data, and at the same time, the backtesting-based correction can be obtained more efficiently. The empirical analysis also shows that this modification has a greater pass ratio of backtesting on VaR than the modification without the overlapping data. We also further develop the theoretical results of higher-order moment VaR to compare whether it can be more effective on the basis of higher-order moment correction.

Keywords：Value-at-Risk(VaR), Backtesting, Higher-order moments