Volatility Sensitive Bayesian Estimation of Portfolio VaR and CVaR

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September 2021

Abstract

In this paper, a new way to integrate volatility information for estimating value at risk (VaR) and conditional value at risk (CVaR) of a portfolio is suggested. The new method is developed from the perspective of Bayesian statistics and it is based on the idea of volatility clustering. By specifying the hyperparameters in a conjugate prior based on two different rolling window sizes, it is possible to quickly adapt to changes in volatility and automatically specify the degree of certainty in the prior. This constitutes an advantage in comparison to existing Bayesian methods that are less sensitive to such changes in the market and also usually lack standardized ways of expressing the degree of belief. We illustrate our new approach using both simulated and empirical data and conclude that it provides a good alternative for risk estimation, especially during turbulent periods.