

A Study on Risk Integration and Risk Amount

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Abstract

The use of internal models in the Solvency II framework has recently been under discussion. There has also been discussion regarding the possibility of reducing required capital by using internal models rather than standard formulae. Why and how do internal models reduce the required capital or risks?

We have reason to believe that the relationship between risk integration and risk amount may be one of the theoretical reasons why internal models reduce risks. The relationship will be our focal point in this paper.

We have confirmed, mainly by Monte-Carlo simulations, that the risk amount of integrated risks is smaller than the risk amount calculated using the additive property of standard deviation. In particular, the integration of fat-tailed risk and non fat-tailed risk makes the decrease even greater.

Finally, based on the above results, we will discuss the effectiveness and challenges of internal model adoption.

Key Words

Integration of Risk, Risk Amount, Internal Model, VaR (Value at Risk), TVaR (Tail Value at Risk), Fat tail, Monte-Carlo simulation