

Estimating Risk Capital for Correlated, Rare Events

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Abstract

Operational Risk, that is, *the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events*, is a very heterogeneous risk class, including events such as bookkeeping errors and terrorist attacks. Modeling dependencies between individual operational-loss categories is of major interest to financial institutions, as they affect the estimation of regulatory minimum-capital requirements.

With a focus on rare events, we demonstrate that the use of correlations to model dependencies among risk categories might lead to a counterintuitive behavior of risk measures, such as Value-at-Risk (VaR) and Expected Shortfall (ES): Their value may decrease as correlation increases. Hence, the goal of reducing minimum capital requirements by incorporating less than perfect correlations, as suggested by the New Basel Capital Accord (*Basel II*), may not necessarily be attainable. We discuss the behavior of VaR and ES measures under different simulation designs and ways of improving the reliability of their estimates in the context of rare events.