

Operational choices for risk aggregation in insurance: PSDization and SCR sensitivity

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Abstract

This paper answers crucial questions about the robustness of the *PSDization process* for applications in insurance. *PSDization* refers to the process that forces a matrix to become positive semi-definite. For companies using copulas to aggregate risks in their internal model, *PSDization* occurs when working with correlation matrices to compute the Solvency Capital Requirement (SCR). We study how classical operational choices concerning the modelling of risk dependence impacts the SCR during PSDization. These operations refer to permutations of risks (or business lines) in the correlation matrix, addition of a new risk, and introduction of confidence weights given to the correlation coefficients. Using genetic algorithms, it is shown that theoretically neutral transformations of the correlation matrix can surprisingly lead to significant sensitivities of the SCR (up to 6%). This highlights the need for a very strong internal control around the PSDization step.

Keywords: Solvency II, risk aggregation, positive semi-definite, Rebonato-Jäckel.

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