

# ON THE NON-LIFE SOLVENCY II MODEL

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## Abstract

We present a simple actuarial rationale for the non-life economic capital formula proposed for Solvency II in QIS3. On the statistical side we improve on the methodology in QIS3 by defining company specific estimators for all quantities of interest including premium risk and reserve risk volatilities as well as correlation coefficients at the granularity level of lines of business.

We develop the non-life Solvency II economic capital formula applying both the value-at-risk (VaR) and conditional value-at-risk (CVaR) risk measures under a log-normal distribution of the portfolio combined ratio, which is defined as the ratio of incurred claims inclusive “run-off” to the premium and reserve volume. We determine confidence levels under which both methods yield approximately identical practical results. Moreover, we point out that economic capital modeling should neither be restricted to a log-normal distribution assumption nor to the VaR and CVaR risk measures and refer to the actuarial literature for various extensions on this. The portfolio combined ratio is decomposed in a weighted sum of the premium risk ratio and the reserve risk ratio as suggested in QIS3. Based on the basic portfolio risk ratio model summarized in the Appendix, we propose simple weighted estimators for all volatilities and correlation coefficients of interest. A numerical example illustrates the use of the proposed estimators.

## Key words

Non-life Solvency II, premium risk, reserve risk, value-at-risk, conditional value-at-risk, weighted estimators