Finma's Swiss Solvency Test 2019
Major Changes in the Market Risk Standard Model

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Finma announces new standard models for the Swiss Solvency Test («SST») 2019. The major changes are in the new market risk standard model, where a simulation-based approach is now used. This is implemented in a new open-source R-based software provided by Finma. This software, known as the «SST Tool», was developed by Effixis for Finma.

1   New Market Risk Standard Model

The new standard market risk model applies to life, health, non-life and re-insurance companies starting from 2019. Captive insurance companies can apply this new model on an opt-in basis for the coming year and are expected to fully switch to this new model by 2020.

Until now, the market risk model for the SST was the delta-normal model. The sensitivity of a portfolio was calculated with respect to the market risk factors and the target capital calculation followed immediately. Finma's new standard market risk model for the SST 2019 is no longer sensitivity-based and uses exact (centered) valuation functions for the most typical insurance positions:

- Fixed income (bonds, fixed mortgages, loans with fixed rates, loans with fixed terms)
- Insurance liabilities
- Positions with direct market price (stocks, real estate, hedge funds, private equity)
- FX forwards and forwards on indices
- Immaterial participations (subsidiaries)

For these positions, there is no need to compute sensitivities: the model inputs are directly the exposures in the asset positions and the cash flows. There is still a delta-normal valuation remainder term for the positions that are not covered by the model, such as floating rate notes, options and swaptions. Thus, sensitivities must only be computed for these positions. The total market risk must then be approximated using Monte Carlo simulations.

Finma's open-source R-based software developed by Effixis allows configuration of the market risk model and computation of the market risk using Monte Carlo simulations. It contains a graphical user interface that allows one to upload Finma's SST Excel template and to export the fundamental data sheet to be submitted to Finma.

Several other minor changes were made, in particular regarding the market risk factors. For instance, the risk factors for interest rates are reduced from 13 buckets per currency to 3 that account for short, middle and long term.

In principle, company-specific adjustments to the new standard market risk model are possible; of course, they are still subject to Finma's approval. As an example, it can be useful to add valuation functions such as for call and put options to better account for their hedging effect.

2   Aggregation, Scenarios and Target Capital Calculation

The aggregation of market and insurance risks has also changed in the SST and is now done using a Gaussian copula. The correlations between market and insurance risks are set to 15 %. Finma's open-source R-based SST Tool implements this aggregation using the reordering algorithm.

Finma's open-source R-based software allows to evaluate macroeconomic scenarios and to aggregate scenarios.

The SST target capital is then obtained through the following steps:

1. Simulate market and insurance risks.
2. Aggregate market and insurance risks based on the Gaussian copula.
3. Compute the expected shortfall of aggregated market and insurance risks.
4. Add the credit risk figure and the market value margin.
5. Subtract the expected financial result and expected insurance result.

3 Challenges with the New SST

Insurance companies will be faced with new challenges arising from the new SST:

- The handling of the new SST Excel Template.
- The impact on the SST target capital being portfolio dependent.
- The possibility for company-specific adjustments.
- The understanding of risk allocation and of other results from the simulations.
- The Finma approval process for potential company-specific adjustments.

4 About Us

The partnership between Effixis and Azenes aims to assist insurance companies overcome the challenges associated with the SST and risk modeling issues in general.

4.1 Effixis

Effixis is the author of Finma's open-source R-based SST Tool. Effixis is therefore best positioned to support the Swiss insurance market in the use, adaptation and modification of this open-source R-based software. Working with Finma allowed Effixis to gain unique knowledge on the new market risk model and of the possibilities for company-specific adjustments.

Effixis, an EPFL-born company, helps its clients build their risk ecosystem through model implementation and training. Effixis' core expertise lies at the intersection of software engineering, quantitative risk management and data science.

www.effixis.ch

4.2 Azenes

Azenes, an actuarial consulting boutique, is providing actuarial mathematics for decision-makers and strategists.

One main area of expertise, «Risk and Regulation», focuses on ensuring that regulations are being implemented efficiently and in a sustainable manner. Activities include risk modeling, model validation and support with supervisory and regulatory requirements in all SST-matters including (partial) internal model validation and review.

www.azenes.ch