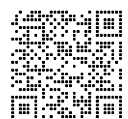


Guidance shadow computation 2019 for captives

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1 Aim

This document contains important information for the shadow computation 2019 for captives. It describes the scope, the provided documents and the modalities for participation. It also contains the guidance for the installation and running of the software.

The shadow computation takes place until 21 June 2019.

2 Scope

FINMA has developed a new market risk model and aggregation model for the aggregation of market risk, credit risk and insurance risk, which have been tested successfully in the 2018 fieldtest for insurance and reinsurance companies, which have to fulfil the SST requirements except the reinsurance captives (short: captives in the remainder of the document). Since the fieldtest has been successfully completed the new models have become compulsory for standard model users for the SST calculation from 2019 onwards. The captives are still exempt on the use of these models for the official 2019 SST calculation.

These new modules shall now be made available for those captives, which use the standard model for captives. Therefore a shadow computation has been designed specifically for the captives to enable

them to test the use of the new market risk model and the new aggregation model. There is an R-Tool designed by FINMA to perform these calculations based on the inputs for the SST. In the R-Tool there have been also features of the captive insurance risk model included. The test is in addition aimed to test this new implementation of the insurance risk within the R-Tool for captives.

The decision on the use of these new modules for captives from the SST 2020 onwards will be made and communicated after the results of the shadow calculation have been evaluated, latest by the end of October 2019.

3 Information on FINMA – website

Please download the documents and files listed below from the SST page of the FINMA Website¹:

- Guidance shadow computation 2019 for captives (this document)
- Technical description of the SST standard model captives (shadow computation 2019)
- SST-Captives-Template_SHADOW_COMPUTATION_2019.xlsx

Remark: The model for non-life insurance risk of a captive is the same as the current one for the official SST 2019. Due to the separation of non-life insurance risk to other risk categories since the last publication of 31.10.2016, the *Technical description of the SST standard model captives (shadow computation 2019)* has been fully rewritten.

The following general information is relevant for the shadow computation 2019 for captives (Captives are still exempted for the official SST 2019 for the new market risk model) and is provided for the official SST 2019 for all insurance companies including non-life insurers and reinsurance companies:

- Technical description for the SST standard model market risk
- Technical description for the SST standard model credit risk
- Technical description for the scenarios
- Technical description for the SST standard model aggregation and MVM
- Technical description for the SST balance sheet and FDS
- IT Notes
- SSTTool_setup_x86.zip for 32 bits Windows OS, respectively SSTTool_setup_x86.zip for 64 bits Windows OS
- SST-Template.xlsx

Facultative: *Reserve risk tool*

Information which is solely specific to captives can be found in the section "Shadow computation 2019 for captives". The other documents and tools have to be downloaded from the other Sections (e.g. "Tools" for the *R-Tool*)

¹ www.finma.ch > Supervision > Insurers > Cross-sectoral tools > Swiss Solvency Test (SST)

4 Delivery and modalities

With the exception of the standard captives model, where for the SST 2019 the old market risk and aggregation method is used, the SST standard model 2019 is made up of the following modules (themselves also called models):

- SST standard model market risk (developed in 2018 and in force since SST 2019)
- SST standard model credit risk
- SST standard model insurance risk (life, health, non-life or StandRe)
- scenarios (as described in the guideline for scenarios)
- SST standard model aggregation and market value margin (MVM):
 - Market, life, non-life (standard model non-life or StandRe) and health insurance risks and – if applicable – scenarios are aggregated.
- SST balance sheet and fundamental data sheet (FDS)

As part of the shadow computation, this set-up will now be applied for the users of the standard captives model, with the standard captives model used as the standard model for insurance risk.

The shadow computation allows for a trial of the new standard market risk and aggregation model and the corresponding R-tool where both the new standard market risk model and the aggregation model are implemented.

In addition in the R-tool some features of the insurance risk model have been included to allow for the calculation of all risk categories within one application. Nevertheless not all relevant features of the application of the reinsurance contracts might be implemented. Therefore there is also still the possibility to calculate the aggregated net insurance risk distribution as usual outside the model and enter it directly as simulated values or as cumulative distribution function, as it is done for the standard model for non-life insurance. For the shadow computation it is important that the effect of the new market risk model and the aggregation model can be evaluated. Therefore we would ask the participants to provide the same result on the insurance risk model as it is provided for the SST 2019.

4.1 Delivery

- Documents to deliver to FINMA are:
 - Fundamental_Data.xlsx
 - SST-Template.xlsx
 - SST-Captives-Template_SHADOW_COMPUTATION_2019.xlsx
 - A supporting document (in pdf or Word) commenting the application of the shadow computation. In particular, it should contain a description of:
 - the impact of the model changes, especially of the new models for market risk and credit risk
 - the challenges encountered (if any) and solutions found for implementing the new setup

- Deadline for delivery is the 21 June 2019
- The "Zustellplattform / plate-forme de transmission" of FINMA should be used to deliver the Excel files and pdf or Word document. Please consult for an instruction on how to use the platform: <https://www.e-service.admin.ch/sis/app/mandant/finma/>

Remark. The intention of the shadow computation is to provide captives with the opportunity to gain experience for the SST 2020, to know the impact on the regulatory SST solvency requirement, and to advise FINMA on potential problems before publication of the modified model for SST 2020. The participation in the shadow computation is facultative.

4.2 Questions and Workshop

Questions can be sent to: quantitative-risk-management@finma.ch

There will be a workshop organized by FINMA on

Tuesday 30 April 2019

9:30 a.m. to 12:30 p.m.

at FINMA-Zurich, Wasserwerkstrasse 12, 8006 Zurich

The main target audience is the specialists who have not have yet experience with the new market risk and aggregation tool. The presentation will be held in English and discussions are welcome in any national language, too. In case of interest, please apply by sending to quantitative-risk-management@finma.ch for each participant: company name, name of participant and email, until **Tuesday 11 April 2019**.

5 IT implementation

For the implementation of the R-Tool please consult the Section "System requirements of the executable version" in the document "IT Notes".

The newly developed features in the R-Tool for the calculation of the insurance risk include the following

- Modelling of PY-risk by PY-LOB with reserves and coefficient of variation as inputs
- Modelling of CY-risk by CY-LOB (with indicator for ground-up loss or maximal possible loss)
 - by CY-LOB modelled by ground-up loss approach according to the specification in the template:
 - As frequency severity model for normal claims with frequency (Poisson), mean and standard deviation for the gamma distribution as inputs
 - As frequency severity model for large claims with frequency (Poisson), shape and threshold (scale) for the Pareto distribution as inputs

- by CY-LOB of maximal possible loss model as a deterministic distribution with maximum net loss and expected net loss as input
- Aggregation to a yearly loss distribution by CY-LOB is done with modelling of the following reinsurance structures by CY-LOB for ground-up modelling in this order:
 - EED-conditions
 - EEL-conditions
 - AAD-conditions
 - AAL-conditions
 - QS after application of the previous contract conditions as described above
- Aggregation of the net losses across the LOBs for PY and CY comonotonic

Disclaimer

- Reinsurance conditions across several LOBs cannot be calculated by the tool
- The effect of reinstatement premiums is neglected in the calculation (in case these are considerable, they should increase the net loss and to be modelled outside the tool)
- The effect of sliding scale commissions and profit commissions have been neglected in the implementation (in case they change considerable the result, the tool cannot be used)
- The tool assumes that the reinsurance contracts are applied in the order given above. If the actual order differs, it needs to be analysed whether the tool can or cannot be used.
- Reinsurance is only applied to CY claims, but not to PY reserves

With the above conditions it should be possible to model the inward reinsurance structure of captives. In some cases it might also be possible to model the outward reinsurance. If this is not the case then the captive needs to model the insurance loss outside of the template.

6 Execution

Step 1:

- Chose the SST-Currency in the sheet *General Inputs* of *SST-Template*.
- Complete the sheets *SST Balance* and *RBC* for computing the RBC.
 - See Technical description for the SST balance sheet and FDS, and for insurance business related positions the Section SST balance sheet of Technical description for the SST standard model captives (shadow computation 2019)
- Complete the sheet *Differences_Stat_SSTBalance* as a reporting requirement.

Step 2:

- Complete SST-Captives-Template_SHADOW_COMPUTATION_2019.xlsx
 - See Technical description for the SST standard model captives (shadow computation 2019).
- *Remark:* for the shadow computation 2019, almost all input figures can be copied from the template used for the official SST 2019 as the model for insurance risk has not been changed.
- What is new is
 - The sheet *CA_premiums_and_reserves*, which is exactly the same reporting requirement as currently used in StandRe
- Facultative: use of *Reserve risk tool* separately

Step 3:

- Copy figures from sheet *CA_input_SST_Template* of *SST-Captives-Template_SHADOW_COMPUTATION_2019* into the corresponding sheets of the *SST-Template* (By doing this, the *SST-Template* is populated with the insurance business related figures.)
 - For instructions on what needs to be copied where in the *SST-Template*, see the sheet *CA_input_SST_Template* which is structured in sections according to the sheets of the *SST-Template*.

Step 4:

- Complete the remaining applicable sheets of the *SST-Template*
 - See *Technical description for the SST standard model market risk*, *Technical description for the SST standard model credit risk*, and where applicable *Technical description for the scenarios*

Step 5:

- Use the SST-Tool (R-Tool) through the executable *SSTTool_setup_x86.zip* for 32 bits Windows OS, respectively *SSTTool_setup_x86.zip* for 64 bits Windows OS.
 - See IT Notes and Technical description for the SST balance sheet and FDS
 - This step produces the output file of the SST calculation *Fundamental_Data.xlsx*.
- *Remark 1:* The SST-Tool performs mainly the simulations for aggregating the risks which would be difficult to be implemented in in Excel stand-alone. In particular:
 - For insurance risk of captives: aggregation from LOBs parameters into the non-life insurance risk distribution via simulations. Though the insurance risk model has not changed, this aggregation tool for aggregating within insurance risk is newly implemented.
 - For market risk: see *Technical description for the SST standard model market risk*
 - Aggregation of risk categories using a dependency structure: see *Technical description for the SST standard model aggregation and MVM*

- *Remark 2:* The non-life insurance risk distribution of a captive is taken into account by one of the two methods, which should lead to the same result:
 - Default method: In the sheet *Non Life Distribution of SST-Template*, select « captives ». Then the *SST-Tool* will produce the required non-life risk distribution by simulation from the parameters input in the sheet *Captives Shadow Computation*.
 - Alternative method: In the sheet *Non Life Distribution of SST-Template*, select « simulations » or « cumulative distribution function », and enter the corresponding simulations or cumulative distribution function obtained by your external tool in this sheet.

If an alternative method is used, please explain why. If the default method is used, please nonetheless provide also FINMA with simulations or a cumulative distribution function if available in sheet *Non Life Distribution of the SST-Template*.

Step 6

- Perform consistency and plausibility verifications, with focus on the main risk drivers of the captive.