

# Stress tests in insurance

Nikola Rodić

Risk manager&Certified actuary

Societe Generale Osiguranje

# WHAT ARE STRESS TESTS?

**Management  
tool**

**SUPERVISORY  
OVERSIGHT  
TOOL**

*Set of severely  
adverse conditions*

**BELIEVABLE NARRATIVE IS CRUCIAL**

**Result of several risk factors  
over several time periods**

*Result of one risk factor  
with short duration*

**PROJECTION OF  
THE FINANCIAL  
CONDITION**

**Extreme scenario with a  
severe impact**

Reverse scenarios  
Historical scenarios  
Synthetic scenarios

**Extreme but plausible**

# USE OF STRESS TESTS IN INSURANCE

- Stress testing can serve a number of purposes:
  - Macro prudential surveillance
  - Micro prudential supervision
  - Crisis management
  - Risk management
- Stress tests in the insurance industry followed developments in the banking industry
- Countries that perform supervisory insurance stress tests: Austria, Bermuda, Canada, Czech Republic, Denmark, EU, Germany, Guernsey, Japan, Singapore, Switzerland, UK and US
- Serbia was one of the countries at the forefront of developments in supervisory stress testing in insurance
  - First insurance stress test in 2016
  - Second insurance stress test in 2017

## HOW DID SOLVENCY 2 EFFECT STRESS TESTS?

- EIOPA got the mandate to perform insurance stress tests in the overhaul of EU regulation (practice of biannual insurance stress testing 2011, 2014, 2016 and 2018)
- Stress testing has become an important part of the supervisory toolkit
- Important area of application is the use of stress tests for own risk and solvency assessments (ORSA)
- Supervisors expect that insurance companies perform stress tests at least annually as part of their ORSA
- ORSA stress tests should be company specific and allow management to assess risks exposure and mitigations techniques
- ORSA gives an incentive to insurance companies to develop own stress tests tailored to specific risks and needs

# USE OF STRESS TESTS FOR BUSINESS STEERING

- A common mistake made by many undertakings in the first ORSA submission was to examine a number of stress scenarios under which they did not breach the SCR
- After the initial reaction and thanks to the learning process and getting accustomed to stress tests, management of insurance companies started getting more involved and seeing the value of stress tests outside ORSA and supervisory compliance
- Stress testing can be used by management for informing decisions and business steering
- It is important that the models are unbiased and can challenge management without being ignored as a “the sky is falling”, but also not to be so mild that they desensitize management to potential risks

# USE OF STRESS TESTS FOR BUSINESS STEERING

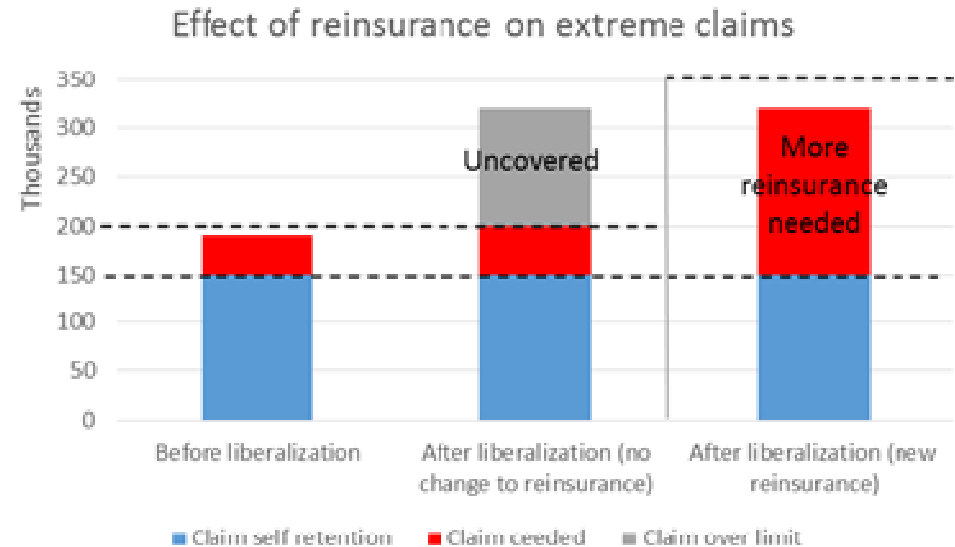
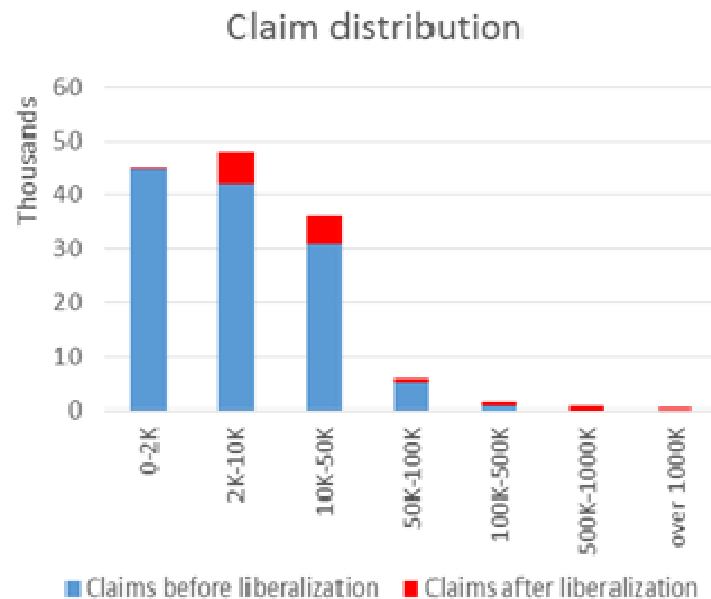
- Inciting management actions is the most important reason for using stress testing for business steering
- Designing stress tests and presenting the results in a right way will usually result in management taking decisions and actions to correct problems or adapt to the future
- Important adaptation of stress tests to business steering is the metric of the test
- For supervisory purposes capital adequacy is the usual metric
- Stress tests for business steering should focus more on events that have an effect on company profit
- Operational stress tests can also be performed to identify operational issues, using metric such as
  - Time to execute some operation
  - Potential monetary loss in case of a mistake
- Application of stress tests is possible for product development also (determining capital requirements per product and profitability per product and stressing these metrics)

# PRACTICAL EXAMPLE – Use of stress test to prepare a strategy for liberalization of MTPL

- Management can use stress tests for business steering, anticipate future developments and prepare to take proactive actions to adapt its business in a timely and adequate way
- Serbia will have to liberalize MTPL market (the most important line of business) by the accession to the EU
- Example describes application of stress testing methodology to MTPL liberalization
- Hypothetical scenario:
  - Regulation stipulates that starting from 1st January there would be a full liberalization of MTPL insurance in Serbia
  - Management of a non-life insurance company with almost half of its portfolio in MTPL insurance has requested an analysis of potential effects of this change on the company
  - At the same time of price liberalization of MTPL insurance in Serbia an increase of insured sum is required
- Graphs are used to describe the stress test effects to management (importance of presentation in a user friendly way)

# PRACTICAL EXAMPLE – Use of stress test to prepare a strategy for liberalization of MTPL

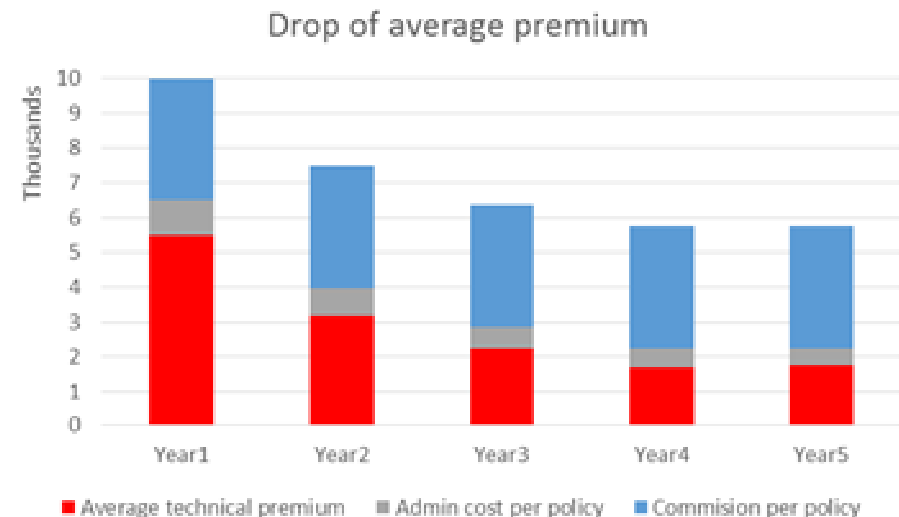
- Change of claim limit changes the distribution of claims for the insurance company
- Amount of highest claims at the right tail of the distribution requires additional reinsurance to be obtained





# PRACTICAL EXAMPLE – Use of stress test to prepare a strategy for liberalization of MTPL

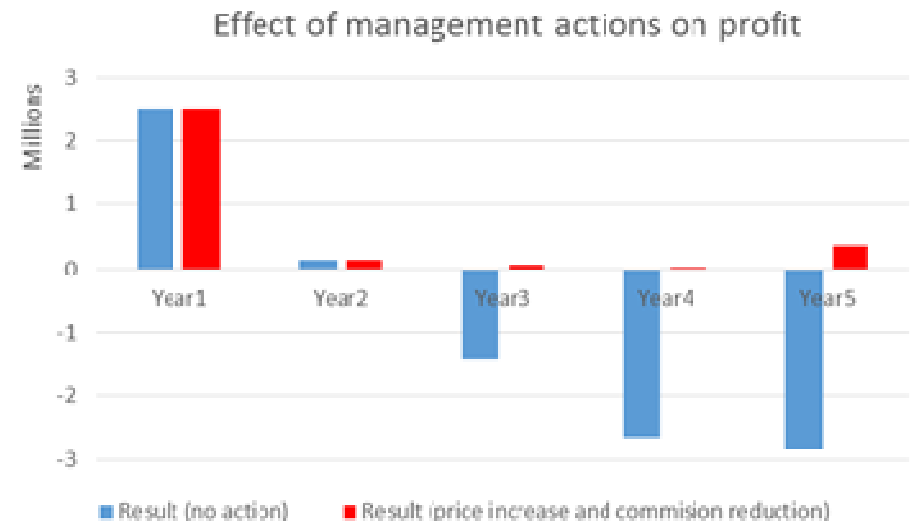
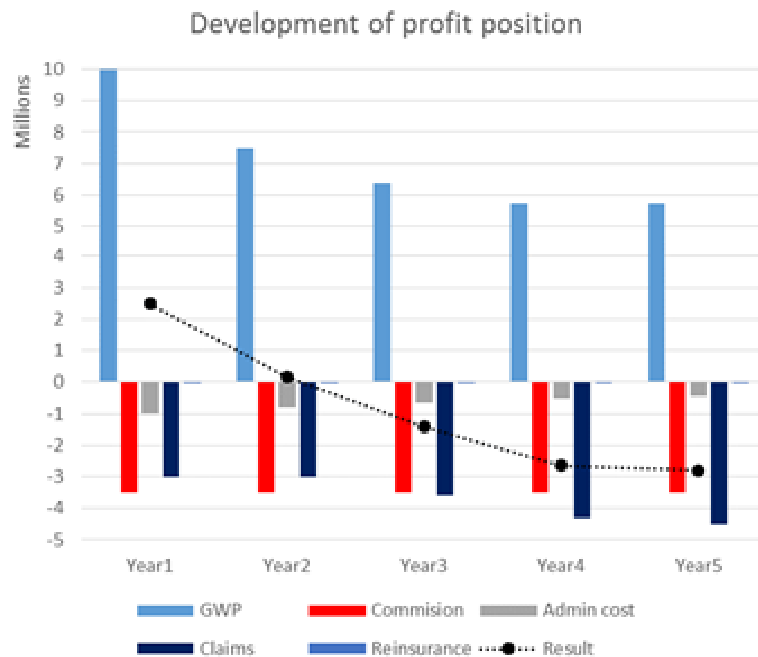
- Price war that starts in Year 2 (start of liberalization)
- Adverse impact on the income of the insurance company
- Premium income could be cut in half in just 3 years
- Competitive pressures would force the company to decrease the premium just to keep the renewals from the current portfolio
- Commissions would have to stay on the same level or even increase
- Room to improve efficiency of the internal processes to decrease admin costs limited
- Technical premium for the coverage of claims would take the biggest hit



# PRACTICAL EXAMPLE – Use of stress test to prepare a strategy for liberalization of MTPL

- Decreased premium combined with commissions at the same level, slight decrease of admin costs and increase of claims and reinsurance, has a significant influence on the result
- Without taking management actions, the situation would turn very bad

- Additional stress test, taking into account management actions, reveals possibilities to mitigate some of the negative effects
- The turnaround has to come from control of commissions, and a start of gradual commission decrease, which in turn leads to loss of market share because of loss of agents who change allegiances and start working for the competition



# Conclusion

- Once stress testing is introduced, usually for regulatory purposes, it becomes easier to apply it for own risk assessment and ultimately for business steering
- Stress testing can be a powerful tool for business steering
- Management can use the results of the stress test to devise actions (to prepare for MTPL liberalization in this example)
  - An interesting point from the example shows that the profit melts away quickly, and stays at the very low level even in case of strong adaptation of the business strategy
- Stress tests can then be used to reassess the developments for the company and the effectiveness of management actions creating a loop and increasing the quality of business steering
- The most important thing to keep in mind is to develop a good narrative, so the management can understand the story
- Assumptions behind the calculations have to be robust and logical
- Not to forget that stress test is just a test and not to overemphasize the numbers and probabilities behind the scenarios

Thank you for your attention

[nikola.a.rodic@socgen.com](mailto:nikola.a.rodic@socgen.com)