

# SUPERVISORY STRESS TESTS OF SELECTED INSURANCE COMPANIES

Financial Market Supervision Department  
Financial Stability Department

2019

## SUMMARY

*The results of the supervisory stress tests conducted in selected insurance companies in 2019 confirmed that the sector was sufficiently resilient to potential adverse shocks. The results demonstrated that the sector as a whole had sufficient own funds and was thus able to absorb the impacts of relatively significant changes in risk factors. The overall solvency ratio of the insurance companies tested was 157% after the application of shocks for market and insurance risks and was thus relatively high above the regulatory minimum of 100%.*

## 1. INTRODUCTION

Another round of supervisory stress tests of selected insurance companies took place in 2019 H1. The aim of these tests is to assess the ability of insurance companies to absorb the impacts of adverse developments in the macroeconomic and financial environment and the materialisation of certain insurance risks. A total of 18 domestic insurance companies, accounting for 98% of the domestic insurance market in 2018 based on gross premiums written, participated in this year's stress testing.

The stress test assessed the impact of significant changes in risk parameters on the value of the insurance company's assets and liabilities according to the Solvency II valuation principles, and subsequently on the insurance company's solvency position, i.e. the ratio of eligible own funds to the solvency capital requirement (SCR) as of 31 December 2018.<sup>1</sup> As in the previous tests, no post-stress recalculation of the SCR was required, so the change in the value of assets and liabilities in the test only affected eligible own funds. The investment risks examined were equity risk, interest rate risk, real estate risk, exchange rate risk, credit spread risk and the risk of a drop in government bond prices. In the case of non-life insurance risks, the test included the risk of a decrease in premiums for the two most important classes of non-life insurance in each insurance company and the risk of claims due to catastrophic flood damage. This year, the stress tests newly included the shock of an immediate lapse of 10% of the insurance company's life insurance portfolio. Insurance companies were allowed to apply long-term guarantee measures leading to a drop in the sensitivity of balance sheets to some market risks. The use of volatility adjustment, applied by eight of the insurance companies tested, was important among these measures.<sup>2</sup>

## 2. STRESS SCENARIO

The stress scenario assumed a decline in domestic and foreign economic activity and an increase in uncertainty on financial markets compared to the end of 2018. The scenario assumed a decline of 35% in equity prices and 14% in property prices. Due to repricing of risk premia, the spread between Czech government bond yields and the risk-free yield curve rose by between 26 bp (the one-year bond) and 101 bp (the 15-year bond) in the scenario. Their prices thus dropped by 0.6%–9.7% depending on residual maturity. In line with the economic slowdown and the outflow of foreign capital, the Czech koruna weakened by 7.35% against the euro. The size of the shock relating to foreign government bonds and domestic and foreign corporate bonds was differentiated by bond residual maturity and rating. The decline in prices of foreign government bonds ranged between 0.6% (bonds rated AA or higher with residual maturity of up to three years) and 26.7% (bonds rated BB or lower with residual maturity of over 10 years). Similarly, prices of corporate bonds decreased by 1.5%–30.8%.

The short end of the risk-free koruna yield curve declined by 89 bp in the scenario. This reflects the return of monetary policy rates to very low values in response to the economic slowdown as considered in the scenario. The decline in

<sup>1</sup> In the case of one insurance company, the stress test was performed on data as of 1 January 2019, since a merger with another insurance company took effect on that date. Data for this insurance company thus enter the test after the completion of the merger.

<sup>2</sup> Volatility adjustment represents an addition to the risk-free yield curve used to calculate the best estimate of obligations arising from insurance. It is aimed at limiting the impact of excessive volatility of interest rate-sensitive assets arising from their market value on the solvency position of insurance companies.

risk-free yields was lower for longer maturities (34 bp for the 10-year yield) due to the method used to construct the risk-free yield curves (which converge towards a fixed value at the long end). When volatility adjustment was considered, the decline in risk-free yields was smaller (60 bp for the one-year yield and 5 bp for the 10-year yield).

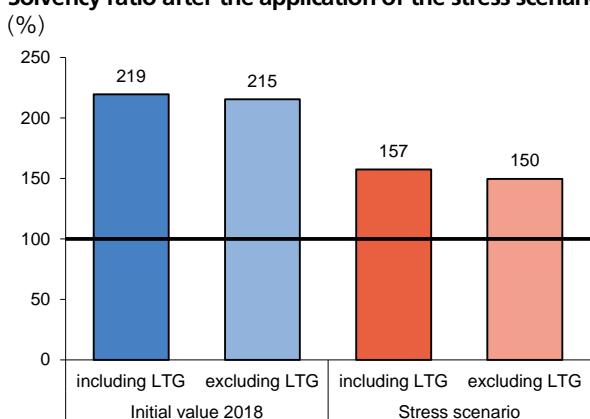
The stress testing was expanded this year to cover the situation where insurance companies' clients revise their saving and expenditure, including premium expenditure, owing to the above-mentioned adverse macroeconomic developments. The scenario assumed premature termination of life insurance policies representing 10% of the life insurance portfolio of each insurance company. As regards non-life insurance risks, the stress test scenario assumed a decrease in earned premiums due to increasing competition. This decrease is reflected in the two most important classes of non-life insurance in each insurance company, while the same level of costs as in 2018 is maintained. This year, the rate of decline in premiums was set at the standard deviation for insurance risk for the given type of insurance according to the standard formula for calculating the SCR.<sup>3</sup> Insurance companies' capitalisation in the event of recurring floods was also tested.

### 3. THE IMPACT OF THE STRESS SCENARIOS ON THE SOLVENCY OF THE INSURANCE SECTOR

The aggregate pre-stress Solvency II ratio as of 31 December 2018 was 219% in the group of insurance companies tested.<sup>4</sup> The solvency capital requirement amounted to CZK 46.2 billion and was covered by eligible own funds of CZK 101.3 billion. The value of eligible own funds was net of planned dividend payouts for 2018 of CZK 14.3 billion.

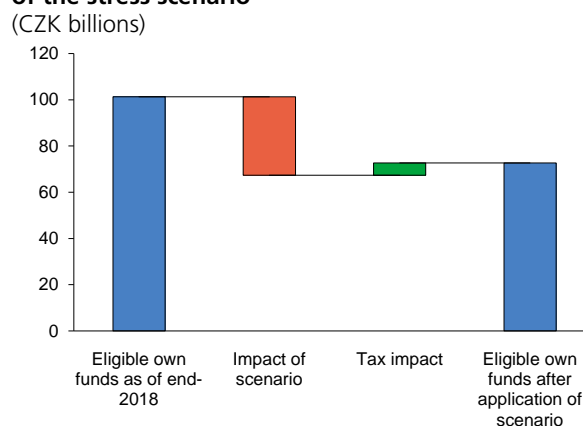
The post-stress solvency ratio was 157% and was thus relatively high above the solvency threshold of 100% (see Chart 1). The impact of the stress scenario on the solvency ratio was reduced by the application of volatility adjustment. If the insurance companies applying volatility adjustment did not make use of this measure, the solvency ratio in the stress scenario would be 150% for all the participating insurance companies. The aggregate impact of the shocks was CZK 33.9 billion. The impact was reduced by an income tax effect<sup>5</sup> of CZK 5.3 billion; eligible own funds would be CZK 72.6 billion after the application of the shocks (see Chart 2).

**Chart 1**  
Solvency ratio after the application of the stress scenario (%)



Source: CNB  
Note: LTG = long-term guarantee measures. Some domestic insurance companies used volatility adjustment as part of these measures.

**Chart 2**  
Change in eligible own funds after the application of the stress scenario (CZK billions)



Source: CNB

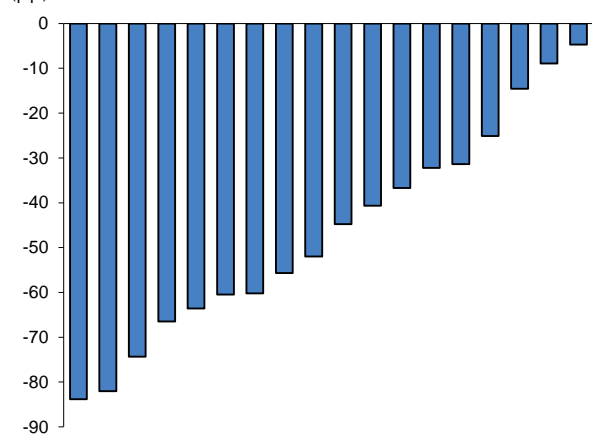
<sup>3</sup> A constant rate of decline in premiums of 10% regardless of insurance class was set in the preceding year.

<sup>4</sup> The aggregate solvency ratio is calculated as the ratio of the sum of eligible own funds of the insurance companies tested to the sum of their capital requirements.

<sup>5</sup> The deterioration in profit after the application of the stress scenario would lead to a decrease in the deferred tax liability.

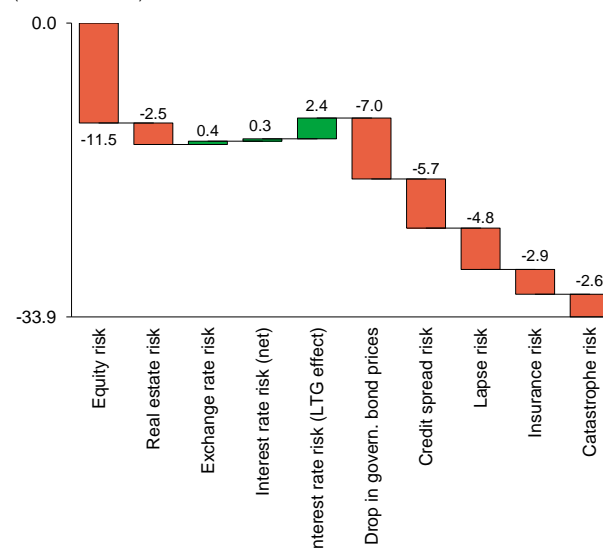
The impacts of the stress scenario on the solvency position differed across insurance companies (see Chart 3). The differences in the magnitude of the impacts were affected mainly by the type of insurance business, the structure of the investment portfolio, the approach to asset and liability management, the structure of life insurance liabilities and the application of volatility adjustment. The solvency ratios of three insurance companies would drop below 100% following the application of the stress scenario. Their overall capital inadequacy under the stress scenario would amount to CZK 773 million, or 2.7% of the overall impact of the stress test.

**Chart 3**  
Change in the solvency ratios of individual insurance companies after the application of the stress scenario (pp)



Source: CNB

**Chart 4**  
Decrease in eligible own funds due to the impact of shocks in the stress scenario broken down by risks (CZK billions)



Source: CNB

Note: The chart represents the decomposition of the *Impact of scenario* column in Chart 2. LTG = long-term guarantee measures. Some domestic insurance companies used volatility adjustment as part of these measures.

#### 4. THE IMPACT OF THE SHOCKS FOR INDIVIDUAL RISKS

Equity risk had the largest impact on the decline in eligible own funds in the scenario applied (see Chart 4 and Table 1), due mainly to the size of the equity shock. The impact of a fall in government bond prices was also significant. This was due to the high share of government bonds in the portfolios of the insurance companies tested.<sup>6</sup> The increase in the credit spread of corporate bonds in the test resulted in a decline of CZK 5.7 billion in eligible own funds. Real estate risk also had a perceptible downward impact on eligible own funds. Given the high level of hedging of insurance companies' foreign currency investments and foreign currency liabilities, the koruna's depreciation in the stress scenario led to a modest increase in eligible own funds. The newly included risk of an immediate lapse of part of the life insurance portfolio, which had an impact of CZK 4.8 billion, contributed to the decrease in eligible own funds in the stress test.

The scenario for interest risk resulted in an increase in eligible own funds. The downward shift of the risk-free koruna yield curve in the stress scenario led to an increase in the value of interest rate-sensitive assets (of CZK 4.6 billion) and

<sup>6</sup> The test also included government bonds classified as held to maturity at amortised cost. They are valued at fair value in accordance with the principles of Solvency II and formed a large proportion of some insurance companies' portfolios.

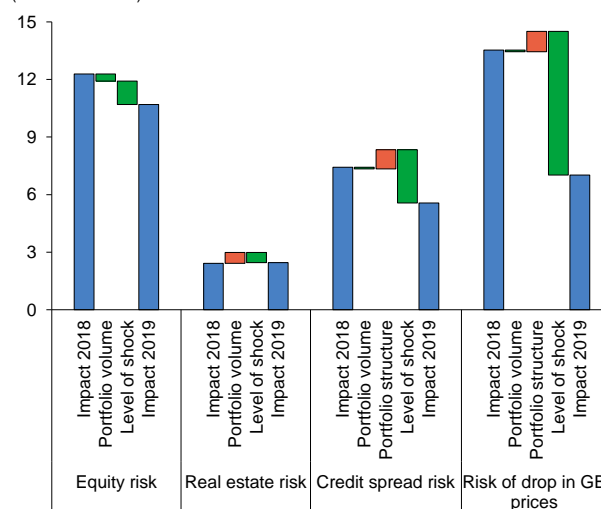
liabilities (of CZK 4.3 billion). The overall net positive impact of interest rate risk was thus CZK 0.3 billion. Eight of the insurance companies tested applied volatility adjustment, the consideration of which led to an upward shift of the risk-free yield curve used to calculate the best estimate of obligations arising from insurance compared to the risk-free yield curve without volatility adjustment. This resulted in an aggregate increase in the value of liabilities of just CZK 1.9 billion. The application of volatility adjustment thus increased the positive impact of the scenario on interest rate risk by CZK 2.4 billion, partly offsetting the impact of the decline in prices of government and corporate bonds considered.

**Table 1**  
**Impact of the stress scenario**

	CZK billions	% of assets
Eligible own funds as of 31 December 2018	101.28	23.51
Equity risk	-11.52	-2.67
Real estate risk	-2.48	-0.58
Exchange rate risk	0.37	0.08
Interest rate risk	2.67	0.62
Risk of drop in government bond prices	-7.04	-1.63
Credit spread risk	-5.66	-1.31
Lapse risk in life insurance	-4.78	-1.11
Insurance risk of decrease in premiums	-2.87	-0.67
Catastrophe insurance risk	-2.61	-0.61
Total impact of risks on eligible own funds	-33.93	-7.88
Other impacts (tax)	5.29	1.23
Eligible own funds after test application	72.63	16.86

Source: CNB

**Chart 5**  
**Year-on-year change in the absolute value of the impact of market risks**  
(CZK billions)



Source: CNB

Note: The values capture the impact of market risks for the insurance companies included in the stress test in 2018 and 2019. GB = government bonds. The results are adjusted for the impact of mergers. The results do not include the impact on assets relating to unit-linked products.

The impacts of equity risk, credit spread risk and the risk of a drop in government bond prices decreased compared to the previous round of stress tests, mainly because of a decline in the size of the shocks (see Chart 5). In the case of credit spread risk and the risk of a drop in government bond prices, the decrease in the shocks outweighed the increase in the impact caused by a riskier portfolio structure compared with a year earlier. The slight increase in the impact of real estate risk was due to an increase in the volume of the portfolio, which, however, was offset by a smaller real estate shock. Due to the low interest rate environment, insurance companies sought other long-term investment opportunities in 2018. This was reflected in the allocation of part of the funds of some insurance companies to real estate investments. The impact of the risk of a decrease in non-life premiums was smaller than in last year's stress test due to a shock size adjustment. Although the impact of the shocks for catastrophe risk increased slightly compared to the 2018 stress test, it remained relatively limited, confirming that insurers have well-structured reinsurance programmes for catastrophic flood damage.

## 5. FREQUENCY OF SUPERVISORY STRESS TESTS

The supervisory stress tests of insurance companies will from now on be carried out every two years in a standard economic and financial environment. The CNB is thus planning to conduct the next supervisory stress tests in 2021. However, it may return to annual stress testing if the financial or macroeconomic situation changes significantly or other material facts arise.