

# Supervisory stress tests of selected insurance companies

## 2023



## SUMMARY

*The results of supervisory stress tests of selected insurance companies conducted in 2023 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 declined from 217% to 156% after the application of adverse shocks for market and insurance risks and remained sufficiently high above the regulatory minimum of 100%.*

### I. INTRODUCTION

Another round of supervisory stress tests of selected insurance companies took place in 2023 H1. The aim of these tests is to assess the insurance companies' ability to absorb the impacts of possible adverse developments in the macroeconomic and financial environment and the materialisation of certain insurance risks. Eighteen domestic insurance companies, accounting for 99.9% of the market of domestic insurance companies in 2022 based on gross premiums written, participated in stress testing.<sup>1</sup>

The stress test assessed the impact of changes in risk parameters on the initial value of the insurance company's assets and liabilities according to the Solvency II valuation principles as of 31 December 2022, and subsequently on the insurance company's solvency position. The key indicator was the solvency ratio, i.e. the ratio of eligible own funds to the solvency capital requirement (SCR). As in the previous rounds of 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 market risks tested were equity risk, interest rate risk, exchange rate risk, real estate risk, credit spread risk and the risk of a fall in government bond prices. In the case of non-life insurance risks, the test included the risk of a decrease in premiums (while maintaining the level of claims and costs) for the two most important classes of non-life insurance in each insurance company and catastrophic flood event risk. In the case of life insurance risks, the stress tests included the shock of an immediate lapse of part of the insurance company's life insurance portfolio. Insurance companies were allowed to apply long-term guarantee measures leading to a decrease in the sensitivity of the balance sheet items to some market risks. Of these measures, only volatility adjustment was used.<sup>2</sup> It was applied by four of the insurance companies tested.

### II. THE STRESS SCENARIO

The main characteristics of the scenario were based on the stress scenario proposed by the European Banking Authority (EBA) for the purposes of European supervisory stress tests of banks. The scenario assumed a substantial deterioration in the global and domestic economic situation due to further escalation of geopolitical tensions accompanied by a further sharp rise in energy commodity prices. Recurring problems with the Covid pandemic, which would lead to local shutdowns in the economy, were also considered. These factors would lead, among other things, to renewed disruptions to supply chains, causing an additional rise in inflation. CNB monetary policy would react to these inflationary shocks with only limited tightening, as the level of risk-free rates was relatively high even before the application of the scenario. Risk-free koruna yields increased along the entire yield curve in the scenario, reflecting a shift in expectations regarding long-term monetary policy settings and the level of neutral interest rates. The short end of the risk-free koruna yield curve in the scenario picked up by 111 bp, and the increase was 86 bp for the five-year yield and 50 bp for the ten-year yield. A more pronounced monetary policy tightening was assumed in the euro area given the lower initial level of policy interest rates (the short end of the risk-free euro yield curve rising by 253 bp). However, the yields for longer maturities rose relatively less than in the Czech Republic (by 78 bp for the five-year yield and 36 bp for the ten-year yield). This suggests a much shorter-term nature of the increase in monetary policy rates than in the Czech Republic. In addition, the inversion of the dollar risk-free curve increased, as long-term yields were broadly flat and shorter-term yields picked up. Taking into account the volatility adjustment, the short end of the koruna risk-free yield curve rose by 153 bp in the scenario, the five-year yield by 128 bp and the ten-year yield by 87 bp. In connection with the narrowing interest rate differential and strong risk aversion, the Czech koruna would weaken by 10% against the euro and by 12.3% against the dollar.

<sup>1</sup> Excluding insurance companies operating in the Czech Republic through a branch. If branches were taken into account, the market share of insurance companies involved in the stress test would be 92% of the Czech insurance market.

<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.

The scenario also assumed a sharp rise in uncertainty on global financial markets, reflected in a surge in risk premiums and, in line with that, a decline of 41%<sup>3</sup> in equity prices and 16% in property prices. The spread between Czech government bond yields and the risk-free yield curve rose by between 41 bp and 80 bp depending on residual maturity. This was reflected in an additional decline in the prices of these bonds between 1.1% (bonds with residual maturity of up to three years) and 8.3% (residual maturity of over 10 years). The size of the shock relating to foreign government bonds and domestic and foreign corporate bonds was differentiated by bond maturity and rating. The decline in prices of foreign government bonds ranged between 2.3% (bonds rated AA or higher with maturity of up to three years) and 18.2% (bonds rated BB or lower with maturity of over 10 years). Similarly, the considered decline in prices of corporate bonds amounted to 3.9%–30.4 % (bonds rated BB or lower with maturity of over 10 years).

The reaction of insurance companies' clients, who would revise their savings and expenditure, including insurance premium expenditure, was considered as a consequence of 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 was applied to the two most important classes of non-life insurance in each insurance company, while the same level of costs as in 2022 was maintained. Insurance companies' capitalisation in the event of recurring floods was also tested.<sup>4</sup>

### III. THE IMPACT OF THE STRESS SCENARIO ON THE SOLVENCY OF THE INSURANCE SECTOR

The initial aggregate Solvency II ratio as of 31 December 2022 of the group of insurance companies tested was 217%.<sup>5</sup> The solvency capital requirement amounted to CZK 47 billion and was covered by eligible own funds of CZK 103 billion.

The aggregate eligible own funds would decrease by CZK 33 billion after the application of the stress scenario. This impact would be reduced by an income tax effect<sup>6</sup> of CZK 4 billion. The decline in eligible own funds would result in a decline in the solvency ratio of 62 pp to 156%, which would thus remain sufficiently high above the statutory solvency threshold of 100% (see [Chart 1](#)). By comparison with the previous stress test, its impact would be 17 pp lower, owing mainly to a decline in the size of investment portfolios<sup>7</sup> and the size of shocks for equity risk, credit spread risk and the risk of a fall in government bond prices. The impact of the stress scenario on the solvency ratio was reduced by the application of volatility adjustment. If insurance companies applying volatility adjustment did not make use of this measure, the solvency ratio for all the participating insurance companies in the stress scenario would decrease from the initial level of 214% by 63 pp to 151%.

The impacts of the stress scenario on the solvency position would differ across insurance companies. The differences in the magnitude of the impact of the stress test would reflect mainly the characteristics of the insurance portfolio<sup>8</sup>, the structure of investment portfolios, the level of asset and liability management and also the application of volatility adjustment. The solvency ratio of one insurance company would decrease below the threshold of 100% after the application of the stress scenario. However, its capital inadequacy would amount to just CZK 6 million after the application of the stress scenario.

3 As regards strategic ownership interests, a decline in value of 21% was considered.

4 Two smaller local floods are assumed, each with claims of CZK 2.5 billion for the entire Czech insurance market, followed by one flood with claims of CZK 25 billion for the entire Czech insurance market.

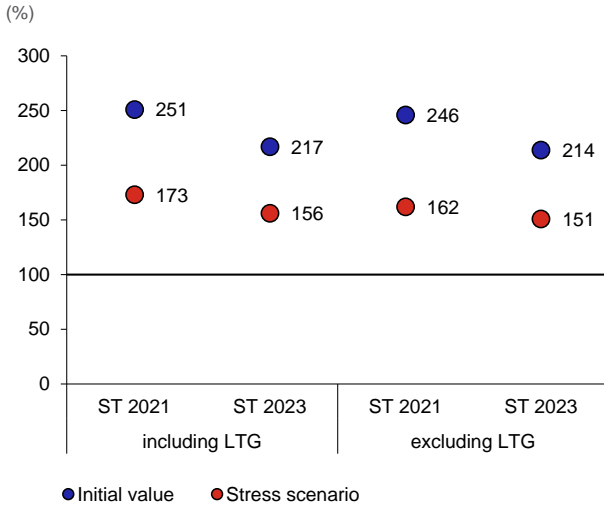
5 The aggregate solvency ratio is calculated as the ratio of the sum of eligible own funds of the insurance companies tested to the sum of their capital requirements.

6 The deterioration in profit after the application of the stress scenario would lead to a decrease in the deferred tax liability, or generate deferred tax assets.

7 The decline in the size of insurance companies' investment portfolios was due e.g. to a rise in the risk-free interest rate and payments of maturing traditional life insurance policies.

8 E.g. the type of insurance business, the duration of insurance contracts, etc.

**Chart 1**  
**Solvency ratio in the previous and current stress tests**

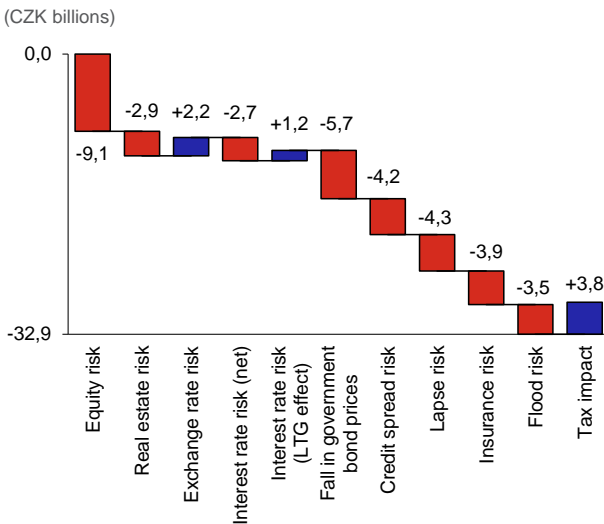


Source: CNB  
Note: ST = stress test. LTG = long-term guarantee measures. Some domestic insurance companies used volatility adjustment as part of these measures.

**IV. THE IMPACT OF THE SHOCKS FOR INDIVIDUAL RISKS**

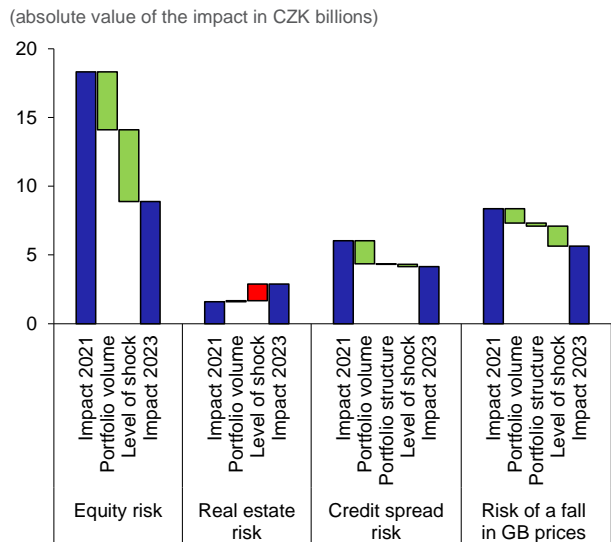
Equity risk again had the largest impact on eligible own funds (CZK 9.1 billion, see Chart 2), despite a decrease in the relative importance of the equity shock compared to the previous stress test. The impact of a fall in government bond prices was also significant (CZK 5.7 billion). This was due to the high share of government bonds in the portfolios of the insurance companies tested. An increase in the credit spread on corporate bonds would lead to a decline in eligible own funds of CZK 4.2 billion. The risk of immediate lapse of part of the life insurance portfolio would have a similar effect (CZK 4.3 billion). Of the other risks tested, non-life premium risk (CZK 3.9 billion) and flood risk (CZK 3.5 billion) would have the biggest impact on the decline in eligible own funds. In the case of exchange rate risk, a significant depreciation of the koruna against the euro and the dollar would conversely foster a rise in eligible own funds of CZK 2.2 billion.

**Chart 2**  
**Decrease in eligible own funds broken down by individual risks considered**



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

**Chart 3**  
**The analysis of a change in the impact of market risks compared to the previous stress test**



Source: CNB  
Note: GBs = government bonds. The values capture the impact of the market risks of insurance companies included in the stress test in both 2021 and 2023.

The scenario for interest risk would result in a decrease in eligible own funds of CZK 1.5 billion. The upward shift of the risk-free yield curves in the stress scenario would lead to a decrease in the value of interest rate-sensitive assets (of CZK 5.6 billion), which would be offset by a decrease in liabilities (of CZK 4.1 billion). These values consider the application of the volatility adjustment by four of the insurance companies tested. If these insurance companies did not apply the volatility adjustment, the decrease in liabilities would be CZK 1.2 billion lower (just CZK 2.9 billion) and eligible own funds would thus fall by CZK 2.7 billion.

Compared with the previous stress test conducted in 2021, the impact of the market risks considered would reduce owing to a decrease in the volume of insurance company investment portfolios and a decline in the size of the shocks. The largest decrease in the impact of market risks was recorded for equity risk (see [Chart 3](#)). Real estate risk was the exception, as its impact on eligible own funds would rise mainly on account of the shock increasing from 9% to 16%. Compared to the previous stress test, the impact of the risk of immediate lapse of part of the life insurance portfolio would increase (up by CZK 1.5 billion), due mainly to a different initial level of the risk-free yield curve.<sup>9</sup> The impact of the risk of a decrease in non-life premiums would increase by CZK 0.6 billion, compared to the previous stress test, due to an increase in premiums written. Although there was a 25% increase in flood claims compared with the previous stress test round, the impact of this risk would rise by just CZK 0.4 billion (14%) and would remain relatively insignificant. The test thus confirmed that insurance companies have well-structured reinsurance treaties for catastrophic flood events.

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<sup>9</sup> The initial risk-free yield curve in this year's supervisory stress test was at a higher level than the initial risk-free yield curve in the previous test (i.e. the curve as of 31 December 2020). This resulted in a lower value of technical provisions in this year's test and hence a higher volume of expected future profits "at risk", which insurance companies would lose due to lapse.

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