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Macro-stress tests of the Pension Management Companies

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The CNB uses macro-stress tests of the pension management companies (PMC) sector as a tool for assessing the sector's resilience to possible adverse shocks. All domestic pension management companies participate in the test. The test methodology is based[1] on the nature of business in this sector. The proposed shocks therefore arise primarily from a decline in the value of the assets of transformed funds (TFs) due to adverse financial market developments. Owing to the statutory duty of a PMC to top up the funds in TF it manages, the simulated shock affects its capitalisation.

1 Stress test scenarios

As with the solvency stress testing of banks and insurance companies[2], alternative macroeconomic scenarios are the starting point for the PMC stress tests. The scenarios are designed using the CNB's official prediction model supplemented with an estimate of the evolution of some additional variables which are not directly generated by the model. An Adverse Scenario is constructed based on the identification of risks that are typical of the Czech financial system or are imminent in the next few periods. Moreover, to compare the adverse outcome with the most probable outcome, the stress tests also use a Baseline Scenario based on the current official macroeconomic prediction of the CNB.

Table 1 Illustration of macroeconomic stress scenarios

(end-period values)

	Actual	Baseline Scenario				Adverse Scenario			
	T	T+1Q	T+2Q	T+3Q	T+4Q	T+1Q	T+2Q	T+3Q	T+4Q
Macroeconomic developments									
GDP (y-o-y %)	3.6	3.8	1.2	-0.6	-1.1	3.6	3.8	-2.2	-7.4
Inflation (y-o-y %)	6.1	11.2	14.5	13.9	12.7	6.1	11.2	14.6	14.3
Unemployment (%)	2.3	2.3	2.4	2.5	2.6	2.3	2.3	2.8	3.7
Nominal wage growth (y-o-y %)	3.8	7.7	2.4	4.2	4.9	3.8	7.7	2.1	3.2
Effective euro area GDP growth (y-o-y %)	2.8	4.6	8.4	8.1	6.8	3.4	4.7	1.1	-1.9
Asset markets (%)									
3M PRIBOR	0.4	0.3	0.5	0.9	1.2	4.8	3.8	2.8	1.8
3M EURIBOR	-0.6	-0.5	-0.2	0.1	0.5	-0.5	-0.4	-0.4	-0.4

Note: T denotes the reference quarter, Q quarter.

In the stress tests, the prediction for financial variables at a horizon of four quarters consistent with the relevant macroeconomic scenario is reflected directly in the value of the TF's assets. Specifically, the value of the TF's assets changes depending on changes in interest rates (interest rate risk), loss allowance (credit risk), the exchange rate (exchange rate risk), market prices of equity securities (equity risk) and the value of real estate investments (real estate risk). The test is

1 This methodology is applicable since 2022.
2 Banking sector stress test methodology, Supervisory stress test methodology for the insurance sector

one-off ("what-if") in nature. The revaluation of the TF's assets is thus immediate and uses the value expected in the scenario four quarters from the start of the test (i.e. consistent with the T+4Q column in Table 1).[3]

2 Risks assessed in the stress test

2.1 Interest rate risk

Given the structure of TFs' portfolios, interest rate risk is the most important area of stress testing. All debt securities held by TFs are potentially subject to this risk. Two types of interest rate risk are taken into account:

1. General interest rate risk – the risk of a change in the market price of an asset due to a change in the market interest rates used to value cash flows arising from ownership of the asset.
2. Specific interest rate risk (credit spread risk) – the risk of a change in the market price of an asset due to a change in the risk premium of the asset as perceived by financial markets.

Debt securities measured at fair value[4] are subject to both types of interest rate risk. Assets measured at amortised cost are not affected by movements in interest rates. With the introduction of the IFRS 9 accounting standard on 1 January 2021, the restriction requiring TFs to measure OECD government bonds of the same or a higher rating than that of Czech government bonds up to a maximum of 35% of the TF's assets at amortised cost was lifted. Funds are thus gradually increasing the shares of bonds measured at amortised cost.

The impact of the realisation of *general interest rate risk* on the value of the TF's debt securities is calculated separately for each issue in the portfolio. The original value of an issue is determined by discounting the cash flows arising from it using the swap curves valid as of the reference date (i.e. the start of the test, T). The new value of the issue is determined by discounting these cash flows using the swap curves assumed in the scenario (see Table 2).[5] The materialisation of general interest rate risk is then given by the difference between the two values. If, for example, interest rates increase across the yield curve, the price of the debt security decreases, because the payments on the asset are lower in value than the current rates. Generally, the larger the rise in the yield curve or the longer the residual maturity (more precisely, duration) of the issue, the greater the decline in the price.

The change in the koruna swap curve is used for koruna-denominated debt securities. The change in the euro swap curve is used for debt securities denominated in other currencies (mostly EUR for TFs).

3 It is thus assumed that the TF does not change the size and structure of its assets portfolio over the test horizon. Exposures to interest rate, credit, exchange rate, real estate and equity risk thus remain constant (the "static balance sheet assumption").
4 In accordance with the IFRS 9 accounting standard: http://data.europa.eu/eli/reg/2016/2067/oj.
5 The exchange rate as of the start of the test is used for debt securities (or derivatives interest payment legs) denominated in foreign currency.

The scenarios for the koruna swap curve are prepared in three stages. In the first stage, the swap curve from 1 to 15 years is decomposed using an affine model into (i) a risk-neutral expectation of yields component and (ii) a term premium component. Two parsimonious characteristics of the yield curve – the level and slope – are calculated for both components. In the second stage, the level and slope forecasts for both components are simulated in connection with the scenario for the future development of macroeconomic variables (inflation, GDP growth, exchange rate, three-month PRIBOR interbank rate). In the third stage, the forecast of swap rates for maturities of 1 to 30 years[6] is derived using the level and slope forecast for the two components. Zero maturity approximately corresponds to the overnight PRIBOR and is forecasted using expert judgement while taking the expected set-up of monetary policy rates and the three-month PRIBOR outlook into account.

The euro swap curve scenarios are based on the forecast for the three-month EURIBOR, and also on the forecast for one-year, five-year and ten-year rates on euro interest rate swaps. Interpolation is used to determine the rates for other maturities of up to 10 years. Rates for maturities from 10 to 30 years are derived by assuming a flat forward curve from 10 years upwards and the forward rate is based on the five-year and ten-year swap rates.[7]

Table 2 Illustration of scenarios for a general interest rate shock
(swap curve in % p.a.)

Maturity (years)	T			T+4Q			
				Baseline Scenario		Adverse Scenario	
	CZK	EUR		CZK	EUR	CZK	EUR
0	3.75	-0.55		6.13	0.60	1.16	-0.43
1	4.67	-0.51		6.67	0.92	1.86	-0.30
2	4.48	-0.29		6.20	1.57	1.91	0.18
3	4.22	-0.13		5.72	1.76	1.88	0.36
4	3.99	-0.06		5.32	1.80	1.87	0.43
5	3.81	0.01		5.00	1.78	1.86	0.46
6	3.66	0.06		4.76	1.75	1.88	0.49
7	3.52	0.12		4.57	1.72	1.91	0.51
8	3.37	0.17		4.42	1.71	1.94	0.54
…	…	…	…	…	…	…	…
28	2.97	0.46		3.93	1.35	2.67	0.41
29	2.96	0.45		3.92	1.33	2.68	0.39
30	2,96	0,45		3,92	1,31	2,70	0,37

6 For more on the preparation of the swap curve scenario see the thematic article "*Decomposition of the Czech government bond yield curve*" in Financial Stability Report 2016/2017 issued by the CNB in 2017.
7 If this assumption were to result in an unusual yield curve course, an expert adjustment would be made.

Calculation technique for general interest rate risk for a debt security

The change in the value of the debt security ΔA is calculated as

$$\Delta A = \alpha \cdot A_{T+4Q}(Y_{currency,T+4Q}) - \alpha \cdot A_T(Y_{currency,T}),$$

where

$$A_T(Y_{currency,T}) = \sum_{k=1}^{K} \frac{C_k}{\left(1+(\overline{t_k}-t_k)\cdot Y_{currency,T}(\underline{t_k})+\left(t_k-\underline{t_k}\right)\cdot Y_{currency,T}(\overline{t_k})\right)^{t_k}} \text{ and}$$

$$A_{T+4Q}(Y_{currency,T+4Q}) = \sum_{k=1}^{K} \frac{C_k}{\left(1+(\overline{t_k}-t_k)\cdot Y_{currency,T+4Q}(\underline{t_k})+\left(t_k-\underline{t_k}\right)\cdot Y_{currency,T+4Q}(\overline{t_k})\right)^{t_k}}.$$

$A_T\left(Y_{currency,T}\right)$ is the value of the asset as of the reference date as a function of the swap curve in the relevant currency as of the reference date ($Y_{currency,T}$). $A_{T+4Q}(Y_{currency,T+4Q})$ is the value of the asset following the application of the shock as a function of the swap curve assumed in the scenario ($Y_{currency,T+4Q}$). The yield curves $Y_{currency}$ are shown in Table 2. Symbols $\overline{\ }$ and $\underline{\ }$ denote the nearest higher and lower integer maturity. k denotes the serial number of a payment on the debt security of amount C_k occurring t_k years after the reference date. For a floating rate bond, $K = 1$ and payment C_1 is the sum of the principal and the coupon determined on the basis of the last setting of the coupon payment (the "rate reset").

A specific correction coefficient α is applied to each security to ensure that the value of the security as of the reference date $A_T(Y_{currency,T})$ equals the valuation of the security in the TF regulatory reporting.

The impact of the materialisation of credit spread risk on the value of the TF's debt securities is calculated separately for each issue in the portfolio. It is based on the market value of the issue as of the reference date and the relative devaluation rate considered in the scenario, which corresponds to the rating and residual maturity of the issue (see Table 3). Generally, a higher devaluation rate corresponds to lower rating and longer residual maturity.

Table 3 Illustration of an Adverse Scenario for credit spread risk – relative devaluation rate for government securities

(percentage change in asset value between T and T+4Q)

	Czech government securities in CZK	Foreign government securities					
		AAA	AA	A	BBB	BB and lower	NR
0 - 1 Y	*-0,47*	-0,64	-0,86	-1,28	-1,55	-2,94	-2,49
>1 - 3 Y	*-2,06*	-2,14	-2,55	-2,57	-2,59	-4,20	-3,11
>3 - 5 Y	*-4,73*	-4,99	-5,27	-5,95	-6,36	-8,92	-7,28
>5 - 7 Y	*-7,34*	-6,54	-6,68	-6,96	-7,53	-11,39	-6,73
>7 - 10 Y	*-11,12*	-6,94	-8,20	-8,88	-9,24	-13,91	-7,86
>10 Y	*-18,46*	-9,15	-11,93	-12,7	-13,99	-19,94	-11,40

Note: The table for the Baseline Scenario is different. The values in the table already account for the impact of general interest rate risk on security prices. The table for corporate securities has a similar design, but the shock sizes differ (they are usually larger).

The relative devaluation rate is applied separately to Czech and foreign government securities and to corporate debt securities. The devaluation for koruna government securities is determined in the Baseline Scenario using the forecast for the koruna Czech government bond yield curve.[8] In the Adverse Scenario, the shock sizes correspond to the scenario for the insurance stress test conducted on the data as of the same starting date.

For foreign government securities and all corporate debt securities, the relative rate of devaluation in both the Baseline Scenario and the Adverse Scenario corresponds to historical experience with falls in debt security prices caused by changes in the credit spread. The median of the distribution is considered in the Baseline Scenario, while in the Adverse Scenario, the calculation uses the "expected shortfall" method, which evaluates average loss at the tail of the loss distribution. The calculation is done separately for government and corporate securities within the respective credit rating and maturity buckets shown in Table 3. Securities held by Czech financial institutions as of the beginning of the test are the source of the underlying data. In both the Baseline Scenario and the Adverse Scenario, the shock sizes correspond to the scenario for the stress test of investment funds conducted on the data as of the same date (the end of the first year of the estimate).

The devaluation caused by the change in the credit spread is always considered on top of the devaluation caused by general interest rate risk. The shock calibration reflects only the increase in the credit spread and disregards the movements of swap curves. Should the information available to the CNB not suffice to value a debt security by discounting the cash flows it offers, the security will be treated as a share for the purposes of the stress test. This contributes to the prudence of the test, because shares are subjected to generally higher shocks than debt securities.

The test takes into account hedging by the TF against general interest rate risk. Interest swaps (IRS or cross-currency swaps) negotiated by the TF are marked to market by discounting payments arising from derivatives using swap curves, analogously to the revaluation of debt securities.

The total change in the value of the TF's assets due to interest rate risk is the sum of the changes in the values of the relevant debt securities and derivatives in the TF's portfolio.

2.2 Credit risk

Government and corporate debt securities, which are included in TFs' portfolios measured at amortised cost, are exposed to risk of default and subsequent loss given default.[9] The impact of the credit risk is calculated by estimating the relationship between coverage of the securities' nominal exposures by loss allowance (coverage ratio) and the credit spread premium at the start of the stress test based on the actually observed loss allowance for individual debt securities. The

8 For more on the preparation of the koruna Czech government bond curve scenario see the thematic article "Decomposition of the Czech government bond yield curve" in Financial Stability Report 2016/2017 issued by the CNB in 2017

9 Assets measured at fair value through other comprehensive income are not allowed to be reduced by loss allowance (5.5.2 IFRS 9) and are not therefore included.

estimate is made separately for government and corporate debt securities. The decrease (increase) in the value of a debt security due to the credit spread assumed in the scenario (see Table 3) is subsequently reflected in an increase (a decrease) in the risk premium given obtained relationship and the expected coverage at the end of the scenario is calculated. The difference between the calculated expected coverage ratio at the start and at the end of the scenario represents the asset impairment, which reduces the value of debt securities and enters the profit/loss statement.

2.3 Exchange rate risk

All bank deposits and debt and equity securities denominated in foreign currency are subject to exchange rate risk. If, in the scenario, the foreign currency appreciates, the koruna value of foreign currency assets generally rises. Conversely, a koruna appreciation is associated with a fall in the koruna value of foreign currency assets. For deposits and equity securities, the change in the exchange rate in the scenario is applied to the koruna value of the foreign currency exposure reported as of the reference date. For debt securities, which are affected jointly by exchange rate and interest rate risk, the exchange rate shock is only applied to the koruna value of the issue after the interest rate shock has been applied.

Calculation technique for exchange rate risk of a debt security

The change in the value of the relevant asset ΔA is calculated as

$$\Delta A = \left(\alpha \cdot A_{CZK,T}(S_{CZK/EUR,T}, Y_{currency,T+4Q}) + IRR_{CZK}\right) \cdot \frac{S_{CZK/EUR,T+4Q} - S_{CZK/EUR,T}}{S_{CZK/EUR,T}}$$

where A_{CZK} is the koruna value of the exposure as a function of the exchange rate $S_{CZK/EUR}$ and the swap curve $Y_{currency}$ in the relevant currency of the exposure. The exchange rates from the scenario and the swap curve in Table 2 are used. IRR_{CZK} is the impact of interest rate risk on the value of the asset and α is the previously described correction coefficient.

The test takes into account derivative hedging of the exposure against exchange rate risk. Foreign currency derivatives are marked to market by discounting payments arising from the derivative using swap curves. In the case of currency forwards and FX swaps, the initial value is calculated using the swap curves and exchange rate applicable as of the reference date. In the case of CCS swaps, the initial value is calculated using the swap curves assumed in the scenario (i.e. after the general interest rate shock is applied) and the exchange rate as of the reference date so to avoid double counting of part of the interest rate shock. The new value is then set for all derivatives using the swap curves and exchange rate assumed in the scenario.

The change in asset value due to exchange rate risk is the sum of the changes in the values of the relevant bank deposits, securities and derivatives in the TF's portfolio. As the majority of TFs' foreign currency exposures are euro-denominated, the stress test primarily uses the CZK/EUR

exchange rate derived by the CNB's official prediction model.[10] The appreciation (depreciation) of the koruna against other currencies is then assumed to be proportional to the appreciation (depreciation) of the koruna against the euro.

2.4 Equity and real estate risk

The change in the value of the TF's investments in equity securities and real estate is calculated as the difference in the value of exposures as of the reference date and the value of exposures after the application of coefficients of growth (decline) in prices of the relevant types of assets assumed in the scenario (see Table 4).

For investments in investment funds, the composition of assets of the respective investment fund is taken into account ("look-through" approach). Based on this composition, the accounting value of the investment in a fund as of the start of the test is split into five segments: (i) cash and bank accounts, (ii) government debt securities, (iii) corporate debt securities, (iv) real estate, and (v) shares and other. Cash and bank accounts are not subjected to any shocks. Government and corporate debt securities are subjected to a shock equal to an average shock for foreign-currency government and corporate debt securities, respectively, in the maturity band of 3–5 years (including the effect of general interest rate risk). For real estate and shares and others, the shocks for real estate and equities apply, respectively.

Table 4 Illustration of scenarios for equity and real estate shocks

(percentage change in asset value between T and T+4Q)

	Baseline Scenario	Adverse Scenario
Equity risk		
Shares	-9.8	-29.1
Investment funds – government debt securities component	-7.7	-8.0
Investment funds – corporate debt securities component	-8.5	-14.6
Investment funds – real estate component	0.4	-11.9
Investment funds – shares component	-9.8	-29.1
Real estate risk		
Real estate exposures	0.4	-11.9

10 If the expected depreciation occurs beyond the horizon of the stress test of pension management companies, later values are used for prudential reasons.

Calculation technique for equity risk and real estate risk

The change in asset value ΔA_{type} is calculated as
$\Delta A_{type} = A_{type,T+4Q} - A_{type,T} = A_{type,T} \cdot shock_{type,scenario}$,
where A_{type} is the value of the investments and $shock_{type,scenario}$ is the coefficient for the particular asset type and scenario in Table 4.

3 Profit/loss of the TF

The TFs' profit/loss for the relevant accounting period is estimated in the stress test. The profit/loss consists of i) the change in asset value due to the impacts of risks (see section 2) and ii) income from the convergence of the bond portfolio towards the nominal value, income from deposits and dividend income.

Changes in asset value due to the impacts of risks

As regards the risks considered, the impacts of credit risk (2.2) and exchange rate risk (2.3) enter the profit/loss in full. The other risks affect the result only in two cases: (i) if the asset is measured at fair value through profit or loss (FVPL)[11] or (ii) if the gain or loss on the asset measured at fair value through other comprehensive income (FVOCI) is *actually realised*[12] in the relevant period (i.e. the asset is sold or matures). In other cases, the change in the value of assets for FVOCI is reported under revaluation changes. The impacts on the value of assets measured through the FVPL and FVOCI methods are not calculated separately in the stress test, but it is assumed that 20% of the change in asset value due to FVPL and FVOCI enters the TF's profit/loss statement and 80% enters revaluation changes.[13]

Income from convergence of the bond portfolio towards the nominal value, income from deposits and dividends

TFs' profit/loss is also dependent on income from the convergence of the bond portfolio towards the nominal value, income from deposits and dividends. These effects enter the profit/loss through the average return for all TFs, which is calculated as the ratio of the returns above mentioned assets to the initial value of TFs' total assets.

11 This approach is not favoured by TFs. As of 31 January 2021 only 1% of securities holdings were valued using this method. Therefore, this valuation method is not assessed more rigorously in the test.
12 Except in the case of equities.
13 These figures are based on the current structure of the portfolios of TFs in the Czech Republic. If that were to change, the assumption could also change.

4 Impact on the pension management company

The TF's profit/loss has a direct link to its PMC. If the TF makes a profit, the PMC may claim up to 10% of that profit. The stress test assumes that the PMC withdraws the maximum amount.[14] If a loss is generated, it is not carried over to the profit/loss of the PMC. The duty of a PMC to top up the funds of the TF it manages arises only if the total value of the assets held by the TF is lower than the value of its liabilities (primarily to the TF's clients). The test therefore compares the value of the TF's assets at the end of the stress test with the value of the TF's liabilities. The final value of the TF's assets is equal to the value of the TF's assets as of the reference date (the start of the test) after addition of the average return, after the application of shocks and after deduction of any part of the TF's profit withdrawn by the PMC. The final value of the TF's liabilities is equal to the value of the TF's liabilities as of the reference date after addition of the TF's profit from a previous year which has to be allocated to clients,[15] and the remainder of the TF's profit/loss created over the course of the stress test. If the profit is positive, it is divided among the TF's clients. The sum which the PMC should pay to the TF is determined from the difference between the final values of the TF's assets and liabilities.

If, at the end of the period, TF's assets exceed TF's liabilities, PMC does not need to top up the TF's capital (Figure 1, situation A). If the liabilities exceed the assets, the difference is deducted from the capital of the PMC (Figure 1, situation B). If the PMC's available capital falls below the minimum capital requirement, the PMC's capital must be topped up (Figure 1, situation C).

In a supplementary sensitivity analysis, the CNB assesses the result of the stress test in a situation where the PMC is awarded the maximal legal size of the asset management fee from the TF and participation funds.[16] When calculating the fee for participation funds, the fund own capital as of the reference day is considered and the assets in such funds are not shocked under the stress test.

14 By contrast, the asset management fee for the TF and participation funds is included in the PMC's profit only in a supplementary sensitivity analysis.
15 Net profit is reported in the amount after the payment of the asset management fee and success fee (share in profit). This means that this profit, if positive, must be allocated to clients. This allocation, which happens in the first half of the stress test year, thus necessarily means an increase in the TF's liabilities.
16 The asset management fee can be lowered by the statute of the TF or participation funds by comparison with the legal maximum. However, such reductions are not taken into account in the stress test.

Calculation technique for the impact of the stress test on the pension management company's capital

In the stress test, the impact of the scenario on the PMC's available capital ΔK_{PS} is calculated as $\Delta K_{PS} = \max\{0{,}1 \cdot Z_{TF}; 0\} + \min\{A_{TF,T+4Q} - L_{TF,T+4Q}; 0\}$,
where Z_{TF} is the TF's profit/loss recorded in the one-year stress test period and $A_{TF,T+4Q}$ and $L_{TF,T+4Q}$ are the values of the TF's assets and liabilities, respectively, at the end of the test. These variables are determined using the following relations:

$$Z_{TF} = A_{TF,T} \cdot r + 0.2 \cdot \Delta A_{bez\,FX} + \Delta A_{FX},$$
$$A_{TF,T+4Q} = A_{TF,T} \cdot (1 + r) + \Delta A_{bez\,FX} + \Delta A_{FX} - \max\{0{,}1 \cdot Z_{TF}; 0\},$$
$$L_{TF,T+4Q} = L_{TF,T} + Z_{TFu,t-1} + \max\{0{,}9 \cdot Z_{TF}; 0\},$$

where $A_{TF,T}$ and $L_{TF,T}$ are the values as of the reference date, $Z_{TFu,t-1}$ is the accounting net profit of the TF for distribution to clients for the last year (which cannot be negative), Z_{TF} is the accounting net profit of the TF for the period of the stress test before paying out any fees to the PMC, r is the estimated accounting profitability of assets, $\Delta A_{bez\,FX}$ is the change in asset value due to the materialization of interest rate, equity and real estate risk and ΔA_{FX} is the change in asset value due to the materialization of exchange rate risk.

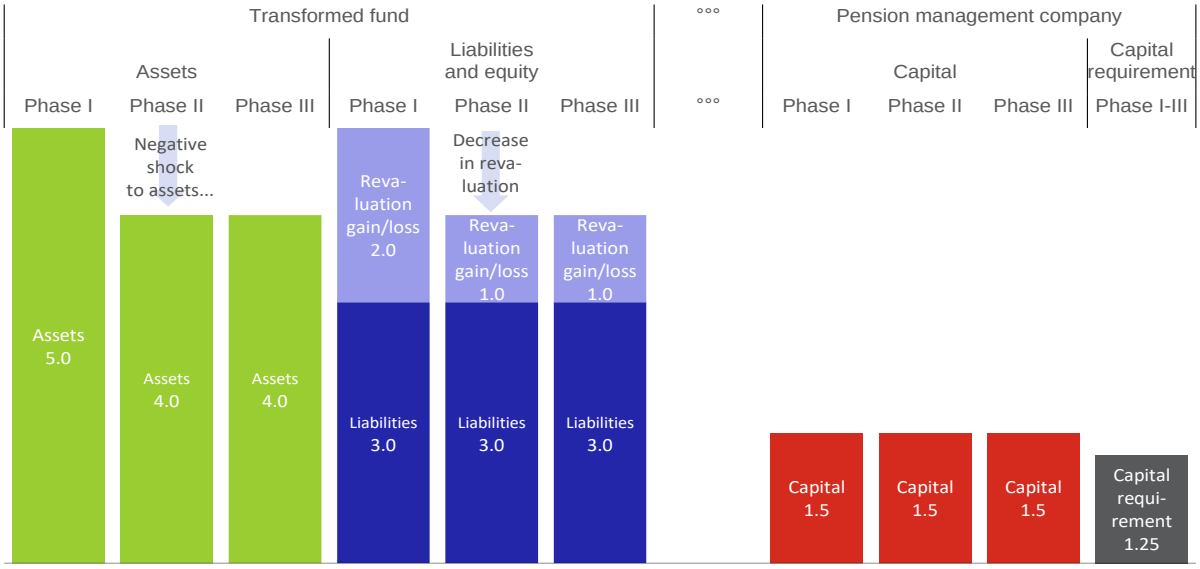
In the case of a supplementary sensitivity analysis which considers asset management fees to the PMC for the TF and participation funds, the relationship for PMC capital and TF asset size changes in the following manner:

$$\Delta K_{PS} = 0.008 \cdot \frac{A_{TF,T} + A_{TF,T} \cdot (1 + r) + \Delta A_{bez\,FX} + \Delta A_{FX}}{2}$$
$$+\max\left\{0{,}1 \cdot \left(Z_{TF} - 0.008 \cdot \frac{A_{TF,T} + A_{TF,T} \cdot (1 + r) + \Delta A_{bez\,FX} + \Delta A_{FX}}{2}\right); 0\right\}$$
$$+0.004 \cdot M_{PKUF} + 0.01 \cdot \sum M_{OUF} + \min\{A_{TF,T+4Q} - L_{TF,T+4Q}; 0\}$$
$$A_{TF,T+4Q} = A_{TF,T} \cdot (1 + r) + \Delta A_{bez\,FX} + \Delta A_{FX}$$
$$-0.008 \cdot \frac{A_{TF,T} + A_{TF,T} \cdot (1 + r) + \Delta A_{bez\,FX} + \Delta A_{FX}}{2}$$
$$-\max\left\{0{,}1 \cdot \left(Z_{TF} - 0.008 \cdot \frac{A_{TF,T} + A_{TF,T} \cdot (1 + r) + \Delta A_{bez\,FX} + \Delta A_{FX}}{2}\right); 0\right\}$$

where M_{PKUF} stands for fund assets (or, precisely, fund equity) of the mandatory participation fund and $\sum M_{OUF}$ is the sum of assets (or, precisely, fund equity) of all other participation funds managed by the respective PMC.

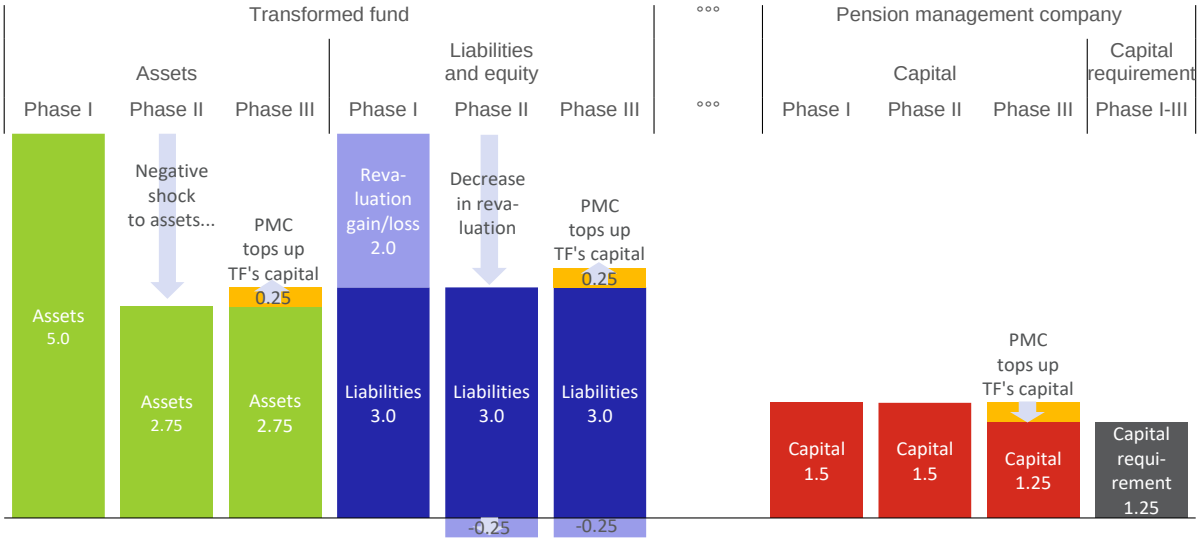
Figure 1 Transmission of a shock from a TF to a PMC

Situation A:



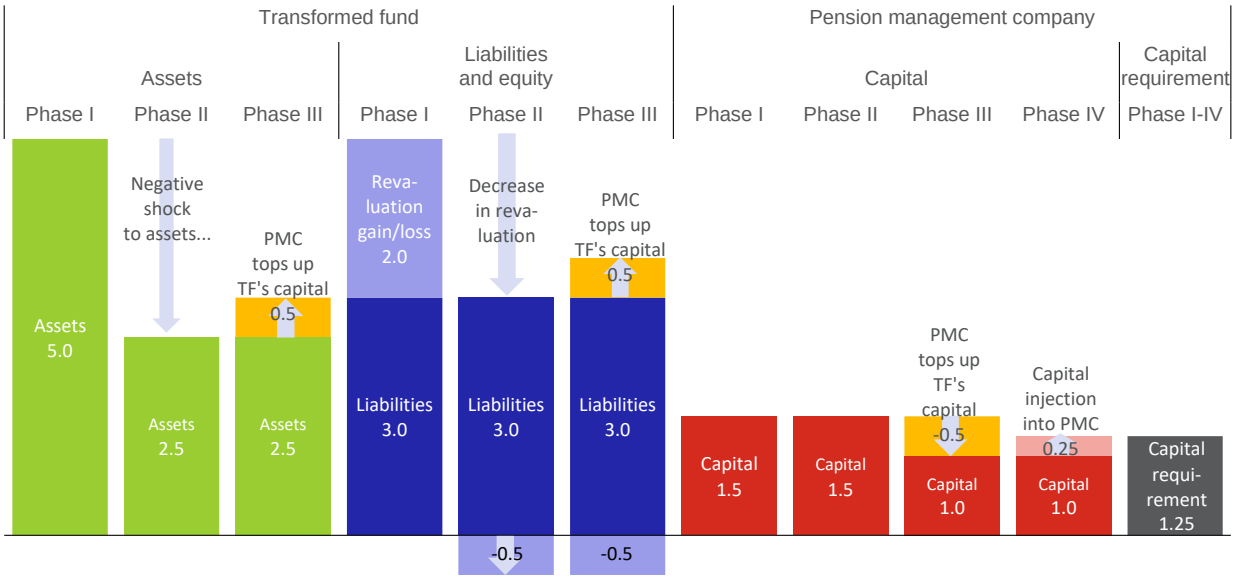
Note: In this situation, the TF's equity other than revaluation gains/losses is not considered, nor is an increase in liabilities due to the crediting of the TF's profit for the period to the participants, i.e. liabilities do not increase and the capital requirement for the PMC remains constant. Phase I indicates the initial state of the TF and the PMC. In Phase II, there is a decline in the TF asset value due to an adverse shock which is reflected in the revaluation gains/losses in the equity. In Phase III, the impact of the Phase II shock is evaluated, assessing whether the regulatory requirement of the same or a higher value of assets than liabilities is met. In this situation, the assets remain 1.0 units higher, i.e. the PMC does not have to top up the TF's capital.

Situation B:



Note: In this situation, the TF's equity other than revaluation gains/losses is not considered, nor is an increase in liabilities due to the crediting of the TF's profit for the period to the participants, i.e. liabilities do not increase and the capital requirement for the PMC remains constant. Phase I indicates the initial state of the TF and the PMC. In Phase II, there is a decline in the TF asset value due to an adverse shock which is reflected in the revaluation gains/losses in the equity. In this situation, the liabilities are 0.25 units higher than the assets, thus the PMC must top up the TF's capital at least in this amount. In Phase III, the TF's capital is topped up, which reduces the PMC's capital by 0.25 units to 1.25, i.e. the value of the capital requirement. However, the capital requirement has not been breached and therefore a capital injection into the PMC is not required.

Situation C:



Note: In this situation, the TF's equity other than revaluation gains/losses is not considered, nor is an increase in liabilities due to the crediting of the TF's profit for the period to the participants, i.e. liabilities do not increase and the capital requirement for the PMC remains constant. Phase I indicates the initial state of the TF and the PMC. In Phase II, there is a decline in the TF asset value due to an adverse shock which is reflected in the revaluation gains/losses in the equity. In this situation, the liabilities are 0.5 units higher than the assets, thus the PMC must top up the TF's capital at least in this amount. In Phase III, the TF's capital is topped up, which reduces the PMC's capital by 0.5 units to 1.0, i.e. a value lower than the capital requirement level for the PMC. In Phase IV, there is a settlement between the shareholders and the PMC, where a capital injection of at least 0.25 units is required. The top-up restores the PMC's capital to the level of capital requirement prescribed by the regulator.

The scenario affects not only the PMC's available capital, but also its capital requirement. As the value of the assets in the TF decreases (increases), the value of the minimum capital which the PMC is required to hold in respect of those assets decreases (increases). As regards the components of the capital requirement, the test considers the change in the capital requirements for assets in the TF and for the risks of the TF.[17] In simple terms, the change in these requirements is proportional to the change in the value of the relevant assets. The other components of the capital requirement – the requirement for assets in other funds and operating costs – are treated as constant in the test.

The main conclusion of the stress test is an assessment of (i) how many TFs will have to have funds topped up by the PMC and in what amount (ii) how many PMCs will record a fall in capital below the capital requirement and what amount the PMC's shareholders will have to inject additional capital to restore the PMC's capital at the minimum statutory level.

17 The calculation of the capital requirement for the risks of the TF abstracts from assessing whether items with preferential risk weights meet the requirement for a country rating at least comparable to that of the Czech Republic.