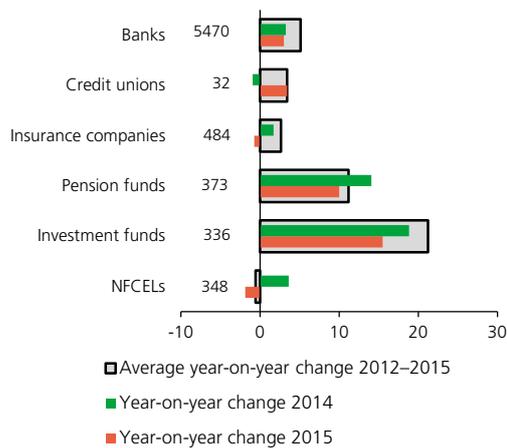


CHART III.1

Rates of growth of segments of the financial sector (%)


Source: CNB

Note: NFCEs = non-bank financial corporations engaged in lending. The figure next to the segment name denotes total assets as of the end of 2015 in CZK billions.

3 THE FINANCIAL SECTOR

3.1 DEVELOPMENTS IN THE FINANCIAL SECTOR

The favourable developments seen in the Czech financial sector in past years continued into 2015. The faster economic growth was reflected in growth in the assets of banks, investment funds and pension funds. The banking sector strengthened its capital adequacy and liquidity and also improved its loan portfolio quality. It is maintaining high profitability despite a continuing decline in interest margins. The insurance sector is also maintaining favourable capitalisation and profitability. Rapid growth of investment funds and pension funds is making them the most dynamic segment of the financial sector. However, it is also leading to increasing exposure to market risks and growth in the investment risks faced by households.

The main risk scenarios for the financial sector are still a contraction in economic activity accompanied by growth in credit and market risk, the environment of sustained low interest rates, and asset price volatility linked with uncertainty in global markets. Acting together, these factors may result in a drop in the profitability of all segments of the financial market, particularly the banking and insurance sectors. They may also lead to a drop in the performance of investment funds and pension funds and to a weakening of the liquidity situation of the banking sector. However, the current capitalisation, liquidity and profitability levels of the most important segments of the banking sector guarantee resilience to such shocks, as evidenced by stress test results.

The financial sector's assets are rising, with investment and pension funds recording particularly dynamic growth

Most segments of the financial market saw year-on-year growth in total assets in 2015 (see Chart III.1). The banking sector, which accounts for 80% of the size of the financial sector, recorded the largest absolute year-on-year growth (CZK 160 billion, or 3.0%). The total assets of credit unions also increased (by CZK 1 billion, or 3.4%). As in the previous year, the highest growth rates were recorded by investment funds (CZK 45 billion, or 15.5%) and pension funds (CZK 34 billion, or 10.0%). These two segments also posted the highest average growth in assets in 2012–2015. Only insurance companies and non-bank financial corporations engaged in lending (NFCEs) saw a drop in assets (of CZK 4 billion, or 0.7%, and CZK 7 billion, or 1.9%, respectively).¹

¹ The drop in the assets of NFCEs was caused by the conversion of one of them into a branch of a foreign bank. Adjusted for this effect, this segment's assets would have increased by CZK14 billion, or 4.2%, year on year.

3.1.1 THE BANKING SECTOR AND CREDIT UNIONS

Banks' capitalisation increased moderately in 2015

The total regulatory capital in the Czech banking sector rose by almost CZK 24 billion² in 2015, reaching CZK 421 billion at the year-end. The overall capital ratio increased by 0.4 pp to 18.4% and the Tier 1 capital ratio by 0.4 pp to 17.9% (see Chart III.2). For the Czech banking sector, Tier 1 is almost identical to Common Equity Tier 1.

The capital requirement consists of Pillar 1 and Pillar 2 requirements...

The minimum level of regulatory capital is stipulated by the CRR in Pillar 1. Its main component is the capital requirement for credit risk. A smaller part consists of market and operational risks, whose share has long been stable. The Pillar 2 requirements, set in the internal capital adequacy assessment process (ICAAP) and the supervisory review and evaluation process (SREP), cover other risks that Pillar 1 does not fully take into account for the bank.³

...and is complemented by capital buffers

CRD/CRR also allows capital buffers⁴ to be used as a macroprudential policy instrument (see section 4.2). They strengthen the banking sector's resilience and the CNB has been using them actively since the regulations made this possible. Banks thus have the duty to comply with overall capital requirements which, in addition to Pillar 1 and Pillar 2, contain a capital conservation buffer (2.5% since July 2014), a systemic risk buffer (1%–3% for some banks since October 2014) and a countercyclical capital buffer (0% since August 2014 and 0.5% since January 2017).

The capital surplus is significant after all components of the requirements are accounted for...

The capital surplus relative to the Pillar 1 minimum requirements amounts to CZK 238 billion. After the current requirements of Pillar 2 and the combined capital buffers are accounted for, it falls to CZK 109 billion (4.8 pp of the capital ratio). Most banks are compliant with the overall Pillar 1, Pillar 2 and capital buffer requirements (the overall capital requirement) by a sufficient margin. One bank is at the threshold level of the overall capital requirement, and the capital surpluses of two other banks are smaller than 2 pp of the capital ratio (see Chart III.3). The CRD requires banks that fail to meet the minimum amount of capital buffers applied to them to activate capital conservation measures.⁵

2 Despite the fact that one bank paid an extraordinary dividend and its capital dropped by about CZK 15 billion.

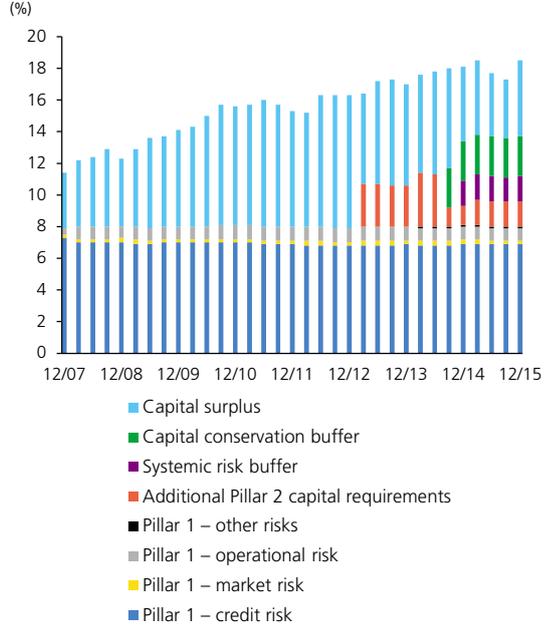
3 For example, business model, internal governance and other aspects of liquidity and solvency risk.

4 Set as a percentage of the total risk exposure amount.

5 The capital conservation plan (capital restoration plan under Article 70 of Decree No. 163/2014) should state how restrictions on distributions and other measures the bank plans to take to ensure full compliance with the capital buffer requirements will be applied. The bank should have it approved by the competent authorities (Articles 141 and 142 of the CRD).

CHART III.2

Structure of capital requirements in the Czech banking sector (%)



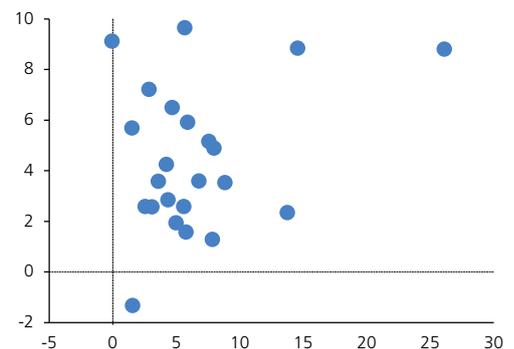
Source: CNB

Note: Due to partial overlap of the capital conservation buffer requirements with the Pillar 2 requirement, the Pillar 2 requirements have since July 2014 been adjusted for the requirements arising from the stress tests conducted for supervisory purposes.

CHART III.3

Deviations from the minimum capital and leverage ratios at the end of 2015

(y-axis: deviation of leverage ratio in pp; x-axis: deviation of total capital ratio in pp)



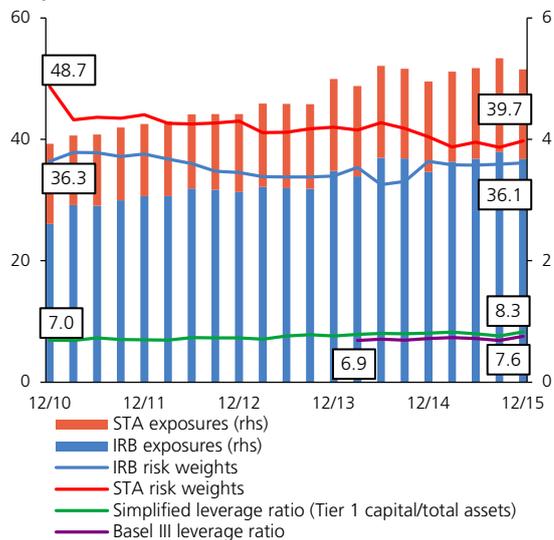
Source: CNB

Note: The minimum capital ratio is given by the sum of the Pillar 1, Pillar 2 and capital buffer requirements applicable to the bank as of the end of 2015. A limit of 3% is assumed for the minimum leverage ratio.

CHART III.4

Risk weights, the leverage ratio and the size of banks' credit exposures

(%; right-hand scale in CZK trillions)



Source: CNB

Note: In contrast to the Basel III leverage ratio, the simplified leverage ratio does not take into account off-balance-sheet items. Data are not available for the Basel III leverage ratio until the start of 2014.

...but it may not be sufficient for some banks in an adverse phase of the business cycle.

The overall impact of the *Adverse Scenario* of the CNB's stress tests (see section 3.2) on the banking sector reveals that the capital ratio does not fall below the Pillar 1 and Pillar 2 capital requirement (the total capital requirement). In individual cases, however, it indicates that some banks may not be able to satisfy the Pillar 1 and Pillar 2 capital requirement in the *Adverse Scenario* of the stress test. The CNB takes stress test results into account in the assessment of capital adequacy in the SREP. The interaction of the Pillar 1, Pillar 2 and capital buffer requirements and stress tests are described in more detail in section 4.2.4.

The overall capital requirement is determined mainly by risk weights

The total risk exposure amount⁶ is crucial for setting the Pillar 1 and combined buffer requirements. In the Czech Republic, it is determined primarily by the amount of risk-weighted exposures for credit risk. This means it is vital to assess whether the evolution and current level of the risk weights used for the relevant credit exposures give rise to any risk of underestimating the necessary level of capital.

The risks arising from the modest downward trend in risk weights...

Since 2010, the aggregate risk weights in banks using the standardised approach to determining risk weights (STA banks) have dropped by 9 pp to 39.7%. In banks using internal models (IRB banks, accounting for 71% of the sector's exposures) they have been fluctuating moderately around 36%. The total value of credit exposures was CZK 3,700 billion in IRB banks and CZK 1,500 billion in STA banks at the end of 2015 (see Chart III.4).

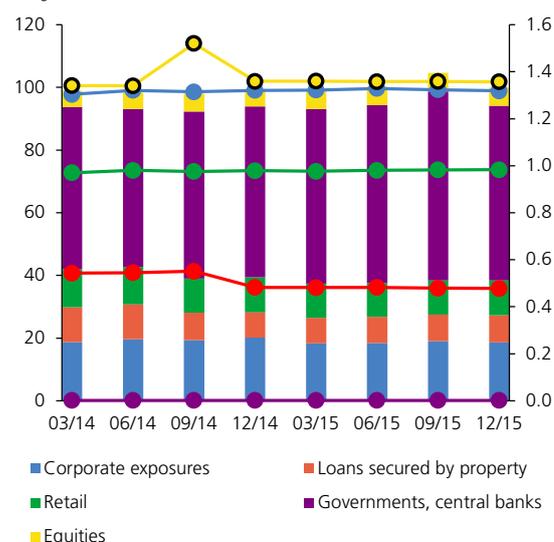
...are offset by growth in the banking sector's leverage ratio

A positive factor is that the sector's leverage ratio (the ratio of Tier 1 capital to non-risk-weighted exposures) rose slightly in the period under review despite the downward trend in aggregate risk weights.⁷ The fall in aggregate risk weights is thus not being accompanied by a decline in the banking sector's capital. The aggregate leverage ratio was 7.6% at the end of 2015, well above the 3% preliminary regulatory and supervisory limit under consideration in the EU (see Chart III.4). Although the leverage ratios of most banks significantly exceed this limit, there is significant heterogeneity across banks (see Chart III.3). Some are close to the 3% limit and one is even below it. The future use of the leverage

CHART III.5

Risk weights and the size of the main credit portfolios of STA banks

(%; right-hand scale in CZK trillions)



Source: CNB

Note: The points connected by lines denote the size of the risk weights for individual credit portfolios (left-hand scale). The size of the columns denotes the size of the exposure (right-hand scale). The colour coding of the points corresponds to the colour coding of the columns.

6 Pursuant to Article 92(3) of the CRR.

7 As defined in Basel III. The advantage of this indicator is its relative simplicity and its robustness to potential efforts by banks to optimise the calculation of risk weights or banks' limited ability to predict potential risks of individual assets with sufficient accuracy. Preliminary data from the leverage ratio reporting template LRS 10-4 are used for the calculation.

ratio for supervisory and regulatory purposes may thus mitigate the risk of insufficient capital in such cases.⁸

Changes in aggregate risk weights are determined mostly by changes in the structure of total credit exposures

An analysis of the risk weights of the main credit portfolios⁹ in 2014 and 2015¹⁰ reveals that they were stable for STA banks and showed low variability for IRB banks (see Charts III.5 and III.6). For both groups of banks, then, the changes in aggregate risk weights in this period were caused mainly by changes in the structure of total credit exposures and not by changes in risk weights for individual loan portfolios. In the case of STA banks, the drop in aggregate risk weights can be explained mainly by a modestly rising share of exposures to governments and central banks, whose risk weights are close to zero. IRB banks generally show a lower risk weight for similar credit portfolios than STA banks (with the exception of exposures to governments and central banks).

Constant attention should be paid to the setting of risk weights in the IRB approach

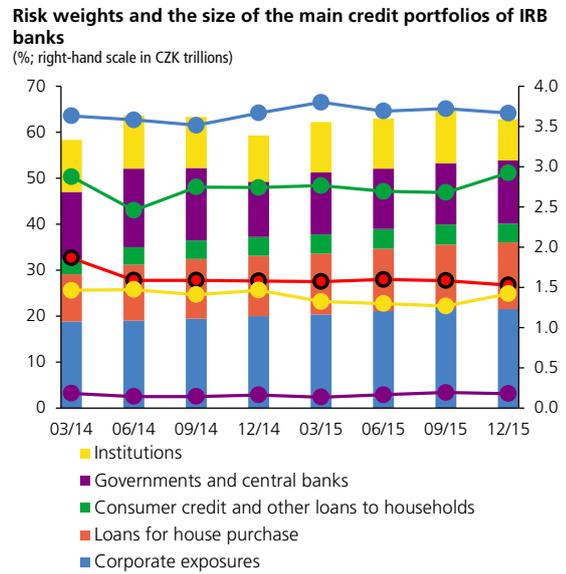
The main risk characteristics that determine risk weights in the internal models of IRB banks are the probability of default (PD) and the loss given default (LGD). A favourable long-term trend in the economy or insufficient robustness of the models due to a low frequency of failures and related losses may give rise to a situation where the risk weights may not capture the level of credit exposure risk with sufficient prudence. The Basel Committee addresses this issue in its consultation documents (see section 4.4.6). The CNB pays constant attention to the issue of internal model risks.

The share of NPLs continues to fall and their quality has improved...

The size of the NPL portfolio, its expected losses and its coverage by provisions are important elements in the assessment of the condition and resilience of the banking sector.¹¹ Credit risk, as expressed by the ratio of NPLs to total loans, dropped by 0.6 pp in 2015 to stand at 4.3% at the year-end (see Chart III.7).¹² The downward trend continued for the fifth consecutive year. The decrease in the NPL ratio was achieved through a combination of growth in total loans and an absolute decline in NPLs in

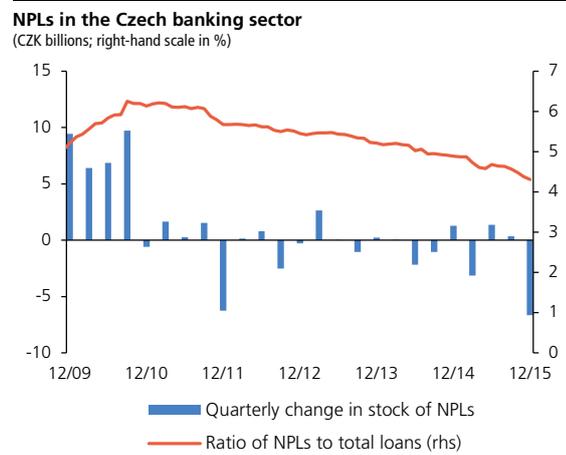
8 For details, see the thematic article *The Role of the Leverage Ratio in Capital Regulation of the Banking Sector* in this Report.
 9 Covering 98% (in the case of IRB banks) and 90% (in the case of STA banks) of total credit exposures. The main credit portfolios of IRB and STA banks are not entirely identical owing to different approaches to loan classification.
 10 Detailed data for the individual types of exposures in the single European reporting framework COREP have only been available since 2014.
 11 The Czech Export Bank and the Czech-Moravian Guarantee and Development Bank were excluded from the analysis of credit risk of the banking sector as a whole. This is because these banks are wholly owned by the Czech state (providing implicit state guarantees for their liabilities), have different business models and have riskier and more volatile credit portfolios.
 12 The figure includes both resident and non-resident loans.

CHART III.6



Source: CNB
 Note: The points connected by lines denote the size of the risk weights for individual credit portfolios (left-hand scale). The size of the columns denotes the size of the exposure (right-hand scale). The colour coding of the points corresponds to the colour coding of the columns.

CHART III.7



Source: CNB

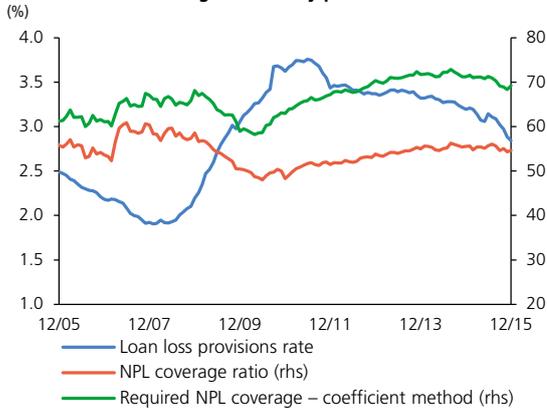
TABLE III.1
Structure of NPLs
 (%)

	NPLs by categorization			Total NPLs
	Non-standard	Doubtful	Loss	
2011	32.4	13.8	53.8	100.0
2012	29.4	12.2	58.4	100.0
2013	27.7	12.2	60.2	100.0
2014	29.4	10.4	60.2	100.0
2015	32.5	9.5	58.0	100.0

Source: CNB

CHART III.8

Provisions and coverage of NPLs by provisions

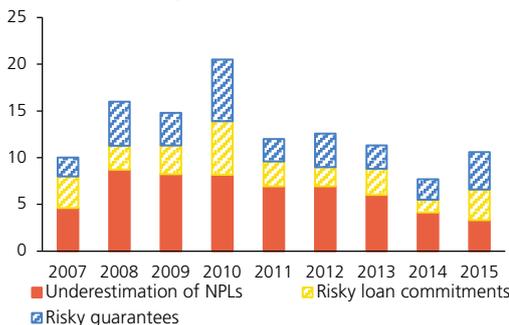


Source: CNB

CHART III.9

Potential underestimation of NPLs, risky loan commitments and risky guarantees

(CZK billions; non-financial corporations, residents)

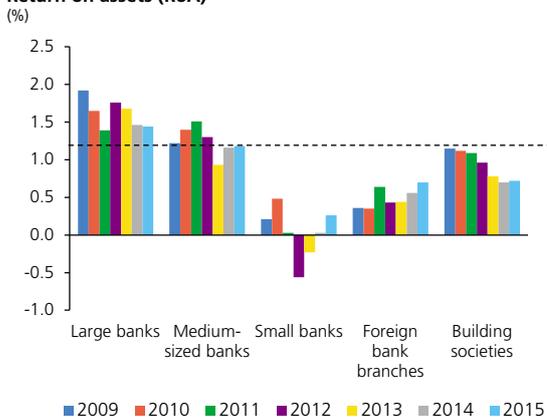


Source: CNB

Note: Underestimation of NPLs = volume of loans provided to clients that are not classified as NPLs even though some bank has already classified its loans to the given clients as NPLs. Risky guarantees/loan commitments = volume of guarantees/irrevocable loan commitments given to clients who have an NPL with the given bank or another bank.

CHART III.10

Return on assets (RoA)



Source: CNB

Note: The classification of banks by asset size relates to the year for which the RoA value is reported. The horizontal line depicts the RoA value for the banking sector as a whole for 2015.

2015.¹³ In the case of resident loans, the NPL ratio of households dropped by 0.7 pp to 4.1% and the NPL ratio of non-financial corporations fell by 1.0 pp to 5.4%. In the case of non-resident loans, the NPL ratio, by contrast, increased by 0.9 pp to 5.5%. The long-term trend of growth in the NPL ratio in the worst, i.e. loss, category reversed in 2015. The NPL ratio in the substandard category rose at the expense of the NPL ratios in the two worse categories (Table III.1). The trends in the NPL portfolio can thus be described as mostly positive.

...which is being accompanied by a drop in NPL coverage

The overall coverage of NPLs by provisions fell by 1.2 pp to 54.3% in 2015, the first year-on-year drop since 2010. It reflects the observed improvement in the NPL structure (see Chart III.8). That improvement also gave rise to a drop in the NPL coverage theoretically required under the simplified coefficient method, where the expected impairment losses are not estimated on the basis of models but are determined using coefficients laid down in a decree.¹⁴ Although the difference between NPL coverage calculated using this method and real NPL coverage decreased, it was still at 14.6% at the end of 2015. However, the calculation does not take account of collateralisation of NPLs, which reduces the necessary level of provisioning.

Hidden balance-sheet credit risk continues to decline...

There are loans in banks' balance sheets that are not currently classified as non-performing even though they may be at increased risk of default. These are loans to clients who have credit from several banks and some of those banks already classify their claims on such clients as NPLs while others still record their loans to such clients as performing loans. Such loans represent a potential source of undervaluation of the NPL level and thus also of the credit risk in banks' balance sheets. Underestimation of NPLs to resident non-financial corporations of CZK 3.3 billion was identified at the end of 2015 using CCR data (see Chart III.9).¹⁵ This represents a year-on-year drop of 20%, the third in a row. The pace of decline was much higher than that of the overall decline in NPLs. This suggests greater consistency in the categorisation of loans across banks. Despite the repeated fall, underestimation of NPLs in domestic non-financial corporations still makes up about 6.3% of NPLs. If this risk were to materialise in full, the ratio of NPLs to non-financial corporations as of the end of 2015 would rise by 1.0 pp to 6.4%.

13 The drop in the NPL ratio was also partly due to write-offs of such loans from banks' balance sheets (as the loans written off are mostly loss loans). The ratio of NPL write-offs to total NPLs increased by 5.9 pp to 14.3% in 2015. However, the supply of new NPLs in 2015, calculated by adjusting the change in total NPLs for the write-off effect, was the same as in 2014 and total NPLs would have decreased in absolute terms in 2015 even if write-offs of such loans had not increased.

14 Under Article 86 of Decree No. 163/2014, banks may determine impairment losses by means of (i) discounting of expected future cash flows, (ii) the coefficient method or (iii) statistical models. The coefficient method consists in setting the impairment loss at 1% for watch claims, 20% for substandard claims, 50% for doubtful claims and 100% for loss claims. Under the decree, however, the coefficients are applied to the unsecured part of the claim only. This could not be done in the analysis in question because of insufficient information on the value of collateral relating to NPLs.

15 Due to data unavailability, it is not possible to perform an analogous analysis for the household segment.

...while off-balance-sheet risk has increased

To quantify the credit risk stemming from off-balance-sheet items, risky guarantees and risky loan commitments were calculated using CCR data. These are defined as guarantees and irrevocable loan commitments given to non-financial corporations that have a bank loan classified as an NPL. The credit risk of off-balance-sheet items increased markedly in 2015 (by 104% to CZK 7.3 billion), so its long-running decline since 2010 has halted. If the underestimation of banks' balance-sheet and off-balance-sheet credit risk were to materialise in full, the ratio of NPLs to non-financial corporations as of the end of 2015 would rise by 1.9 pp to 7.3%.

The profitability of the banking sector remains high

The banking sector turned in a profit of CZK 66.9 billion in 2015, a rise of 6.1% on a year earlier.¹⁶ Profit is the principal source of capital for covering capital requirements related to growth in credit activities in good economic times and the primary source of capital for absorbing shocks in bad times. The Czech banking sector has long been profitable and its profitability significantly exceeds the euro area average.¹⁷ As in the previous year, the return on assets (RoA) was 1.2% (the EU average was 0.2% in 2014). However, large differences persist across the groups of banks (see Chart III.10). The RoA of large and medium-sized banks remained at 1.4% and 1.2% year on year respectively. The continued growth in the profitability of small banks, which recorded a 0.2 pp increase in RoA to 0.3%, is a good sign. Building societies maintained their profitability following several years of decline. This can also be seen as positive.

The decline in profit from fees and commissions continues...

The overall profit was negatively affected by a continued decline in profit from fees and commissions, which fell for the fourth year in a row. Profitability was positively affected by profit from financial revaluation and also by a modest rise in interest profit (see Chart III.11). Growth in profit from financial revaluation was recorded primarily for financial assets held for trading, mostly derivatives. The cost-to-income ratio dropped by 1.5 pp year on year to 44.3%, while the average ratio in the EU was 59.8% in Q3. The operational efficiency of the Czech banking sector is thus high by international comparison and contributes substantially to its profitability.

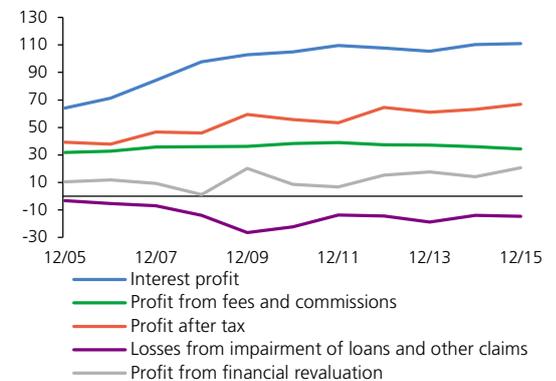
...as does the pressure on interest profit from falling interest margins

The fall in interest rates has been accompanied by a decline in client interest margins in recent years. The average interest margin on existing loans has been falling for six years now (see Chart III.12). Margins on new

CHART III.11

Key components of total profit

(CZK billions)

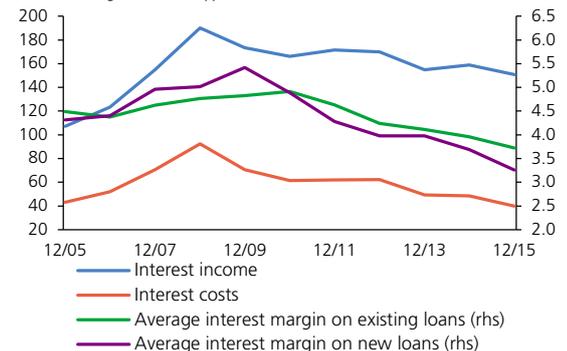


Source: CNB

CHART III.12

Key components of interest profit

(CZK billions; right-hand scale: pp)



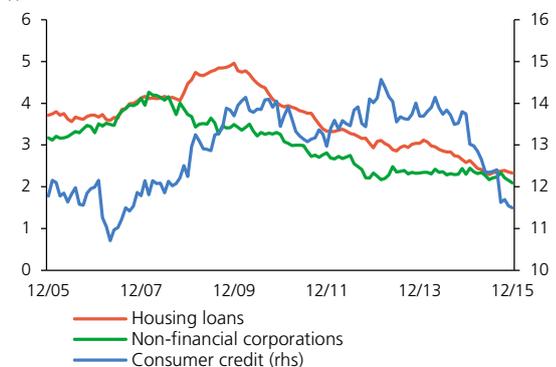
Source: CNB

Note: Margin is calculated as the difference between the average client loan rate and the average client deposit rate.

CHART III.13

Czech banks' interest margins on new loans

(pp)



Source: CNB, CNB calculation

Note: Margin is calculated as the difference between the average client loan rate for the sector and the average client deposit rate. The non-financial corporations item excludes revolving loans and credit cards.

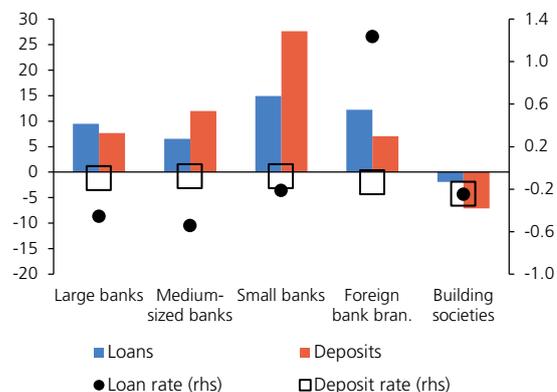
¹⁶ Domestic banks' profit also includes dividends paid by their subsidiaries. They totalled CZK 6.7 billion in 2014 and rose to CZK 8.1 billion in 2015. Excluding dividend profit, the banking sector's profitability would have risen by 4.0% year on year.

¹⁷ See CNB (2015): *Analyses of the Czech Republic's Current Economic Alignment with the Euro Area*, p. 102

CHART III.14

Year-on-year change in client (resident) loans, deposits and rates

(CZK billion; right-hand scale: pp; as of 31 December 2015)



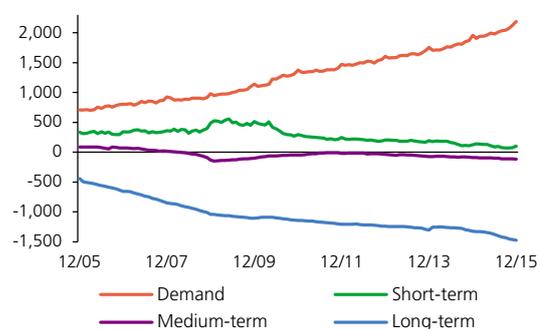
Source: CNB

Note: Households and non-financial corporations are included in the client category.

CHART III.15

Maturity mismatch between client loans and deposits: net balance-sheet position

(in CZK billions; deposits minus loans of households and non-financial corporations)



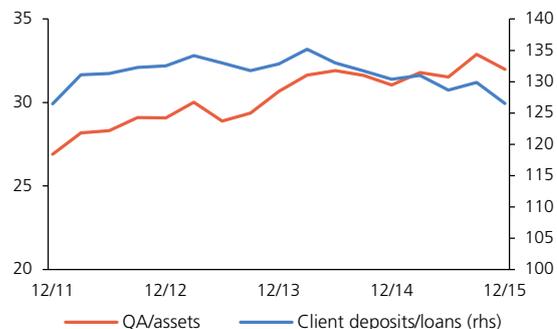
Source: CNB

Note: Short-term deposits and loans have maturities of up to 1 year, medium-term deposits and loans have maturities of 1–5 years and long-term deposits and loans have maturities of over 5 years.

CHART III.16

Liquidity ratios over time

(%)



Source: CNB

Note: QA = quick assets. The ratio of deposits to loans covers both residents and non-residents.

consumer credit are falling at the fastest year-on-year rate. The decline in margins on new loans to households for house purchase and loans to non-financial corporations to record lows continues (see Chart III.13). The modest year-on-year rise in interest profit was due to growing credit activity and a drop in interest costs, which fell markedly faster (by 17.6%) than interest income (by 5.0%) in year-on-year terms. The faster decline in the interest margin on new loans (see Chart III.12) together with the limited room for a future marked decrease in interest costs are expected to continue to squeeze interest profit. The pressure may be reduced by the continuing growth in loans, which is currently increasing the risks to financial stability (see section 4.2.2).

Growth in client loans is being accompanied by growth in client deposits

Client deposits (88%) and loans (81%) continue to be denominated mostly in Czech koruna. Most deposits accepted (95%) and loans provided (88%) are resident ones. Client loans provided to residents rose by CZK 128 billion (7.2%) year on year and client deposits by CZK 157 billion (6.1%). The highest growth rates of both loans and deposits were recorded by small banks (see Chart III.14). Building society loans and deposits declined for the third consecutive year. The year-on-year decline in interest rates on client loans (by 0.38 pp to 4.2%)¹⁸ and client deposits (by 0.15 pp to 0.47%) continues.

The growing share of demand deposits and long-term loans is increasing the risks linked with maturity transformation...

The falling deposit rates and the preference for liquidity are reducing the share of time deposits in the total deposits of households and non-financial corporations. At the same time, the low loan rates are boosting demand for long-term loans. The share of client demand deposits in total client deposits was 48.5% at the end of 2005 but had reached 78.8% by the end of 2015. The share of long-term client loans in total client loans rose from 47.6% to 72.5% in the same period. The maturity mismatch between client loans and client deposits is therefore growing significantly, partly because of low interest rates (see Chart III.15). The risks linked with maturity transformation can be mitigated by the net stable funding ratio (NSFR) requirement, a minimum standard for which will be introduced in 2018 (see section 3.3).

...but the liquidity position of banks remains good

The banking sector has long had a good liquidity position with a sizeable excess of deposits over loans. The ratio of client deposits to loans went down by 3.9 pp year on year to 126.5% (see Chart III.16). The ratio of quick assets to total assets rose by 0.9 pp to 32%. This was due mainly to a 33% year-on-year increase in cash holdings at the CNB, which was linked with its foreign exchange interventions and with the negative Czech government bond yields. The liquidity buffer, which domestic

¹⁸ They increased only in the case of branches of foreign banks, although this was due to the conversion of one non-bank into a branch of a foreign bank.

banks can use in the event of a sudden liquidity shock and to ensure compliance with the new CRR liquidity rules (see section 3.3), also leaves sufficient room for the further development of lending activity.

The prudential rules applying to credit unions have been tightened...

Act No. 333/2014 Coll., which responds to the riskiness of the credit union segment by setting rules for some of its activities, came into force in 2015. The new legislation ties the maximum amount of client deposits to the amount of the membership deposit (the "1:10" rule effective since mid-2015) and sets a cap on a credit union's balance-sheet total (CZK 5 billion with effect from 2018). Furthermore, contributions to the Deposit Insurance Fund have been doubled since 2015 (to 0.08% of insured deposits) and a minimum membership deposit (of CZK 1,000) and a maximum loan to members (of CZK 30 million) have been set.

...and the segment's growth rate and riskiness have declined

Growth in the total assets of the credit union segment slowed in 2015. Their year-on-year growth was 3.4%, reaching CZK 32.3 billion at the year-end. On the liabilities side, client deposits increased by 0.6% in 2015, accounting for 85% of total liabilities. Stagnation or a decline in the segment's assets can be expected in the years ahead due to the need to convert credit unions that exceed the cap on total assets (they accounted for 65% of the segment's total assets at the end of 2015). The segment's riskiness remains high compared to banks, but fell in year-on-year terms. The NPL ratio dropped by more than 5 pp to 24.6%, while the liquid asset ratio, the coverage of loans by provisions, the Tier 1 capital ratio and the aggregate RoE all rose (see Table III.2). The CNB continues to pay constant attention to this segment and its risks.

3.1.2 INSURANCE COMPANIES

The insurance sector is maintaining its capitalisation and profitability...

The financial stability of the Czech insurance sector remains high and its contribution to systemic risk is not currently significant (see the thematic article¹⁹ in this Report for more information about the systemic importance of Czech insurance companies). The profitability of the sector as a whole is relatively stable (RoE of 13.3%; see line *Nl.6* in the Table of Indicators) and its solvency is well above the regulatory minimum of 100% (solvency ratio of 319% for life insurance, see line *Nl.3*, and 338% for non-life insurance, see line *Nl.4*).²⁰ Its investment structure is conservative, consisting mainly of debt securities (about 60% of assets), more than half of which are Czech government bonds (see Chart II.15). Thanks to the recovery of the Czech economy, the non-life insurance market, which is more closely tied to the business cycle, even recorded

19 Dvořák, Hausenblas, Gronychová and Komárková (2016): *Could the Czech Insurance Sector Be a Source of Systemic Risk?*

20 Unless stated otherwise, the data in this section cover insurance companies based in the Czech Republic, including EGAP.

TABLE III.2

Selected indicators of credit unions as compared to banks
(%; end-2014 and end-2015 data; credit unions active as of 31 December 2015)

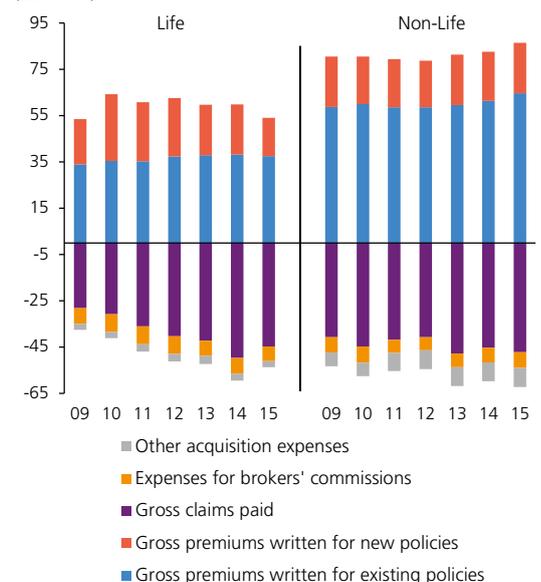
	2014		2015	
	Credit unions	Banks	Credit unions	Banks
Client NPL ratio	30.0	6.3	24.6	5.9
Quick assets/total assets	11.0	27.4	16.9	32.0
Coverage of NPLs by provisions	18.4	47.6	20.4	46.3
Tier 1 capital ratio	12.4	17.5	15.4	17.9
RoE	0.5	16.3	1.0	16.3

Source: CNB

Note: Liquid assets are assets pursuant to Article 416 of the CRR. Any inconsistency with figures in other parts of this section is linked with different approaches to the inclusion of the figures for Czech Export Bank and the Czech-Moravian Guarantee and Development Bank.

CHART III.17

Key financial indicators for the insurance sector
(CZK billions)

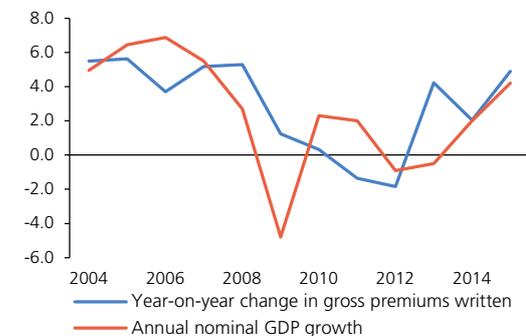


Source: CNB

Note: The data only cover insurance companies with their headquarters in the Czech Republic and active as of 30 September 2015.

CHART III.18

Economic growth and the non-life insurance market in the Czech Republic

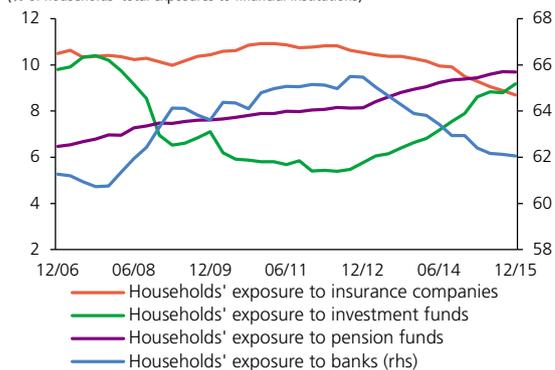


Source: CNB, CZSO, Czech Insurance Association

Note: The data on premiums written cover all insurance companies active in the Czech Republic, including branches of foreign insurance companies.

CHART III.19

Structure of households' exposures to financial institutions

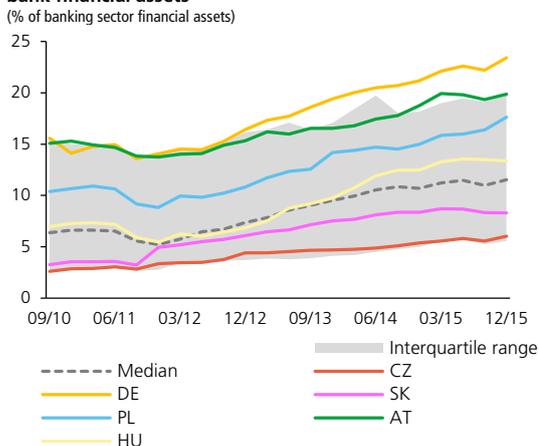


Source: CNB

Note: Exposures include both resident and non-resident financial institutions. The chart does not show exposures of households to other financial sector institutions: NCFELs, non-bank security dealers, financial auxiliaries and the central bank.

CHART III.20

Comparison of the ratio of investment fund financial assets to bank financial assets



Source: ECB, CNB calculation

Note: The grey area represents the interquartile range from a sample of 23 EU countries; EU, BG, DK, HR, SE and UK are excluded due to data unavailability.

growth across product segments (see Charts III.17 and III.18), particularly in insurance related to the operation of motor vehicles.

...the risks associated with the low-yield environment persist...

The life insurance segment as a whole shrank significantly in 2015 (see Chart III.17). Traditional life insurance products saw a further gradual decline in the number of policies and a marked fall in total premiums paid. The persisting low-rate environment has been a source of risk for the life sector in recent years. The long-running decline in returns on high-quality assets is particularly unfavourable for insurers with long-term liabilities arising from life insurance with guaranteed yields. To reduce exposures to interest rate risk, it is vital for life insurers to set a sufficiently prudent technical interest rate relative to their expected investment returns and to maintain a low maturity mismatch between their technical reserves and investments. For some time now, the Czech insurance sector has also been reducing the supply of traditional insurance products and focusing more on products with declared guarantees and unit-linked investment life insurance products. In addition, the average duration of the life insurance liabilities of most Czech insurance companies does not exceed the duration of the assets used to cover them (both are close to 7 years on average; see Chart 2 in the aforementioned thematic article). However, the current downward trend in returns on high-quality assets (see section 2.1), which account for the bulk of insurance companies' investments, poses medium-term risks for life insurance companies. Yields on the secondary Czech government bond market have turned negative for maturities of up to 6 years and the supply of bonds with positive yields on the primary market has been declining.

...and will be tested using the EIOPA stress test

The domestic insurance sector's resilience to risks, including those mentioned above, is regularly evaluated in stress tests conducted by the CNB in cooperation with insurance companies. The CNB will not carry out its own stress test this year, as the EIOPA Stress Test 2016 will be conducted. This test will involve the domestic insurers that previously took part in the stress tests conducted by the CNB. It will be based on two scenarios defined by the EIOPA. The CNB will supply an additional stress scenario reflecting the specifics of the Czech insurance market. Given the timing of the EIOPA Stress Test 2016, the communication of the aggregate test results will change. The aggregate results are not presented in this Report, but will be published on the CNB website under *Financial stability/Stress testing*.

3.1.3 THE NON-BANK FINANCIAL SECTOR EXCLUDING INSURANCE COMPANIES

The role of institutional investors in the Czech financial sector is increasing...

The relative importance of the segments of the financial sector has been changing in recent years. There has been sizeable growth in the amount invested by households in investment and pension funds, whose share in households' total financial assets is thus rising (see Chart III.19). Households' investment in investment funds rose by 24.5% year on year

to CZK 333 billion and that in pension funds by 10.4% to CZK 351 billion. This growth is outpacing that in households' deposits with banks (5.5%) and that in households' investments in insurance products (a year-on-year decline of 2%). Besides households, investment funds are becoming increasingly important in the portfolios of insurance companies and funds themselves.

...the low interest rate environment is encouraging the transfer of investment risks to households

The upward trend in the importance of investment products can be partially explained by the decline in deposit interest rates (see Chart III.14), which is motivating economic agents to look for more profitable ways of investing their assets (see section 2.1).²¹ This is leading to partial transfer of the risk of investment losses from the financial sector to households. Such a shift on the one hand is reducing risk concentration (increasing diversification), but on the other may give rise to new risks.

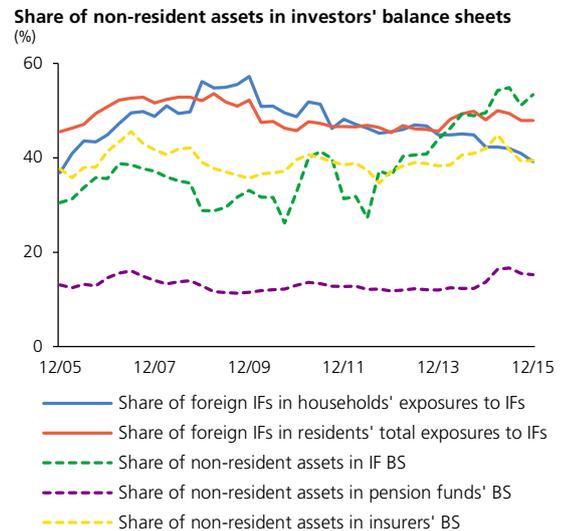
A large proportion of invested funds is in foreign investment funds

The importance of investment funds in the Czech Republic is still among the lowest in the EU. The amount of assets in domestic investment funds relative to banking sector assets is much lower than in Slovakia or Hungary (see Chart III.20). However, foreign investment funds play a major role. They account for about 50% of residents' total investment in investment funds (see Chart III.21). Institutional investors (insurance companies and domestic investment funds) maintain particularly large exposures to non-resident funds. By contrast, the share of foreign funds in households' total investments in investment funds is showing a slight downward trend and stood at 39% at the end of the period under review. Investments in foreign funds expose investors to heightened sensitivity to the global financial market situation (see section 2.1).

Investment funds hold a large amount of liquid assets

In the event of adverse market developments, investment funds are exposed to a risk of investor redemptions. Funds are responding to this risk by holding large quantities of liquid assets. The share of quick assets in funds' total assets dropped by 3 pp year on year to 30% at the end of 2015. This was primarily due to a relative decline in the importance of government bonds in investment funds' assets, mainly in favour of foreign assets (see sections 2.1 and 3.1.4). The risk of exit from funds is not material for financial stability at present. However, it may increase in importance as investment funds' assets grow.

CHART III.21

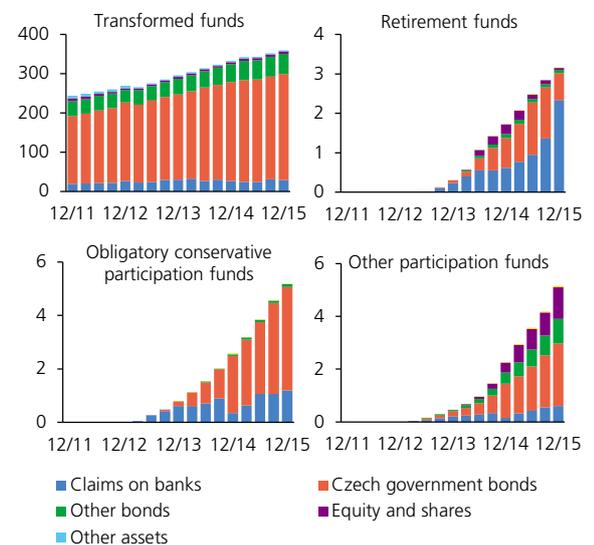


Source: CNB

Note: IFs = investment funds, BS = balance sheet.

CHART III.22

Pension fund assets and their placement (CZK billions)



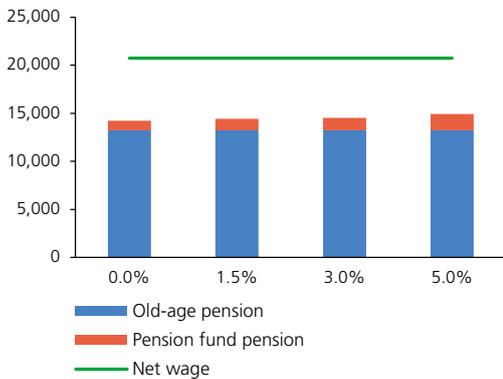
Source: CNB

²¹ However, there are more reasons behind the relative growth in the importance of institutional investors. To some extent this is a natural process accompanying growth in the wealth of economic agents and the related willingness to invest part of their savings in riskier assets.

CHART III.23

Effect of private pension policies on retirement income under various asset profitability assumptions

(CZK; monthly; at 2015 wage level)



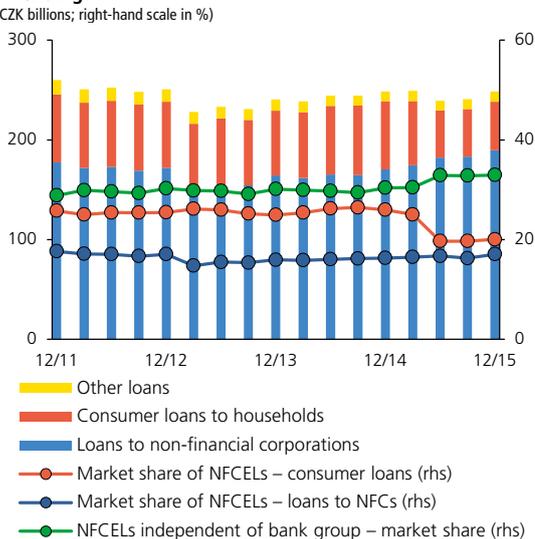
Source: CNB

Note: The calculation is based on the situation of the average pension fund client (age 50 years, saved amount CZK 80,000, saving CZK 620 a month, employer contributing CZK 130 a month) and an average gross wage of CZK 26,400. Wage inflation of 2% and the current state support in real terms are assumed. On retirement at the age of 65, the policyholder withdraws the saved amount, deposits it at a rate of 1% and withdraws a fixed amount every month until her death at the age of 80. "Pension fund pension" is the maximum size of that withdrawal.

CHART III.24

Loans provided by non-bank financial corporations engaged in lending

(CZK billions; right-hand scale in %)



Source: CNB

Note: The market share of NFCs is related to total loans provided to residents by banks and NFCs combined. The market share of independent NFCs relates solely to loans to residents provided by all NFCs.

The importance of pension funds continues to grow

Total assets administered by pension management companies continue to grow (see Chart III.22). A slight fall in the number of clients (which has dropped by 8.5% to CZK 4.6 million since June 2013) is being offset by a rise in the average client deposit (from CZK 559 a month in 2013 to CZK 620 in 2015). However, the role of pension funds in providing savings for old age is still relatively low (see Chart III.23) and the upward trend in deposits and assets in funds is therefore set to continue. The rising amount of savings in transformed funds, which are the most important type of fund,²² is increasing the risks faced by pension management companies, which provide clients with a guarantee of non-negative returns, as they would have to cover a higher amount of liabilities with their own funds in the event of adverse market developments. By contrast, a legislative change allowing the portfolio of government bonds held to maturity, which is not marked to market, to be increased from the 30% to 35% of transformed funds' assets has helped reduce market risks. The CNB regularly assesses the stability of pension management companies in stress tests (see section 3.2).

The second pension pillar is undergoing liquidation

Pension funds making up the second pension pillar are undergoing liquidation in 2016. About CZK 3 billion in savings of the funds' more than 84,000 clients will be paid back to clients or transferred to pension management companies' other funds, including transformed funds. Pension management companies' parent groups are therefore expected to make efforts to retain these clients. In the third pension pillar, new clients may only join participation funds, which, however, do not offer the statutory guarantee of non-negative returns²³ and have generally riskier profiles than transformed funds operating under the previous legislation (see Chart III.22).

The amount of loans provided by NFCEs was unchanged...

The segment of non-bank financial corporations engaged in lending (NFCEs) is dominated by leasing companies (which account for more than 80% of its assets). It also contains factoring companies and other providers of loans – particularly consumer credit to households. The total amount of loans provided was almost unchanged from a year earlier, standing at CZK 249 billion at the year-end (see Chart III.24). However, the importance of loans to non-financial corporations in the NFCEs segment increased. Such loans rose by CZK 19 billion year on year to CZK 190 billion. NFCEs thus also increased their share in the total market for loans to non-financial corporations, which exceeded 17% for the first time since 2012. By contrast, loans to households for consumption dropped by CZK 19.3 billion year on year to CZK 48.9 billion. This led to a year-on-year decline in NFCEs' market share in this segment of 5.9 pp to 20%.²⁴

22 Transformed funds account for 96% of total assets of funds administered by pension management companies.

23 However, pension management companies often offer similar guarantees to clients at their own initiative if certain conditions are met.

24 This decline was due in large part to the conversion of an NFCE providing loans to households into a branch of a foreign bank. Adjusted for the effect of this conversion, the

...while the quality of the loans remains at a favourable level

At the aggregate level, the default rate on NFCEL loans is higher than that on bank loans. The secured nature of financial leasing loans is reflected mainly in the quality of loans to non-financial corporations. The three-month default rate on these loans has long been declining and is converging towards the riskiness of comparable bank loans. In the case of loans to households, the default rate is approximately double that on bank loans and is stable at around 3% (see Chart III.25)

3.1.4 INTERCONNECTEDNESS OF THE FINANCIAL SECTOR

The links between the segments of the financial sector are not amplifying systemic risks

The interconnectedness of the financial sector fundamentally affects the outcomes of adverse shocks to which the sector may be exposed. There are two important areas of interconnectedness: balance-sheet interconnectedness and common exposures. As regards balance-sheet interconnectedness, the segments of the financial sector are interconnected through exposures in the form of deposits, loans, ownership interests and other instruments. A strengthening of balance-sheet interconnectedness in the financial sector could intensify the structural component of systemic risk, leading to an increased risk of financial distress spreading across segments. However, the level and evolution of the credit interconnectedness of banking groups suggests that the structural component of systemic risk has not been rising in recent years. The existence of significant common exposures is giving rise to a risk of a potential adverse shock associated with such exposures having a simultaneous impact on multiple segments of the financial sector. This is resulting in growth of the systemic impacts of such shocks. Common exposures exist mainly in relation to the public sector and non-residents as of the end of the period under review.

The balance-sheet interconnectedness of the main segments of the Czech financial sector is unchanged

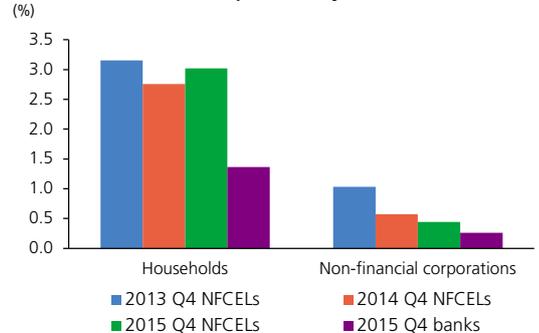
The most important link in the balance-sheet interconnectedness of Czech financial institutions is Czech banks, on which all segments of the financial market²⁵ have aggregate claims in the form of deposits and other instruments (mainly long-term debt securities). This is a natural exposure based on institutions' need to keep part of their funds in sufficiently liquid form, while also being an appropriate portfolio diversification tool. Besides exposures in banks, holdings of investment fund shares and units by banks, insurance companies and investment funds themselves and exposures to other financial intermediaries are significant aspects of interconnectedness (see Chart III.26). The share of mutual asset and liability exposures of the segments of the financial

amount of loans provided by NFCELS to households for consumption dropped by CZK 2.3 billion and the share of NFCELS in the market for such loans fell by 0.7 pp.

²⁵ Namely banks, insurance companies, investment companies, investment funds, pension management companies, pension funds and other financial intermediaries (mainly NFCELS and non-bank security dealers). The central bank, non-residents and captive companies are excluded from the description of balance-sheet interconnectedness, as by nature they are not entities through which a financial shock could be transmitted.

CHART III.25

3M default rate on loans provided by credit institutions (%)

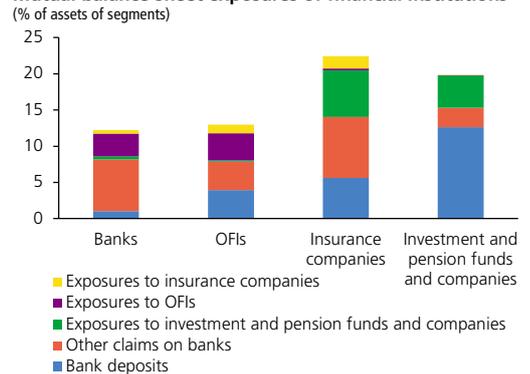


Source: CBCB, CNCB, SOLUS, CNB

Note: The default rate on loans provided to households by NFCELS is calculated as the average of the data from the NRCI and SOLUS. Only the NRCI is used for loans to non-financial corporations.

CHART III.26

Mutual balance-sheet exposures of financial institutions (% of assets of segments)

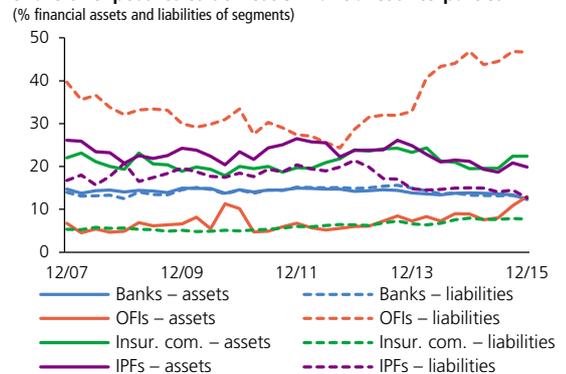


Source: CNB

Note: The segment of other financial intermediaries (OFIs) comprises non-bank financial corporations engaged in lending and non-bank security dealers.

CHART III.27

Share of exposures to domestic financial counterparties (% financial assets and liabilities of segments)



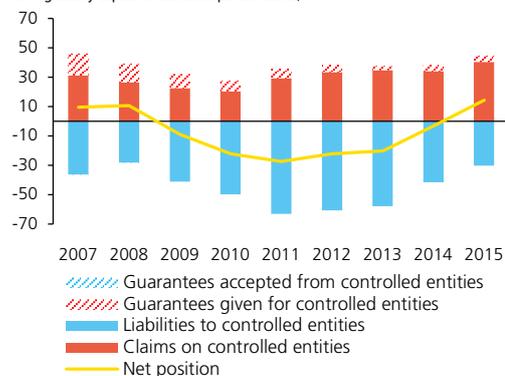
Source: CNB

Note: IPFs = Investment and pension funds and companies. The segment of other financial intermediaries (OFIs) comprises non-bank financial corporations engaged in lending and non-bank security dealers.

CHART III.28

Credit interconnectedness in domestic bank groups

(% of regulatory capital of domestic parent banks)



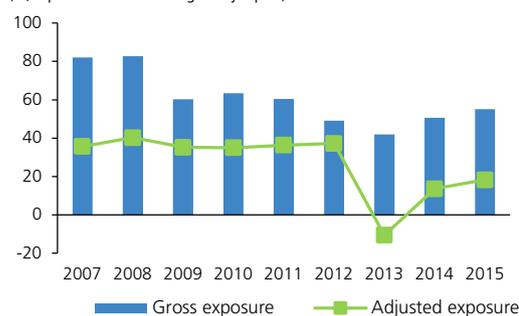
Source: Obligatory information to be disclosed pursuant to Decree No. 123/2007 and Decree No. 163/2014

Note: The chart depicts the aggregate interconnectedness of the largest domestic banks, i.e. Česká spořitelna, ČSOB, Komerční banka and Raiffeisenbank. UniCredit Bank is included only in the periods when it controlled entities.

CHART III.29

Gross and adjusted exposure to parent groups

(%; exposure in relation to regulatory capital)



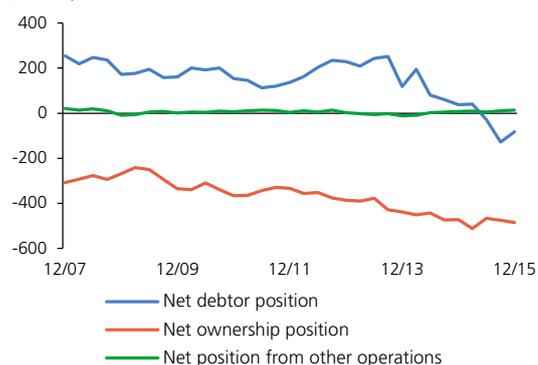
Source: CNB

Note: The chart shows the aggregate exposure of the five largest banks in the Czech Republic, which have foreign parents in the euro area. Gross exposure consists mainly of claims in the form of loans provided to the parent group and claims arising from derivatives transactions and other off-balance-sheet items in the investment and trading portfolios. Adjusted exposure = gross exposure minus liabilities in the form of deposits and loans accepted from foreign parent banks. The values in the chart do not reflect any collateralisation. In cases where a bank did not record exposures to its foreign parent in a particular period, it is not included in the calculation in that period.

CHART III.30

Net position of the banking sector vis-à-vis non-residents

(CZK billions)



Source: CNB

sector is stable at less than one-quarter of their assets and liabilities. The exception is other financial intermediaries: more than 40% of their funds come from the financial sector, mostly in the form of long-term loans and ownership interests of banks in consolidated groups (see Chart III.27). The significant presence of the real sector, the central bank and non-residents in financial institutions' balance sheets reduces the risk of transmission and multiplication of adverse shocks across the financial sector.

The interconnectedness of domestic banking groups is little changed...

The interconnectedness of domestic banking groups saw no major year-on-year structural changes. Banks returned to being net creditors of their domestic groups for the first time since 2008 (see Chart III.28). Claims on controlled entities rose by CZK 28 billion to CZK 118 billion. In their banking groups, the largest banks are in a creditor position mainly vis-à-vis NFCEs. Those claims increased by CZK 14.4 billion, accounting for 80.3% of total claims on controlled entities. By contrast, liabilities to controlled entities continued to fall (by CZK 21 billion to CZK 88 billion) in 2015. These liabilities consist mainly of excess liquidity from building society subsidiaries.

...banks remain net creditors of their foreign parents...

The aggregate gross exposure of the largest Czech banks to their foreign parents rose by 4.4 pp year on year to 55.1% of regulatory capital. Liabilities to parents also went up in 2015, although at a slower pace. Banks thus remain net creditors of their parent groups (see Chart III.29).

...and banks become a net debtor vis-à-vis non-residents

The downward trend in the banking sector's net position vis-à-vis non-residents continued. The net debtor position decreased by CZK 121 billion year on year to CZK -83 billion. The banking sector thus became a net debtor vis-à-vis foreign entities in 2015 (see Chart III.30). This was due mainly to growth in foreign entities' deposits in domestic banks as a result of the exchange rate commitment. The net ownership position decreased by CZK 13 billion year on year to CZK -474 billion at the end of the period under review. The position from other operations (particularly financial derivatives) remains balanced in the long run.

Common exposures are dominated by the government sector and, in the case of institutional investors, also by foreign investments

Czech government bonds make up a large part of financial institutions' exposures. Although their relative importance in balance sheets is not rising, interest rate risk is growing due to increasing holdings of Czech government bonds by non-residents (see section 2.1). The CNB monitors risks relating to sovereign exposures in a public finance stress test (see section 3.4). The low yields on Czech government bonds are simultaneously motivating institutional investors to look for investment alternatives. This is resulting in growth in the share of non-resident assets in investors' balance sheets, particularly in the case of investment funds (see Chart III.21). Exposure to foreign shocks connected with a drop in foreign asset prices carries a risk of losses for institutional investors and households and liquidity risks for investment funds.

3.2 SOLVENCY STRESS TESTS OF BANKS AND PENSION MANAGEMENT COMPANIES

The stress tests demonstrate that the banking sector is highly resilient to selected adverse scenarios. Banks have a large capital buffer enabling them to absorb adverse shocks and maintain their overall capital ratio sufficiently above the regulatory threshold of 8% even in a very adverse scenario. The pension management company sector has long been sensitive to interest rate volatility. In certain circumstances, a decline in prices of Czech government bonds could adversely affect its profitability and solvency.

The stress tests are based on the *Adverse Scenario*, which has been extended to include other sensitivity analyses

The resilience of banks and pension management companies was tested in macro stress tests using a *Baseline Scenario* for the most probable future developments and a hypothetical *Adverse Scenario* assuming a strong and long-running decline in economic activity in the Czech Republic accompanied by a fall of the economy into deflation (see section 2.1). The developments represented by the *Adverse Scenario* are extended to include other sensitivity analyses that amplify its impacts and thus enable the sectors' resilience to relevant risks to be assessed.

The bank stress test methodology is regularly updated

The stress tests saw no major methodological changes. As usual, the test parameters were refined using satellite models, which were re-estimated using the most recent time series. As in the previous Report, the banking sector tests were performed on end-2016 Q1 data.²⁶ A sensitivity analysis concerning the impact of hypothetical losses from operational risk was newly added.

In the *Baseline Scenario* credit risks stagnate and the sector's profitability continues to decline

Stress tests are traditionally one of the most important tools for assessing the resilience of the banking sector to potential risks to the stability of the Czech financial sector. Particular attention is paid to credit risk, which is the most important risk in the Czech banking sector. The evolution of credit risk is closely linked with developments in the household and corporate sectors. The economic growth is reflected in the *Baseline Scenario* in a greater ability of households and corporations to repay their debts, i.e. a low level of credit risk (see sections 2.2 and 2.3). The default rate, a key indicator of credit risk, remains low in both the non-financial corporations and household sectors (see Table III.3). The long-standing environment of low interest rates reduces banks' traditional interest income. Given the expected interest rate developments, the *Baseline*

TABLE III.3

Key variables in the individual scenarios

(averages for given years)

	Actual value	Baseline Scenario				Adverse Scenario		
		2015	2016	2017	2018	2016	2017	2018
Macroeconomic variables								
GDP (y-o-y %)	4.3	2.3	3.4	3.5	-2.7	-3.3	-0.7	
Inflation (%)	0.3	0.4	1.9	2.2	-0.6	-4.6	-0.5	
Unemployment (%)	5.1	4.4	4.3	4.1	5.3	7.7	9.8	
Nominal wage growth (%)	3.4	4.0	5.2	4.7	-1.7	-11.7	-2.9	
Effective GDP growth in euro area (%)	2.0	2.1	2.0	2.0	0.6	-2.0	-1.0	
Credit growth (%)								
Total	5.5	6.8	7.2	8.2	2.7	-4.1	-4.2	
Corporations	5.9	7.4	7.8	8.5	3.3	-6.2	-4.8	
Households	5.8	7.3	8.6	9.7	3.4	-1.8	-3.0	
Default rate (PD, %)								
Corporations	1.2	1.1	1.1	1.1	3.7	5.2	4.8	
Loans for house purchase	2.2	2.0	2.0	2.2	4.4	5.1	5.8	
Consumer credit	5.5	5.3	5.5	6.0	9.8	11.4	11.6	
Loss given default (LGD, %)								
Corporations	45.0	45.0	45.0	45.0	54.9	58.4	53.5	
Loans for house purchase	22.0	22.0	22.0	22.0	25.4	39.1	42.6	
Consumer credit	55.0	55.0	55.0	55.0	58.2	67.9	76.2	
Asset markets (%)								
3M PRIBOR	0.3	0.3	0.8	1.8	0.3	0.3	0.3	
5Y yield	0.1	0.0	0.7	2.2	1.6	3.3	3.5	
3M EURIBOR	0.0	-0.2	-0.3	-0.2	-0.2	-0.3	-0.2	
5Y EUR yield	0.0	0.0	0.0	0.0	0.6	1.2	1.2	
Change in residential property prices	4.5	6.7	7.6	8.0	0.2	-13.0	-3.4	
Change in share prices	1.0		-5.0			-30.0		
Banks' earnings								
Adjusted operating profit (y-o-y %)	-0.7	-2.0	-2.0	-1.0	-16.0	-22.6	-21.7	

Source: CNB, CNB calculation, BRCI

²⁶ Data on capital ratios were unavailable at the time of the testing, so end-2015 capital values were used.

TABLE III.4

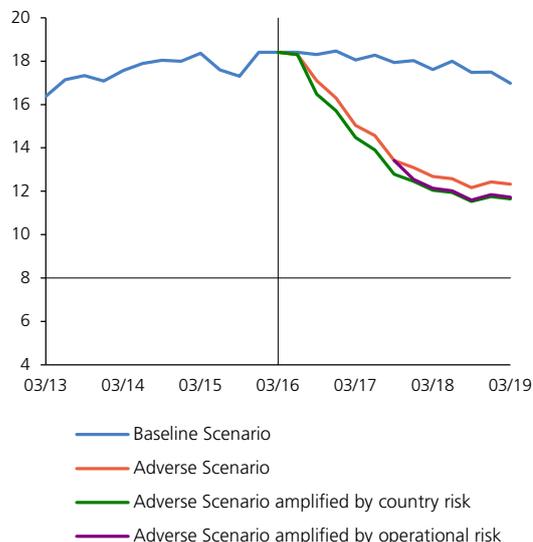
	Baseline Scenario			Adverse Scenario		
	2016	2017	2018	2016	2017	2018
Expected credit losses						
CZK billions	-17.1	-20.7	-23.1	-45.8	-77.2	-78.5
% of assets	-0.3	-0.3	-0.4	-0.8	-1.4	-1.4
Profit/loss from market risks						
CZK billions	4.5	-11.5	-5.4	-14.1	-3.7	-0.7
% of assets	0.1	-0.2	-0.1	-0.2	-0.1	0.0
Earnings for covering losses (adjusted operating profit)						
CZK billions	73.9	72.4	71.7	63.3	49.0	38.4
% of assets	1.2	1.2	1.1	1.1	0.9	0.7
Pre-tax profit/loss						
CZK billions	61.3	40.2	43.2	3.3	-33.1	-40.9
% of assets	1.0	0.6	0.7	0.1	-0.6	-0.7
Capital ratio at end of period in %						
Total	18.5	18.0	17.5	16.3	13.1	12.4
Tier 1	18.0	17.6	17.1	15.9	12.8	12.1
Capital injections						
CZK billions		0.5			6.6	
% of GDP		0.01			0.1	
No. of banks below 8% capital ratio						
		3			7	

Source: CNB, CNB calculation

Note: Minus sign for losses. Stress tests covered all banks active on 31 December 2015.

CHART III.31

Capital ratios of the banking sector depending on scenarios (%)



Source: CNB, CNB calculation

Scenario expects banks' adjusted operating profit to continue to trend downwards by around 2% a year in 2016 and 2017.²⁷

The banking sector remains very well capitalised in the *Baseline Scenario*

Despite the worse profitability outlook, the banking sector remains resilient over the entire three-year test horizon and has sufficient capital reserves. The sector's aggregate capital ratio is around 17.5%, i.e. well above the regulatory minimum of 8%. The Tier 1 capital ratio is only about 0.4 pp below the total capital ratio, illustrating high quality of the capital structure. Nevertheless, three banks (which, however, represent only around 1.8% of the sector's assets) get into a situation of insufficient capital adequacy in the *Baseline Scenario*, which could imply a need to adjust their business models or top up their capital in the future.²⁸

The *Adverse Scenario* would imply significant accounting losses for the banking sector...

The *Adverse Scenario* assumes that seriously negative developments in the EU would result in a sizeable decline in economic activity in the Czech Republic, a surge in unemployment and financial market turbulence, leading to a significant jump in EU government bond yields. Since this negative shock would result in a contraction of the domestic economy over the entire test horizon, the financial reserves of some households and corporations would be exhausted and debt repayment by the real sector would deteriorate. This would be reflected in a sizeable rise in the default rate in both the non-financial corporations and household sector. The banking sector's overall credit losses would be roughly three times larger than in the *Baseline Scenario* at the three-year horizon. Given the expected rise in government bond yields in the Czech Republic and other EU countries, banks would also record market losses due to a decline in the value of these debt instruments (see Table III.4, column 2). These credit and market losses, combined with a decline in operating profit, result in an accounting loss of the sector and a sizeable fall in its capital ratio.

...but the sector's overall capital ratio would remain sufficiently above the regulatory threshold

Despite these adverse developments, the capital ratio of the banking sector does not drop below 12% in the *Adverse Scenario* (see Chart III.31). Although the aggregate capital ratio stays sufficiently above 8%, seven banks – representing about 7.5% of the sector's assets

²⁷ Adjusted operating profit comprises net interest income and net income from fees and commissions less administrative expenses, depreciation and amortisation. Adjusted operating profit is largely the same as pre-provision profit but does not include the impacts of market (interest rate and exchange rate) gains/losses.

²⁸ Banks may also get into a situation of an insufficient capital ratio because the stress test methodology assesses their business model as unsustainable in the longer run, although this may not be the case. This is because the methodology is based on a universal bank model and may not be entirely accurate for specialised banking institutions. The CNB therefore takes into account institutions' specific characteristics when assessing the test results.

– record a fall in capital adequacy below the regulatory minimum and have to top up their capital. The necessary capital injections total around CZK 6.6 billion, i.e. 0.15% of GDP (see Table III.4, column 2). Relative to the size of the banking sector, this figure is not significant enough to jeopardise its stability. The banking sector's stability is based on its high capital ratio, which went up by a further 0.4 pp compared to the previous year, and on its ability to generate income to cover losses even in the event of highly adverse developments.

The capital ratio falls in the *Adverse Scenario* mainly because of high losses and a sharp rise in risk weights

A decomposition of the change in the capital ratio clearly illustrates the impacts of the main factors underlying the evolution of the capital ratio in the stress tests. In the *Baseline Scenario*, the Czech banking sector's income increases the capital ratio by as much as 10.7 pp over the test horizon.²⁹ Part of this income is used to cover expected credit and market losses (-3 pp) and to pay dividends and taxes (-5.9 pp). The growth in economic activity leads to a rise in banks' exposures, lowering the capital ratio by 2.7 pp. A change in risk weights due to a change in the structure of lending reduces the capital ratio by a further 0.6 pp to 17% at the end of the three-year test horizon (see Chart III.32).³⁰

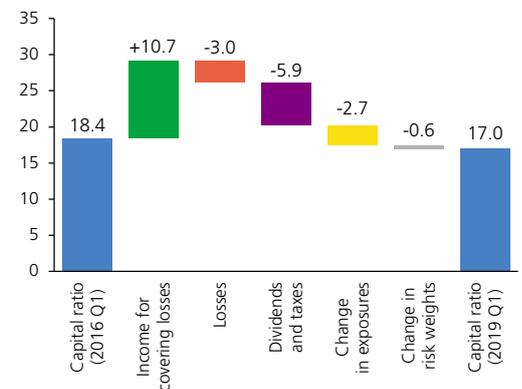
Even in the *Adverse Scenario*, banks are able to generate income to cover their losses (+9.8 pp). This income is sufficient to cover all the expected losses over the test horizon (-9.3 pp). Dividends and taxes, paid mainly from profits for 2015, make a negative contribution to the capital ratio of 2.8 pp. Banks then react to the worse situation by lowering the volume of loans, which reduces the decline in the capital ratio by 1.2 pp. The deterioration of the economic environment and the materialisation of credit risk increase the risk weights, fostering a marked drop in the banking sector's capital ratio of 5 pp to 12.3% in the final period of the test (see Chart III.33).

An additional sensitivity analysis in the *Adverse Scenario* assesses the impacts of partial impairment of exposures to indebted countries

Within the *Adverse Scenario*, a sensitivity analysis is performed assuming partial impairment of all domestic banks' exposures to EU countries with debt exceeding 60% of GDP. Some haircut on exposures is already assumed in the *Adverse Scenario* through a decline in the value of government bonds of EU countries, including the Czech Republic, due to growth in their yields. To this baseline haircut the additional sensitivity analysis adds haircuts on all domestic banks' exposures to indebted countries derived from those countries' average ratings (see Table III.5). This assumption generates additional losses of CZK 22 billion for the

CHART III.32

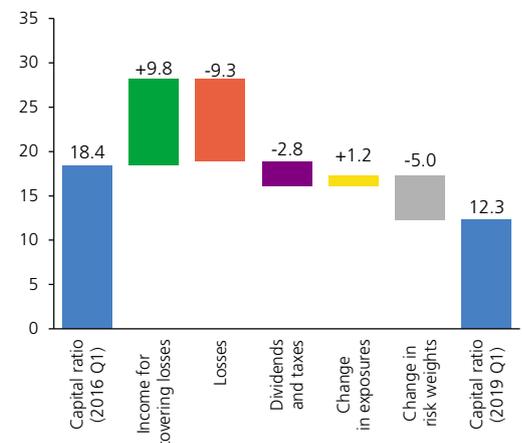
Decomposition of the change in the capital ratio of the banking sector in the *Baseline Scenario* (%)



Source: CNB, CNB calculation

CHART III.33

Decomposition of the change in the capital ratio of the banking sector in the *Adverse Scenario* (%)



Source: CNB, CNB calculation

²⁹ The income used to cover losses includes profits for 2015 and expected income in 2016, 2017 and 2018.

³⁰ Stronger growth in loans to households than in loans to corporations is expected in the *Baseline Scenario*. Loans to households, especially consumer credit, are riskier (have higher default rates), which leads to an increase in the average risk weights.

TABLE III.5

Haircuts on EU countries' exposures
(%)

Country	Haircut
Belgium	7
Finland	2
France	6
Croatia	33
Ireland	16
Italy	24
Cyprus	38
Hungary	30
Malta	18
Germany	0
Netherlands	0
Portugal	30
Austria	2
Greece	49
Slovenia	22
Spain	22
United Kingdom	2

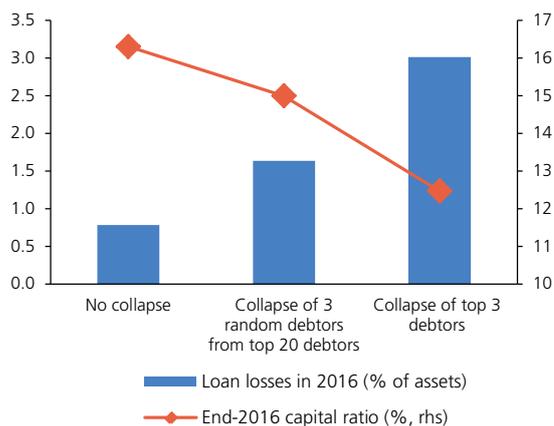
Source: Rating agencies, CNB calculation

Note: The haircuts are calculated using the main agencies' ratings as of May 2016 for EU countries with debt exceeding 60% of GDP.

CHART III.34

Impact of the collapse of the top three debtors of each bank

(%; in Adverse Scenario; LGD = 50 %)



Source: CNB, CNB calculation

banking sector. The sector's capital ratio remains above 11.5% over the test horizon (see Chart III.31, *Adverse Scenario* amplified by country risk), while three more banks fall below the 8% threshold and the capital injections increase to CZK 12 billion (around 0.5% of GDP).

A further sensitivity analysis in the Adverse Scenario analyses the impacts of losses from operational risk

Owing to an increase in risks in the areas of information security and compliance with legislative rules ("conduct risk"), a test of banks' operational risk has been newly added to the stress test. For the end of the second year of the tests in the *Adverse Scenario*, banks are assumed to have incurred losses equivalent to double the three historically highest losses arising from operational risk in 2005–2011.³¹ The sector's capital ratio remains above 11.5% over the test horizon (see Chart III.31, *Adverse Scenario* amplified by losses from operational risk), while one more bank falls below the 8% threshold and the capital injections increase to CZK 9 billion (around 0.2% of GDP).

The portfolio concentration test represents a strong shock...

The final sensitivity analysis in the *Adverse Scenario* focuses on testing concentration risk and assumes default by the largest debtors of each bank. Although the concentration of client loan exposures (as measured by the share of the three largest exposures in the portfolio of loans to legal entities) has long been relatively constant at around 14%, the largest loans may not be sufficiently collateralised in some cases. This is evidenced by the fact that the share of uncollateralised loans in loans to the top three debtors was 55% at the end of 2015.³² If these debtors default, banks' credit losses could reach high levels.

...but the banking sector is resilient to this major shock, too

The concentration test is performed in two variants. The first assumes the collapse of three random debtors from the top 20 debtors of each bank. The other, stricter one assumes the collapse of the top three debtors of each bank. Given the above share of uncollateralised loans in loans to the largest clients, a 50% haircut on these exposures is considered in both cases. This shock has a big effect on the banking sector's credit losses and capital ratio. The capital ratio falls to 15% at the end of 2016 for the collapse of three random large debtors. The collapse of the top three debtors of each bank would cause an even sharper fall in the capital ratio, to 12.5% (see Chart III.34). The concentration test represents a very strong stress scenario, and the resulting banking sector capital ratio based on such a large shock can therefore be assessed as positive.

³¹ The historical data on losses from operational risk are obtained from the banks participating in the joint stress tests, which accounted for almost 75% of the sector's assets at the end of 2016 Q1. An alternative approach was used for the other banks. It assumes that the losses are equal to the capital requirement for operational risk (see the fall-back option in the methodology of the 2016 EU-wide stress tests).

³² The share of uncollateralised claims to non-financial corporations in loans to the three largest borrowers was 59% at the end of 2014.

BOX 3: JOINT STRESS TESTING BY THE CNB AND SELECTED BANKS

In addition to top-down macro stress tests of the banking sector, the CNB has been performing bottom-up micro stress tests in partnership with selected Czech banks since 2009. Such testing is also being performed in 2016 for the largest EU banks. The micro stress tests differ from the macro stress tests mainly in that the impacts of shocks on banks' capital ratios are calculated based on their portfolios by the banks themselves. They thus use much more detailed information on individual portfolios than that available to the CNB for its macro stress tests. However, it is the CNB that defines the most probable and adverse macroeconomic scenarios in both types of test.

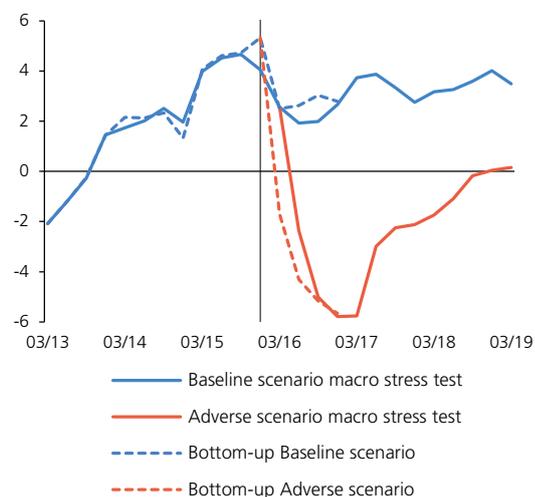
Ten domestic banks, representing 75% of the assets of the Czech banking sector, took part in the twelfth round of micro stress tests using end-2015 data. As usual, the focus was on testing credit risk, which is the largest risk for the Czech banking sector. Since 2014 the micro stress tests have also included a sensitivity analysis of interest rate risk for the banks' entire portfolios and specific interest rate risk for domestic government bonds.

Since the micro stress test scenarios are prepared one quarter before the macro stress tests presented in this Report and the horizon of the micro stress tests is only one year, the scenarios and results of the two types of test are not fully comparable. The baseline scenario for the micro stress tests (*Bottom-up Baseline*) is based on the CNB's macroeconomic forecast published in Inflation Report I/2016 and assumes a slightly higher growth rate of the Czech economy at the one-year horizon than this Report's *Baseline Scenario*. The fall in economic activity in the stress scenario of the micro stress tests (*Bottom-up Adverse*) is similar to that in the *Adverse Scenario* of this Report (see Chart III.1 Box).

The macroeconomic developments assumed in the *Bottom-up Baseline* and *Bottom-up Adverse* scenarios are reflected in the credit risk parameters. As the micro stress tests are calculated for a one-year horizon, faster transmission of credit risks to banks' balance sheets is assumed than in the macro stress tests. In the *Bottom-up Baseline* scenario, a constant level of credit risk in the case of corporate exposures and a slight increase in the case of retail portfolios can be observed at the one-year horizon relative to the actual figures reported by banks. In the *Bottom-up Adverse* scenario, considerably higher credit risk is visible, reflecting the hypothetical adverse evolution of economic activity. This is expressed by a broad rise in both the probability of default (PD) and the loss given default (LGD) in all the credit portfolios tested except central government, for which the PD remains at zero (see Table III.1 Box).

CHART III.1 BOX

Differences in the evolution of real GDP (%)



Source: CNB

TABLE III.1 BOX

Risk parameters for the credit segments and scenarios tested (%; weighted by EAD)

	31.12.2015		Bottom-up Baseline 31.12.2016		Bottom-up Adverse 31.12.2016	
	PD	LGD	PD	LGD	PD	LGD
Corporate exposures	1.4	36.8	1.4	36.8	2.9	48.0
- large enterprises	0.9	38.3	1.0	38.1	2.0	50.0
- small and medium-sized enterprises	2.0	34.8	2.0	34.7	4.1	45.4
- specialised credit exposures	1.6	37.4	1.6	37.2	3.3	48.8
Retail exposures	2.2	29.4	2.3	29.7	3.3	39.2
- real estate SMEs	4.8	35.0	4.8	35.1	9.9	47.9
- loans for house purchase	1.5	22.9	1.5	22.9	2.3	31.3
- revolving loans	2.6	53.2	3.1	56.6	3.7	70.1
- other loans to individuals	3.5	48.3	4.4	48.4	5.2	59.8
- other loans to SMEs	4.8	43.5	4.7	43.4	9.6	56.7
Institutions	0.2	23.9	0.3	23.9	0.4	27.5
Central governments	0.0	11.5	0.0	11.5	0.0	17.3

Source: CNB

TABLE III.2 BOX

Banks' capital requirements and capital ratios (%)

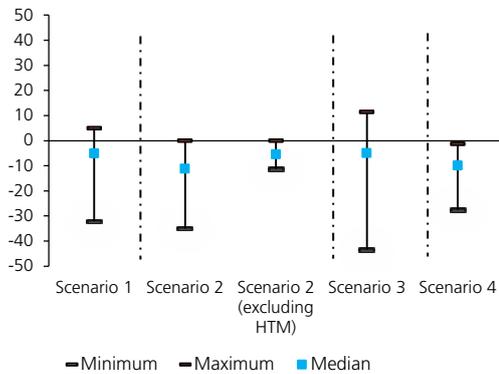
	31.12.2015	Bottom-up Baseline 31.12.2016	Bottom-up Adverse 31.12.2016
Capital requirements (year-on-year change)	-	3.3	51.0
Regulatory capital (year-on-year change)	-	2.9	-2.4
Tier 1 capital ratio	18.7	18.5	12.3
Capital ratio	19.0	18.8	12.6

Source: CNB

CHART III.2 Box

Interest rate risk sensitivity analysis

(as % of regulatory capital)



Source: CNB

Note: Banks included in micro stress tests, excluding building societies. In Scenario 2 (excluding HTM), accounting principles are taken into consideration and so CZK government bonds held to maturity are not marked to market. HTM = held to maturity.

The results of the micro stress tests for the *Bottom-up Baseline* scenario point to a slight rise in the capital requirements of banks and a fall in annual profit of 10%. The aggregate Tier 1 capital ratio of the banks tested would decrease slightly to 18.5%. In the *Bottom-up Adverse* scenario the capital requirements rise by a significant 51% and profit declines by more than 43% overall. Despite these adverse developments, the aggregate Tier 1 capital ratio of the institutions tested remains well above the 8% threshold at the one-year horizon, dropping to 12.3% (see Table III.2 Box).

The micro stress test results confirm that the banks tested are highly resilient to adverse scenarios, in line with the results of the macro stress tests of the banking sector. The results and individual parameters, however, are not fully comparable, not only because of the slightly different macroeconomic scenarios, but also because of the different samples of institutions tested and different test horizons, which lead to different assumptions about the speed of transmission of risks to banks' portfolios.

In addition to the *Bottom-up Baseline* and *Bottom-up Adverse* scenarios, a sensitivity analysis of general interest rate risk and the specific interest rate risk for CZK government bonds was performed. The economic logic of the test was applied in the interest rate risk testing and the effect of accounting categories on the revaluation of bank assets and liabilities was suppressed. The sensitivity analysis thus covered the entire bank portfolio (the banking and trading books) and used four scenarios. *Scenario 1* assumed a 3 pp parallel shift of the yield curve, *Scenario 2* assumed a 3 pp widening of the CZK government bond spread vis-à-vis the IRS yield curve,³³ *Scenario 3* assumed a larger increase in the slope of the yield curve³⁴ and *Scenario 4* contained a combination of a more moderate increase in the slope of the yield curve and a 2 pp widening of the CZK government bond spread vis-à-vis the IRS yield curve.³⁵

The results of the sensitivity analysis show that a rise in interest rates would have mixed impacts across the banks tested

33 A variant of *Scenario 2* in which accounting principles are taken into consideration and so CZK government bonds held to maturity are not marked to market was also considered for comparison.

34 A 5 pp shift was assumed for maturities of over 5 years, the curve was left unchanged for maturities of up to 3 months, and linear interpolation was used for the shift for maturities of over 3 months and up to 5 years.

35 Increase in the yield curve slope: a 3 pp shift was assumed for maturities of over 5 years, the curve was left unchanged for maturities of up to 3 months, and linear interpolation was used for the shift for maturities of over 3 months and up to 5 years. Widening of the CZK government bond spread: a 2 pp shift was assumed for maturities of over 5 years, and linear interpolation was used for the shift for maturities of over 3 months and up to 5 years.

(see Chart III.2 Box). In *Scenario 1*, the impact of a parallel shift of the yield curve would be between -32.1% and 5.0% of capital. In *Scenario 3*, banks' sensitivity to rotation of the yield curve increases further, with the impact on the banks' capital ranging from -43.4% to 11.5%. *Scenario 2* assumes a widening of the CZK government bond spread because of a rise in the yield demanded by investors. The strongly negative impact of this scenario (between -35.0% and 0.0%) is due to the significant exposure of domestic banks to Czech government bonds. However, if accounting principles are taken into consideration, moving away from a purely economic perspective, the impact of the test is significantly smaller (between -11.2% and 0.0%), since domestic banks hold more than half of domestic government bonds in the "held to maturity" accounting category and hence do not mark these debt securities to market (see section 2.1). In *Scenario 4*, the impact is between -27.6% and -1.2%.

The stress tests of pension management companies assess the sector's resilience at the one-year horizon

The stress tests of pension management companies (PMCs) focus on assessing the risks to the sector at the one-year horizon. Besides the *Baseline Scenario*, the sector's resilience to the *Adverse Scenario* was also tested; this variant captures adverse economic developments coupled with a rise in risk premia in financial markets. The *Adverse Scenario* manifests itself in a marked decline on property and stock markets, a weakening of the koruna, a rise in interest rates in the Czech Republic and the euro area, and a decrease in prices of all types of bonds. Given their current exceptionally low yields, Czech government bonds are hit hard by these developments (see Table III.3).

The PMC stress-testing methodology has been revised in the area of interest rate risk

The PMC stress-testing methodology was further refined in this year's tests. The most important change was an innovation in the creation of the scenario for interest rate risk of government and corporate securities. For Czech koruna government bonds and euro government bonds with the highest rating, the issuer-specific interest rate risk (the interest rate spread indicating the difference between the yield on the relevant asset and "risk-free" swap rates) is now derived from the forecast for the yield on Czech and German government bonds (see Table III.3). The interest rate spread for other government bonds is set by adding a margin for the highest-rated euro bonds. The interest rate spread for corporate bonds is set as the spread for the government bonds of the issuer's country plus a margin corresponding to the bond's rating. This ensures that corporate bonds will be hit harder by a rise in risk aversion than the governments of the countries in which they are based. In addition, a stronger reaction to market developments is assumed for longer-term bonds than for short-term ones.

TABLE III.6

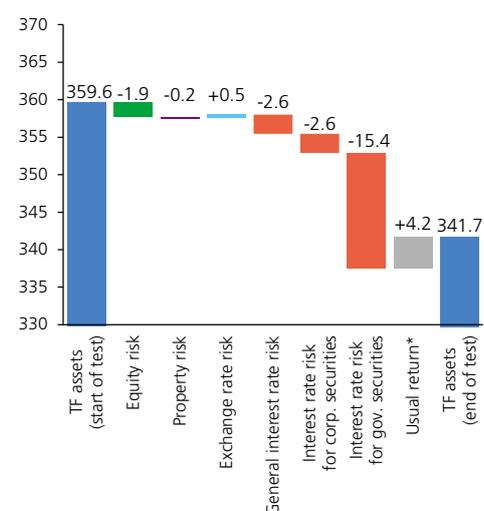
		Baseline scenario	Adverse scenario
PMC Equity (start of test)	CZK billions	8.8	8.8
Capital ratio (start of test)	%	136.1	136.1
Change in TF asset value - interest rate risk	CZK billions % of TF assets	-2.1 -0.6	-20.5 -5.7
Change in TF asset value - exchange rate risk	CZK billions % of TF assets	0.0 0.0	0.5 0.1
Change in TF asset value - equity risk	CZK billions % of TF assets	-0.3 -0.1	-1.9 -0.5
Change in TF asset value -property risk	CZK billions % of TF assets	0.1 0.0	-0.2 0.0
Total impact of risks on TF assets	CZK billions % of TF assets	-2.3 -0.6	-22.0 -6.1
Profit of transformed funds	CZK billions	4.0	1.0
PMC Equity (end of test)	CZK billions	9.2	2.3
Capital ratio (end of test)	%	142.7	33.8
Capital injection	CZK billions	0.0	4.7

Source: CNB, CNB calculation

Note: Start of test: end of 2015; end of test: end of 2016.

CHART III.35

Change in the value of assets of transformed funds due to the individual types of risk in the Adverse Scenario (CZK billions)



Source: CNB, CNB calculation

Note: * The assumed rise in value that would occur even without market revaluation of assets in the Adverse Scenario. It represents dividend income, bond coupons and the return on the HTM portfolio. A usual return of 1.2% of the book value of assets at the start of the test is considered for all TFs. This equals the average return (net profit/assets of TFs) in recent years. Start of test: end of 2015; end of test: end of 2016.

Transformed funds are mainly sensitive to interest rate risk...

The effect of the considered risks on the results of transformed funds and PMCs is summarised in Table III.6 and Chart III.35. As these funds invest mainly in government bonds, interest rates have the largest impact on their results, as in previous years. The sharp rise in yields on Czech and foreign government bonds assumed in the *Adverse Scenario* leads to a 5.7% decrease in the value of asset holdings. Funds holding a large proportion of their assets in fixed-rate koruna bonds with longer average residual maturities are hit the hardest. Approaches to interest rate risk differ across funds. The predominant method for mitigating the impact of interest rate risk is to hold assets to maturity and invest in floating-rate bonds (both account for more than 58% of the koruna bond portfolio). By contrast, hedging of interest risk using derivatives is applied to only a limited extent. In the *Adverse Scenario*, it would eliminate only 22% of the total loss caused by the rise in swap rates. Equity risk and real estate risk rose slightly compared to the previous stress test owing to the rising share of such investments in funds' portfolios, but remained insignificant in size. In the *Adverse Scenario*, funds make exchange rate gains as a result of a weakening of the koruna. Despite the sizeable volume of foreign currency investments (12.8% of assets), the effect of the exchange rate on funds' results is limited, as funds use derivatives to hedge exchange rate risk. However, the degree of exchange rate risk hedging fell slightly in some funds compared to the previous stress test.

...but remain profitable even in the Adverse Scenario

The change in the value of assets of transformed funds has only a limited impact on their accounting profit, as only some investments are realised in the given period. Therefore, assuming materialisation of 15% of the potential profit or loss, even the sizeable decrease in asset value in the *Adverse Scenario* results in the generation of profit by transformed funds and non-zero returns for their clients.

In the Adverse Scenario, a large proportion of PMCs would see a fall in capital adequacy

PMCs guarantee non-negative returns to the clients of their transformed funds by law. If the assets of a transformed fund decline below the level of its liabilities, the PMC has to top up the transformed fund's resources. This is the case for all PMCs in the *Adverse Scenario*. As a result of the top-up, the capital ratios of seven out of the eight PMCs falls below the required level, leading to negative capital for four of them. The owners would have to inject capital of CZK 4.7 billion in order to meet the capital adequacy requirement. These results are consistent with last year's stress test.³⁶ When the value of the transformed fund assets rises again, the PMC may withdraw the injected funds. However, it is apparent that in the event of highly adverse market developments, the duty to top up

³⁶ The *Adverse Scenario* can be assessed as slightly less stressful than last year's stress scenario. A smaller increase in koruna swap rates in this year's test is offset by a larger increase in the interest rate spread for government bonds and especially corporate bonds. If last year's stress scenario is applied, the capital injection is CZK 3.9 billion.

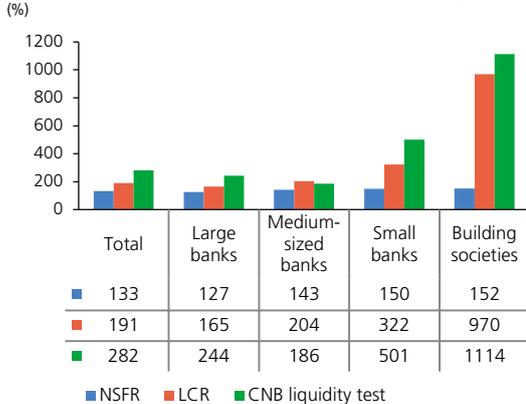
transformed funds' resources represents a substantial burden on PMCs and their owners.

Koruna assets sell-off in a situation of lower market liquidity could have an adverse impact on PMCs in the short-term

The scenario of a sizeable decline in prices of Czech government bonds could materialise, for example, in the event of a mass outflow of non-residents from the koruna asset market (see section 2.1). Such a scenario would enable funds to achieve higher returns if they purchased the bonds anew. However, revaluation of the *existing* bonds in funds' portfolios could lead to the above-mentioned transfer of stress to PMC owners.

CHART III.36

Comparison of selected bank balance-sheet liquidity indicators (%)



Source: CNB, CNB calculation

Note: The LCR is the ratio of the liquidity buffer to the net liquidity outflow of banks over a 30-day stress horizon as defined by EC Regulation 2015/61. The NSFR is the ratio of available stable funding to required stable funding as defined by Basel III. The CNB liquidity test indicator is the ratio of the liquidity buffer to the net liquidity outflow of banks over a one-year stress horizon as defined by the CNB.

3.3 BANK LIQUIDITY STRESS TESTS AND LIQUIDITY REGULATION

Banks having their registered offices in the Czech Republic passed the liquidity tests. Both the CNB's macro-stress test and the liquidity coverage and stable financing survey demonstrated the high resilience of Czech banks to a liquidity shock. This is due to a strong client deposit base and good capitalisation on the liabilities side and to a significant proportion of high-quality government bonds and exposures to the CNB on the asset side. Low diversification of the liquidity buffer remains a less favourable aspect of the Czech banking sector's liquidity.

The values of the liquidity coverage ratio confirm the banking sector's resilience to short-term liquidity risk

The domestic banking sector's resilience to a short-term liquidity shock is regularly tested using the liquidity coverage ratio (LCR³⁷). The aggregate LCR for the entire sector based on the end-March 2016 data is 191%³⁸, well above the current regulatory requirement of 70% (see Chart III.36). All domestic banks are also compliant with the regulatory limit of 100% required as from 2018. Domestic banks continue to hold almost all their assets from the LCR liquidity buffer in the form of Level 1 liquid assets, to which no haircuts are applied (see Table III.7). Given the monthly horizon of the stress considered, the highest aggregate LCR was achieved as usual for building societies, which, compared to the other groups of banks, have a significantly lower share of deposits, to which a higher outflow rate is applied in the test. Small banks also showed comparatively higher aggregate LCRs due to a higher ratio of the liquidity buffer to total assets.

TABLE III.7

Comparison of the impacts of the LCR on groups of banks

(% of total assets of individual groups of banks; rates in %)

	Large	Banks Medium- sized	Small	Building societies	Total
Liquidity buffer	30	29	44	19	31
Liquid assets	30	30	42	19	31
Weighted average rate of eligibility after application of haircuts*	100	99	100	99	100
Expected outflows	27	20	15	3	23
Balances of outflows	97	83	92	31	89
Weighted average rate of outflow*	28	24	16	10	26
Expected inflows	9	5	2	2	7
Balances of inflows	15	12	19	2	7
Weighted average rate of inflow*	59	44	9	84	50
LCR	165	204	322	970	191

Source: CNB

Note: *The extent to which items subject to haircuts, outflows or inflows in the stress period are represented in balance sheets.

BOX 4: NET STABLE FUNDING RATIO

The Basel III liquidity instruments include a net stable funding ratio (NSFR). A general stable funding requirement has been applied to banks in the EU since 2016 (Article 414 of the CRR), and a minimum standard is expected to be introduced in 2018³⁹. In accordance with the CRR, the European Banking Authority (EBA) has drafted a report assessing the impact of the NSFR and the options for incorporating it into EU law⁴⁰. The report was

37 The LCR is a requirement to cover a net liquidity outflow over a 30-day horizon with liquid assets. It is calculated as the ratio of the liquidity buffer to the net liquidity outflow. The assets in the liquidity buffer are divided into three categories based on their quality and liquidity: Level 1 – cash, highest-rated and highest-liquidity government bonds, and claims on the CNB; Level 2A – government bonds with a 20% risk weight, covered bonds meeting requirements regarding, for example, collateral quality, rating (at least second grade) and issue size (above EUR 250 million); and Level 2B – shares from the main index of an EU Member State and corporate debt securities meeting quality and liquidity requirements.

38 The aggregate results take liquidity subgroups into account.

39 Regulation 575/2013 and Directive 2013/66/EU (CRR/CRD IV), issued in June 2013, contain a set of prudential requirements to be observed by credit institutions, including liquidity rules.

40 EBA Report on Net Stable Funding Requirements under Article 510 of the CRR.

published in December 2015. The European Commission is now expected to issue a legislative proposal for a binding minimum standard for stable funding by the end of 2016.

The aim of the net stable funding requirement is to ensure that a bank's funding profile adequately reflects the composition and type of its balance sheet and off-balance sheet assets. The financial crisis revealed that banks with insufficient liquid assets and a large proportion of short-term unstable funding sources are more vulnerable to liquidity risk. This vulnerability stems on the one hand from an inability to raise necessary funds in time by quickly selling assets for cash and on the other hand from pressure from creditors withdrawing short-term deposits, which are hard to renew on the market in a crisis.

The NSFR is a structural requirement and is monitored over a one-year horizon. It is defined as the ratio of available stable funding (ASF) to required stable funding (RSF). The items entering the ratio are broken down by quality, liquidity, stability and counterparty on an aggregate basis. These characteristics are reflected in the weights assigned to the items, which range from 0% to 100% (see Table III.3 Box). At the same time, all items are broken down by maturity into short-term (less than one year) and long-term (one year or more). Items with a residual maturity of up to one year are further broken down into two maturity classes (less than six months and six months or more). This is done mainly to eliminate excessive volatility in the quarterly measurement of the ratio. Put simply, an item's weight in the ratio gradually goes down as its residual maturity decreases.

The more stable and longer is the source of funding represented, the higher is the weight of an item included in the available sources (also known as the ASF factor). Capital and all sources of funding with a residual maturity of one year or more are assigned a weight of 100%. Retail deposits have a specific position. These short-term deposits are considered more stable than sources of the same or similar maturity provided by other counterparties (e.g. non-financial corporations and financial institutions). This is mainly because they are covered by the deposit insurance scheme of the Financial Market Guarantee System up to an amount of EUR 100,000, and also because they are small depositors' funds, which correspond in terms of size to such depositors' transaction and precautionary motives and cannot be deposited elsewhere than on cash accounts at banks. Retail deposits therefore have a minimum weight of 90%. By contrast, deposits of financial institutions are not insured and are used mainly for those institutions' own liquidity risk management. Therefore, banks' short-term liabilities to financial institutions mostly do not represent a stable source of funding and are assigned a low or

TABLE III.3 Box

Simplified list of weights of balance-sheet items in the Basel III net stable funding ratio
(%)

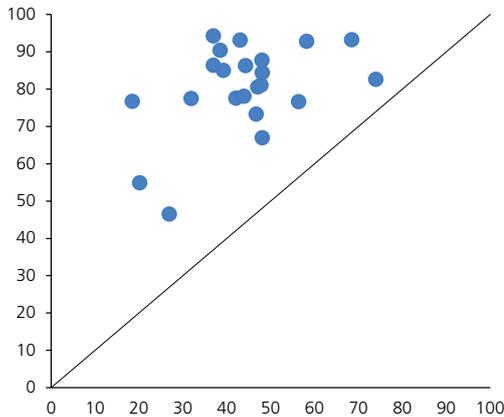
Assets (items requiring stable funding)	Weight (RSF factor)
Coins and bank notes	
Claims on central banks with maturities of less than 6 months	0
Unencumbered Level 1 assets	5
Loans to financial institutions with maturities of less than 6 months, where the loan is secured against Level 1 assets with option to rehypothecate	10
Unencumbered Level 2A assets	
Loans to financial institutions with maturities of less than 6 months	15
Unencumbered Level 2B assets	
Loans to financial institutions and central banks with maturity between 6 months and less than 1 year	
Deposits held at other financial institutions for operational purposes	50
Encumbered high-quality and liquid assets with maturity between 6 months and less than 1 year	
Other assets with maturity of less than 1 year	
Unencumbered loans to retail segment (max. RW 35% under STA for credit risks) with maturity of 1 year or more	65
Other unencumbered securities and loans with maturity of 1 year or more, excluding loans to financial institutions	85
Assets encumbered for 1 year or more	
NSFR derivative assets and liabilities	100
Other assets with maturity of 1 year or more,	
Off-balance sheet: Irrevocable and conditionally revocable facilities	5
Liabilities (sources ensuring stable funding)	Weight (ASF factor)
Total regulatory capital (excluding Tier 2 with maturity of less than 1 year)	
Priority shares and other capital instruments with maturity of 1 year or more	100
Liabilities with maturity of 1 year or more	
Stable retail deposits	95
Other retail deposits	90
Operational deposits	
Liabilities to non-financial corporations or sovereigns with maturity of less than 1 year	50
Liabilities to financial institutions or central banks with maturity between 6 months and less than 1 year	
Other liabilities	0

Source: CNB from Basel NSFR standard, October 2014

CHART III.37

Available and required stable funding sources for banks in the Czech Republic

(%; y-axis: average ASF factor; x-axis: average RSF factor)



Source: CNB, CNB calculation

Note: Average RSF factor: average volume of items requiring stable funding. Average ASF factor: average volume of items ensuring stable funding. Basel III NSFR standard.

zero weight. With a weight of 50%, liabilities to non-financial corporations lie between stable retail sources and unstable sources from financial institutions.

The lower is the liquidity and quality of an asset and the longer is its residual maturity, the higher is the weight of an item requiring stable funding (also known as the RSF factor).⁴¹ A zero weight thus corresponds to a high-quality, highly liquid asset which does not need to be covered by stable long-term funds. These assets consist solely of cash and claims on the central bank with residual maturities of less than six months. High-quality government bonds are assigned a weight of 5%. For comparison, mortgage loans to households have a weight of 65%. All non-liquid assets – i.e. assets with a residual maturity of one year or more and assets encumbered for one year or more – require a very stable source of funding and are assigned a weight of 100%.

Following the disclosure of the intention to introduce the NSFR, concerns arose that the required minimum 100% level would lead to a significant reshuffling of bank balance sheets and reduce lending to the real economy. However, an EBA report on the impact of the NSFR, assessing data for December 2014 and covering 279 banks representing 75% of the assets of the EU banking sector, states that these concerns are not justified. The report says that 70% of the banks assessed would already be compliant with the 100% minimum requirement today. Only 14% recorded values below 90%. These credit institutions must eliminate a mismatch totalling about EUR 600 billion. The report uses two different methodological approaches to assess the impact of the introduction of the NSFR on lending. Simulation results show that even higher lending does not preclude a higher NSFR level provided that loans remain unencumbered, i.e. provided that they are not used, for example, to cover issued bonds. A regression analysis did not prove a direct relationship between lower NSFR levels and changes in lending. For most banks, efforts to comply with the minimum required NSFR should not lead to major deleveraging. Higher NSFR-related costs pertain more to investment-oriented banks.

The European Systemic Risk Board (ESRB) recommends allowing national discretion to set the NSFR requirement above the 100% minimum based on systemic risk developments, and hence allowing it to be used for macroprudential policy purposes.⁴² The ESRB proposes that this instrument be used to reduce both the

41 An asset's quality and liquidity is determined according to the rules of the LCR liquidity standard.

42 ESRB response to the consultation on the Net Stable Funding Ratio (NSFR) as mandated by Article 510 CRR.

cyclical and structural dimensions of systemic liquidity risk. The cyclical aspect would enable national authorities to tighten the ratio during good times and relax it during bad times. The structural aspect would take into account the settings of the ratio based on the importance of individual banks from the perspective of systemic liquidity risk. However, these ESRB proposals have yet to undergo detailed discussion.

Banks' balance sheet liquidity is newly assessed also using an estimate of the stable funding ratio

The resilience of domestic banks to liquidity shocks is confirmed by a preliminary calculation of the net stable funding ratio (NSFR), which is defined as the ratio of available stable funding to required stable funding (see Box 4). The aggregate NSFR for the domestic banking sector is 133% according to end-2015 data (see Chart III.36).⁴³ This level reflects sufficient sources of available stable funding in Czech banks. This is due to a strong client deposit base, solid capitalisation and an asset structure featuring a significant proportion of government bonds and claims on the CNB, which are associated with a low stable funding coverage need (see Chart III.37).

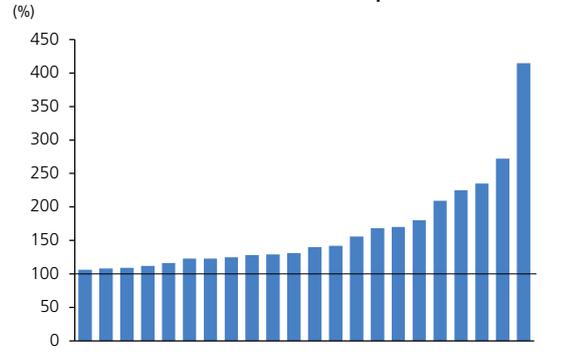
Client deposits provide sufficient stable funding

The estimated NSFR differs across the bank groups monitored, but is sufficiently above the regulatory limit of 100% for all of them (see Charts III.36 and III.38). As in the case of the LCR survey, building societies have the highest estimated NSFR, as long-term deposits with a contractual maturity of over one year, which are considered 100% stable under the NSFR methodology, account for a relatively large share of their assets (see Chart III.39). Large and medium-sized banks, by contrast, have a shorter and more diversified funding base comprising corporate deposits as well as retail ones. In addition to high-quality and liquid assets, which do not require stable funding, the asset side of Czech banks' balance sheet includes the relatively significant component of claims on non-financial corporations and financial institutions. A need for coverage with a higher weight of stable funding (over 50%) thus pertains to roughly one-half of their balance sheet, with loans to natural persons and non-financial corporations being the largest items (an average weight of 86% and 76% respectively; see Chart III.40). For medium-sized banks, encumbered loans to households, which require full coverage with stable funding, are a significant item relative to total assets.

43 Due to unavailability of data for 2015, data as of 31 December 2014 were used for one bank. Liquidity subgroups are taken into account in the aggregate calculation.

CHART III.38

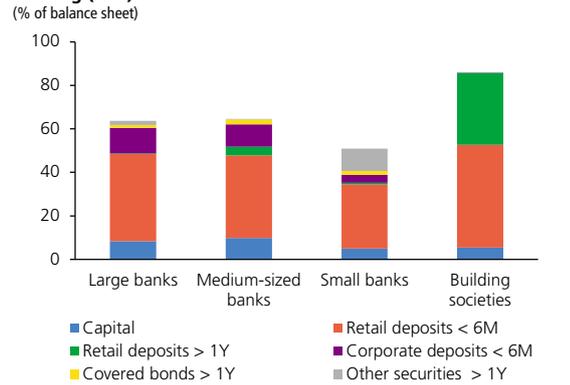
NSFR estimates for banks in the Czech Republic



Source: CNB, CNB calculation
Note: Basel III NSFR standard.

CHART III.39

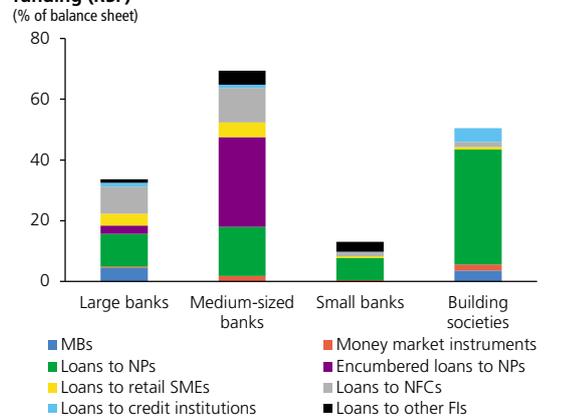
Structure and amount of selected items ensuring stable funding (ASF)



Source: CNB, CNB calculation
Note: The chart contains items whose weights exceed 2% in any of the groups of selected banks. Basel III NSFR standard.

CHART III.40

Structure and amount of selected items requiring stable funding (RSF)



Source: CNB, CNB calculation
Note: The chart contains items whose weights exceed 2% in any of the groups of selected banks. NPs: natural persons; NFCs: non-financial corporations; Fls: financial institutions. Basel III NSFR standard.

TABLE III.8

Liquidity stress test scenario (%)				
Balance-sheet item / Maturity bands	< 3M	3M–6M	6M–9M	9M–12M
1. Liquidity buffer				
	Interest rate and equity shock			
1.1 Q-o-q change in yield curve in pp*				
1Y PRIBOR	0.3	0.0	0.0	0.0
5Y GB yield	1.5	0.5	0.8	0.3
1Y EURIBOR	0.2	0.0	0.0	0.0
5Y EUR GB yield	1.0	0.4	0.2	0.1
1.2 Haircuts from value of capital instrument	30.0	30.0	30.0	30.0
2. Inflows				
	Size of deduction from expected inflow			
2.1 Secured claims	1.2	1.2	1.2	1.2
2.2 Unsecured claims due**				
on NPs	2.3	2.4	2.5	2.6
on NFCs and retail SMEs	0.6	1.1	0.9	1.0
3. Outflows				
	Expected outflow rate			
3.1 Drawdown of credit lines	5.0	5.0	5.0	5.0
3.2 Issued debt securities	100.0	100.0	100.0	100.0
3.3 Retail deposits				
insured	3.3	3.8	3.8	3.8
others	6.5	7.5	7.5	7.5
3.4 Liabilities to NFC				
insured	13.1	15.0	15.0	15.0
others	26.1	30.0	30.0	30.0
3.5 Liabilities to FIs				
insured	13.1	15.0	15.0	15.0
others	32.7	37.5	37.5	37.5
3.6 Growth in new loans, of which***				
secured claims	0.0	0.6	0.6	0.0
due to NPs	0.0	0.0	0.0	0.0
due to NFCs and retail SMEs	0.0	0.0	0.0	0.9

Source: CNB

Note: The parameter values are the averages of those applied to individual banks. *The haircut is determined by multiplying the change in the yield curve by the duration of the bond portfolio. **Due claims on financial institutions were not subject to deductions in this scenario. ***The credit growth assumption is calculated using satellite models in macro stress tests of bank solvency. NFCs: non-financial corporations, FIs: financial institutions, NPs: natural persons. This table does not contain the endogenous (systemic and reputational) shocks generated in the second round of shocks.

The CNB also assesses the banking sector's liquidity using its own stress test...

Besides assessing balance-sheet liquidity using the LCR and NSFR ratios, the CNB conducts its own macro stress test. The test methodology was revised slightly on the introduction of these ratios.⁴⁴ The main changes consisted in linking the liquidity test to the macro stress test scenario and the solvency test and extending the horizon of the impact to one year by including four maturity bands. This change enables better testing of the impact of scenarios with a lagged pass-through of an adverse economic situation to the quality of banks' loan portfolios and to the financial markets. The model is still a two-round one and takes into account links between balance-sheet and market liquidity and the feedback reaction of the banking sector. A liquidity indicator is used to assess banks' resilience to liquidity risk. The sufficiency of a bank's liquid asset buffer relative to its maturity mismatch and funding stability is tested using this indicator over a one-year horizon. The indicator is defined as the ratio of the liquidity buffer⁴⁵ to net expected liquidity outflows, i.e. the difference between expected outflows and inflows of liquidity. Expected outflows comprise liabilities with maturity less than one year, drawdown of credit lines and newly provided loans. Expected inflows consist of claims with maturity less than one year. As in the case of the LCR and NSFR under Basel III, the lowest permissible value of the indicator is 100%.

The liquidity stress test was applied to 21 banks having their registered offices in the Czech Republic⁴⁶ using the *Adverse Scenario* (see section 2.1 and Table III.3) and the end-2015 data. In the first round of stress, a liquidity outflow was generated for each maturity band by increasing the asset funding requirement (see Table III.8, lines 3.1 and 3.6) amid lower sources (see lines 3.2 and 3.5). At the same time, the outflow of expected liquidity (lines 2.1 and 2.2) for the relevant maturity band was lowered, as was the value of some assets in the liquidity buffer (lines 1.1 and 1.2). The second round of stress captures the consequences of the rise in reputational and systemic risk brought about by banks' efforts to cover the net outflow and is expressed through additional losses arising from the sale of assets from the buffer.

...its results also confirmed strong resilience to liquidity shocks

The test results reveal that the domestic banking sector as a whole would withstand the simulated stress and is able to cover a net outflow of liquidity lasting even one year (see Chart III.36). The impacts of the negative shocks on the balance sheets of the groups of banks monitored were mixed. When the impact was measured using the aggregate decline in the total liquidity buffer, large banks were hit hardest, followed by medium-sized banks (a decline of around 70%; see Chart III.41). Four

44 For details see the thematic article *The Relationship between Liquidity Risk and Credit Risk in the CNB's Liquidity Stress Tests* in this Report.

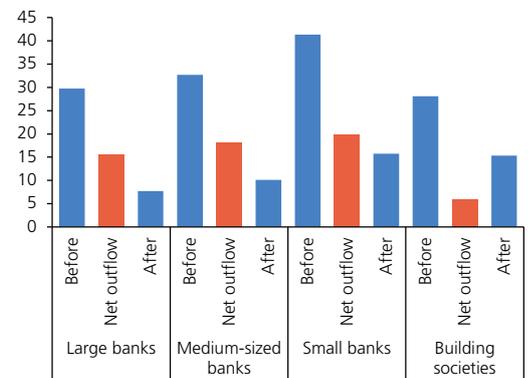
45 The liquidity buffer is the sum of cash, claims on the central bank (excluding minimum reserves), government bonds and corporate marketable securities except those held as loans.

46 State-owned banks, which have a specific business model, were not included in the stress test. Moreover, the test takes liquidity subgroups into account.

banks would exhaust their entire buffer during the test, although not before the fourth quarter. A small impact is apparent for building societies (a decline in the total buffer of around 40%) for similar reasons as in the assessment of the LCR and NSFR results. At the one-year horizon, six banks, whose indicator fell below the 100% minimum, would be unable to cover the outflows generated. Some of them were banks with specific business models. However, the methodology indicated that even some universal banks have less stable funds over a longer horizon relative to the size of their liquidity buffers.

CHART III.41

Results of the liquidity stress test of the Czech banks (% of total assets of individual groups of banks)



Source: CNB, CNB calculation

Note: The column "Before" represents the pre-stress size of the liquidity buffer and the column "After" the post-stress size of the liquidity buffer. The column "Net outflow" represents the outflow of liquidity over the one-year horizon.

TABLE III.9

Czech public finance stress test					
	2015	Adverse Scenario			Critical limit
	2015	2016	2017	2018	
Macroeconomic variables					
Real GDP growth (%)	4.3	-2.7	-3.3	-0.7	< -2.3
Current account balance (% of GDP)	0.6	3.3	2.6	1.0	< -1.8
Gross national savings (% of GDP)*	28.2	28.2	28.2	28.2	< 19.3
External debt (% of GDP)*	70.0	70.0	70.0	70.0	> 99.6
Difference between real GDP growth and real 10Y GB yield (pp)	-4.0	5.0	10.4	4.4	> 6.3
Fiscal variables					
Government debt (% of GDP)	41.1	45.0	55.5	64.6	> 64.7
Primary balance (% of GDP)	0.7	-0.5	-3.8	-5.8	< -3.2
10Y government bond yield (%)	0.7	1.7	2.4	3.1	> 10.8
Government debt maturing within one year (% of GDP)	6.7	8.9	12.0	13.4	> 19.0
Share of government debt maturing within one year (%)	16.4	19.7	21.6	20.7	> 21.7
Share of foreign currency debt (%)	15.4	15.5	15.8	11.7	> 27.1
Share of non-residents in debt holdings (%)*	38.4	38.4	38.4	38.4	> 34.9
Institutional variables					
Government effectiveness (WGI score)*	1.02	1.02	1.02	1.02	< 1.0
Political stability (WGI score)*	1.0	1.0	1.0	1.0	< 0.8
Rule of law (WGI score)*	1.1	1.1	1.1	1.1	< 1.2
Banking crisis*	No	No	No	No	> 0
Past sovereign defaults*	No	No	No	No	> 0
Sovereign risk indicator (ISR, %)	-	0.23	0.80	0.27	

Source: CNB, CZSO, ECB, WB, CNB calculation

Note: * Variable not modelled; last known value assumed in projection. The figure for the share of non-residents in debt holdings is derived from the Balance of Payments statistics. The symbol > (<) denotes that a higher (lower) value means breaching of the critical limit and indication of increased risk. Where the limit is breached, the relevant variables are further indicated in red.

3.4 SOVEREIGN EXPOSURES AND THE PUBLIC FINANCE STRESS TEST

The CNB has identified credit institutions' exposures to the Czech public sector as systemically important under its internal methodology. On the basis of stress test results, the CNB will not require credit institutions operating in the Czech Republic to meet an additional capital requirement to cover the risk of concentration of exposures to Czech government debt over a three-year horizon.

The CNB reviews and assesses the risks of concentration of sovereign exposures

Since 2015 the CNB has been reviewing and evaluating the risks of concentration of sovereign exposures in the balance sheets of Czech credit institutions under its internal methodology.⁴⁷ In its Financial Stability Reports it informs the market about which sovereign exposures it has identified as systemically important and whether it will require credit institutions to meet an additional capital requirement to cover the risk of concentration of these exposures over a three-year horizon. The methodology defines an important sovereign exposure as an exposure held by a credit institution⁴⁸ with a minimum ratio to its eligible capital of 100%. It becomes systemic if the assets of credit institutions with important exposures exceed 5% of the total assets of the Czech banking sector. It is indicated that an additional capital requirement must be met if the three-year outlook for the risk indicator of the systemic sovereign exposure exceeds one of its thresholds.⁴⁹ However, the CNB requires additional capital only where the credit institution holds exposures in excess of the limit and those exposures are not already sufficiently covered by capital.⁵⁰

Banks' exposures to the Czech government are systemically important...

The CNB considers exposures to the domestic government to be systemically important sovereign exposures held by credit institutions having their registered offices in the Czech Republic. At the end of 2015, they totalled around CZK 681 billion, or 162% of eligible capital, in aggregate terms. Credit institutions for which this exposure exceeded total eligible capital accounted for 68% of the total assets of credit institutions having their registered offices in the Czech Republic. Sovereign exposures to other governments, the EU and the EIB were not found to be systemically important.

47 The internal methodology is described in FSR 2014/2015.

48 It only covers credit institutions having their registered offices in the Czech Republic.

49 The CNB primarily monitors two thresholds: a soft threshold of 5% indicating additional capital creation where an additional expert analysis proves this to be necessary, and a hard threshold of 8% indicating unconditional creation of additional capital.

50 The above-limit part of a sovereign exposure is determined using the sovereign risk indicator (ISR) where this indicator exceeds its thresholds. The ISR provides a simplified assessment of the risk of default on a sovereign exposure. The threshold separating the limit and above-limit parts of a sovereign exposure gradually falls as this indicator increases. As a result, the above-limit part rises. The highest effective limit is 222% and the lowest is 0%.

...but their riskiness does not exceed the thresholds

The sovereign risk indicator (ISR)⁵¹ was estimated for exposures to Czech government identified as systemically important. Projections of the main variables entering the ISR were obtained using a stress test of Czech public finances based on the *Adverse Scenario* (see section 2.1 and Table III.3). The marked economic decline assumed in the *Adverse Scenario* was reflected in a rise in the primary deficit to 5.8% and a subsequent increase in total government debt to 64.6% of GDP (see Table III.9). The reaction of the financial markets led to an increase in nominal yields on Czech government bonds along the entire government koruna yield curve. However, given the deflation assumed in the *Adverse Scenario*, the ten-year government bond yield did not exceed 3.1% over the three-year test horizon. The impact of debt servicing costs on the total deficit was therefore low. However, the difference between the real yield and the GDP growth rate exceeded the critical limit of 6.3% of GDP. As real economic growth, the primary deficit and the share of non-residents in debt holdings also reached their critical limits (see also section 2.1), the ISR reached its highest level of 0.8% in 2017. In 2018, however, the ISR fell to 0.27% owing chiefly to an assumed increase in the rate of economic growth and its return below the critical limit. The estimated ISR did not exceed its supervisory threshold values of 5% and 8% over the three-year horizon of the Czech public finance stress test. The CNB will therefore not require credit institutions operating in the Czech Republic to meet an additional capital requirement to cover the risk of concentration of exposures to Czech government debt.

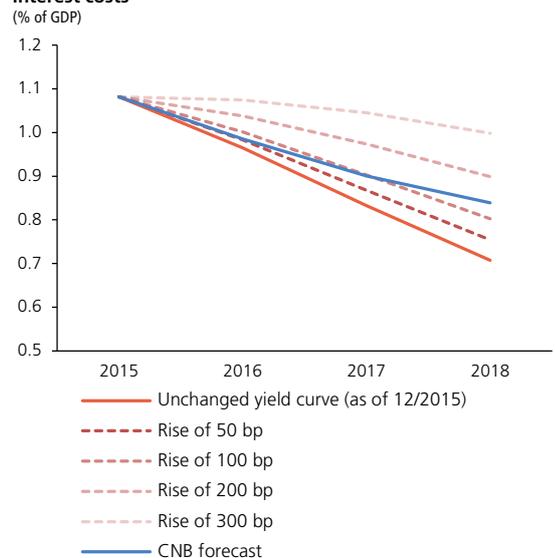
The stress test results are confirmed by a sensitivity analysis of interest costs on Czech government debt

The current exceptionally easy monetary conditions on the financial markets are enabling the Czech government sector to be funded at very advantageous terms (see section 2.1). However, a change in these terms may cause a sharp adjustment of market prices and a marked rise in yields on Czech government bonds. In such a scenario, new government debt would have to be issued at a significantly higher cost than at present. A simple analysis was performed to assess the sensitivity of Czech public finances to interest rate risk. Based on the trajectories of the primary deficit and total government debt of the Czech Republic according to the CNB forecast (see *Inflation Report III/2016*), the evolution of interest costs was estimated for a number of alternative scenarios involving a rise in the yield curve. Besides a scenario assuming that the yield curve will stay at the end-2015 level, scenarios assuming a rise of 50–300 bp along its entire length were also modelled (see Chart III.42). The results of the analysis suggest that interest costs would fall relative to GDP even in the case of a sharp increase in government bond yields. This result is affected mainly by the assumed GDP growth and expected primary general government surpluses.

51 This indicator is used solely for the CNB's supervisory purposes. In view of its calculation method, it cannot be unconditionally interchanged with the probability of default on an exposure to the Czech government.

CHART III.42

Effect of a yield curve movement on total government debt interest costs



Source: CNB

Note: The scenarios differ only in the assumption made about the yields at which new public debt will be issued in 2016–2018. For the CNB forecast see *Inflation Report II/2016*. The other scenarios assume that yields will be based in all years on the Czech koruna government bond yield curve as of 31 December 2015 shifted by the given number of basis points.