

3 THE FINANCIAL SECTOR

3.1 DEVELOPMENTS IN THE FINANCIAL SECTOR

The developments recorded in the Czech financial sector were mostly positive in 2014. In an environment of economic recovery, the banking sector increased its profitability and strengthened its capital adequacy and liquidity. It is comfortably compliant with the new European regulatory rules. Insurance companies are well capitalised and most of them are maintaining stable profitability. The sector's performance, however, was adversely affected by external developments. Investment funds, which are offering an alternative to bank deposits in an environment of low interest rates, are showing dynamic growth. The process of stabilisation of the credit unions segment continued, and legislative changes regulating their activities in accordance with cooperative principles were approved. The pension management companies sector is also stable. Following the abolition of the second pillar, planholders are saving in traditional transformed funds and new participation funds, which may have a riskier profile.

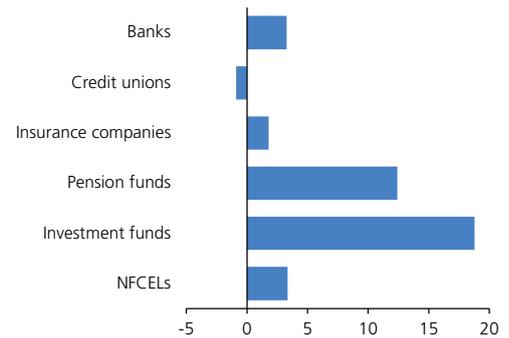
The main risk scenario for the financial sector is a renewed economic recession leading to a sharp deterioration in its profitability. Credit risk remains the principal source of systemic risk. Credit risk decreased in the area of loans to residents. However, the difficult geopolitical situation is generating increased risks in the area of loans to non-residents and also to residents with strong direct or indirect economic links to vulnerable regions.

The economic recovery was accompanied by growth in the financial sector's assets; collective investment funds saw dynamic growth

Total assets increased year on year in almost all segments of the financial market (see Chart III.1). The banking sector recorded the largest absolute growth in assets (CZK 168 billion, or 3.3%). It remains the dominant segment of the Czech financial market, accounting for almost 80% of total assets. The highest growth rates were recorded by investment funds (CZK 46 billion, or 18.8%) and pension funds (CZK 37 billion, or 12.4%). The segments of insurance corporations and non-bank financial corporations engaged in lending (NFCEs) saw no major changes in size. The total assets of credit unions decreased for the second consecutive year (by CZK 0.3 billion, or 0.9%), again due mainly to one credit union's licence being revoked.

CHART III.1

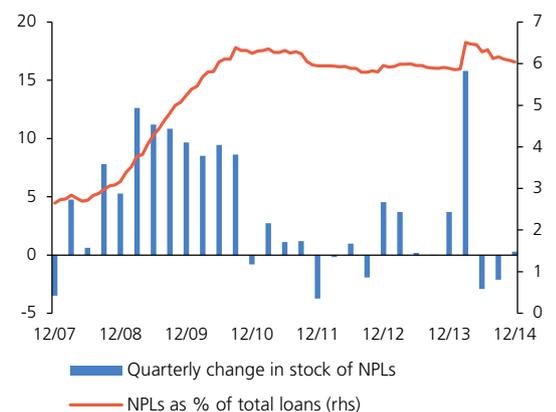
Year-on-year change in assets of financial sector segments (%)



Source: CNB

CHART III.2

NPLs in the Czech banking sector
(CZK billions, %; client loans)



Source: CNB

TABLE III.1

Structure of NPLs (%)

	NPLs by categorisation			NPLs, total
	Substandard	Doubtful	Loss	
2011	32.7	13.9	53.4	100.0
2012	27.0	14.3	58.7	100.0
2013	26.5	14.3	59.2	100.0
2014	29.1	11.2	59.7	100.0
2014*	25.8	9.0	65.2	100.0

	NPLs past due			NPLs, total
	Not past due	Up to 3M past due	More than 3M past due	
2011	46.2	9.1	44.7	100.0
2012	43.6	9.2	47.2	100.0
2013	42.0	6.7	51.3	100.0
2014	41.1	8.2	50.7	100.0
2014*	35.8	8.8	55.4	100.0

	NPLs by collateralisation			NPLs, total
	Collateralised loans to households and corporations	Non-collateralised loans to households and corporations	Other loans	
2011	36.8	30.6	32.6	100.0
2012	35.5	29.4	35.1	100.0
2013	32.1	30.6	37.3	100.0
2014	28.3	28.2	43.5	100.0
2014*	31.2	31.1	37.7	100.0

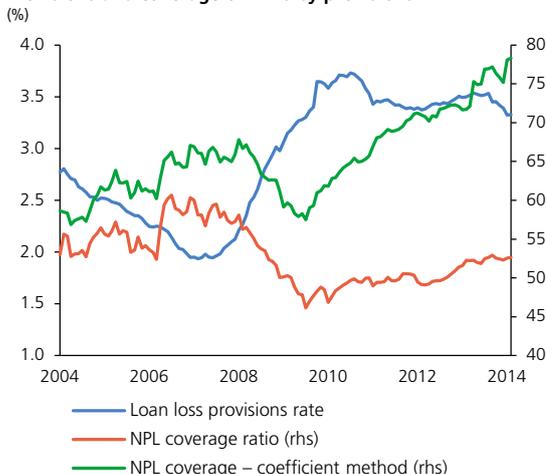
Source: CNB, CNB calculation

Note: Collateralised loans = loans for house purchase + loans to corporations backed by property and at least two other types of collateral (pledged receivables, movables, securities, sureties, guarantees, etc.). Other loans are loans not included in the collateralised and non-collateralised categories.

* After adjustment for the one-off increase in NPLs in the portfolio of the Czech Export Bank in March 2014.

CHART III.3

Provisions and coverage of NPLs by provisions (%)



Source: CNB

Note: The calculations do not take into account the effect of the one-off increase in NPLs in the portfolio of the Czech Export Bank in March 2014.

A decrease in credit risk as expressed by the NPL ratio for loans to residents was accompanied by an increase in credit risk vis-à-vis non-residents

Credit risk in banks' balance sheets, as expressed by the ratio of non-performing loans (NPLs) to total loans, was adversely affected by a sharp rise in the non-resident segment in March 2014, due to which NPLs jumped by 10.8%¹ compared to February 2014 (see Chart III.2). The NPL ratio was thus 0.1 pp higher at the end of 2014 than at the end of 2013, at 6.0%. In the case of residents, however, it dropped by 0.4 pp year on year to 5.1% at the year-end (down by 0.5 pp to 6.6% for non-financial corporations and by 0.3 pp to 4.7% for households). The improvement in both sectors was due to a combination of growth in loans provided and an absolute decline in NPLs. Although this decline was partly due to write-offs of such loans from banks' balance sheets, the write-off rate was low compared to the past five years.² By contrast, the NPL ratio for loans to non-residents surged by 4.0 pp to 13.1% and may rise further in some banks owing to geopolitical developments.³

The quality of the NPL portfolio continues to deteriorate

In 2014, NPLs migrated to the worst, i.e. loss, category at roughly the same pace as in 2013 (recording growth of 0.5 pp to 59.7% compared to December 2013). The share of loans in the substandard category rose significantly (by 2.7 pp to 29.2%). The share of NPLs that are not actually past due fell slightly in 2014 (to 41.1% at the end of 2014) and growth in the proportion of NPLs more than three months past due halted. However, the modest improvement in the NPL structure was mostly due to the aforementioned one-off sharp increase in non-resident NPLs in March 2014. Adjusted for this effect, the rate of migration of NPLs to the loss category and the length of the default period are increasing compared to past years. The collateral distribution of loans is also changing, to the detriment of collateralised NPLs (see Table III.1).

Coverage of NPLs by provisions rose slightly...

Banks should adjust their provisioning to reflect the continuing shift of the NPL portfolio to the loss category. The overall coverage of NPLs by provisions rose slightly in 2014 (by 1 pp to 52.6%).⁴ This rise can be seen as positive, especially given the aforementioned continued decline in the share of collateralised NPLs. The rising share of the loss NPL category is further widening the gap between the actual level of provisioning and its conservative level calculated "mechanically" using the coefficient method, where impairment losses are not estimated on the basis of models, but are determined using coefficients laid down in a decree (see

- 1 This change was due to loan reclassification by the Czech Export Bank.
- 2 The average write-off rate in 2014 was 8.1% of the NPL volume, compared to 7.7% in 2013, almost 9% in 2012 and 10.5% in 2011 and 2010.
- 3 See the thematic article *Credit Portfolio Sector Concentration and its Implications for Capital Requirements* and the country risk sensitivity analysis in section 3.2.
- 4 The calculation does not take into account the effect of the one-off increase in NPLs in the portfolio of the Czech Export Bank in March 2014. If that were included, the overall NPL coverage ratio would fall to 47.8%.

Chart III.3).⁵ This calculation does not take into account the collateralisation of NPLs, which reduces the necessary level of provisioning, but this indicator should not be ignored given the falling share of collateralised NPLs and the rising share of non-collateralised NPLs (see Table III.1).

... but some banks remain below the sector's average coverage levels

Looking more closely at the year-on-year change in the NPL coverage ratios in banks with market shares exceeding 1%, mostly favourable developments are apparent in 2014. However, one large bank and one building society exhibited an undesirable combination of a fall in the NPL coverage ratio and a rise in the NPL ratio. At the same time, there are still banks whose coverage ratios lie well below the sector average (see Chart III.4). The coverage adequacy in these banks is being individually assessed as part of the CNB's supervisory activities.

Some indicators suggest a decline in hidden balance-sheet credit risk...

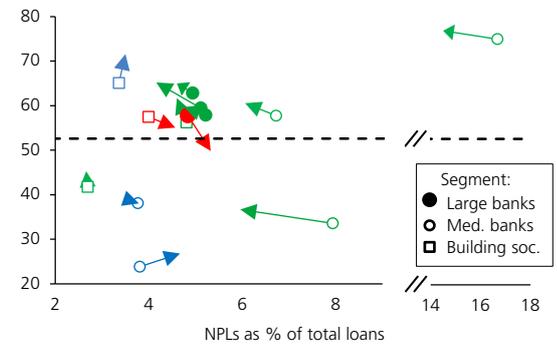
There are loans in banks' balance sheets that are not currently classified as NPLs even though they are at risk of default. These are loans to clients who have credit from several banks and some of those banks already classify their claims on such clients as NPLs while others still record their loans to such clients as performing loans. Loans to such clients classified as performing loans represent a possible source of underestimation of NPLs and thus of the credit risk in banks' balance sheets. Underestimation of NPLs to resident non-financial corporations of CZK 5.5 billion was identified at the end of 2014 using Central Credit Register (CCR) data (see Chart III.5).⁶ This indicator declined by more than 26% (CZK 1.9 billion) year on year, but underestimation of NPLs to resident non-financial corporations still accounts for about 9.4% of NPLs in this segment. This decline may be partly due to an overall decrease in NPLs to resident non-financial corporations in banks' balance sheets. However, the pace of the decline is much higher than that for NPLs. This suggests greater consistency in the categorisation of loans across banks. Despite the positive trend in the amount of underestimation, its inclusion in total NPLs would mean an increase of 0.6 pp in the ratio of NPLs to resident non-financial corporations to 7.2% at the end of 2014.

... and off-balance-sheet risk

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

CHART III.4

Year-on-year change in NPL coverage ratios across banks
(y-axis: % of NPLs covered by provisions; arrows indicate change between end of 2013 and end of 2014)



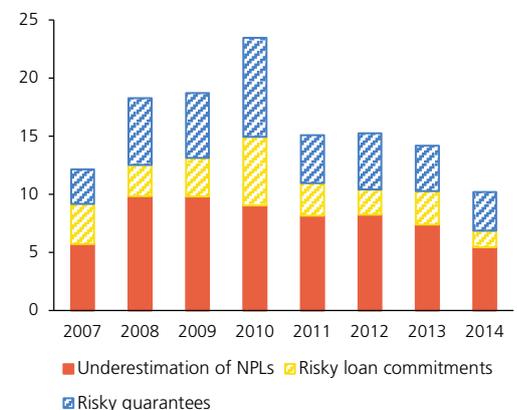
Source: CNB

Note: Green colour indicates an improvement, red colour a deterioration, and blue colour an ambiguous path of the combined risk position. Only banks (excluding branches of foreign banks) and building societies with market share > 1% (as measured by total outstanding loans) are included. The dashed line marks the mean NPL coverage ratio of 52.6% at the end of 2014.

CHART III.5

Underestimation of NPLs, risky loan commitments and 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.

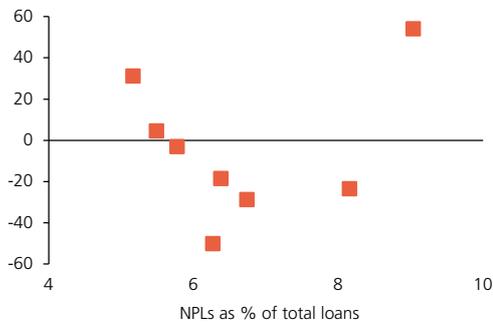
5 Under Article 86 of Decree No. 163/2014, banks may determine impairment losses by means of i) discounting of expected future cash flows, ii) the coefficient method or iii) statistical models. The coefficient method consists in setting the impairment loss at 1% for watch claims, 20% for substandard claims, 50% for doubtful claims and 100% for loss claims. 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.

6 Owing to data unavailability, it is not possible to perform an analogous analysis for the household sector.

CHART III.6

Bank credit portfolio quality and lending to risky segments

(y-axis: year-on-year change in loans to risky segments in %; as of 31 December 2014)



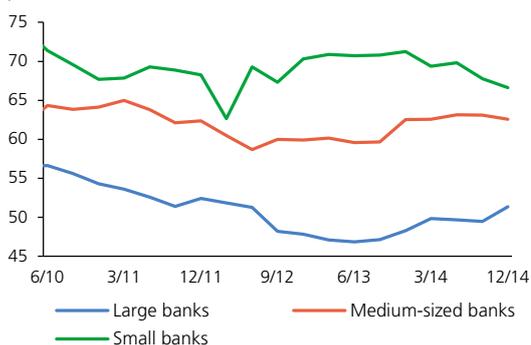
Source: CNB

Note: Risky credit segments are defined according to credit provided to non-financial corporations with the highest default rate in 2010–2013. The segmentation is by industry, turnover and number of employees of the firm. Only banks (excluding branches of foreign banks) with market share > 1% are included.

CHART III.7

Risk weights for banks' credit portfolio

(%)



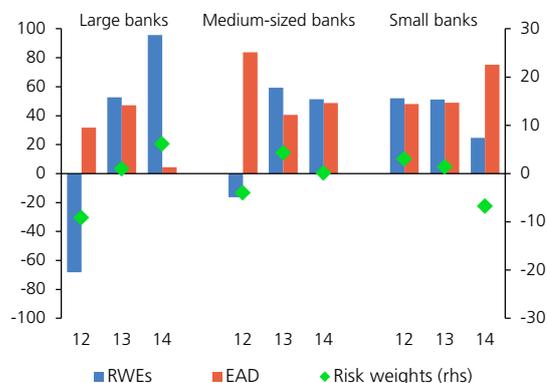
Source: CNB

Note: The calculation of risk weights covers credit risk net of sovereign exposures. Relevant exposures in the trading portfolio, investment portfolio and off-balance sheet were included in the calculation.

CHART III.8

Risk weights and their decomposition

(%, year-on-year changes)



Source: CNB

Note: Risk weights are defined as the ratio of risk-weighted exposures (RWEs) to exposure at default (EAD) approximated by exposures in the investment portfolio less sovereign exposures. The decomposition of the change in risk weights is constructed in such a way that the sum of absolute values of RWE and EAD contributions is always equal to 100%.

to non-financial corporations whose bank loans are classified as NPLs. Their evolution since the end of 2010 suggests declining credit risk arising from off-balance-sheet items. However, if this risk were to materialise in full, NPLs would rise by a further CZK 4.7 billion. Including the underestimation of credit risk in banks' balance sheets and off-balance sheets, the share of NPLs to non-financial corporations would have been 7.8% at the end of 2014.

Risk indicators for new loans to non-financial corporations are showing positive tendencies

An analysis of lending to non-financial corporations reveals that year-on-year growth in new loans in 2014 was recorded mainly in banks with lower NPL ratios.⁷ Most banks with significant market shares also cut their lending to risky segments (see Chart III.6). Lending to the most risky segments also dropped in banks accounting for more than 1% of the market as a whole, and the default rates on loans provided by banks to non-financial corporations in 2013⁸ were lower by comparison with new loans in previous years.⁹

The long-running decline in aggregate risk weights halted

Risk weights can also be used to assess the riskiness of bank portfolios. These are calculated as the ratio of risk-weighted exposures (RWEs) for credit risk to exposures at default (EAD).¹⁰ Total risk weights – adjusted for sovereign exposures – increased by 2.3 pp year on year to 52.5%, thus continuing the upward trend which started in 2013 H2. In 2014, the growth was driven mainly by large banks (growth of 3.0 pp compared to the end of 2013, to 51.3%). By contrast, risk weights in small banks decreased by 4.7% compared to the end of 2013 and were flat in medium-sized banks (see Chart III.7). The decomposition of the change in risk weights also reveals that in cases where the weights were increased, the growth in risk-weighted exposures considerably exceeded the growth in EAD and vice versa (see Chart III.8). Box 2 analyses the factors affecting the level and evolution of risk weights in 2009–2014 in more detail.

BOX 2: AN ANALYSIS OF THE FACTORS AFFECTING THE RISK WEIGHTS OF CZECH BANKS AND OF THE EVOLUTION OF THOSE WEIGHTS IN 2009–2014

In this box, we analyse the effect of the regulatory approach, business model and business cycle on the level and evolution of

7 Data for households are not available for this type of analysis.

8 Here, the default rate is measured for each year as default in the next 6, 12, 18 months etc. and is therefore not available for loans provided in 2014.

9 See the thematic article *Use of the Czech Central Credit Register for Financial Stability Purposes* published in this Report.

10 The risk weights only relate to credit risk and take into account both balance-sheet and off-balance-sheet items. The calculations use COREP data on a solo basis.

the risk weights used to determine the capital requirements for credit risk, whose comparability and consistency have recently come under increased scrutiny.¹¹

Risk weights are affected by the regulatory approach...

The current CRD IV/CRR regulatory framework allows the standardised approach (STA) and the internal ratings based (IRB) approach to be used to set risk weights for the purposes of determining capital requirements for credit risk. The STA approach takes into account the type of exposure, its external rating and the quality of collateral. The IRB approach is based on the internal rating set by banks and takes into account the perceived risk of various asset classes in a given economic environment. In the Czech Republic, the IRB approach is used by all large banks and some medium-sized banks, with a combined market share of around 80%. The level of risk weights¹² in banks using the STA and IRB approaches differs across the main asset classes (see Table III.1 Box) and the difference increases with the level of risk of the asset class. The difference is due to the nature of the IRB approach. When using this approach, the bank implicitly derives the risk weights based on its own assessment of the riskiness of the portfolio, i.e. on the basis of its own model estimates of the probability of default (PD) and the loss given default (LGD). In a standard economic environment, the risk weight is lower in IRB banks than in STA banks, except in the case of exposures to central governments.

... the bank's business model...

For the purposes of this box, we classify a bank's business model based on the structure of its credit exposures to the main market segments (see Table III.1 Box). In this classification, the banks under review¹³ are divided into four categories. The first (see Chart III.1 Box, plotted in blue) is dominated by less risky exposures to central governments and institutions, and the banks in this category show the lowest risk weights. The other categories of banks generally have riskier exposures to the corporate and retail sectors in various ratios. Banks that are predominantly exposed to the corporate sector are assigned to the second category (see Chart III.2 Box, plotted in red) and have the highest risk weights.¹⁴ Banks whose retail exposures are

11 EBA (2015): *Joint Committee Report on Risks and Vulnerabilities in the EU Financial System*, March 2015, p. 5.
 12 The risk weights used in this box only apply to credit risk and only take into account balance-sheet items.
 13 i.e. all banks that operated on the Czech market throughout the year, except for the Czech Export Bank and the Czech-Moravian Guarantee and Development Bank. Foreign bank branches and building societies are also excluded.
 14 Changes in business model also affected the movements in risk weights of individual institutions in the period under review. Only one of the STA banks predominantly exposed to the corporate sector (see Chart III.2 Box) saw a risk weight decrease despite a rise in the

TABLE III.1 Box

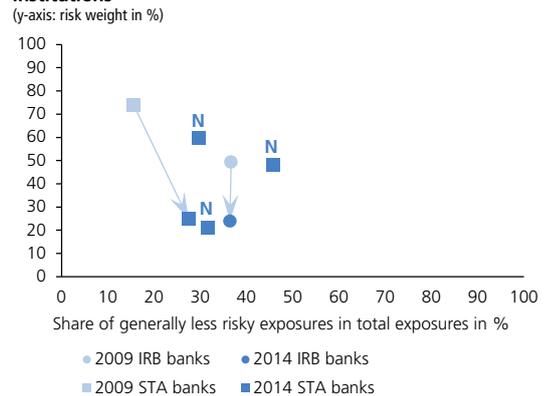
Risk weights for the main asset classes for IRB and STA banks in 2014

	Central governments		Institutions		Retail		Corporate sector	
	IRB	STA	IRB	STA	IRB	STA	IRB	STA
Weighted average RW	2	0	29	43	38	37/74**	65	92
Historically highest RW – IRB (2009–2014)	6		35		43		79	
Regulatory RW – STA*		0		20		35/75**		100
Std. dev. of RW – IRB	1		3		2		6	

Source: CNB
 Note: * This is the usual RW in the given segment portfolio for exposures to which an external rating has not been assigned. The true risk weight can be affected by the collateral quality of the exposure as well as the external rating.
 ** The first figure refers to the risk weight for mortgage loans and the second to the risk weight for other retail loans.

CHART III.1 Box

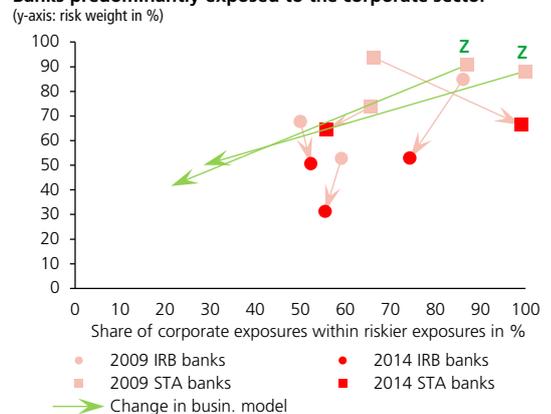
Banks predominantly exposed to central governments and institutions



Source: CNB
 Note: The connecting lines indicate the same bank in 2009 and 2014. Unconnected banks entered the market after the start of 2009 (and are denoted by the letter N).

CHART III.2 Box

Banks predominantly exposed to the corporate sector

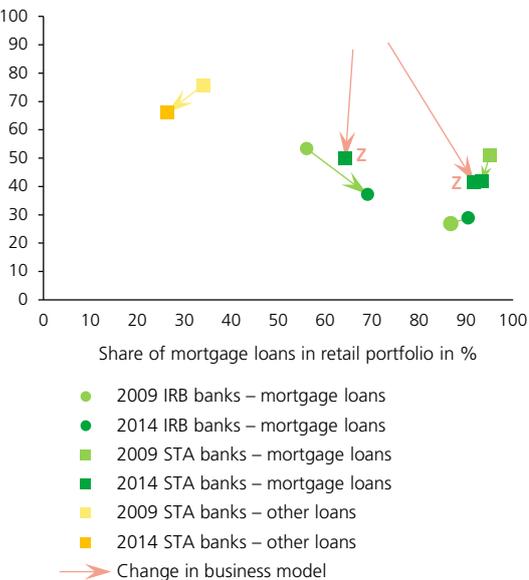


Source: CNB
 Note: The connecting lines indicate the same bank in 2009 and 2014. Banks which underwent a change in business model according to the given classification in the period under review are denoted by the letter Z.

CHART III.3 Box

Banks predominantly exposed to the retail sector within generally riskier exposures

(y-axis: risk weight in %)



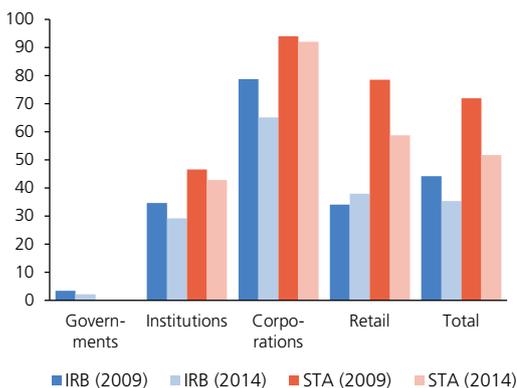
Source: CNB

Note: The connecting lines indicate the same bank in 2009 and 2014. Banks which underwent a change in business model according to the given classification in the period under review are denoted by the letter Z.

CHART III.4 Box

Weighted average RW for segment portfolios of STA and IRB banks

(y-axis: risk weight in %)



Source: CNB

dominated by mortgage loans are included in the third category (see Chart III.3 Box, plotted in green) and have generally lower risk weights. Banks in which other retail loans dominate are assigned to the fourth category (see Chart III.3 Box, plotted in orange) and have generally higher risk weights. We can thus say that the risk weights are significantly affected by the bank's business model and that the risk weight of IRB banks is lower than that of STA banks with a similar business model.

... and its evolution...

The risk weights of Czech banks have decreased since 2009 (see Chart III.4 Box). Between 2009 and 2014, the weighted average risk weight fell from 44% to 35% in the case of IRB banks and from 72% to 52% in the case of STA banks. The change in credit exposure structure towards less risky assets is an important factor explaining the decline in risk weights. The aggregated balance sheet of IRB banks saw a 4% increase in the share of generally less risky exposures, while STA banks even recorded a 13% rise. As regards the structure of generally riskier exposures, the share of the retail sector rose by 1% in IRB banks and by 9% in STA banks. The retail portfolio of IRB banks saw a 9% increase in the weight of less risky mortgage loans to the detriment of other loans. The increase for STA banks was 6%. The change in the balance-sheet structure thus also explains the larger decline in STA banks' risk weights.

... the business cycle also plays a role, especially in the corporate exposures of IRB banks

The risk weights for credit exposures to the main market segments differed considerably between IRB and STA banks in 2009–2014 (see Chart III.4 Box). The segment risk weights for exposures to the corporate sector in IRB banks decreased by 14%, while those in STA banks dropped by only 2%. STA banks recorded a drop in segment risk weights of 20% for the retail portfolio, whereas IRB banks saw an increase of 4%. Especially important as regards the impact on IRB banks' capital is the decline in, and high variance of, risk weights for exposures to the corporate sector (see Table III.1 Box). The probability of default for corporate exposures is closely linked with the business cycle, which thus affects the risk weights. This is evidenced by the correlation between the default rate for these exposures¹⁵ and GDP (see Chart III.5 Box), which was -0.51 in 2004–2013 and -0.72 in 2004–2011. The decline in risk weights can thus be

share of exposures to the corporate sector within generally riskier exposures. In this bank, however, exposures to retail were replaced mainly by exposures to central governments, so the risk weight decreased.

¹⁵ Data on the default rate for corporate exposures for 2014 will be available at the end of 2015.

explained to some extent by the ongoing recovery of the Czech economy. To assess the dispersion of risk weights for corporate exposures more objectively, one can use a benchmark portfolio method where individual banks assign risk weights to an identical sample of exposures. Using this method, it is possible to assess the impact of a potential model distortion on the capital requirement for credit risk of IRB banks. As the risk weight levels are crucial for ensuring that banks are sufficiently capitalised, the CNB is paying special attention to this area. Risk weight issues are also under discussion at international level. The BCBS is currently preparing a revision of the approaches for setting risk weights.¹⁶

Capital adequacy is favourable...

The Czech banking sector is continuing to strengthen its capital adequacy. Its total regulatory capital rose by CZK 29 billion in 2014, reaching CZK 397 billion at the year-end. The sector's overall capital ratio rose to 18.0%, while its Tier 1 capital ratio is at 17.5% (see Chart III.9).¹⁷ The banking sector is thus compliant with the new CRD IV/CRR capital regulations by a sufficient margin. This is also evidenced by the fact that banks representing more than 73% of the sector's assets had a Tier 1 capital ratio exceeding 15% at the end of 2014 and that the lowest individual Tier 1 capital ratio was 9.5%.

... and the leverage ratio is sufficient

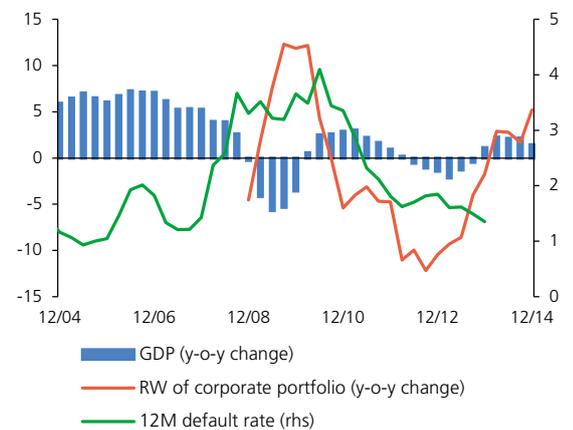
Capital adequacy can also be examined using the leverage ratio, which Basel III defines as the ratio of Tier 1 capital to non-risk-weighted exposures. The advantage of this indicator is its relative simplicity and its robustness to efforts by banks to optimise the calculation of risk weights (or capital requirements). The leverage ratio is expected to be implemented under the new CRD IV directive as from 2018 (see section 4.6). The aggregate leverage ratio of the Czech banking sector was 7.2% at the end of 2014, well above the preliminary 3% minimum regulatory limit. Although the leverage ratio of most banks significantly exceeded the 3% limit, there was significant heterogeneity across banks. Some were close to the 3% limit at the end of 2014, and two were even below it (see Chart III.10). The low leverage ratio of one of these two banks was largely due to high concentration of sovereign exposures in its balance sheet, while the other has a high concentration of off-balance-sheet exposures. The causes of non-compliance with the leverage ratio provide a good illustration of one intended effect of the leverage ratio, namely to curb excessive growth in the balance sheet and off-balance sheet.

16 See BIS (2014): *Capital Floors: The Design of a Framework Based on Standardised Approaches* – consultative document; BIS (2014): *Revisions to the Standardised Approach for Credit Risk* – consultative document.

17 Tier 1 for the Czech banking sector is almost identical to the newly required Common Equity Tier 1.

CHART III.5 Box

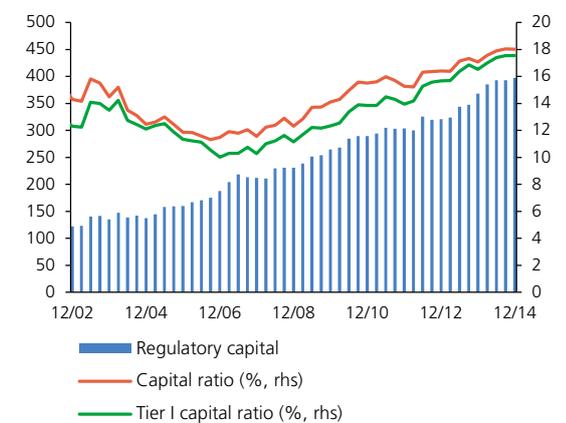
Relationship between annual GDP growth, risk weights for corporate exposures and the 12M default rate



Source: CNB, CZSO

CHART III.9

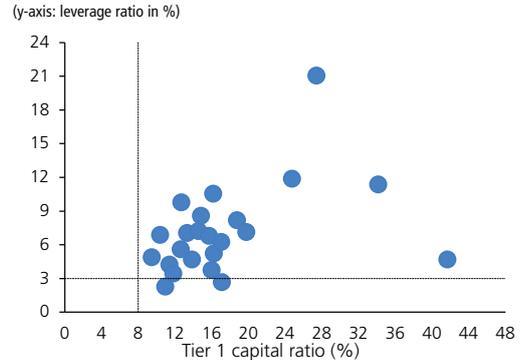
Capital and capital ratio in the Czech banking sector



Source: CNB

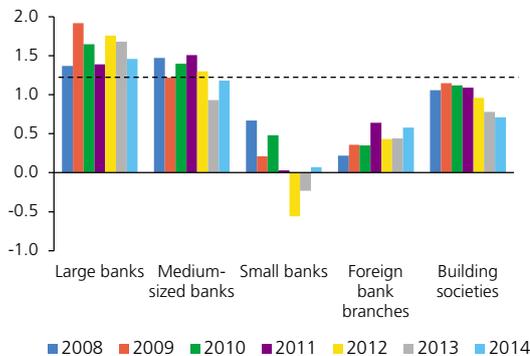
CHART III.10

Tier 1 capital ratio and leverage ratio across banks at the end of 2014



Source: CNB

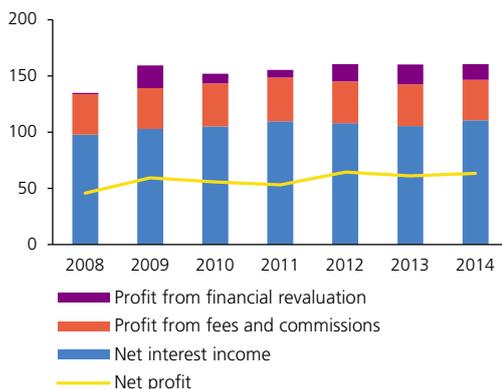
CHART III.11

Return on assets (RoA)
(%)

Source: CNB

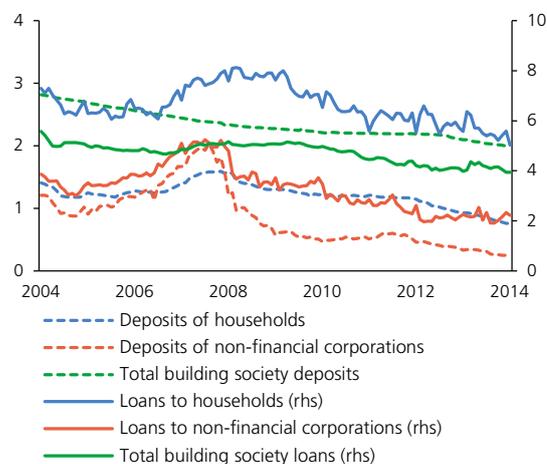
Note: The classification of banks by asset size relates to the year for which the RoA value is reported. The horizontal line depicts the RoA value for the banking sector as a whole for 2014.

CHART III.12

Key components of profit from financial activities
(CZK billions)

Source: CNB

CHART III.6 Box

Interest rates on deposits and loans
(%)

Source: CNB

Note: Loans consist solely of new loans to residents. Deposits comprise all deposits from residents.

The profitability of the banking sector remains high...

The Czech banking sector has long been profitable and its profitability significantly exceeds the euro area average.¹⁸ The return on assets (RoA) of the banking sector as a whole was 1.2% in 2014 (the euro area average was 0.2% in 2013), down by 0.1 pp year on year. However, large differences persist across banking sector segments. The sector's profitability is determined above all by the performance of large banks, which account for 57.1% of the banking sector's assets. The RoA of large banks remains high (see Chart III.11) despite a year-on-year decrease of 0.2 pp to 1.5%. A 0.3 pp improvement in this indicator for medium-sized banks and a positive RoA (0.1%) in small banks, which have emerged from a two-year period of losses, are positive signals. The profitability of building societies is being adversely affected by their legislative framework, which limits their ability to respond quickly to a decline in interest rates.

... interest profit increased after two years of decline

The sector's net profit rose by 4.0%¹⁹ year on year (see Chart III.12), mainly because of lower provisioning and higher interest profit, which is a key component of earnings. The downward trend in net interest profit seen in previous years reversed in 2014. In addition to a rising amount of loans, the increase in interest profit was due to stabilisation of interest rates on loans to non-financial corporations and on consumer credit coupled with a continuing decline in deposit rates. Profit from fees and commissions fell slightly for the third year in a row, reflecting persisting competitive pressure on the credit, deposit and other banking services markets. Profit from financial revaluation also decreased in year-on-year terms.²⁰ However, the long-running environment of low interest rates may have a negative effect on the banking sector's profitability (see Box 3).

18 See CNB (2014): *Analyses of the Czech Republic's Current Economic Alignment with the Euro Area*, p. 94.

19 Domestic banks' profit also includes dividends paid by their subsidiaries. They totalled more than CZK 8.8 billion in 2013 and dropped to CZK 6.7 billion in 2014. Excluding dividend profit, the banking sector's profitability would have risen by 8.6% year on year.

20 Financial revaluation consists mainly of gains or losses on financial assets and liabilities held for trading and valuation changes.

BOX 3: RISKS OF SUSTAINED LOW INTEREST RATES FOR THE DOMESTIC BANKING SECTOR

The environment of sustained low interest rates may have a major impact on interest income on loans, which is the biggest component of the domestic banking sector's profit. Interest rates on loans to non-financial corporations have fallen significantly since 2008, followed, with a lag, by rates on loans to households (see Chart III.6 Box). This has not been fully offset by a corresponding decline in the deposit rate, a fact reflected in a decline in net interest margins for key components of banks' loan portfolios (see Chart III.7 Box). At the same time, the stock of loans to non-financial corporations and consumer credit has been flat (see Chart III.8 Box), resulting in a decline in net interest income across the banking sector.

The decline in income has so far been offset by corresponding changes in costs. The ratio of operating costs to total assets declined constantly between 2009 and 2014. The ratio of impairment losses to total assets also fell in the same period, especially in the first half of it (see Chart III.9 Box). The decline in the net interest margin and interest income has therefore had only a slight impact on the banking sector's profitability as measured by RoA (see line BS.43 in the *Table of Indicators*), which also remains high in international terms. The only exception is the small banks segment, which remains vulnerable due to its price policy.²¹ The building societies segment, where there is little room for further cuts in operating costs, is also less adaptable. The level of deposit rates is much higher in this segment than in the rest of the market, as the legislative framework for building saving schemes limits the scope for rapid interest rate adjustment or changes in business model (see Chart III.6 Box). This is negatively reflected in building societies' lending competitiveness, as evidenced by a relatively low loan-to-deposit ratio, which stood at 61.1% in 2015 Q1.²²

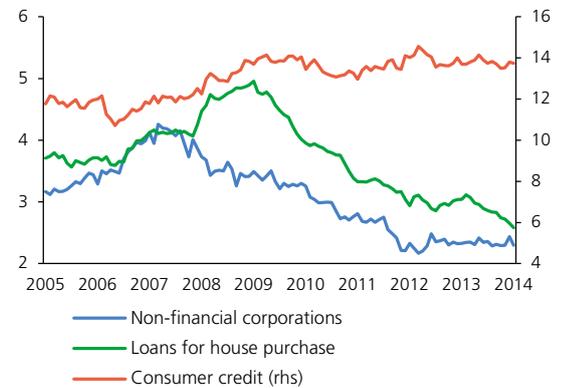
At the end of 2014, banks were making most of their interest income from loans to households for house purchase (40%), followed by consumer credit and loans to non-financial corporations (both 30%; see Chart III.10 Box). Interest income is being negatively affected by a decline in the rate on new loans for house purchase (including refinanced loans) and by the gradual refixation of those loans at lower rates (see Box 1, section 2.3). This effect is being partly offset by growth in the stock of loans

21 Small banks are pursuing a more aggressive price policy than other banks in order to gain a larger market share.

22 The loan-to-deposit ratio of the banking sector as a whole was 76.1% in the same period.

CHART III.7 BOX

Net interest margin on new bank loans by borrower sector (%)

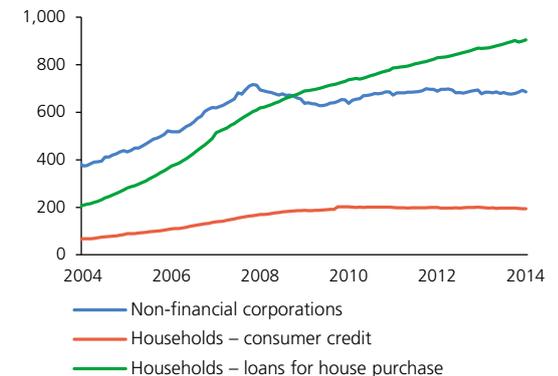


Source: CNB

Note: Net interest margin is calculated as the interest rate on new loans minus the rate on existing bank deposits.

CHART III.8 BOX

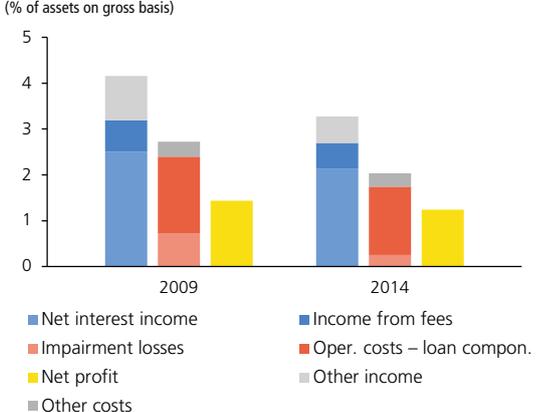
Stock of bank loans by borrower sector (CZK billions)



Source: CNB

CHART III.9 BOX

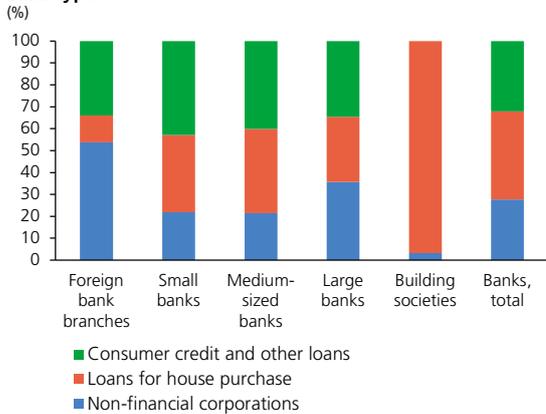
Composition of revenues and costs of banks in the Czech Republic (% of assets on gross basis)



Source: CNB

CHART III.10 Box

Shares of individual loan types in total loan interest income by bank type

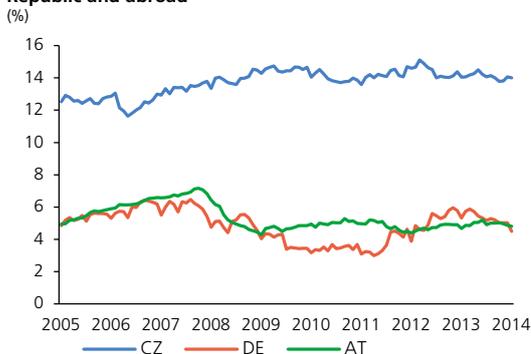


Source: CNB

Note: Both total interest income and the interest income on individual components of the loan portfolio are calculated as the stock of loans as of the given period multiplied by the weighted interest rate on those loans. "Banks, total" includes building societies, for which loans to households for house purchase generate the bulk of their interest income.

CHART III.11 Box

Interest rates on new bank consumer credit in the Czech Republic and abroad

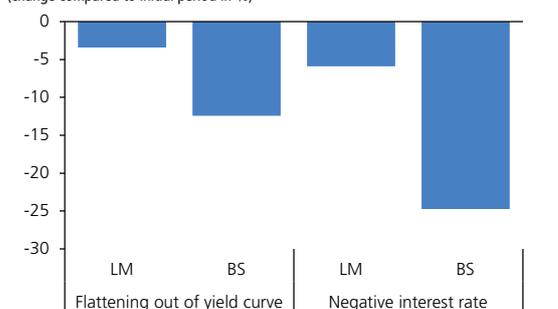


Source: CNB, ECB

Note: The interest rate on loans to households for consumption in Germany and Austria encompasses floating rate loans and loans with rates fixed for up to one year.

CHART III.12 Box

Simulation of the change in net interest income in response to a change in market interest rates at the three-year horizon (change compared to initial period in %)



Source: CNB

Note: Flattening out of yield curve – interest rate spread decreases to 5 bp. Negative interest rate – long-term rates fall to -0.8% while short-term rates remain flat at 0.05%. LM = large and medium-sized banks, BS = building societies.

(see Chart III.8 Box). A sizeable drop in the consumer credit rate, which has long been much higher than the rate on the other types of loans, could have a major impact on interest income.²³ This difference is larger in the Czech Republic than in advanced euro area countries (see Chart III.11 Box). The risk of a decline in rates on consumer credit could be exacerbated by increased competitive pressures from foreign banks and their branches in the Czech Republic or from non-bank intermediaries. Moreover, the low interest rates on deposits of households and non-financial corporations (see Chart III.6 Box) are limiting the room for further offsetting the decline in loan rates.

As simulations²⁴ indicate (see Chart III.12 Box), a further decline in market interest rates could lead to a fall in banks' interest income. Building societies are more sensitive, and large and medium-sized banks less sensitive, to such developments. This is evidenced by the relative resilience of large and medium-sized banks to changes in the interest rate spread (the difference between long-term and short-term rates²⁵). The banking sector as a whole recorded no losses due to a decline in interest income in any of the simulations. However, if long-term rates were to turn significantly negative and banks were not able to respond in time by changing their business strategy, banks' net interest income – and hence also their profitability – might drop more markedly.

The volume of deposits in the banking sector increased, while interest rates continued to fall

The growth rate of deposits declined compared to 2013. Koruna bank deposits of households and resident non-financial corporations rose by 2.9%, or CZK 70 billion, in 2014 (see Chart III.13). The deposits of households increased by 3.1% despite a decline in average interest rates of 0.16 pp to 0.78%. Deposits of non-financial corporations increased by 2.4% and the average interest rate declined by 0.11 pp to 0.22%. The largest proportion of new deposits of households was received by large banks rather than small banks as had been the case in the previous two years. A large difference was observed in the interest rate offered on household deposits with medium-sized banks, as in 2013. An outflow of

23 The higher interest rate level reflects the higher level of risk of consumer credit, as mentioned in FSR 2012/2013, p. 34.

24 The simulation uses an econometric model that explains banks' net interest income by means of bank-specific variables and interest rates. The resulting sensitivity to interest rate changes makes it possible to assess the impact of selected scenarios on net interest income. The simulation is performed for large and medium-sized banks and building societies. Small banks are excluded from the simulation due to limited data availability. Given their currently low profitability, however, small banks are generally highly vulnerable.

25 Long-term rates are proxied by 10-year government bond yields and short-term rates by the 3-month interbank PRIBOR.

household deposits was recorded by building societies²⁶ for a second consecutive year, despite the fact that building societies offered the highest returns on deposits. Non-financial corporations reduced their deposits with foreign bank branches.

Banks are further increasing their liquidity buffer...

The banking sector has long had a good liquidity position with a sizeable excess of client deposits over client loans. However, loans grew faster than deposits in 2014 and ratio of deposits to loans therefore dropped by 2.5 pp to 128% (see Chart III.14). Most client deposits (88%) and loans (81%) continue to be denominated in Czech koruna. Despite the decrease in the excess of deposits over loans, the quick assets ratio improved to 31%. This was due mainly to an increase of 26% in government bonds held to maturity in Czech banks' balance sheets. This liquidity buffer, which domestic banks can use in the event of a liquidity shock (see section 3.3), including to ensure compliance with the new CRR liquidity rules (see section 4.2), leaves sufficient room for the development of lending activity.

... building societies are constantly depositing liquidity in their bank groups

Building societies traditionally have a smaller liquidity buffer (see Chart III.15). Their quick assets ratio rose by 0.3 pp year on year and has been hovering around 17% since 2011. Their smaller liquidity buffer compared to the other segments of the banking sector stems from the configuration of the building savings system. Building societies deposit their excess liquidity with their domestic parent banks in the form of deposits with long maturities. This is possible because they form regulated consolidated groups with their parent banks, to which no caps on mutual exposures are applied.

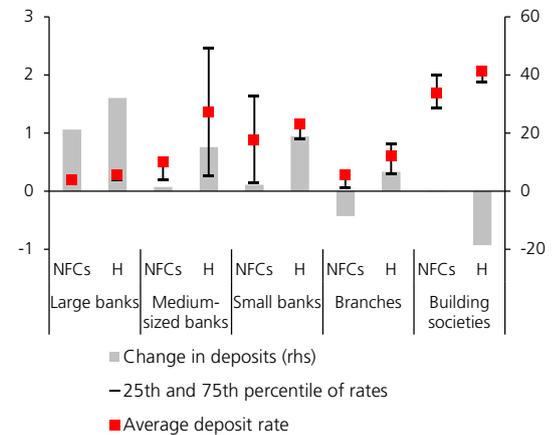
Banking groups are also active in other areas of financial intermediation, thereby increasing the complexity of financial intermediation...

Domestic banking groups not only operate in the banking business and, via their subsidiaries, in the building society business, but also in some cases form quite large consolidated groups subject to consolidated supervision. They are involved in activities in less regulated sectors (e.g. non-bank lenders and financial leasing), thereby contributing to the interconnectedness of the financial sector and increasing the complexity of the sector and the structural component of systemic risk. This may limit effective and timely identification of risks associated with credit interconnectedness and intra-group liquidity spillovers and heighten the risk of reputational contagion.

²⁶ The decline in the deposits of building societies may be linked with the 2011 reduction in the annual state support provided for building savings schemes and with the general move away from time deposits.

CHART III.13

Change in household deposits in 2014 and average interest rates (rates in %; deposits of residents in CZK billions)

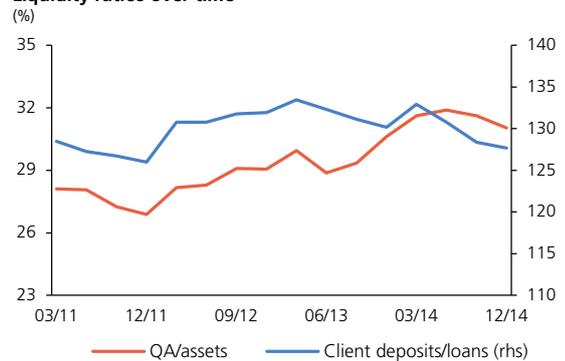


Source: CNB

Note: Bank size classification by asset size as of 30 June 2014. NFCs = non-financial corporations; H = total households. NFCs' deposits at building societies are deposits of housing cooperatives and owners' associations. NFCs' deposits account for less than 0.5% of total building society deposits.

CHART III.14

Liquidity ratios over time (%)



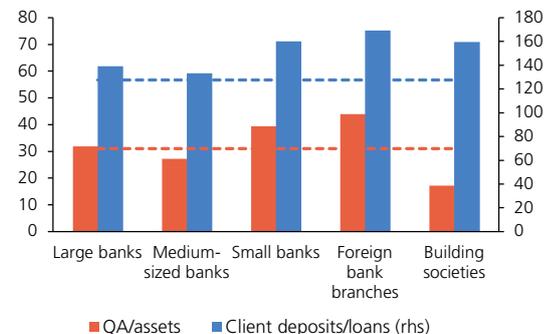
Source: CNB

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

CHART III.15

Liquidity situation in the banking sector

(%; as of December 2014)



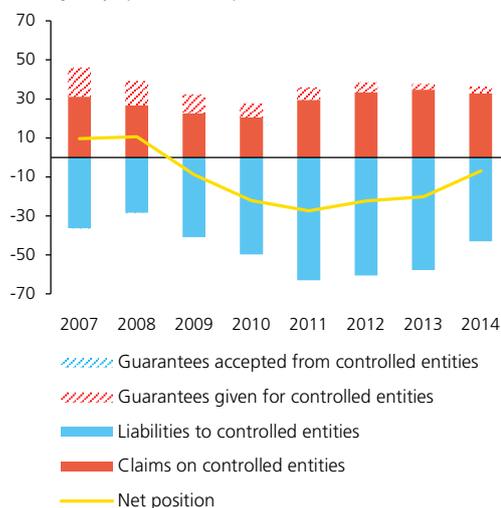
Source: CNB

Note: QA = quick assets. The value for medium-sized banks excludes Hypoteční banka and the Czech Export Bank owing to their specific funding models. The dashed lines denote values for the banking sector. The ratio of deposits to loans covers both residents and non-residents.

CHART III.16

Credit interconnectedness in domestic bank groups

(as % of regulatory capital of domestic parent banks)



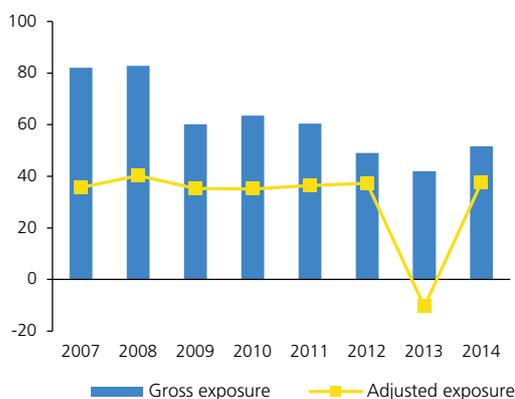
Source: Obligatory information to be disclosed pursuant to Decree No. 123/2007 and Decree No. 163/2014

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.17

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 collateralization.

... but credit interconnectedness in domestic bank groups is little changed

The largest domestic banks saw a decline in liabilities to the entities they control. Banks' net debtor position fell by CZK 13 billion to just CZK 7 billion at the end of 2014 (see Chart III.16). Domestic parent banks are in a debtor position mainly vis-à-vis building societies that are members of their groups. These liabilities accounted for 83% of parent banks' total liabilities to all controlled entities, representing a slight year-on-year decline. Parent banks are lenders to non-bank financial corporations engaged in lending (NFCEs), which include leasing, consumer financing and factoring services companies. Claims on these companies account for 90% of total claims on all controlled entities. This share rose by 2 pp year on year. Intra-group claims on NFCEs are usually one of banks' largest exposures. The volume of, and growth in, credit interconnectedness indicates that the structural component of systemic risk has been shrinking over recent years.

The largest domestic banks returned to being net creditors of their parent groups...

Following a decline in previous years, the gross exposure of the five largest domestic banks to their foreign parent banks increased in 2014. Gross exposure increased by 9.6 pp to 51.6% of regulatory capital (see Chart III.17). However, there are significant differences across banks, and the ratio for one of the monitored banks exceeded 100% of regulatory capital. Adjusted exposure, which takes into account some liabilities of domestic banks to their parent banks, turned positive at the end of 2014. The effect of the November 2013 foreign exchange interventions, which were associated with demand among domestic banks for euro, has thus dropped out.

... and the banking sector's net position vis-à-vis foreign entities remains slightly positive

The high volume of residents' deposits ensures that the domestic banking sector as a whole is independent of foreign sources of funding. Its net external position – the difference between foreign claims and foreign liabilities – has thus long been positive. However, it started to decline gradually in 2013 and stood at CZK 54 billion at the end of 2014.

Credit unions remain risky...

The total assets of active credit unions rose further in 2014. Although one credit union had its licence revoked in this period, the assets of the rest increased by 15.2% year on year to CZK 31 billion. Year-on-year growth in deposits, which account for the bulk of credit unions' liabilities, amounted to 17.4%. The risk indicators of the credit union segment were mixed in 2014. The NPL ratio worsened further. It rose by 4 pp to 29.9%, remaining many times higher than that of banks (see Table III.2). RoE also remains low, despite having risen to 2.2% year on year. However, the level of this indicator is very mixed across credit unions. The ratio of the five largest loans to capital improved slightly, falling by 3 pp to 90%. NPL coverage by provisions also rose slightly.

... but legislation has been passed which tightens the prudential rules applying to their operations

In previous years, the inadequate legislative framework applying to the operations of credit unions led to efforts to tighten the regulatory conditions. As a result, Act No. 333/2014 Coll., tightening some prudential rules, was passed in 2014. Among other things, the act introduces a future cap on a credit union's balance-sheet total, limits the size of individual loans provided and increases credit unions' contribution to the Deposit Insurance Fund. A 1:10 rule for the ratio of the membership deposit to remunerated deposits is also being introduced. This measure is aimed at reinforcing the cooperative principle and encouraging depositors to get actively involved in the credit union's management.

Most insurance companies are maintaining stable profitability, but the sector's performance was negatively affected by developments abroad

The non-life insurance segment continued to grow in 2014. This growth took the form of an increase in gross premiums written and a decline in gross claim settlement costs (see Chart III.18). However, the technical account for non-life insurance recorded an overall decline due to increased creation of insurance reserves for risks to foreign commercial transactions in credit insurance.

The low interest rate environment is affecting insurance companies' performance...

Claim settlement costs in life insurance continued to rise (due mainly to policies maturing), while premiums written stayed at roughly the previous year's level. However, the overall result in this segment was offset by a slight increase in returns on financial placement (investment) and remains comparable with previous years' results. The increase in returns on financial placement was a result of a significant year-on-year decrease in the yield curve and related revaluation of the bond portfolio. However, the extremely low level and flattening out of the yield curve are negatively affecting financial results in the life insurance segment. The size of this risk depends on the difference between the returns on financial placement and the guaranteed returns on insurance products (the technical interest rate, TIR), on the differences between the maturity profiles of assets and liabilities, and on the product structure of each insurance company,

... and is leading insurance companies to seek alternative business models

The average duration of insurance companies' assets was around 4.8 years at the end of 2013, while the duration of insurance liabilities was around 5.4 years. Simply put, this means that liabilities are more sensitive to interest rate risk than claims are. For some insurance companies this sensitivity is well above the sector average. The difference in the yields on safe assets and the TIR is illustrated by Chart III.19. It shows that the yield on long-term government bonds, which Czech insurance companies typically invest in, was well below the rate of return guaranteed by the average Czech insurance company in a traditional life

TABLE III.2

Selected indicators of credit unions as compared to banks
(%; end-2013 and end-2014 data; credit unions active as of 31 December 2014)

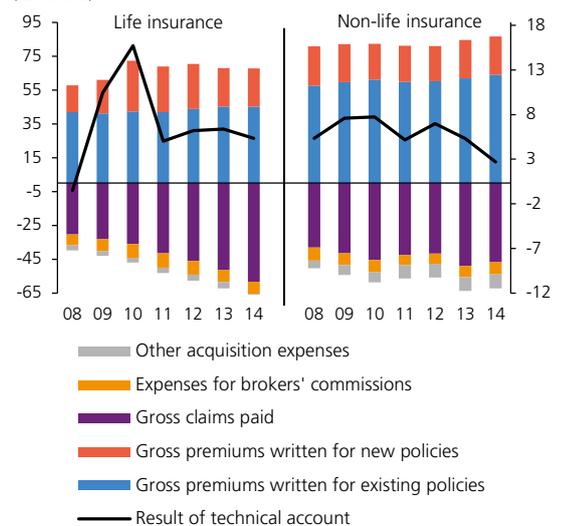
	2013		2014	
	Credit unions	Banks	Credit unions	Banks
Average interest rate on client loans (1)	7.8	4.0	8.3	3.9
Average interest rate on client deposits (2)	2.8	0.8	2.4	0.7
Interest margin (1)-(2)	5.0	3.2	5.9	3.2
Client deposits/loans (excluding general government)	118.2	114.6	131.0	115.7
Client NPL ratio	25.3	6.1	29.9	6.3
Quick assets/total assets	17.4	30.7	23.8	31.0
Coverage of NPLs with provisions	16.1	51.6	18.4	47.8
Tier 1 CAR	12.4	16.5	12.8	17.3
RoE	-0.1	17.1	2.2	16.6
RoA	0.0	1.2	0.2	1.2
Share of sector in client loans	0.7	99.3	0.7	99.3
Share of sector in client deposits	0.8	99.2	0.8	99.2

Source: CNB

Note: The year-on-year comparison excludes WPB Capital, spořitelni družstvo, whose licence was revoked in June 2014. The accounting period is not unified across the credit union segment, so the relevant data were annualised for some institutions.

CHART III.18

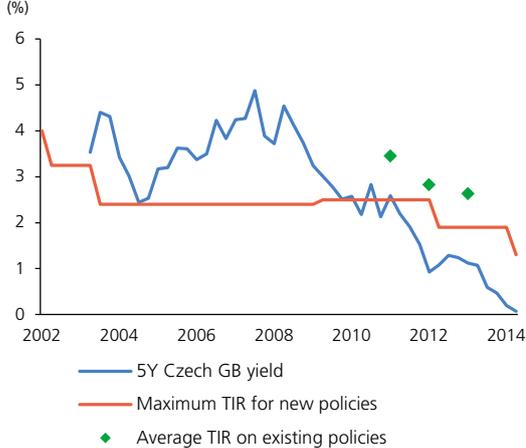
Key financial indicators for the insurance sector
(CZK billions)



Source: CNB

CHART III.19

Technical interest rate and Czech government bond yields (%)



Source: CNB

Note: Average TIR data from a sample of 11 insurance companies taking part in joint stress tests.

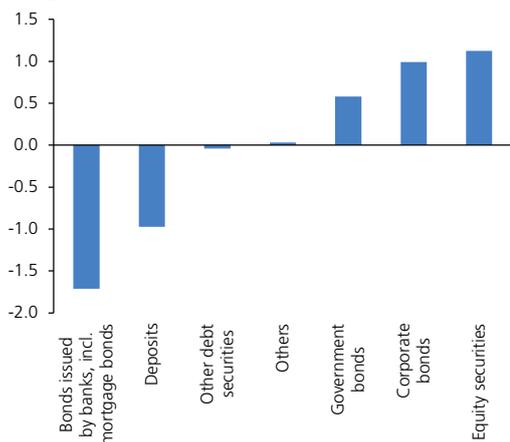
insurance policy in past years. A widening of this gap is constrained by regulation of the maximum TIR for new policies. However, even this limit has been well above the yield on Czech government bonds since 2012. In accordance with the regulations, some insurers thus had to set aside additional reserves to cover liabilities arising from contracts for traditional life insurance products. Generally, this environment is causing insurance companies to make significant changes to their insurance product ranges and investment strategies. Although the investment strategies of domestic insurance companies remain relatively conservative (with investment in Czech government bonds playing the main role), an increase can be seen in the shares of more profitable types of assets, such as bonds issued by non-financial corporations, equity securities and real estate (see Chart III.20). Some diversification can also be seen in the government bond portfolio, as the share of exposures to countries other than the Czech Republic is on the rise (9.2% at the end of last year, as compared to 6.4% at the end of 2012).

On the liability side, insurance companies are adjusting to the environment of sustained low interest rates most frequently by lowering the TIR and changing the structure of their product ranges. They are reducing the supply of traditional insurance products with long-term guaranteed returns and focusing more on products with declared guarantees and unit-linked investment life insurance products. The share of investment life insurance (as a percentage of financial placement) has risen from 14% in 2011 to around 17% at present.

CHART III.20

Changes in financial placement for coverage of life insurance (excluding investment life insurance)

(pp; change between 31 December 2011 and 31 December 2014)



Source: CNB

Note: The government bond category contains government bonds issued by OECD member states and by the EIB, the ECB, the EBRD and the IBRD.

In addition to financial market developments, regulatory changes will play an important role

Until the end of this year, insurance companies have the option of valuing high-quality government bonds (with the same or higher rating than the Czech Republic) held to maturity at amortised cost under the Solvency I rules. However, in 2016, when Solvency II takes effect, this option will be abolished for regulatory purposes. As a result of market revaluation, the performance of some insurance companies could be affected by excessive volatility in financial markets. Therefore, the approved European implementation of the new rules contains measures to reduce sensitivity to some market risks, known collectively as the "Long-Term Guarantee Package". These measures include matching adjustment and volatility adjustment. The former enables selected portfolios of liabilities and assigned asset portfolios that comply with prescribed expected cash flow criteria to be excluded from market revaluation. The latter enables the risk-free yield curve to be adjusted for part of the difference between the yield of the curve used and the return on a reference portfolio containing a wider range of financial assets. The adjusted curve and the original risk-free curve are calculated and published monthly by the European Insurance and Occupational Pension Authority (EIOPA). Despite these measures, domestic insurance corporations will have to improve their asset and liability management processes, strengthen their risk management systems and assess risks over the medium term.

The pension management companies sector has undergone legislative changes and is continuing to expand

The pension management companies sector was affected by legislative changes. In 2014, it was decided to abolish the second pillar (retirement funds) with effect from 2016. In addition to the state pension in the first pillar, the option of voluntary saving in transformed and participation²⁷ funds under the third pillar remains in place. Although no new participants may join transformed funds by law and the number of members is steadily falling, these funds' total assets increased by 12.4% year on year to CZK 333 billion. The balance of contributions and benefits fell by 15% year on year to CZK 32 billion (see Chart III.21), with a rise in expenditure on lump-sum settlements being accompanied by a slight decrease in planholders' contributions. Participation funds were established in 2013 and their total assets of CZK 4.9 billion, which increased by 288% year on year, currently constitute a marginal part of the sector. In line with their nature, participation funds (with the exception of conservative funds) have a riskier balance-sheet structure than transformed funds (see Chart III.22).

Investment funds recorded a significant inflow of new funds...

The total assets of investment funds increased by 19% year on year to CZK 291 billion at the end of 2014. Collective investment funds, which invest money collected from the public, accounted for approximately 60% of this amount. As in 2013, the largest inflow of funds among collective investment funds was recorded by mixed funds, whose portfolios are made up of shares, bonds and money market instruments (see Chart III.23).

... so households are more exposed to new risks

More than 50% of the liabilities of all investment funds are liabilities to the household sector. At the end of 2014, these liabilities amounted to CZK 154 billion (see Chart III.24). Following a fall in the total assets of investment funds in 2008, households' exposure to investment funds accounted for less than 4% of their net assets. However, this share has been rising over the last three years and stood at just below 5% at the end of 2014. Households are thus increasing the proportion of their wealth deposited in higher-yield, but riskier assets in the form of investment fund units.

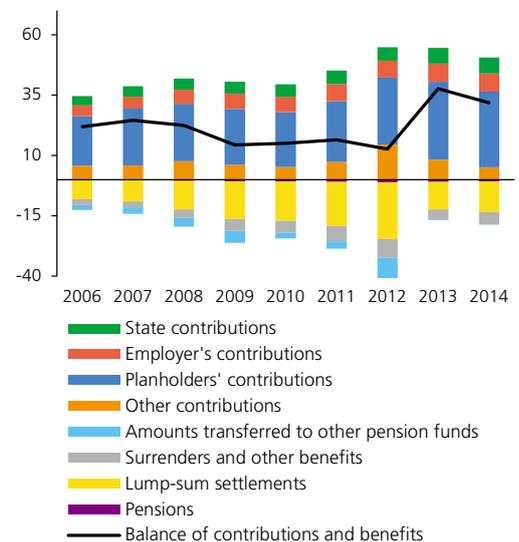
The position of non-bank intermediaries was little changed

Total loans provided by non-bank financial corporations engaged in lending (NFCEs) rose slightly to CZK 247.5 billion in 2014 (see Chart III.25). Loans to non-financial corporations increased by CZK 6 billion, while loans to households for consumption rose by just CZK 2.7 billion. The market shares of NFCEs in loans to non-financial corporations and

²⁷ Transformed funds were established by conversion from pension funds under the 2013 pension reform. Entry to these funds was conditional on establishing a private pension policy until 1 December 2012. In contrast to transformed funds, saving in participation funds is not conditional on the date of conclusion of the contract and offers investment strategies of various degrees of risk.

CHART III.21

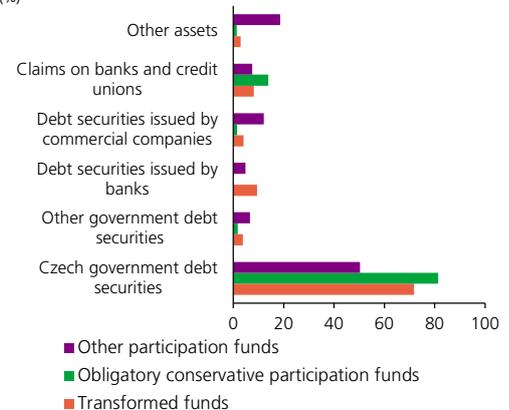
Pension fund contributions and benefits (CZK billions)



Source: CNB

CHART III.22

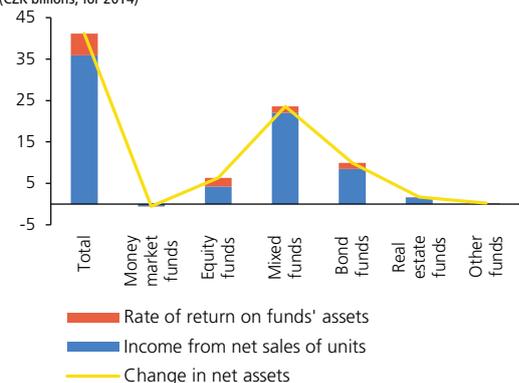
Placement of assets of pension management company funds (%)



Source: CNB

CHART III.23

Decomposition of changes in the net assets of open-ended mutual funds intended for the public (CZK billions; for 2014)

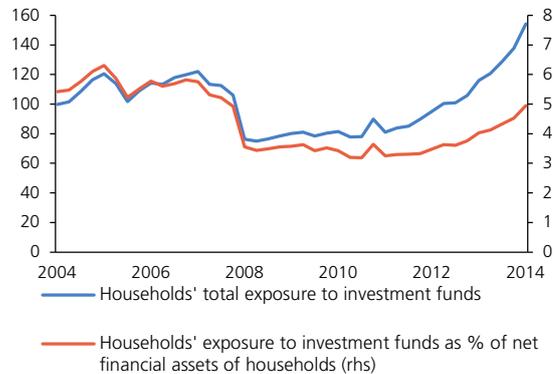


Source: CNB

CHART III.24

Households' exposure to investment funds

(CZK billions; right-hand scale in %)



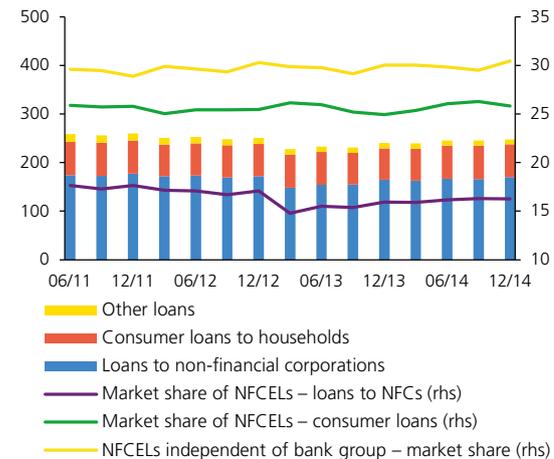
Source: CNB

consumer loans to households in the Czech Republic remained stable and stood at 16.3% and 25.8% respectively at the end of the year. According to figures from the Czech Leasing and Finance Association, there is increasing interest in operational leasing²⁸ for households. However, the amount of financing provided in this way by the association's members remained negligible in 2014 (CZK 2 billion). The share of loans to business borrowers financed through operational leasing on total volume of leasing decreased slightly to 40.7%. According to data from the Banking Client Information Register and from the credit register of natural persons maintained by the SOLUS association, credit risk in NFCEL balance sheets declined in 2014 (see Chart III.26). However, it remains higher than that of banks.

CHART III.25

Loans provided by non-bank financial corporations engaged in lending

(stock of loans in CZK billions; right-hand scale in %)



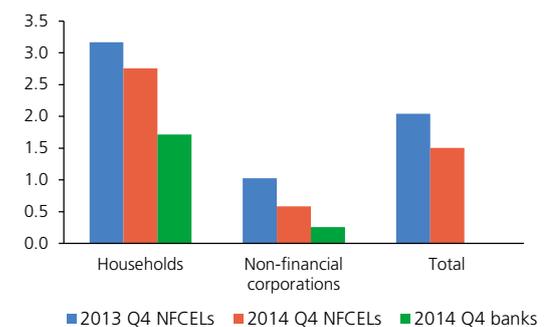
Source: CNB

Note: Market share of NFCs in 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.

CHART III.26

3M default rate on loans provided by credit institutions

(%)



Source: CBCB, CNB, SOLUS, CNB

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

²⁸ Operational leasing allows a movable or immovable item to be used, but unlike in the case of financial leasing there is no transfer of the substantial risks and benefits associated with ownership of the asset. Operational leasing is therefore de facto renting and is not included in the CNB's financial intermediation statistics.

3.2 SOLVENCY STRESS TESTS OF BANKS, INSURANCE COMPANIES 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 insurance company sector also showed sufficient resilience to an adverse scenario thanks to its large capital buffer. The pension management company sector is sensitive to interest rate volatility, and a rise in koruna rates could adversely affect its profitability and solvency in some circumstances.

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

The resilience of banks, insurance companies 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*, representing a strong and persistent 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 the shocks' impacts and illustrate the sectors' resilience to relevant risks.

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-Q1 data.²⁹ The tests are newly based on reports from the COREP and FINREP single European reporting frameworks. The stress tests of insurance companies and pension management companies were performed on end-2014 data.

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 largest risk in the Czech banking sector. The evolution of credit risk is closely linked with developments in the household and corporate sectors. The economic recovery is reflected in a greater ability of households and corporations to repay their debts, i.e. a lower level of credit risk (see sections 2.2 and 2.3). The default rate, a key indicator of credit risk, remains at historical lows in the *Baseline Scenario* 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 (see Box 3 in section 3.1). Given the expected interest rate developments, the *Baseline Scenario* expects banks' adjusted

TABLE III.3

Key variables in the individual scenarios (averages for given years)

	Actual value	Baseline Scenario			Adverse Scenario		
		2014	2015	2016	2017	2015	2016
Macroeconomic variables							
GDP (y-o-y %)	2.0	2.6	3.2	3.5	-0.9	-3.7	-2.8
Inflation (%)	0.4	0.2	1.7	1.9	-0.4	-2.1	-2.6
Unemployment (%)	6.2	5.4	5.0	4.4	5.6	7.0	9.1
Nominal wage growth (%)	2.2	2.3	4.2	5.0	-1.5	-7.4	-3.3
Effective GDP growth in euro area (%)	1.1	1.8	2.2	2.0	-0.1	-0.6	-0.4
Credit growth (%)							
Total	5.1	6.0	7.0	7.9	2.5	-5.0	-8.3
Corporations	1.1	3.8	4.8	5.4	0.6	-4.3	-5.8
Households	4.8	5.1	5.7	6.2	2.6	-1.8	-4.5
Default rate (PD, %)							
Corporations	1.7	1.5	1.5	1.5	4.0	5.3	5.5
Loans for house purchase	2.8	2.6	2.4	2.3	5.1	6.2	6.5
Consumer credit	6.7	6.4	6.5	6.5	8.7	10.1	10.8
Loss given default (LGD, %)							
Corporations	45.0	45.0	45.0	45.0	51.9	58.9	57.6
Loans for house purchase	22.0	22.0	22.0	22.0	25.6	37.9	46.3
Consumer credit	55.0	55.0	55.0	55.0	60.2	64.4	71.8
Asset markets (%)							
3M PRIBOR	0.4	0.3	0.3	1.1	0.3	0.3	0.3
5Y yield	0.5	0.1	0.1	1.5	2.4	3.9	4.0
3M EURIBOR	0.2	0.0	0.0	0.1	0.0	0.0	0.0
5Y EUR yield	0.3	0.0	0.0	0.0	1.3	2.4	2.4
Change in residential property prices	2.2	4.1	5.0	6.2	0.0	-8.1	-9.0
Change in share prices	-4.3		-5.0			-30.0	
Banks' earnings							
Adjusted operating profit (y-o-y %)	-1.1	-2.0	-2.0	0.0	-13.7	-20.3	-19.4

Source: CNB, CNB calculation, BRCI

²⁹ Data on capital ratios were unavailable at the time of the testing, so end-2014 capital values were used.

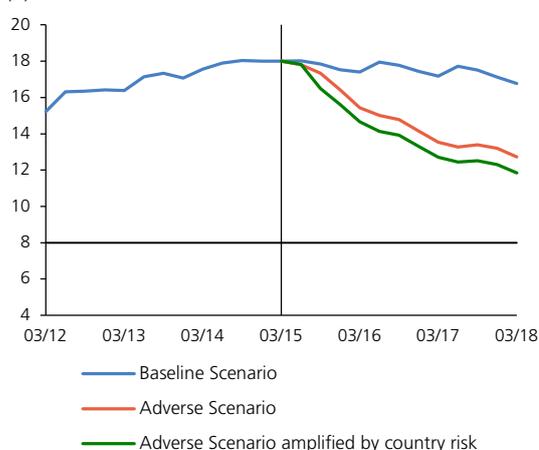
TABLE III.4

	Baseline Scenario			Adverse Scenario		
	2015	2016	2017	2015	2016	2017
Impact of the alternative scenarios on the banking sector						
Expected credit losses (minus sign for losses)						
CZK billions	-19.3	-24.7	-25.9	-42.6	-74.4	-78.8
% of assets	-0.3	-0.4	-0.4	-0.8	-1.4	-1.6
Profit/loss from market risks						
CZK billions	5.1	-0.9	-14.7	-24.1	-2.4	-0.3
% of assets	0.1	0.0	-0.2	-0.4	0.0	0.0
Earnings for covering losses (adjusted operating profit)						
CZK billions	74.4	72.9	73.0	65.5	52.2	42.1
% of assets	1.3	1.3	1.2	1.2	1.0	0.8
Pre-tax profit/loss						
CZK billions	60.2	47.3	32.4	-1.5	-25.4	-37.1
% of assets	1.1	0.8	0.5	0.0	-0.5	-0.7
Capital ratio at end of period in %						
Total	17.5	17.4	17.1	16.4	14.2	13.2
Tier 1	17.1	17.0	16.7	16.0	13.8	12.8
Capital injections						
CZK billions		0.7			9.0	
% of GDP		0.02			0.2	
No. of banks below 8% capital ratio						
		3			10	

Source: CNB, CNB calculation

CHART III.27

Capital ratios depending on scenarios (%)



Source: CNB, CNB calculation

operating profit to continue to trend downwards by around 2% a year in 2015 and 2016.³⁰

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%, 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 1.5% of the sector's assets) get into a situation of insufficient capital adequacy in the *Baseline Scenario*, implying an adjustment of their business models or a need to top up their capital in the future.³¹

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 negative growth 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 almost 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 the sector's 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 12.5% in the *Adverse Scenario* (see Chart III.27). Although the aggregate capital ratio stays sufficiently above 8%, ten banks – representing about 12% of the sector's assets – record a fall in capital adequacy below the regulatory minimum and have to top

30 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.

31 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. However, this 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.

up their capital. The necessary capital injections total around CZK 9 billion, i.e. around 0.2% 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 0.9 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 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 10.7 pp over the test horizon.³² Part of this income is used to cover expected credit and market losses (-3.5 pp) and to pay dividends and taxes (-4.7 pp).³³ The recovery in economic activity leads to a rise in banks' exposures, lowering the capital ratio by 2.8 pp. A change in risk weights due to a change in the structure of lending reduces the capital ratio by a further 1 pp to 16.8% at the end of the three-year test horizon (see Chart III.28).³⁴

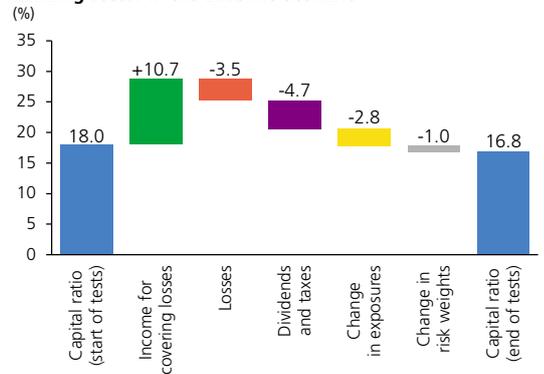
Even in the *Adverse Scenario*, banks are able to generate income to cover their losses (+9.6 pp). However, this income is not sufficient to cover all the expected losses over the test horizon (-10 pp). Dividends and taxes, paid above all from profits for 2014, make a negative contribution to the capital ratio of 1.7 pp. Banks then react to the worse situation by lowering the volume of loans, which reduces the decline by 1.9 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 12.7% in the final period of the test (see Chart III.29).

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 based on figures derived from those countries' average ratings

CHART III.28

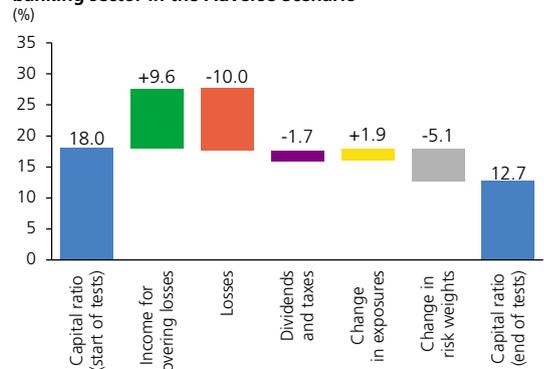
Decomposition of the change in the capital ratio of the banking sector in the *Baseline Scenario*



Source: CNB, CNB calculation

CHART III.29

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



Source: CNB, CNB calculation

32 The income used to cover losses includes profits for 2014 and expected income in 2015 and 2016.

33 The stress tests assume that banks that generate a profit in the previous financial year decide about its distribution in the second quarter of the following year. The amount of dividends paid depends on the difference between the actual capital ratio in the given quarter and the targeted capital ratio.

34 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

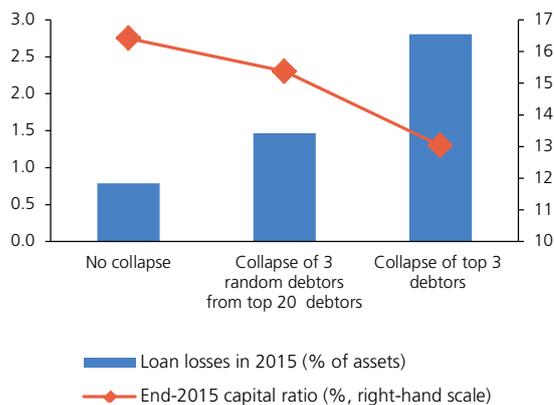
Haircuts on EU countries' exposures (%)

Country	Haircut
Austria	2
Belgium	7
Croatia	32
Cyprus	43
France	5
Germany	0
Greece	49
Hungary	30
Ireland	18
Italy	24
Malta	18
Netherlands	1
Portugal	31
Slovenia	22
Spain	23
United Kingdom	2

Source: Rating agencies, CNB calculation

Note: The haircuts are calculated using the main agencies' ratings as of May 2015 for EU countries with debt exceeding 60% of GDP.

CHART III.30

Impact of the collapse of the top three debtors of each bank
(%; in Adverse Scenario; LGD = 50%)

Source: CNB, CNB calculation

(see Table III.5). This assumption generates additional losses of CZK 27 billion for the banking sector. The sector's capital ratio remains above 11.5% over the test horizon (see Chart III.27, *Adverse Scenario* amplified by country risk), while the capital injections increase to almost CZK 18 billion (around 0.4% of GDP).

The portfolio concentration test represents a strong shock...

The final sensitivity analysis in the *Adverse Scenario* focuses on testing concentration risk assuming 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 13%, 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 59% at the end of 2014.³⁵ 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 2015 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 13% (see Chart III.30). 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.

BOX 4: AGGREGATE RESULTS OF JOINT (BOTTOM-UP) 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 was performed in 2014 for the largest EU banks in a comprehensive check by the ECB and the EBA. The micro stress tests differ from the macro stress tests mainly in that the impacts of shocks on banks' capital ratios are calculated by the banks themselves based on their own portfolios. They thus use much more detailed portfolio information than that available to the CNB for its macro stress tests. However, it is the CNB that defines the

³⁵ The share of uncollateralised claims to non-financial corporations in loans to the five largest borrowers was 53% at the end of 2013.

most probable and adverse scenarios in both types of test.

The nine largest domestic banks, representing 73% of the assets of the Czech banking sector, took part in the eleventh round of micro stress tests using end-2014 data.³⁶ The focus was on testing credit risk, which is the largest risk for the Czech banking sector. In 2014 the micro stress tests were extended to include testing of key market risks. Therefore, they now include a sensitivity analysis of interest rate risk for the bank's entire portfolio and specific interest rate risk for domestic government bonds.

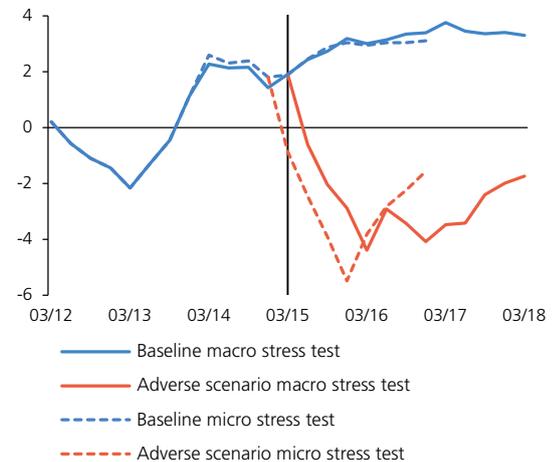
Since the micro stress test scenarios are prepared one quarter before the macro stress tests presented in this Report and the horizon of the micro stress tests is only one year, the scenarios and results of the two tests are not fully comparable. The baseline scenario for the micro stress tests (*Baseline*) is based on the CNB's macroeconomic forecast published in Inflation Report I/2015 and assumes a similar growth rate of the Czech economy as this Report's *Baseline Scenario*. Compared to the *Baseline Scenario* in this Report, the stress scenario for the micro stress tests (*Adverse*) assumes a sharper fall in economic activity in the first year and a more moderate decrease in the following years, which lie beyond the test horizon (see Chart III.13 Box).

The macroeconomic developments assumed in the *Baseline* and *Adverse* scenarios determine the evolution of 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. A slight rise in credit risk for both corporate exposures and retail portfolios can be observed for the *Baseline* scenario one year ahead. Much higher credit risk is visible in the *Adverse* scenario, in line with the 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 segments tested except central government, for which the PD remains at zero (see Table III.2 Box).

The results of the micro stress tests for the *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 remain unchanged at 18.2%. In the *Adverse* scenario the capital requirements rise by a significant 52.2% and profit declines by more than 42% overall. Despite these adverse developments, the aggregate Tier 1 capital ratio of the institutions

CHART III.13 Box

Differences in the evolution of real GDP (%)



Source: CNB

TABLE III.2 Box

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

	31 Dec. 2014		Baseline		Adverse	
	PD	LGD	PD	LGD	PD	LGD
Corporate exposures	1.6	36.4	1.7	36.8	3.6	45.7
- large enterprises	0.9	37.1	1.0	37.1	2.1	46.7
- small and medium-sized enterprises	2.3	34.7	2.3	34.8	5.0	43.4
- specialised credit exposures	2.1	40.2	2.2	40.3	4.7	50.3
Retail exposures	1.9	23.3	2.1	23.6	3.1	31.2
- retail-assessed SMEs	5.0	37.8	4.8	36.7	10.4	46.3
- loans for house purchase	1.2	15.5	1.4	15.7	1.9	22.0
- other loans to individuals	3.4	44.7	3.8	44.8	4.9	56.5
Institutions	0.2	26.7	0.2	26.7	0.4	30.8
Central governments	0.0	10.2	0.0	10.2	0.0	15.1

Source: CNB

³⁶ Banks were selected according to whether they have received approval to use the IRB approach for calculating the capital requirement for credit risk.

TABLE III.3 Box

Banks' capital requirements and capital ratios

(%)

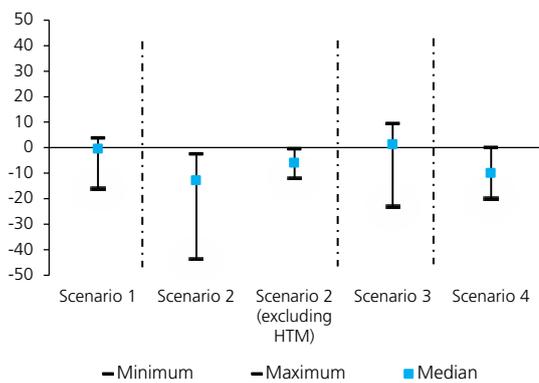
	31 Dec. 2014	Baseline 31 Dec. 2015	Adverse 31 Dec. 2015
Capital requirements (year-on-year change)	-	4.4	52.2
Regulatory capital (year-on-year change)	-	5.4	-4.0
Tier 1 capital ratio	18.2	18.2	11.9
Capital ratio	18.5	18.6	12.1

Source: CNB

GRAF III.14 Box

Interest rate risk sensitivity analyses

(as % of Tier 1 and Tier 2 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.

tested remains well above the 8% threshold at the one-year horizon, dropping to 11.9% (see Table III.3 Box).

The micro stress test results confirm that the banks tested are highly resistant 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 *Baseline* and *Adverse* scenarios, a sensitivity analysis of general interest rate risk and the specific interest rate risk of CZK government bonds was performed. The economic logic of the test was applied in the interest rate risk testing, so the effect of accounting categories on the revaluation of bank assets and liabilities was suppressed. The sensitivity analysis covers the entire bank portfolio (the banking and trading books) and uses four scenarios. *Scenario 1* assumes a 3 pp parallel shift of the yield curve, *Scenario 2* assumes a 3 pp widening of the CZK government bond spread vis-à-vis the IRS yield curve, *Scenario 3* assumes a larger increase in the slope of the yield curve³⁷ and *Scenario 4* contains 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.³⁸

The results of the sensitivity analysis show that a rise in interest rates would have mixed impacts across the banks tested (see Chart III.14 Box). In *Scenario 1*, the impact of a parallel shift of the yield curve would be between -16.1% and 3.7 % of capital. In *Scenario 3*, banks' sensitivity to rotation of the yield curve increases further, with the impact on the capital of the banks most exposed to interest rate risk ranging from -23% to 9.4%. *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 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

37 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.

38 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.

the test is significantly smaller, since domestic banks hold almost half of domestic government bonds in the “held to maturity” accounting category and hence do not mark these debt securities to market. In *Scenario 4*, the impact is between -20.1% and 0%.

The stress tests of transformed funds 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. Together with the *Baseline Scenario*, the sector’s resilience to the *Adverse Scenario* was also tested; this variant captures adverse economic developments coupled with increased tensions in financial markets. The *Adverse Scenario* will manifest itself as sharp falls in the property and equity markets, depreciation of the exchange rate and a jump in yields on long-term Czech and foreign government bonds. In particular, a marked rise in bond yields could pose a significant risk given the portfolio structure of these institutions.

The PMC stress-testing methodology has been further refined

The PMC stress-testing methodology was refined in this year’s tests. Given the significant share of koruna securities in the balance sheets of transformed funds, market revaluation of these instruments is now considered.³⁹ This implies a potential marked increase in stress compared to the stress tests performed in previous years. In addition, a price decline depending on credit quality and maturity is assumed for corporate and government securities in the *Adverse Scenario*. Regarding currency and interest rate risk, hedging applied by funds to reduce their exposure to these risks is considered in a more elaborate way. A key feature of the test is the transfer of stress from transformed funds⁴⁰ to the relevant PMCs. The law⁴¹ stipulates that if the value of assets of transformed funds should fall below the value of liabilities,⁴² the pension management company must top up the difference from its own funds. This amount is subtracted from the capital of the PMC.

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.7. Interest rates, which affect the value of bond holdings, have the largest impact. While the overall effect of interest rate risk in the *Baseline Scenario* is positive owing to the decline in rates, assets fall in value by 5.9% in the *Adverse Scenario*, which

Tab. III.7

		Results of the stress tests of PMCs	
		Baseline Scenario	Adverse Scenario
Equity (as of beginning of period)	CZK billions	8.3	8.3
Capital ratio (as of beginning of period)	%	139.8	139.8
Change in asset value – interest rate risk	CZK billions	2.1	-19.5
	% of TF assets	0.6	-5.9
Change in asset value – exchange rate risk	CZK billions	0.0	0.2
	% of TF assets	0.0	0.0
Change in asset value – equity risk	CZK billions	-0.2	-1.4
	% of TF assets	-0.1	-0.4
Change in asset value – real estate risk	CZK billions	0.1	-0.1
	% of TF assets	0.0	0.0
Total impact of risks on TF assets	CZK billions	1.9	-20.8
	% of TF assets	0.6	-6.3
Profit of transformed funds	CZK billions	4.5	2.2
Equity (as of end of period)	CZK billions	9.0	1.3
Capital ratio (as of end of period)	%	151.2	22.5
Capital injection	CZK billions	0.0	4.6

Source: CNB, CNB calculation
Note: TF = transformed funds

39 With the exception of portfolios designated as held to maturity, which must not exceed 30% of assets according to the legislation in force.

40 The stress tests do not include retirement and participation funds, as the participants in these funds, not pension management companies, bear the entire investment risk. Moreover, the total assets of retirement and participation funds only account for 2% of this segment’s assets.

41 Article 187(2) of Act No. 427/2011 Coll., on Supplementary Pension Savings.

42 In particular, the participants’ savings inclusive of past returns and credited state support.

assumes a rise in rates. Funds holding a large proportion of their assets in fixed-rate koruna bonds with longer average residual maturities are hit the hardest. Exchange rate risk is hedged in all funds, so even a sizeable depreciation of the koruna has a minimal impact on fund assets. The effect of changes in equity and property prices is limited, as the share of such investments is small.

... but remain profitable even in the *Adverse Scenario*

The change in the value of assets of transformed funds has only a minor impact on their accounting profit, as only some investments are realised in the given period. Therefore, assuming realisation of 10% of the potential profit or loss, the sizeable decrease in the value of assets in the *Adverse Scenario* does not preclude the generation of profit by transformed funds and non-zero returns for their participants.

In the *Adverse Scenario*, a large proportion of PMCs would see a fall in their capital ratios

As a result of the need to top up capital in transformed funds, the capital ratios of six out of the eight PMCs would fall below the required threshold in the *Adverse Scenario*. For three of them, it would cause their capital to turn negative. The owners would have to inject capital of CZK 4.6 billion in order to meet the capital ratio requirement. This represents 55% of the equity of the PMCs as at the end of 2014. When the value of the transformed fund assets rises again, the PMC may withdraw the funds. However, it is apparent that in the event of very unfavourable developments, the duty to top up resources in transformed funds represents a substantial burden on PMCs and their owners.

Portfolio sales in a situation of lower market liquidity could exacerbate the stress

The effect described above could be amplified in the event of mass sales of assets. Such sales would cause the already low market prices assumed in the *Adverse Scenario* to fall further. This drop in prices could be particularly significant in an environment of lower market liquidity (see section 2.1). This would lead to a downward spiral in the value of balance-sheet assets, a need for PMCs to top up resources again, and further capital injections from PMC owners.

BOX 5: AGGREGATE RESULTS OF JOINT (BOTTOM-UP) STRESS TESTING BY THE CNB AND SELECTED INSURANCE COMPANIES

A sixth round of joint stress testing by the CNB and selected insurance companies took place in April 2015. The aim of the test is to assess the ability of insurance companies to absorb the impacts of adverse economic developments. The test is repeated on an annual basis. The ten insurance companies participating this year accounted for around 91% of the domestic market in 2014 based on gross premiums written.

As Solvency II will take effect on 1 January 2016, the test methodology was changed compared to 2014 and the test was performed fully in line with Solvency II principles. According to the new regulation, insurance companies should have sufficient funds relative to the actual risks they face. Solvency II introduces different rules for the valuation of assets and liabilities. The main changes concern the valuation of technical provisions. Their value for regulatory purposes will be set as the discounted expected value of future cash flows from insurance contracts plus a risk margin. The change in technical provisions compared to Solvency I will lead to a rise in capital that can be used to cover risks. The method for setting the solvency capital requirement (SCR), which is based on the insurance company's risk profile, has changed substantially. The SCR represents the amount of capital that would cover unexpected large losses of the insurance company within a one-year time frame with a probability of 99.5%. The capital requirement set in this way under Solvency II is usually much higher than that under the previous regulation. In the context of these changes, the initial solvency ratio, i.e. the ratio of eligible capital to the SCR, was lowered significantly compared to last year's stress test. Under Solvency I, the initial solvency ratio as of 31 December 2013 before the application of the stress test had been 311%, with an available solvency margin of CZK 59.9 billion and a required solvency margin of CZK 19.2 billion. The initial solvency ratio under Solvency II as of 31 December 2014 was 212% and the eligible capital to cover the SCR of CZK 44 billion was CZK 93.1 billion. Eligible capital also takes into account expected dividend payments for 2014.

The stress test assesses the impact of significant changes in risk parameters on the value of the insurance company's assets and liabilities according to Solvency II valuation, and hence on the solvency position in accordance with the principles of Solvency II as of 31 December 2014. To make the stress test easier to process, no post-test recalculation of the SCR was required, so the change in the value of assets and liabilities in the test only affected the capital eligible to meet the SCR. As last year, the investment risks examined were equity risk, asset and liability interest rate risk, real estate risk, exchange rate risk, credit risk and the risk of a fall in government bond prices, and the non-life insurance risks tested were motor vehicle insurance premium risk and the risk of claims due to natural disasters. The stress testing scenario was derived from the adverse macroeconomic scenario that the CNB used to test the resilience of the banking sector, supplemented with risk factors relevant to insurance companies.⁴³

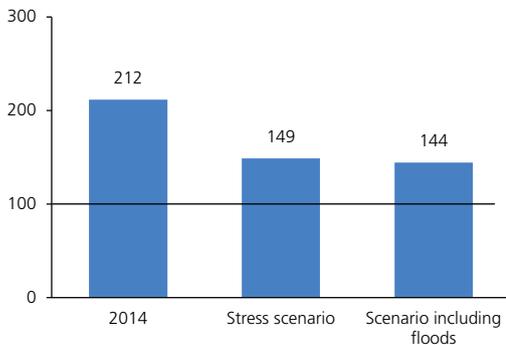
TABLE III.4 Box

Impact of the stress scenario		Stress scenario including flood risk
Equity risk	CZK billions	-10.36
	% of assets	2.50
Real estate risk	CZK billions	-3.44
	% of assets	0.83
Exchange rate risk	CZK billions	-0.19
	% of assets	0.05
Interest rate risk	CZK billions	-7.06
	% of assets	1.70
Credit spread risk	CZK billions	-1.08
	% of assets	0.26
Risk of fall in GB prices	CZK billions	-8.31
	% of assets	2.01
Motor-vehicle insurance premium risk	CZK billions	-2.22
	% of assets	0.54
Risk of claims due to natural disasters	CZK billions	-2.43
	% of assets	0.59
Total impact of risks on available capital	CZK billions	-35.09
	% of assets	8.47
Other impacts (tax)	CZK billions	3.34
	% of assets	0.85
Available capital as of end of 2014	CZK billions	93.12
	% of assets	22.49
Available capital after application of test	CZK billions	63.47
	% of assets	15.33
Solvency ratio	2014	212%
	2015 (stress test)	144%

Source: CNB

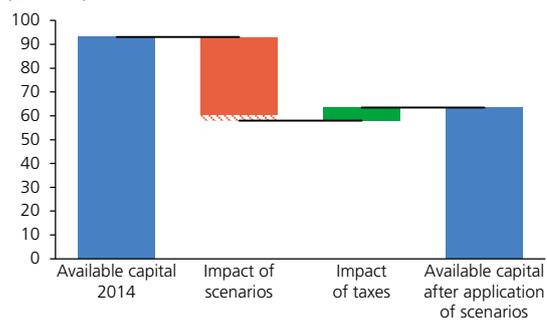
43 We assumed a 41% drop in the value of shares, a 24% fall in property prices, a rise of about 2.5 pp in the risk-free curve, a decrease of 6.3% on average in government bond

CHART III.15 Box

Solvency ratio for the stress scenario and the scenario including floods
 (%)


Source: CNB

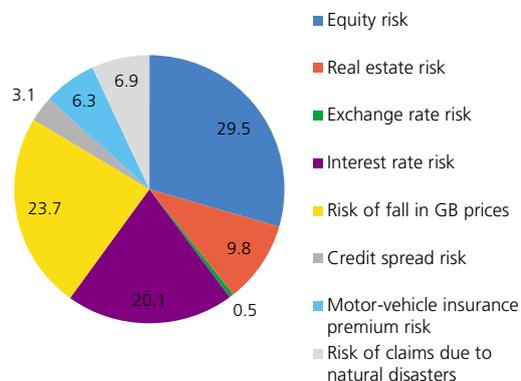
CHART III.16 Box

Change in available capital
 (CZK billions)


Source: CNB

Note: In the "Impact of scenarios" column the impact of floods is indicated by hatching.

CHART III.17 Box

Shares of individual risks in the decline in the available solvency margin caused by the shocks
 (%)


Source: CNB

Furthermore, this scenario was extended to include a 10% decline in premiums written for motor vehicle insurance at the same level of costs as in 2014. The extended scenario also tested how insurance companies' capital would be affected in the event of simultaneous floods.

The aggregate results confirm that thanks to sufficient eligible capital, the sector as a whole, as represented by the participating insurance companies, would absorb the impacts of a large increase in risk factors, including simultaneous floods, even under the new Solvency II regulation (see Table III.4 Box and Chart III.15 Box). The sector would stay relatively high above the 100% solvency threshold even after the application of significant shocks (the solvency ratio would be 144%). The aggregate impact of the shocks on the level of capital available to meet the SCR (CZK 35.1 billion) in the test was lowered to take account of an income tax effect of CZK 3.3 billion (see Chart III.16 Box). In the scenario applied, equity risk would have the biggest impact on the decline in the available solvency margin relative to the shock size (see Chart III.17 Box). The effect of the shock in terms of the risk of lower government bond prices would also be significant. This is partly because the test also includes government bonds classified as held to maturity at amortised cost, which are valued at fair value in accordance with the principles of Solvency II. The impact of the shock on interest rate risk this year already fully incorporates the economic view of the interest rate risk of liabilities. Its magnitude in individual insurance companies is affected mainly by matching of the maturity profiles of assets and liabilities. As in the previous year, the impact of the stress scenario on real estate risk is noticeable, as insurance companies have in recent years been looking for other long-term investment opportunities given the environment of low interest rates. The favourable result for shocks for the risk of floods relative to the other risks shows that insurance companies have well-structured reinsurance treaties for catastrophic flood damage.

Owing to the persisting environment of low interest rates, the stress test was extended to include an additional scenario focused on testing the impacts of this environment and a qualitative assessment of reinvestment risk in the event of this environment lasting for a prolonged period.⁴⁴ The overall effect of the additional scenario on the aggregate eligible capital of the participating insurance companies was minimal. However, this was not the case for individual insurance companies, where the

prices, a 10% depreciation of the koruna and a rating-dependent increase in the corporate bond spread.

⁴⁴ In this scenario, we assumed a flat risk-free yield curve, with yields of 0.26% and 0.39% for 10-year and 15-year maturities respectively.

matching of asset and liability flows was important. In a long-running environment of low interest rates, insurance companies in general face a risk of insufficient investment income on financial placement to cover the guaranteed technical interest rate (see section 3.1). The results of the qualitative assessment reveal that insurance companies are mostly opting for a strategy of changing their product structure to mitigate this risk. This chiefly involves focusing more on unit-linked life insurance and term life insurance and on reducing guaranteed rates on new insurance policies. In general, the sector does not foresee a need for any major change in investment strategy in the event of a prolonged period of low interest rates. The low interest rate environment should not cause domestic insurance companies any significant capital problems over the next few years. As part of its supervisory work, the CNB will continue to address this issue intensively. It will insist that insurance companies focus systematically on interest rate risk, on managing and assessing it not only in isolation, but also in the context of other investment risks, reinsurers' credit risk, lapse risk and other insurance risks, and on enhancing their ALM practices.

3.3 BANK LIQUIDITY STRESS TESTS AND LIQUIDITY REGULATION

Banks passed a liquidity stress test. Both the CNB's macro-stress testing and a liquidity coverage survey demonstrated a high resilience of Czech banks to liquidity shocks. Low diversification of the liquidity buffer, which consists mainly of domestic government bonds, remains a negative aspect of the sector's liquidity. A potential increase in the riskiness of this asset would be associated with a rise in liquidity risk.

The liquidity testing methodology has been changed slightly with regard to the LCR...

The assessment of the banking sector's resilience includes a macro-stress test of balance-sheet liquidity. The original two-round methodology introduced in FSR 2010/2011 has been adjusted slightly to make the test results comparable with the liquidity coverage ratio (LCR). It now works with two liquidity buffer levels. The narrower liquidity buffer concept (level 1) remains as defined in the original methodology.⁴⁵ The wider concept (level 2) is closer to the LCR liquidity buffer and includes also other freely transferable assets such as foreign government bonds, corporate securities and equity instruments. Due to their lower liquidity and loan quality, however, they are subject to higher stress haircuts, as in the LCR liquidity buffer calculation. The indicator used up to now to

⁴⁵ The level 1 liquidity buffer for the one-month horizon is defined as the sum of cash, claims on the central bank (excluding minimum reserves), domestic government bonds and claims maturing within one month, while claims maturing within three months are taken into account for the three-month horizon. The liquidity buffer for the three-month horizon is equal to or greater than the liquidity buffer for the one-month horizon.

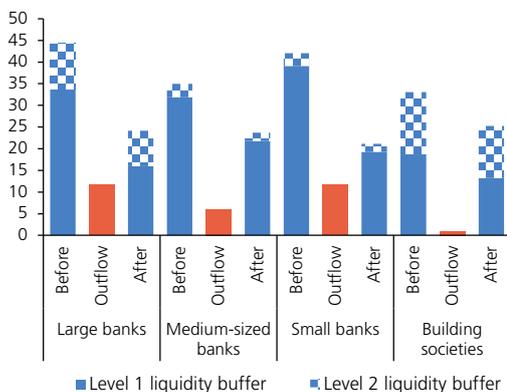
TABLE III.8

Scenario type and shock size in the liquidity stress test (%)	
Type of stress	Degree of stress
Outflow of uninsured/unsecured deposits from FIs except CB	20/25*
Outflow of uninsured/unsecured deposits from non-financial entities	15/20*
Outflow of secured/insured deposits	5/10*
Maturing of bonds issued**	100
Drawdown of credit lines from CIs	20/30*
Drawdown of credit lines from non-financial entities except government	10/20*
Unavailable claims on CIs**	30/50*
Unavailable claims on other clients except government and CB**	20/40*
Reduction in value of CZK bonds issued by domestic government or CI	15
Reduction in value of foreign-currency bonds issued by domestic government or CI	25
Reduction in value of bonds issued by foreign government or CIs	25
Reduction in value of bonds issued by non-financial corporations	35
Reduction in value of capital instruments	50

Source: CNB, CNB calculation

Note: *The first figure applies to the one-month test and the second to the three-month test. **Claims/liabilities maturing within one month and three months respectively. CIs = credit institutions, FIs = financial institutions.

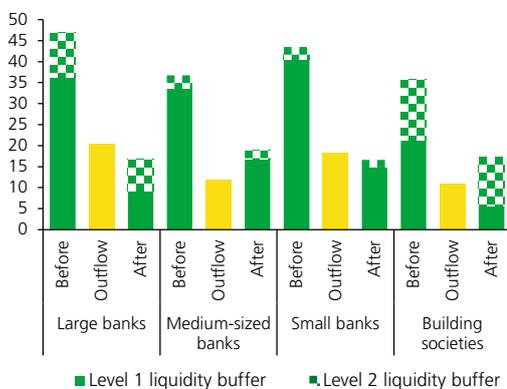
CHART III.31

Results of the bank liquidity test at the one-month horizon
 (% of total assets of individual groups of banks)


Source: CNB, CNB calculation

Note: The column "Before" represents the size of the unstressed liquidity buffer and the column "After" the size of the liquidity buffer after the two-round stress. The column "Outflow" represents the outflow of liquidity at the 30-day horizon.

CHART III.32

Results of the bank liquidity test at the three-month horizon
 (% of total assets of individual groups of banks)


Source: CNB, CNB calculation

Note: The column "Before" represents the size of the unstressed liquidity buffer and the column "After" the size of the liquidity buffer after the two-round stress. The column "Outflow" represents the outflow of liquidity at the 90-day horizon.

assess resilience – the liquidity buffer-to-assets ratio – has been supplemented by another liquidity indicator defined as the ratio of the liquidity buffer for each level to the gross liquidity outflow. As in the case of the LCR, the lowest permissible value of the indicator is 100% (see section 4.2).

... but remains a two-round methodology for the one-month and three-month horizons

The banking sector was as usual tested at both the one-month and three-month horizons, primarily because of the lower sensitivity of the building societies sector to some shocks at the one-month horizon (as confirmed by the estimated LCR results – see below). The scenario was applied to 23 banks having their registered offices in the Czech Republic using the end-2014 data. In the first round of the impact, a liquidity outflow was generated for a crisis period of 30 or 90 days caused by increased demand for asset financing amid lower funds and a concurrent decline in the value of some assets with no difference in their accounting (see Table III.8). The second round of stress captures the consequences of the rise in reputational and systemic risk brought about by banks' efforts to cover the outflow and is expressed through additional losses arising from the revaluation of the assets used. Overall, these are strong stress scenarios.

The balance-sheet liquidity test confirms banks' resilience to liquidity shocks

The test results reveal that the banking sector as a whole would withstand the simulated stress and is able to cover a sudden outflow of liquidity at both the one-month and three-month horizons. This is mainly because the initial liquidity buffers are kept at high levels (see Charts III.31 and III.32). Although building societies have long held the lowest amount of level 1 quick assets, they hold a relatively high share of level 2 quick assets. On the one hand their total buffer is more diversified, but on the other it may be subject to higher losses in value in the case of riskier assets in a crisis period.

The impacts of the negative shocks on the balance sheets of the groups of monitored banks were mixed across them and also horizons. In terms of the aggregate decline in the total liquidity buffer, universal banks were hit hardest (a decline of more than 50% at both horizons). Such banks are most prevalent among large and small banks (see Charts III.31 and III.32). In the case of building societies, a small impact can be observed at the one-month horizon (a decline in the total buffer of around 23%) and a fairly large impact can be seen at the three-month horizon (a decline of almost 53%). In terms of the number of banks with exhausted buffers on an individual basis, the hardest hit were specialised banks, most of which hold hardly any quick assets. "Only" one bank would exhaust all the level 1 assets from its liquidity buffer at the one-month horizon, but even it would be able to cover the outflow using additional assets from its level 2 buffer. So, the liquidity ratio would not drop below 100% for any bank. Eight banks would fully exhaust their level 1 liquidity buffers at the three-month horizon, and three of them would not be able to cover the outflow using their level 2 buffers. These banks could thus face liquidity

problems in the event of a strong liquidity crisis. However, these are specialised banks with very specific business models.⁴⁶

The test results are supplemented for the first time with LCR results...

The macro-stress test results were supplemented and confirmed by results obtained from a liquidity coverage survey (the estimated LCR). The LCR is different from the liquidity indicator used in the CNB's macro-stress test. It differs mainly in the calculation of the ratio, which, instead of the gross outflow, it also takes into account expected inflows of liquidity in the stress period (albeit up to a maximum of 75% and 90% of the outflows respectively). The composition of the liquidity buffer is also different, as the LCR does not include short-term claims in its buffer and stricter rules apply to the inclusion of specific types of transferable assets. However, the macro-stress tests are stricter in terms of the scenario, as they do not exclude any assets (or government bonds) from the stress, in contrast to the haircuts applied to the LCR. The differences in the calculation are visible in the comparison of the aggregate LCR results with the liquidity indicator (see Chart III.33), especially for medium-sized banks with a higher balance-sheet share of short-term claims on other credit institutions. On an individual basis, however, the results are largely the same. The results from the LCR survey and the macro-stress tests thus complement each other very well, since they allow for overall monitoring of the sensitivity of banks' individual models to different types of liquidity shock.

... confirming the resilience of the banking sector

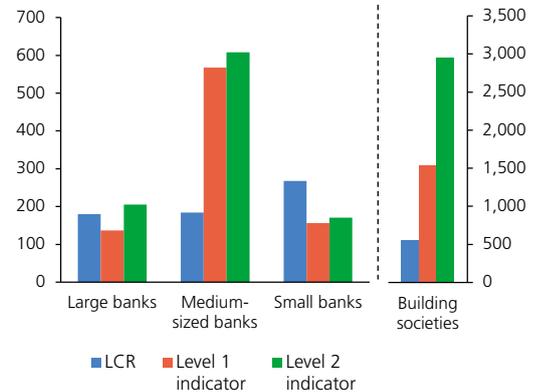
The LCR estimate performed on end-2014 data for all 23 banks operating in the Czech Republic⁴⁷ takes an aggregate value of 192%,⁴⁸ confirming a high degree of resilience of the domestic banking sector. Owing to the stress horizon considered (30 days), the LCR estimate is highest for building societies and is also high for small banks. The group of large banks has the lowest indicator value. Even in this case, however, the aggregate values are at 180% (see Chart III.33). Overall, the LCR liquidity buffer would fail to cover the expected net liquidity outflows for just two banks. Only one bank would not be compliant with the LCR requirement of 60% on an individual basis as required from October 2015. Again, this is a bank with a specific business model which holds virtually no liquid assets.

Given the universal applicability of this requirement to credit institutions in the EU, it is appropriate to assess the impacts of this regulation on the Czech banking sector. This can be done in a simplified way by comparing

CHART III.33

Comparison of the liquidity test results with the survey results for the LCR

(%; weighted by assets of individual groups of banks)



Source: CNB, CNB calculation

Note: The indicator is the ratio of the level 1 or level 2 liquidity buffer to the outflow of liquidity generated in the stress test.

46 By definition, very specific business models where long-term assets financed by issues of the institution's own securities come up against the minimum liquidity buffer (less than 5% of the balance sheet on average) cannot withstand the simulated stress.

47 Since the final text of the Commission Regulation governing the LCR is not known yet, the liquidity coverage template from EBA's consultation paper EBA/CP/2014/45 was used for the survey.

48 The LCR level for the entire banking sector and groups of banks was obtained by aggregating items across banks, while taking into account the limits on the individual items in the calculation applicable to each bank individually.

TABLE III.9

Comparison of the impacts of the LCR on groups of banks

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

	Banks			Building societies	Total
	Large	Medium-sized	Small		
Liquidity buffer	29	19	35	16	26
Liquid assets	29	19	35	17	26
Weighted average rate of eligibility after application of haircuts*	99	100	99	98	99
Expected outflows	26	14	16	5	21
Balances of outflows	98	62	91	30	83
Weighted average rate of outflow*	26	23	18	17	25
Expected inflows	10	4	4	2	7
Balances of inflows	12	14	7	3	11
Weighted average rate of inflow*	80	29	50	88	65
LCR	180	184	268	561	192

Source: CNB

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

the ratio of liquid assets and the balances of liquidity outflows and inflows to the total assets of each bank type, taking into account the weighted average weights applied to these groups of items in the LCR calculation. These weights capture the extent to which items subject to large market haircuts and expected outflows/inflows in the stress period are represented in banks' balance sheets (see Table III.9).

Almost all assets from the LCR liquidity buffer are held by domestic banks in the form of level 1 liquid assets,⁴⁹ to which no haircuts on the market value are applied. In building societies and small banks, the expected outflows are represented mainly by retail deposits where the payout has been agreed within 30 days and retail deposits subject to higher outflow (an outflow of no more than 15% in either case). In large and medium-sized banks, the expected outflows consist mainly of non-operational deposits by financial customers and non-operational deposits by other customers not covered by Deposit Guarantee Scheme (outflows of 100% and 40% respectively). The difference between the LCR for building societies and that for large banks is therefore due mainly to a much smaller liquidity outflow relative to the size of the liquidity buffer in building societies. The difference between the LCR in large and small banks is due to a larger liquidity buffer in small banks. The expected inflows of liquidity are insignificant relative to the size of the expected outflows in domestic banks.

Composition of the liquidity buffer

Despite the estimated compliance with the LCR, excessive homogeneity of the liquidity buffer remains a negative aspect of the liquidity of the Czech banking sector. The buffer consists mostly of withdrawable reserves with the central bank and domestic government bonds. They account for more than 60% of the sector's liquidity buffer. In the event of adverse developments in public finance, the risk of excessive concentration of sovereign exposures (see section 4.5) might be accompanied by liquidity risk.

The Commission delegated regulation gives a more extensive recognition to covered bonds in the LCR

The more extensive recognition of covered bonds as assets making up the LCR liquidity buffer makes it possible to increase the diversification of portfolios of liquid assets. Nevertheless this recognition is subject to several quantitative and qualitative criteria, including requirements relating to minimum issue size, haircuts and over-collateralisation. The delegated regulation is based on an EBA analysis, according to which the main factors affecting the market liquidity of covered bonds are credit ratings, time-to-maturity, issue size and quality of regulation.⁵⁰ Moreover,

49 Commission Regulation 2015/61 defines four categories of liquid assets – level 1 assets, level 2A assets, level 2B assets and level 2B securitisations. In simplified terms, level 1 assets consist of exposures to central banks, government bonds and extremely high quality covered bonds.

50 EBA (2013): *Report on Appropriate Uniform Definitions of Extremely High Quality Liquid Assets (Extremely HQLA) and High Quality Liquid Assets (HQLA) and on Operational Requirements for Liquid Assets under Article 509(3) and (5) CRR.*

asset liquidity must be tested by regularly monetising a representative sample of assets.

Only a small quantity of covered bonds in the Czech Republic are freely for trading...

Covered bonds in the Czech Republic consist almost entirely of mortgage bonds. As of December 2014, there were 256 issues, with a total volume of CZK 412 billion, representing almost 7.8% of the domestic banking sector's total assets. Medium-sized banks account for the largest volumes of mortgage bonds issued. Issues take place mainly within banking groups (see Charts III.34 and III.35). There are no major differences between the accounting categories reflecting investors' intentions regarding the handling of mortgage bond holdings (see Chart III.35). Aggregate data for the banking sector reveal that almost all mortgage bonds represent long-term investments not held for trading (67%) or held as available for sale (31%). Less than 2% are held in the trading book. Most mortgage bonds are held by the domestic banking sector (CZK 246 billion, 89%). The rest are held by domestic insurance companies (CZK 26 billion) and PMC funds (CZK 4 billion). Here again, only a tiny proportion are held for trading. Very few mortgage bonds are freely available in the market.

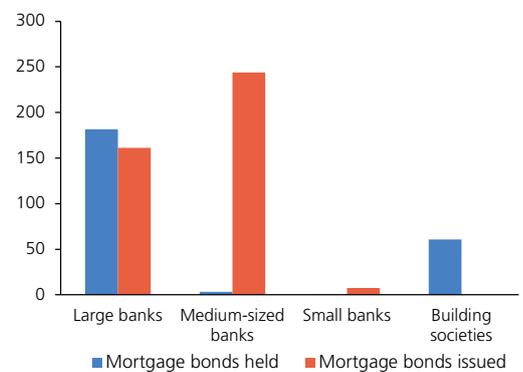
... and this is reflected in their low market liquidity

Using three basic market liquidity metrics – turnover, turnover ratios and ratio of zero-trading days – the relative liquidity of mortgage bonds was compared with the liquidity of covered bonds in the European market and of government bonds in the Czech and European markets on data for the period 1 January 2008–30 September 2014.⁵¹ The analysis revealed that Czech mortgage bonds display lower liquidity for all the metrics and investment opportunities compared (see Table III.10). The lower turnovers are due mainly to the lower volumes of mortgage bonds compared to covered bonds in the European market. However, turnover is also five times lower in relation to the volume issued than in the European covered bond market. The ratio of zero-trading days also indicates low liquidity of the Czech mortgage bond market. Domestic mortgage bonds are traded on only 1% of trading days, i.e. once every 4.5 months on average. However, there are sizeable differences in frequency across issues – some of them are traded on 25% of trading days on average, while others are never traded.

51 The calculations for the EU were taken from an EBA analysis. Since the EBA documents do not give certain methodological details that affect the data base for the calculations, the comparison of the measured values may be somewhat distorted. The methodological differences in the calculations on Czech data may be to the detriment of mortgage bonds, as a more conservative approach was used whenever anything was unclear in the calculations. The EBA also presented other liquidity metrics derived from market price volatility in its analysis. These metrics were not calculated for mortgage bonds owing to the small number of quoted issues.

CHART III.34

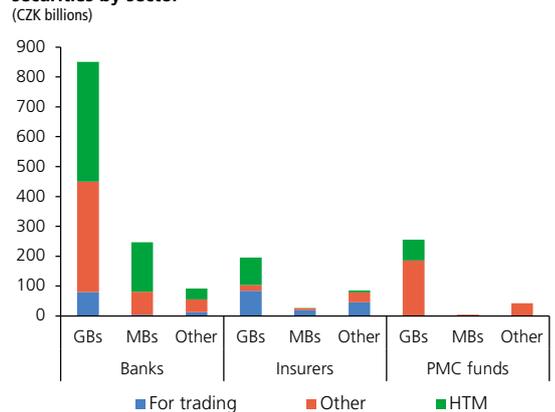
Mortgage bonds held and issued by domestic banks (CZK billions)



Source: CNB

CHART III.35

Holdings of mortgage bonds and other types of debt securities by sector (CZK billions)



Source: CNB

Note: HTM = held to maturity.

TABLE III.10

Comparison of the liquidity of the covered bond and government bond markets in the EU and the Czech Republic (CZK billions)

Type of security	Turnover (CZK billions)	Turnover ratio	Zero-trading days
GBs (EU)	98.171	0.131	0.792
	(467.458)	(0.489)	(0.334)
GBs (CZ)	2.908	0.098	0.506
	(1.534)	(0.078)	(0.153)
CBs (EU)	4.232	0.059	0.884
	(22.577)	(0.29)	(0.218)
MBs	0.462	0.012	0.989
	(1.466)	(0.036)	(0.025)

Source: CNB, EBA

Note: CBs = covered bonds. The standard deviations of the indicators are given in parentheses.

Czech mortgage bonds do not satisfy the criteria for inclusion in the liquidity buffer

Insufficient market liquidity is not the only reason why Czech mortgage bonds cannot be included in the LCR liquidity buffer (special transactions could be used to formally satisfy the regulatory testing rule for market liquidity in certain circumstances). Czech mortgage bonds also fail to satisfy the quality requirements laid down in the Commission delegated regulation, especially the criterion on minimum regulatory over-collateralisation. A comparison of regulatory frameworks across selected EU countries⁵² reveals that the current regulation of covered bonds in the Czech Republic is less specific in most key areas of liquidity and credit quality and is not compliant with the recommended provisions in several areas. These provisions include, for example, a stable share of mortgage loans backed by residential and commercial property, the stipulation of minimum over-collateralisation and the regulation of all risks associated with covered bonds. For this reason, it is desirable to amend the rules for covered bonds. The ability to diversify the current fairly homogeneous liquidity buffer will be enhanced if, in the future, mortgage bonds can be treated as liquid assets for LCR purposes.

52 EBA (2014): *EBA Report on EU Covered Bond Frameworks and Capital Treatment*.