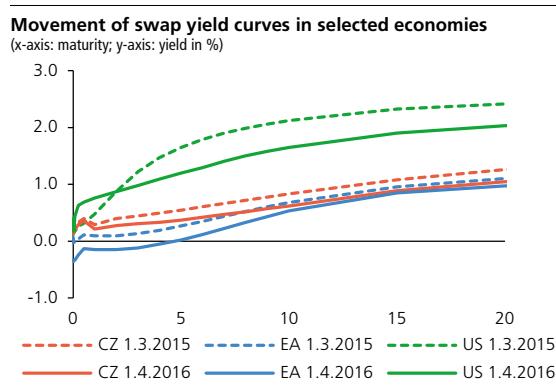


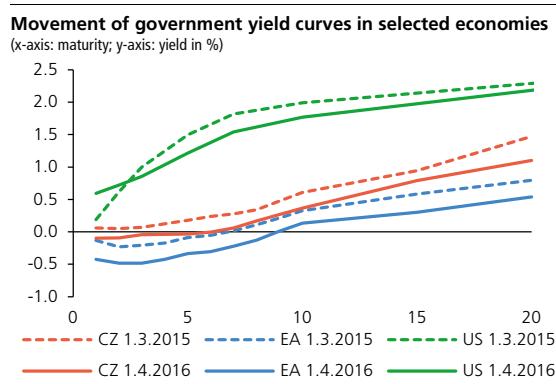
CHART II.1



Source: Bloomberg L.P.

Note: The yield curves are derived from interbank rates with maturities of up to six months and swap rates denominated in the currency of the relevant region.

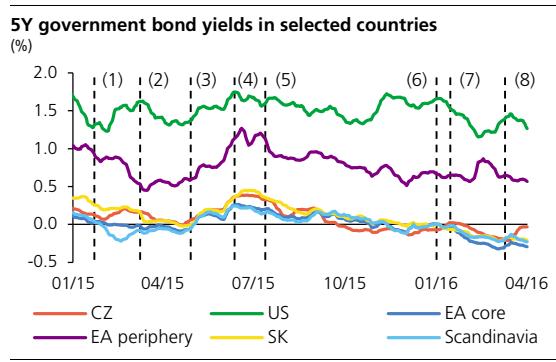
CHART II.2



Source: Bloomberg L.P.

Note: The yield curves are derived from generic government bond yields. German government bonds are used for EA.

CHART II.3



Source: Thomson Reuters, Bloomberg, CNB calculation

Note: EA core comprises AT, BE, DE, FR and NL. Periphery consists of ES, IE, IT, PT and SI. Scandinavia is represented by DK, FI and SE. The figures for groups of countries are the simple averages of the yields. The series are smoothed by the 5-day moving average. (1) The announcement of QE by the ECB on 22 January 2015, (2) the launch of QE by the ECB on 9 March 2015, (3) the FOMC meeting on 29 April 2015 and the deadline for renegotiating Greek aid conditions, (4) the start of the decline on the Shanghai exchange on 12 June 2015, (5) the agreement with Greece on a new bail-out programme on 13 July 2015, (6) the lowering of the deposit rate by the ECB on 3 December 2015, (7) the increase of the main MP rate by the Fed on 17 December 2015, (8) the further reduction of MP rates by the ECB and the modification of its QE programmes on 10 March 2016.

## 2 THE REAL ECONOMY AND FINANCIAL MARKETS

### 2.1 THE MACROECONOMIC AND FINANCIAL ENVIRONMENT

The recovery in advanced economies, including the euro area, remains fragile. As a result of persisting anti-inflationary risks, the ECB and other central banks in Europe are continuing to ease monetary conditions. Euro area credit growth is showing signs of recovery, but remains very mixed across countries. Economic growth in some emerging economies is slowing further. Coupled with a high share of foreign currency debt and low commodity prices, this is generating risks with regard to the debt servicing ability of some countries. The growth of the Czech economy and the easy monetary conditions are being reflected in faster growth in loans to the private sector. The easy monetary conditions are also giving rise to a further decline in Czech government bond yields, which have turned negative even for longer maturities. Given the low liquidity of this market, the rising share of non-residents in holdings of Czech government bonds could become a source of vulnerability for the domestic financial sector. However, a potential return to recession and financial market instability in the euro area remain the primary risks to the Czech economy.

#### 2.1.1 THE EXTERNAL ENVIRONMENT

##### The economic recovery in advanced economies is still fragile...

Economic growth remained weak in the euro area and mixed across the member countries in 2015. The GDP forecasts for this year and the next expect relatively modest growth of around 1.5% in both Germany and the euro area as a whole. In the USA, by contrast, the strong economic recovery observed in 2014 continued in the first half of 2015. According to preliminary data,<sup>1</sup> however, 2015 Q4 saw a slowdown in GDP growth in the USA and many other advanced economies, including Asian ones. The economic growth outlooks for this year worsened in some advanced countries in connection with these data.<sup>2</sup> Global economic growth thus remains surrounded by many uncertainties.<sup>3</sup>

##### ...and the monetary conditions will remain easy for a longer period to come

In December 2015, the Fed responded to robust data from the real economy (in particular from the labour market) by raising its monetary policy rates by 0.25 pp for the first time since 2008. So far it has not continued to tighten the monetary conditions because of uncertainty

1 IMF (2016): *World Economic Outlook*, April.

2 According to these outlooks, the rate of growth of the euro area economy will be close to that of the US economy this year, but will diverge from it again next year, with the US economy accelerating ahead by 0.8 pp. Japan is still expecting growth of only just above 0.5% this year, with slightly declining outlooks.

3 For details see CNB (2016): *Global Economic Outlook*, March.

regarding a more lasting recovery of the US real economy, and its recent communications have been shaping expectations of more gradual monetary policy tightening. There are also concerns that a sharper increase in dollar interest rates could have an adverse effect on global market risk premia and could lead to higher volatility of interest rates, exchange rates or asset prices. Expectations of a somewhat longer period of very low interest rates are also visible in a further downward shift of the long end of the dollar yield curve (see Charts II.1 and II.2).

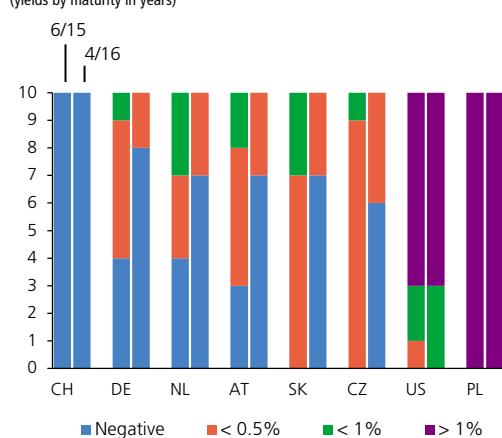
The euro area monetary conditions remain easy, with no sign of tightening before the end of 2017. The ECB cut its monetary policy rates in December 2015 and again in March 2016. The key rate was set at 0% and the deposit rate at -0.40%. In addition, the quantitative easing programme was expanded. As from April 2016, the monthly amount of purchased instruments was extended from EUR 60 billion to EUR 80 billion and investment-grade corporate bonds will now also be purchased. In addition, a new programme of longer-term refinancing operations (TLTRO II) with a maturity of four years was announced, with the first operation to be launched in June 2016. In response to the announcement, euro yield curves fell again along their entire length (see Charts II.1 and II.2) and negative values can now be observed for the government bond yield curves of the euro area core countries and Scandinavia (DK, FI, SE) even for maturities of 5–8 years (see Charts II.3 and II.4). Government bonds of euro area countries represent about 70% of the instruments purchased under the ECB's asset purchase programme.<sup>4</sup> In several lower-debt countries, purchased bonds now account for a significant proportion of government debt (see Table II.1).

### The low asset yields are a source of market risk

The low interest rates on bank products and very low government bond yields are creating an incentive for investors to take on risk on riskier asset markets. This may result in some asset prices rising above levels consistent with the long-term trends in economic fundamentals. From the global perspective, high prices on corporate bond markets combined with a decline in their risk premia remain one of the possible sources of systemic risk. The spreads on US and European high-yield corporate bonds have increased since the start of last year but remain relatively low (see Chart II.5). Rather than a low risk level, this may indicate a reduced ability of the markets to price the relevant risks. A sudden correction in bond prices (for example in response to negative economic news or stronger geopolitical risks) could be amplified by low market liquidity on bond markets. Owing to the strong correlation between many assets, there could be contagion to other markets and subsequent sizeable market losses.

CHART II.4

**Decline in government bond yields in selected countries**  
(yields by maturity in years)



Source: Bloomberg L.P., CNB calculation

Note: The first column of each pair denotes data as of 1 June 2015 and the second data as of 1 April 2016. On the vertical axis, yields for maturities of 1 to 10 years are colour-coded into one of four categories by yield level.

TABLE II.1

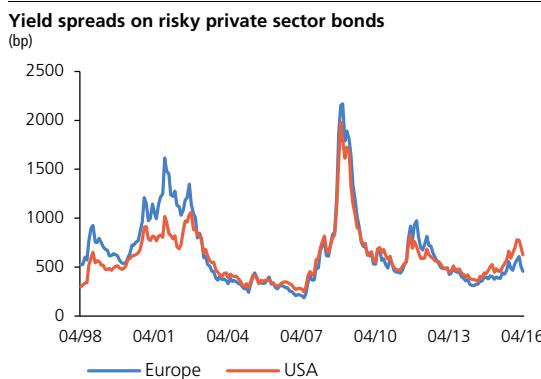
**Share of the purchased portion of government bonds in the ECB's QE programme**  
(%; as of 1 April 2016)

Country	Share of purchased portion in country's EUR issuance	ECB capital key	Debt to GDP (%)	5Y yield
LU	24.6	0.3	21.4	-0.24
LT	20.0	0.6	42.7	0.44
PT	19.9 (8.8)	2.5	129.0	1.78
SK	19.6	1.1	52.9	-0.22
LV	18.0	0.4	36.4	0.05
GR	17.7 (17.7)	2.9	176.9	8.90
IE	14.9 (7.2)	1.6	93.8	-0.01
SI	14.2	0.5	83.2	0.28
FI	11.9	1.8	63.1	-0.20
ES	10.8 (2.8)	12.6	99.2	0.33
DE	10.1	25.6	71.2	-0.33

Source: ECB, Bloomberg L.P., CNB calculation

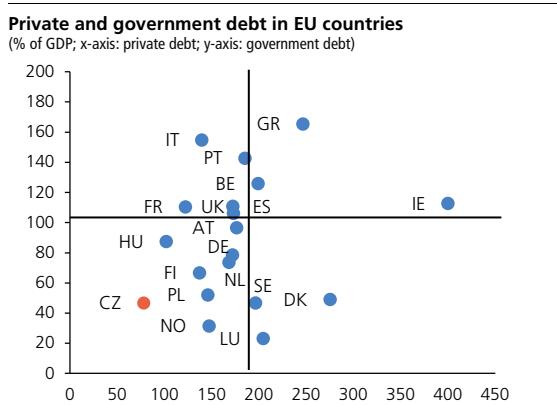
Note: The figure in parentheses denotes the portion purchased under the SMP programme discontinued in June 2014, which remains on the ECB's balance sheet. Capital key represents the country's share in the capital of the ECB, which determines the composition of government securities purchased in the ECB's QE programme. Debt to GDP as of the end of 2015. The table lists the countries whose share of the purchased portion exceeds 10%.

4 [www.ecb.europa.eu/mopo/implement/omt/html/index.en.html](http://www.ecb.europa.eu/mopo/implement/omt/html/index.en.html)

**CHART II.5**

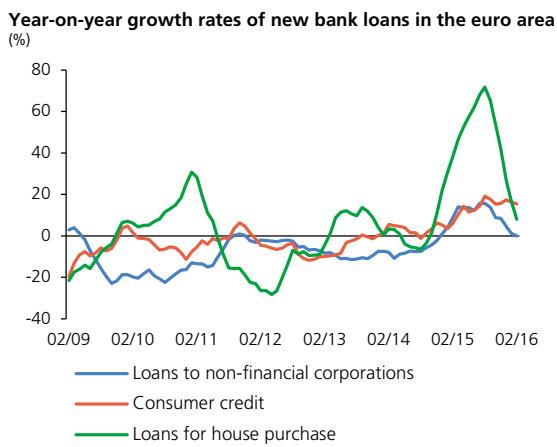
Source: Bloomberg L.P.

Note: The spread is the difference between yields on risky bonds and yields on government bonds adjusted for any embedded options (the option-adjusted spread). A risky bond is a speculative-grade bond (BB+ or lower).

**CHART II.6**

Source: BIS

Note: Debt is the sum of all credit provided by domestic banks, non-banks and non-residents. The private sector comprises non-financial corporations, households and NPISHs. The BIS debt calculation methodology may differ from that used by national authorities. For that reason, the data in the chart may not match those reported by other institutions.

**CHART II.7**

Source: ECB

Note: Smoothed by the three-month average.

**The effectiveness of ECB monetary policy may be reduced by persisting high indebtedness**

Persisting high private debt, which is often accompanied by sizeable government debt, is one of the obstacles to a return to stable economic growth in some euro area countries (see Chart II.6). This may reduce the effectiveness of the ECB's unconventional monetary policy instruments<sup>5</sup> and prompt a need to extend the period of very low interest rates. On the one hand, very low rates support domestic demand, but on the other hand they may be reflected in a further rise in private sector debt and a pick-up in property prices. These trends may not be sustainable from the long-term perspective.<sup>6</sup> At the same time, very low interest rates may contribute to the provision of lower-quality and riskier loans.<sup>7</sup> A return to recession would then lead to higher credit losses, which would complicate the still unfinished process of stabilisation of bank balance sheets.

**Credit growth remains very mixed across euro area countries**

The year-on-year growth rates of the stock of loans to households range from -4% in Ireland to 13% in Slovakia. The range is even wider for loans to non-financial corporations – from -15% in Malta to 8% in Estonia.<sup>8</sup> The aggregate perspective suggesting a recovery in euro area credit growth (see Chart II.7) thus conceals significant differences between countries. The low rates of growth, and in some countries absolute declines, in the stock of loans provided to the private sector, indicate a risk of a sustained deflation trend. Together with a further decrease in interest rates on new bank loans (see Chart II.8), this is significantly increasing the importance of preventive macroprudential policies at both the national and international level.

**Economic growth in emerging market economies is slowing...**

The GDP growth rates of emerging market economies (EMEs), including China, declined in 2015. The outlooks for this year and the next were subsequently revised downwards.<sup>9</sup> This, together with expectations of interest rate growth on US markets, was reflected in a substantial outflow of capital from these countries. While the slowdown in economic growth is putting pressure on countries' ability to repay existing debt, the capital outflow may contribute to a rise in potential future debt

5 CNB (2015): *Financial Stability Report 2014/2015*, pp. 21–22.6 Shirakawa, M. (2015): *Debate on deflation and the role of "nominal anchor"*, presentation at an inflation expectations symposium, Federal Reserve Bank of Minneapolis, 30 March 2015.7 Negative effects connected with excessive risk-taking by banks and the private sector may occur. For details see, for example, BIS (2012): *82nd Annual Report*, June, or Frait, J., Malová, S., Tomšík, V. (2015): *The interaction of monetary and macroprudential policies in the pursuit of the central bank's primary objectives*, Financial Stability Report 2014/2015, CNB.8 ESRB (2016): *ESRB Risk Dashboard*, March.9 In particular, news about the Chinese economy leads to swings in international capital flows. The impact of such news on other EMEs has increased markedly over the last 20 years. According to estimates, it currently explains about one-third of the total volatility on global stock and currency markets. Rising financial integration between countries plays a key role in this case and has become a more important factor than international trade. For details, see IMF (2016): *Global Financial Stability Report*, April.

refinancing costs. In some countries, rising debt servicing costs may result in defaults and substantial losses for investors.<sup>10</sup>

### **...which, together with the high share of foreign currency debt and low commodity prices, is putting pressure on important sectors of the economy**

The debt of the EME non-financial sector relative to GDP climbed to more than 170% in 2015, due mainly to non-financial corporations (around 100%), and to a lesser extent to government (around 40%) and households (around 30%). As many large corporations are state-owned, a deterioration of the debt sustainability outlook in the corporate sector may make public debt financing more expensive via state guarantees.<sup>11</sup> Liabilities denominated in US dollars, which could be subject to currency risk, account for a sizeable share of total EME debt (see Chart II.9). As a result of the expected economic slowdown in EMEs, the currencies of EMEs are weakening against the dollar, which is raising the cost of servicing this debt (see Chart II.10). Low commodity prices are another factor adversely affecting the debt servicing ability of some countries. Falling prices of oil, food and other commodities are generating risks for the public, non-financial and financial sectors. The risks mainly originate from persisting low commodity prices in the energy sector, which financed itself using a large quantity of bonds in the period of high profitability (a similar scenario pertains to the domestic energy sector – see section 2.3).<sup>12</sup>

## **2.1.2 THE DOMESTIC ENVIRONMENT**

### **The external environment is still the main risk to domestic economic growth**

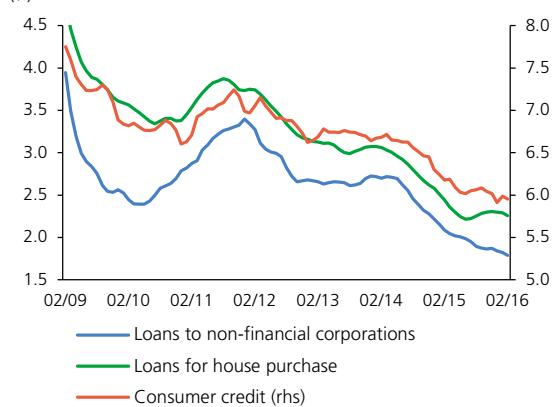
Domestic GDP increased by 4.3% in 2015, making the Czech economy one of the fastest-growing economies in Europe. The economic growth was fuelled by a combination of domestic factors. In the area of economic policy, these included easy monetary conditions and increased growth in government investment. A potential deterioration of economic activity in advanced countries (especially the euro area) is the main source of risk to the Czech economy over the next two years. Any adverse developments on emerging markets would hit the domestic economy only indirectly through a worsening of global sentiment and volatility in global financial markets.

### **The growth of the Czech economy and the easy monetary conditions are being reflected in faster growth in loans to the private sector**

Total bank loans to the private sector rose by 5.8% and total deposits by 7.0% year on year in 2015. The faster credit growth reflected stronger dynamics of loans to both non-financial corporations and households

**CHART II.8**

**Interest rates on new bank loans in the euro area (%)**

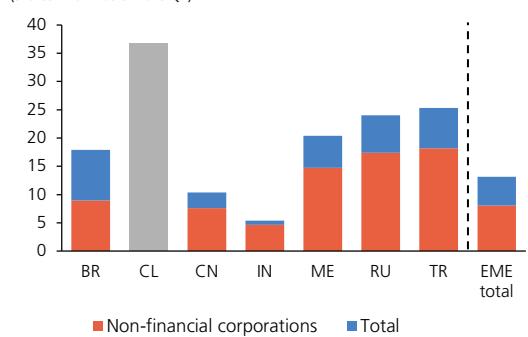


Source: ECB

Note: Smoothed by the three-month moving average.

**CHART II.9**

**USD-denominated debt of non-banks (shares in GDP as of 2015 Q2)**

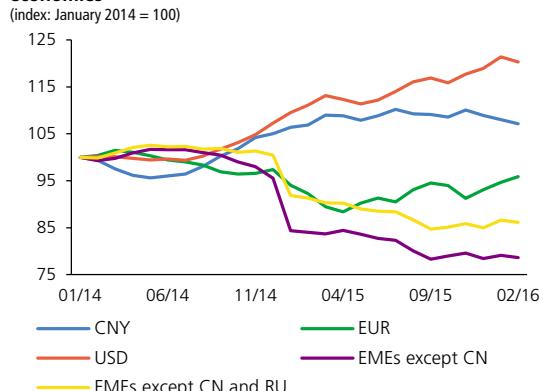


Source: BIS, IMF

Note: Non-banks comprise non-bank financial institutions, non-financial corporations, government, households and international organisations. Debt is the sum of local and cross-border loans and bonds issued in USD. In the case of Chile, it was not possible to separate non-financial corporations from the rest of the non-bank sector.

**CHART II.10**

**Nominal effective exchange rates in EMEs and selected economies (index: January 2014 = 100)**



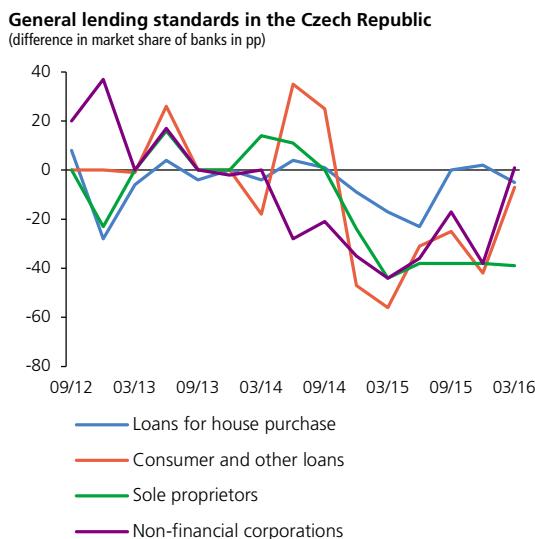
Source: BIS, IMF, CNB calculation

Note: The index for EMEs is calculated as a weighted sum, where the weights are annual GDP. The index covers 20 countries accounting for more than 80% of the total GDP of all EMEs. Higher values mean appreciation.

10 Increased debt problems of firms, reflected in a rise in NPLs, are now visible in some EMEs.

11 IMF (2016): *Global Financial Stability Report*, April; p. 25.

12 IMF (2016): *Global Financial Stability Report*, April; p. 24.

**CHART II.11**

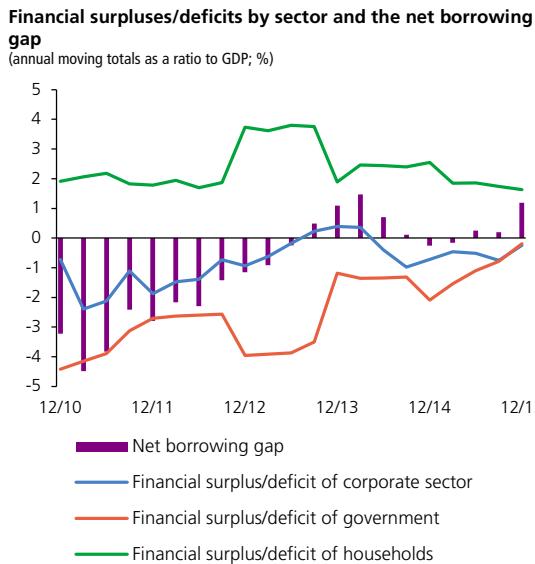
Source: Bank Lending Survey, CNB

Note: The data represent the difference between the market share of banks that reported a tightening of credit standards and banks that reported an easing of credit standards in the past three months. More information on the indicator methodology can be found on the CNB website.

(see sections 2.3 and 2.4). The sizeable decline in the average client interest rate on new loans to the private sector has stabilised in recent months, mainly because the declines in interest rates on loans to non-financial corporations and loans for house purchase halted. By contrast, rates on new consumer credit started to fall more markedly during 2015 (see section 2.4). According to the Bank Lending Survey,<sup>13</sup> demand for loans for house purchase and consumer credit, and to a lesser extent corporate loans, saw broad growth in 2016 Q1. The easing of credit standards applying to most types of loans came to a halt (with the exception of loans to sole traders; see Chart II.11). In 2016 Q2, banks expect credit standards to ease for corporate loans and consumer credit, but to tighten for house purchase loans.

### The risk of a balance-sheet recession in the Czech economy remains low

The financial surplus of households decreased slightly and the financial deficit of the corporate sector (non-financial and financial corporations) declined during 2015 amid a decrease in the general government deficit (see Chart II.12). The gap between the financial surpluses of the private sector and general government thus remained close to zero for most of the year. This indicates that the domestic economy is not generating excessive financial surpluses with a negative effect on demand.

**CHART II.12**

Source: CZSO, CNB

### Czech government bond yields are falling into negative territory even for longer maturities

The combination of a persisting positive interest rate differential between the Czech koruna and the euro in some financial market segments and the use of the exchange rate as an additional monetary policy instrument increased the interest of foreign investors in domestic assets. The increased interest of non-residents was reflected in a rise not only in their share of the financing of Czech banks, but also in their share in Czech koruna government bond holdings (see Chart II.13). The free koruna liquidity held by non-residents, coupled with the situation on the koruna foreign exchange market, led to a drop in domestic government bond yields to negative levels for maturities of up to six years (see Chart II.2). The Czech Republic has negative rates even on the primary market (see Table II.2). The same can be seen for some euro area countries and for Switzerland and Sweden.

### The rising share of non-residents in holdings of Czech assets is increasing the risk of elevated volatility of the prices of such assets

The risk of spillover of external shocks to the domestic financial system is rising as the presence of non-residents increases and their share in holdings of domestic assets. In an environment of lower liquidity on Czech financial markets, a sell-off of domestic assets by global investors could cause high market price volatility. This would affect domestic financial institutions, which are still major holders of such assets

13 CNB (2016): *Bank Lending Survey*, April.

(see Chart II.14). The CNB has long analysed this scenario in its Financial Stability Reports. Market risk in each sector is stress tested on an annual basis (see sections 3.2 to 3.4). The stress tests confirm that institutional investors are among the most sensitive to market risk (especially interest rate risk). This results from the structure of their portfolios, which are made up mainly of high-quality bonds revalued to fair value (see Chart II.15). The impact of this scenario on financial institutions depends to a large extent on the size of the revalued bond portfolio, the volume and price of sales, the amount of bonds used as collateral in repo operations in the event of sale of collateral, and above all the level of hedging of each financial institution against interest rate risk. The portfolios of the different types of institutional investors are very similar (see Chart II.16). However, their reactions to sharp temporary swings in bond prices may not take the uniform shape of mass sell-offs and immediate realised losses. Insurance companies are partially protected against temporary market swings by the rules for pricing assets and liabilities (see the relevant thematic article in this Report)<sup>14</sup> and their level of hedging against interest rate risk is relatively high. The pension management company sector uses interest rate risk hedging to a limited extent (see section 3.2). Transformed funds of pension management companies may be partly protected against temporary swings by an accumulated buffer of unrealised revaluation changes from previous years. In addition, pension management companies might prefer the risk of having to temporarily supply their own funds in the event of a decline in the asset value of a transformed fund below its liabilities as they did in 2007–2009, to realising their high-quality assets at disadvantageous prices.

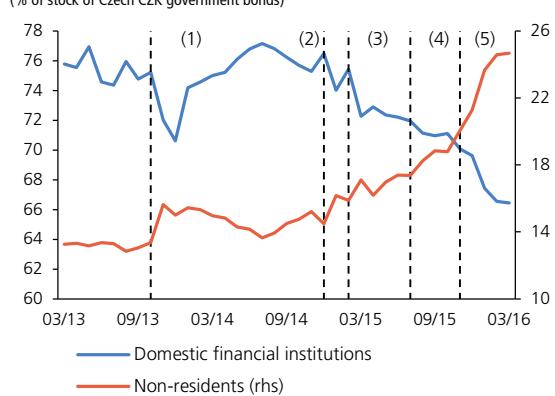
#### Domestic financial institutions could reduce their presence on the domestic government bond market

The current developments on the Czech government bond market seem to be pointing to a potential rise in medium-term systemic risks. With yields in negative territory, Czech government bonds are ceasing to be an attractive investment for domestic financial institutions. The traditional government bond holders are thus being gradually crowded out of the market by non-residents (see Chart II.13). On the one hand, this means a gradual decrease in sovereign exposure concentration risk in the domestic sector (see section 3.4) and hence in the risk of sizeable market losses if yields were to rise back to historically normal levels. On the other hand, the options for these institutions to diversify their liquid portfolios have narrowed considerably (see section 3.3). For banks, depositing liquidity with the CNB remains virtually the only koruna option. The environment of negative yields is having a greater impact on institutional investors, whose balance sheets are dominated by Czech government bonds (see Chart II.15). These institutions do not have direct access to CNB facilities, and bank deposits are often subject to intra-group limits. They

<sup>14</sup> Dvořák, M., Gronychová, M., Hausenblas, V., Komárová, Z. (2016): Could the Czech insurance sector be a source of systemic risk? Financial Stability Report 2015/2016, CNB.

CHART II.13

#### Holders of Czech government bonds (% of stock of Czech CZK government bonds)



Source: MF CR, CNB calculation

Note: Vertical lines denote the last monthly observation before (1) the announcement of the exchange rate commitment by the CNB on 7 November 2013, (2) the official announcement of QE by the ECB on 22 January 2015, (3) the launch of QE by the ECB on 9 March 2015, (4) the first CNB foreign exchange intervention since November 2013 on 17 July 2015 and (5) the lowering of the deposit rate by the ECB on 3 December 2015.

TABLE II.12

#### Tenders for Czech government securities with negative yields

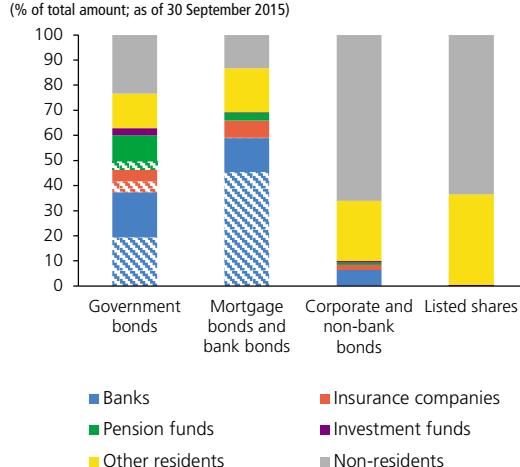
Tender period	No. of tenders	Average maturity (years)	Average yield (%)	Volume of issue (CZK billions)	Share in koruna bonds (%)
2015 Q3	6	1.29	-0.26	45 135	3.3
2015 Q4	9	1.90	-0.27	70 329	5.2
2016 Q1	14	1.62	-0.11	66 134	4.9
Total	29	1.65	-0.21	181 598	13.3

Source: MF CR, CNB, CNB calculation

Note: The volume does not include issues purchased by the Finance Ministry. Tenders up to 1 April 2016. The share in koruna bonds relates to the debt outstanding by the end of 2015.

CHART II.14

#### Holdings of financial assets issued by residents broken down by sector (% of total amount; as of 30 September 2015)

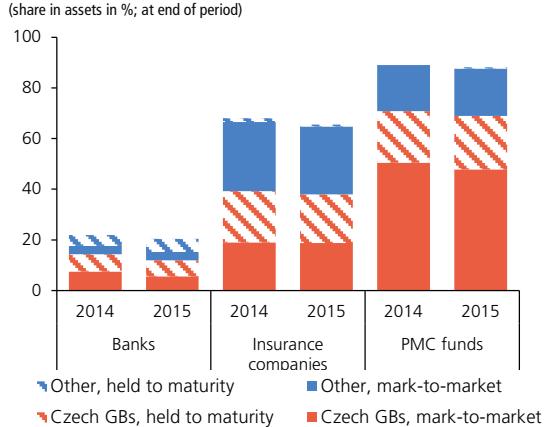


Source: CNB

Note: The hatched areas represent securities in the accounting categories "held to maturity" or "loans and other receivables", which are not available for sale.

**CHART II.15****Structure of the bond portfolio by sector and valuation method**

(share in assets in %; at end of period)



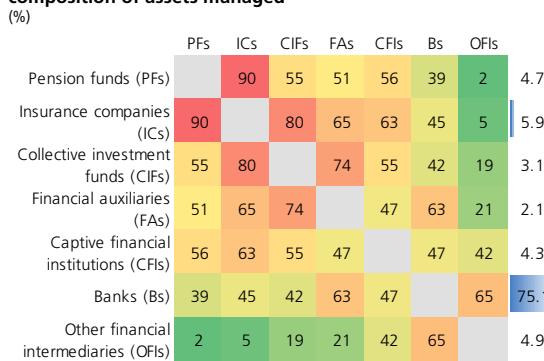
Source: CNB

Note: The category "mark-to-market" includes available-for-sale assets. The figures for the insurance sector include financial placement of unit-linked policies. GBs = government bonds.

may therefore opt to invest in riskier assets, including foreign currency assets (see section 3.1).

### **Shortening average residual maturity may imply medium-term risks**

From the point of view of current government debt servicing costs and fiscal space, the continued negative yields achieved in bond auctions are having a favourable effect and are contributing to a further drop in the Czech government's interest rate expenditure. This is in line with the nature of demand from non-residents (see Charts II.17 and II.18). From the medium-term perspective, however, this trend is increasing the risks regarding future refinancing of domestic debt. The possibility of negative debt financing costs is creating an incentive to issue at the short end of the yield curve. However, a longer average maturity would be desirable, as it generally acts as a safeguard against adverse conditions arising when too much debt is refinanced over a short time (insufficient demand, higher interest rates in the future). From the financial stability perspective, it would be beneficial to at least maintain the medium-term horizon for the average residual maturity of Czech government debt with a target value of six years until 2018, or even extend it as in other countries given the generally favourable interest rate conditions (see Chart II.18). Such an issuance policy would also partly satisfy the demand among domestic institutional investors for government bonds with positive yields. Their demand tends to be more stable over time than demand from non-residents.

**CHART II.16****Similarity of sectors of the financial market according to the composition of assets managed (%)**

Source: CNB, CNB calculation

Note: A high figure (red) denotes high similarity in the composition of financial assets. The last column represents the sector's importance in terms of its share in total assets. Similarity is measured as cosine similarity (Brehler et al. 2014: *Similarity and Clustering of Banks: Application to the Credit Exposures of the Czech Banking Sector*, CNB Research and Policy Notes 2014/04). The asset composition is divided into categories: loans to non-financial corporations, loans to households, Czech government bonds, bonds of non-financial corporations, bonds of financial institutions, equities and shares of non-financial corporations, equities and shares of financial institutions, currency and deposits, other domestic exposures, foreign equities and shares, foreign bonds and deposits, other foreign assets.

### **Alternative economic scenarios**

Alternative economic scenarios were defined on the basis of potential alternative future macroeconomic trends along with the risks identified. These scenarios are used mainly in sections 3.2 to 3.4 to test the resilience of the Czech financial sector. The paths of key variables in each scenario are shown in Charts II.19 A–D.<sup>15</sup> The evolution of other variables relevant to the stress tests in relation to the evolution of the macroeconomic environment (credit growth, the default rate, the NPL ratio<sup>16</sup> and property prices) is presented in the following sections.

The *Baseline Scenario* is based on the CNB's May macroeconomic forecast published in Inflation Report II/2016 and assumes slower growth in economic activity of 2.3% this year due to a decline in government investment co-financed from EU funds. On the other hand, economic activity will still be supported by easy monetary conditions, rising external demand and low oil prices. This scenario expects economic growth to pick up pace to more than 3% in 2017 and 2018. The general unemployment rate falls to 4% as economic activity increases at the scenario horizon. Headline inflation will rise from its current low levels

<sup>15</sup> The path for the *Baseline Scenario* in the first two years is based on the CNB's official prediction of May 2016. Beyond this horizon it is extrapolated towards the expected long-term equilibrium values.

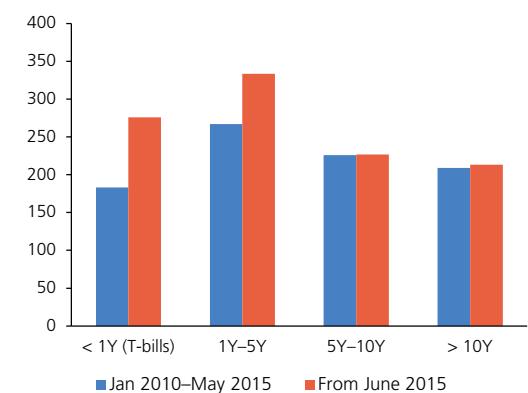
<sup>16</sup> The default rate and the NPL ratio relate to the same event, i.e. to default. Whereas the default rate is a (usually forward-looking) flow indicator focused on a particular time interval (see the Glossary), the NPL ratio is a stock indicator describing the level of NPLs at a given point in time.

and reach the 2% inflation target in the second half of 2017. Consistent with the forecast is stability of market interest rates until mid-2017, followed by a gradual increase in rates in the second half of 2017. The forecast also assumes that the exchange rate will be used as a monetary policy instrument until mid-2017.

The Adverse Scenario assumes an end to the euro area recovery and a marked drop in economic activity in Europe. This may be caused, for example, by negative expectations about global economic growth and a renewed increase in investors' risk aversion with regard to the EU and emerging economies. The Czech economy falls back into recession owing to a decrease in external demand. This causes a return of pessimistic private sector expectations about future economic developments and renewed deferral of household consumption and corporate investment. The combination of a downturn in external demand and then also in domestic demand will cause a sizeable decline in economic activity in the Czech Republic and result in a V-shaped recession. In addition, the debt deflation scenario will materialise, with price deflation leading to an increase in private sector debt in real terms as a result of declining economic activity, rising unemployment and falling wages. The adverse economic situation causes the funds of households and non-financial corporations gradually to become exhausted. Coupled with a rise in real debt, this causes a significant deterioration in their ability to repay their obligations. The problems in the real economy later also affect the financial sector, which records considerable credit losses and a marked decline in profits. Monetary policy remains easy, the three-month PRIBOR stays very low over the entire test horizon and the exchange rate weakens sharply. However, long-term bond yields surge as global risk aversion increases and the quality of some assets is re-assessed. At the same time, banks tighten their view of credit risk and increase their risk mark-ups on interest rates on new loans, which will shift to a much higher level also due to an increase in long-term interest rates. The related rise in debt service together with the other impacts of recession will increase the default rate for loans for house purchase and loans to non-financial corporations.

**CHART II.17**

**Excess demand in tenders for Czech government securities**  
(x-axis: maturity of issue; y-axis: demand from primary dealers relative to original supply from ministry in %)

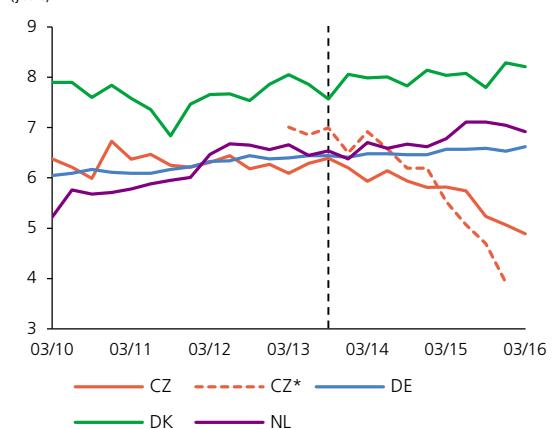


Source: CNB, CNB calculation

Note: Tenders up to 1 April 2016. A total of 56 issues have taken place since June 2015. Weighted by issue size.

**CHART II.18**

**Average residual maturity of government debt in selected countries**  
(years)

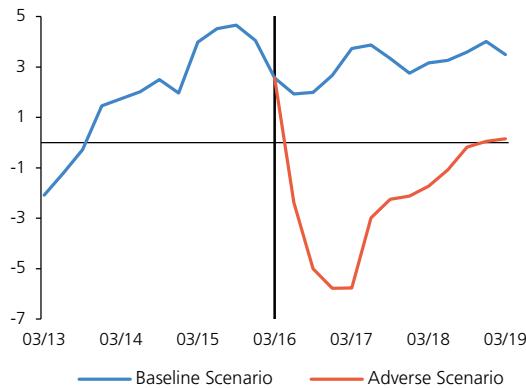


Source: Bloomberg L.P., CNB, CNB calculation

Note: CZ\* represents the average residual maturity of koruna government bonds held by non-residents. The vertical line denotes the last quarterly observation before the announcement of the exchange rate commitment by the CNB.

**CHART II.19 A**

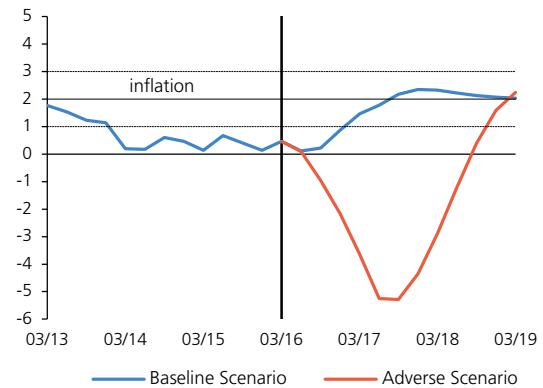
**Alternative scenarios: real GDP growth**  
(year-on-year change in %)



Source: CNB

**CHART II.19 B**

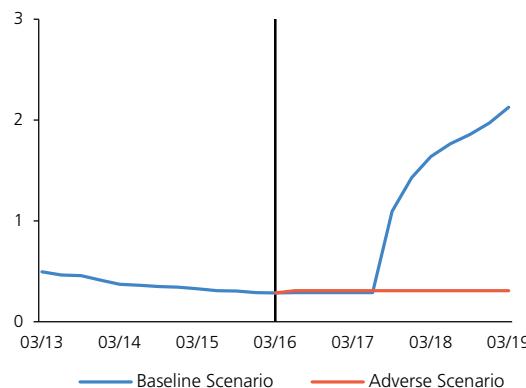
**Alternative scenarios: inflation**  
(%)



Source: CNB

**CHART II.19 C**

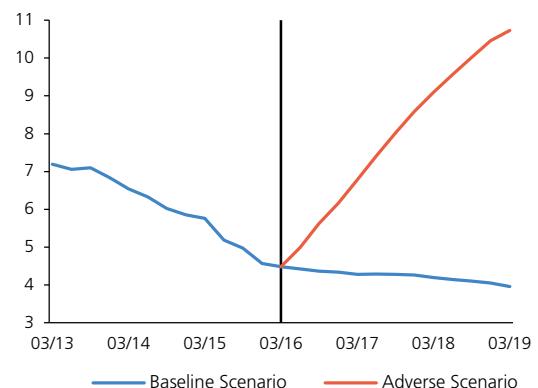
**Alternative scenarios: 3M PRIBOR**  
(%)



Source: CNB

**CHART II.19 D**

**Alternative scenarios: unemployment**  
(%)



Source: CNB

## 2.2 THE PROPERTY MARKET

Residential and commercial property prices in the Czech Republic both went up in 2015, as they did in many other countries. As regards residential property, the highest growth was recorded for apartment prices, which accelerated throughout the year. The different growth in apartment prices in Prague and the rest of the country equalised. In Prague, the difference between asking prices and transaction prices continued to widen. Overly optimistic expectations about future price growth could lead to adjustment of transaction prices towards asking prices and to the emergence of a price spiral. In the event of an adverse shock in the form of a sizeable increase in interest rates and a deterioration in the income of borrowers, credit losses on mortgage loans could increase significantly. In the event of lower-than-planned selling prices, credit losses on loans to developers could rise.

### Easy monetary conditions in many countries are fostering property price growth

Globally low interest rates on loans for house purchase and the search for yield in an environment of low returns on alternative assets are motivating households and investors to purchase property and are thus fostering property price growth. In some countries, residential property prices are continuing to show growth driven by demographic trends and long-term easing of credit standards (SE, NL). Prices are also rising sharply in countries that experienced substantial corrections in past years (UK, IE, EE). Some markets are seeing much faster price growth in their capital cities or several large agglomerations (AT, DE, IE, DK).<sup>17</sup> In most cases, this is being fuelled in part by foreign demand. Commercial property prices are also rising and their prime yields are falling. These returns are already below their pre-crisis levels in some countries (DE).<sup>18</sup>

### Residential property prices are also rising in the Czech Republic...

Residential property prices went up in all segments in the Czech Republic (see Chart II.20).<sup>19</sup> Transaction prices of apartments rose by 4.5% year on year in 2015, with the pace of growth increasing as the year progressed (see Chart II.21). This was fuelled by accelerating price growth outside Prague, which according to estimates reached 7.4% year on year in 2015 Q4 and outpaced that in Prague (4.6%). According to regional estimates available for the first half of the year, apartment prices rose in most regions. Consistent with the *Baseline Scenario* is a further gradual rise in apartment prices (see Chart II.22).

### ...and are assessed as slightly overvalued

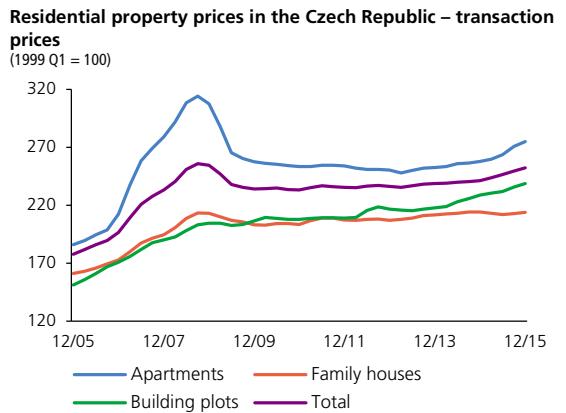
The methods used by the CNB indicate that apartment prices were slightly overvalued at the end of 2015. The estimated overvaluation in relation to economic fundamentals was mostly close to 5%

<sup>17</sup> ECB (2015): *Financial Stability Review*, November 2015.

<sup>18</sup> Ibid.

<sup>19</sup> Transaction prices of family houses fell in some regions; on average they were flat.

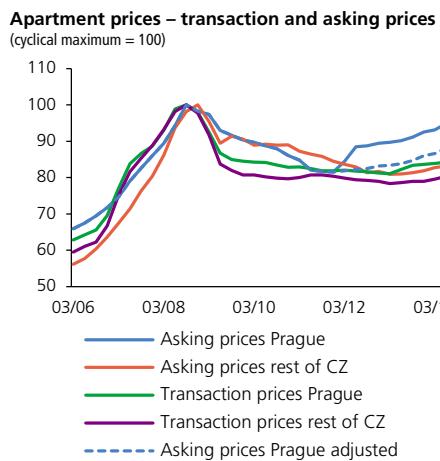
CHART II.20



Source: CZSO, HB index, CNB calculation

Note: The data for family houses and apartments for 2015 H1 are preliminary. The other data for 2015 are calculated from alternative sources of data on transaction prices (apartment transaction prices from a CZSO survey, the HB index and the CZSO House Price Index).

CHART II.21



Source: CZSO, CNB calculation

Note: The adjustment of asking prices in Prague according to the CZSO involved reducing them by the significant growth recorded in 2012, which has not been confirmed by alternative data sources.

CHART II.22

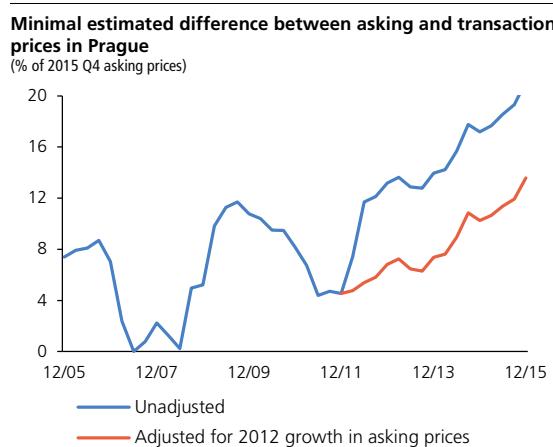


Source: CNB

**TABLE II.3**

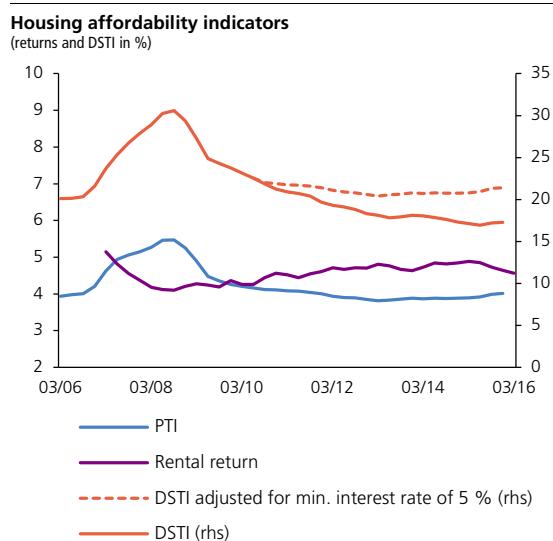
Degree of apartment price overvaluation according to various methods (%)	
Supply and demand model	0.3
Adjusted price-to-income ratio	4.8
Adjusted price-to-rent ratio	4.5
Accelerator model	5.2

Source: CNB calculation

**CHART II.23**

Source: CZSO, CNB calculation

Note: The adjustment of asking prices in Prague involved reducing them by the significant growth recorded in 2012, which has not been confirmed by alternative data sources.

**CHART II.24**

Source: CZSO, IRI, CNB calculation

Note: PTI and DSTI are obtained as the ratio of, respectively, the price of and monthly instalment on a 68 m<sup>2</sup> apartment to, respectively, the moving average of the annual and monthly wage. A mortgage with an LTV of 65% and a repayment period of 20 years was considered for the DSTI calculation. The data for 2015 are preliminary. The apartment rental return was obtained as the ratio of annual rent to the price of a 68 m<sup>2</sup> apartment.

(see Table II.3).<sup>20</sup> At times of economic growth and buoyant credit growth, however, property price determinants may themselves show "better-than-sustainable" growth. Price sustainability evaluation techniques that work with such determinants can therefore underestimate the actual overvaluation. One of these determinants that is currently at historical lows is the interest rate on loans for house purchase.<sup>21</sup> According to the *Baseline Scenario*, the overvaluation of apartment prices will increase further over the next two years.<sup>22</sup>

### The growth in asking prices of apartments may become one of the sources of a price spiral...

The apartment price trend in Prague continued to be characterised by faster growth in asking prices than transaction prices. While asking prices in Prague as of the end of 2015 recorded cumulative growth of 30% compared to their previous lows, thus exceeding their 2008 high (see Chart II.21), transaction prices were only 12% higher on the same date.<sup>23</sup> By contrast, asking and transaction prices in the rest of the Czech Republic were up by a close 12% and 14% on their previous lows. According to CNB estimates, asking prices in Prague may have been at least 14% higher than transaction prices at the end of 2015 (see Chart II.23).<sup>24</sup> Moreover, growth in asking prices in Prague accelerated further in 2016 Q1 (to 10.2% year on year). Earlier and faster growth in asking prices than in transaction prices is typical of an initial price recovery stage. However, sustained excessive growth in asking prices could lead to self-fulfilling expectations about future price growth and to the emergence of a price spiral.

### ...and lead to credit losses on mortgage loans in the event of a significant change in interest rates...

Slightly faster growth in residential property prices relative to wage growth in 2015 led to a gradual decrease in apartment affordability (the price-to-income ratio, PTI; see Chart II.24). Slowing growth or a decline in rent in some regions also led to a decrease in rental returns.<sup>25</sup> Due to a further reduction of interest rates on loans for house purchase, the affordability of loans and the perceived profitability of purchasing an apartment on credit (the debt service-to-income ratio, DSTI) increased

20 Three out of the four methods used by the CNB to evaluate price sustainability indicate price overvaluation of close to 5%. The fourth method evaluates prices as being in line with fundamentals.

21 In relation to income (i.e. excluding all other factors), apartment transaction prices rose by 7% from their last low.

22 The forecasts were drawn up using the accelerator model, which is a method used to evaluate the sustainability of current prices. The advantage of this model is that it works with fundamentals predicted by CNB satellite models.

23 Part of the growth in asking prices in Prague was due to rapid year-on-year growth recorded in 2012. As apartment prices went down in this period according to alternative apartment price estimates, this could be a statistical anomaly in the CZSO data.

24 The average difference between asking and transaction prices in Prague cannot be determined exactly – information on such prices is only available in the form of a price index measuring their relative growth, not their absolute level. The estimation therefore assumes that asking prices were equal to or higher than transaction prices when they reached their trough in the monitored period. For the purposes of this estimation, asking prices in Prague according to the CZSO were reduced by the growth recorded in 2012, which has not been confirmed by alternative data sources.

25 Apartment rental returns were obtained as the ratio of annual rent to the price of a 68 m<sup>2</sup> apartment.

further. However, the ability of some households to service these loans could deteriorate in the event of a sharp rise in interest rates (see sections 2.4 and 4.3). Given a hypothetical assumption of a 5% increase in interest rates on loans for house purchase, the ratio of the instalments on an illustrative mortgage<sup>26</sup> to the wage would have been 4 pp higher at the end of 2015.

#### **...or to credit losses on loans to developers in the event of lower-than-expected price growth**

An analysis of the number of apartment starts reveals<sup>27</sup> that in 2015 apartment starts in Prague were broadly in line with the average price elasticity to asking prices observed since 2006 (see Chart II.25). In the rest of the Czech Republic, by contrast, apartment starts were relatively lower. However, a simple model of the relationship between growth in asking and transaction prices<sup>28</sup> indicates that at the end of 2015, asking prices in Prague were 7% higher than implied by the relationship between those two types of prices observed since 2005. A potential downward adjustment in asking prices could therefore lead to lower selling prices of real estate projects than those expected by developers, and eventually to credit losses on loans on those projects.

#### **Commercial property prices in the prime segment have also been rising...**

In line with the global trend in commercial property markets, prime yields in the Czech Republic declined further in 2015 (by 0.4 pp on average; see Chart II.26). At the end of the year, they were lowest for retail property (5%), for which they fell below the 2007 level. Capital prices meanwhile increased across all types of commercial property.<sup>29</sup> Growth in realised transactions stopped as the room for profit in the prime commercial property segment narrowed, but it remained close to the 2007 level.

#### **...but high office property vacancy and construction rates still pose a risk**

Planned construction of industrial and office property remained elevated in 2015, at 65% and 56% respectively of its 2007 and 2008 highs. Despite a further substantial rise in stock (of 14% year on year), the vacancy rate for industrial property decreased significantly further in 2015 (see Chart II.27). The vacancy rate for office buildings also fell, but remains quite high (15%). Part of the new office stock may be absorbed by migration of tenants from lower segments to the prime segment. The high rate of construction, however, is generating a risk of vacancies or lower-than-planned rent in newly completed premises. In such case, credit losses on loans to developers could increase.

26 The estimates are based on an assumption of a mortgage with an LTV of 65% and a maturity of 20 years.

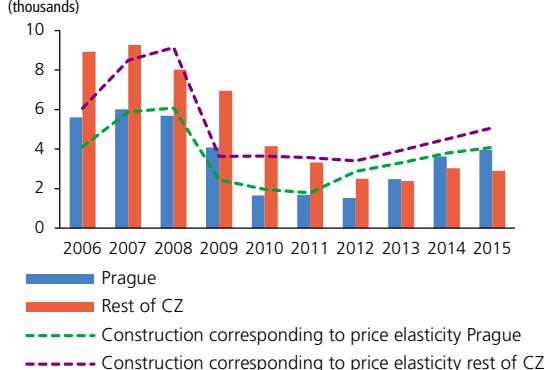
27 The number of apartment starts corresponding to the price elasticity to asking prices was obtained as the balanced values from the estimation of the equation ( $\text{number of apartment starts} = a + b \cdot \text{change in asking prices}$ ) on annual data for 2006–2015 using OLS.

28 The implied level of asking prices in relation to transaction prices was obtained by estimation of the Johansen cointegration between asking and transaction prices on quarterly data for 2005–2015.

29 Capital prices are calculated as the ratio of the rent to the prime yield.

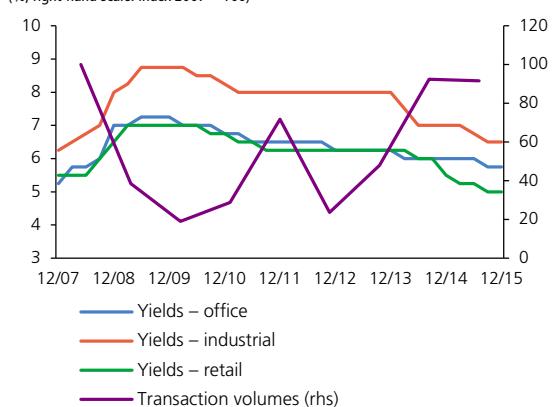
**CHART II.25**

#### **Numbers of apartment starts (thousands)**



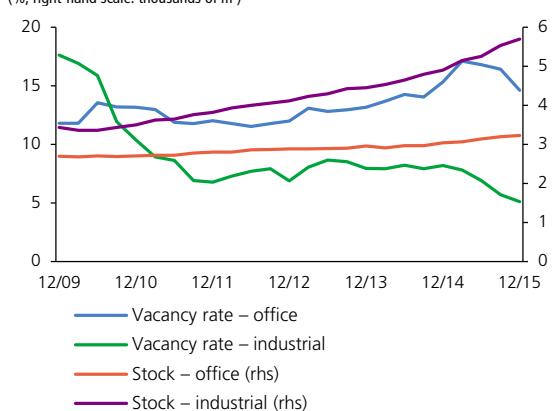
**CHART II.26**

#### **Yields and volumes of commercial property transactions (%; right-hand scale: index 2007 = 100)**



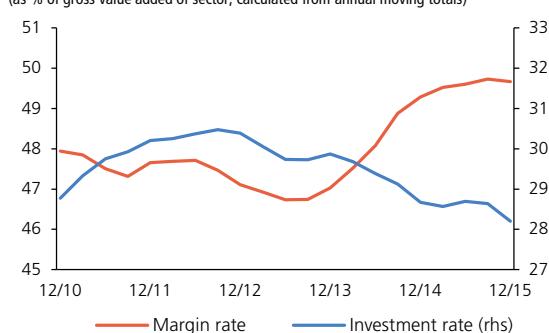
**CHART II.27**

#### **Total stock and vacancy rates for commercial property (%; right-hand scale: thousands of m<sup>2</sup>)**



**CHART II.28**

**Margin rate and investment rate**  
(as % of gross value added of sector; calculated from annual moving totals)

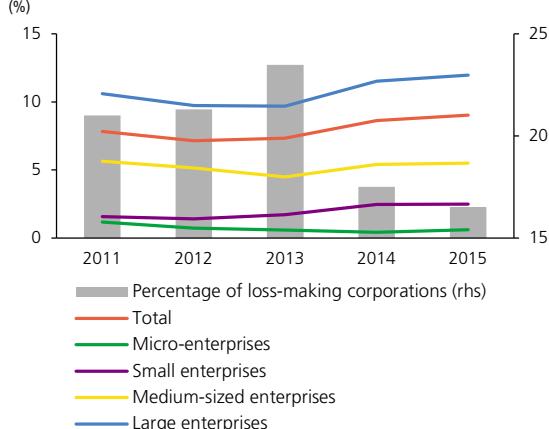


Source: CZSO

Note: Margin rate = gross operating surplus/gross value added of sector. Investment rate = gross fixed capital formation/gross value added of sector.

**CHART II.29**

**After-tax RoE by enterprise size and percentage of loss-making corporations**  
(%)

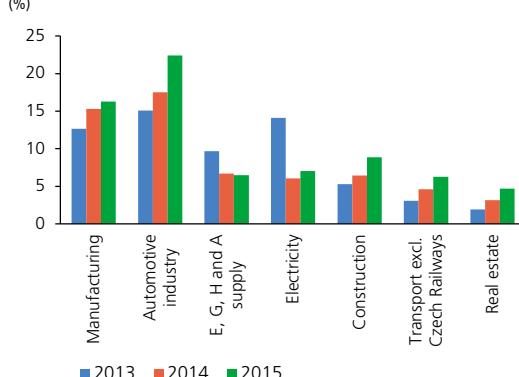


Source: CZSO, CNB calculation

Note: The results are based on a sample of corporations. The sample contains around 1,500 corporations together accounting for more than 40% of the sector's gross value added.

**CHART II.30**

**After-tax RoE in selected branches of activity**  
(%)



Source: CZSO, CNB

Note: E, G, H and A are electricity, gas, heat and air-conditioned air. The results are based on a sample of corporations. The sample contains around 1,500 corporations together accounting for more than 40% of the sector's gross value added. The property development sector is included under construction. The automotive industry contains companies in NACE 29.

## 2.3 NON-FINANCIAL CORPORATIONS

The non-financial corporations sector as a whole recorded a further rise in performance and profitability thanks to strong economic growth. This was reflected in a decline in the sector's credit risk. Nevertheless, the situation is not improving much in some segments. In particular, the smallest firms and energy companies are facing increased stress. Credit risk thus remains at elevated levels in these segments. Despite rising growth in bank loans, the sector's debt remains relatively low and its debt servicing ability has improved. Adverse external developments are the main risk scenario.

### The economic growth is being positively reflected in the sector's overall condition...

The sector's overall performance rose further during 2015 and the favourable economic situation had a positive impact on the financial condition of most non-financial corporations (NFCs). The sector's aggregate profitability increased further in 2015, although Q4 saw a slight slowdown (see Chart II.28). The improvement in the sector's overall situation in 2015 also fostered a decline in the total number of loss-making firms (see Chart II.29). An increase in investment optimism was also apparent in the first half of 2015, even though investment activity grew more slowly than value added and the total investment rate fell (see Chart II.28).

As usual, the growth in performance was due mainly to manufacturing, which saw a year-on-year increase in production of 5.8% last year.<sup>30</sup> Combined with lower input prices, the sector recorded a further rise in profitability (see Charts II.30 and II.31). Positive increases were recorded in other sectors besides manufacturing, including services, trade and transport. The growth in domestic demand in 2015 also had a favourable effect on businesses in the real estate sector (see section 2.2) and in construction, which had been in long-running decline until the end of 2014.<sup>31</sup> However, the performance of the construction industry started to slow in 2015 Q4 and production fell by 4.6% year on year in 2016 Q1.

### ...but the situation remains unfavourable in some branches and parts of the sector

Along with the construction industry, the energy sector has been facing a combination of adverse factors for several years now. Besides an EU-wide energy strategy targeted at supporting renewable energy sources,<sup>32</sup> the sector's problems are due to falling energy commodity prices. The

30 Within manufacturing, the automotive industry is of key importance. It increased its production by 10.7% year on year in January 2016.

31 The rise in demand for construction output was driven mainly by increased drawdown of EU funds in the previous programme period and to a lesser extent by growth in private investment.

32 Generation from renewable sources is subsidised in the form of either guaranteed electricity purchase prices or "green bonuses".

electricity generation price<sup>33</sup> dropped by more than 60% between 2011 Q2 and February 2016 to a 12-year low. In these conditions, given the use of standard sources and the need to subsidise renewable sources, electricity generation is exposed to increased pressure. The RoE of the energy sector in 2015 indicates improving profitability (see Chart II.30), but this is due to a decline in equity. The current condition is better documented by value added, which fell by 9.7% year on year in the first half of 2015 (see Chart II.31).<sup>34</sup> Expectations regarding energy commodity prices do not suggest any major reversal in the current trend in the near future, so the outlook for the sector as a whole remains very unfavourable. Another sector in long-running decline is mining and quarrying, where black coal mining is being cut back. While coal mines have gradually been closed down in most EU countries, some mines in the Czech Republic are still running. Given developments in the global black coal market, characterised by surplus stocks, purchase prices of coal are being squeezed to very low levels.<sup>35</sup> The costly mining industry is thus becoming loss-making and the process of winding down mining in some regions of the Czech Republic will probably continue.<sup>36</sup>

In the wake of the recent financial crisis, the financial results of corporations also remain very heterogeneous in terms of company size. In particular, the smallest (micro-)corporations, whose profitability was very low for the fifth consecutive year, remain exposed to high financial stress (see Chart II.29). The available data suggest that the strong growth in domestic demand is passing through to the condition of the smallest firms only very slowly.

### Adverse external developments remain the main source of risks faced by the sector in recent years

Given the strong dependence of the sector's performance on export-oriented industries, adverse developments in the external environment can be viewed as a potential source of risk. The probability of this scenario materialising has increased in recent quarters due to a combination of several factors observed in the global economy (see section 2.1). However, the potential impacts might be partly reduced by domestic demand and consumer (and, to a lesser extent, investment)

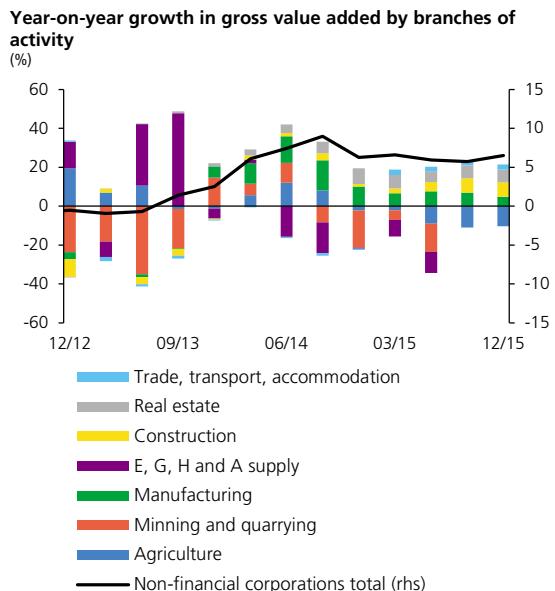
33 The price of 1 MWh of electricity (base load) with annual delivery in the Czech Republic traded on the Central European energy exchange.

34 The financial indicators were also affected by unplanned outages of various power units of the Dukovany power station (which covers about one-fifth of total electricity consumption in the Czech Republic when in full operation) in the second half of 2015. The longest outage was in Unit 1, which was out of operation for about six months starting in mid-September. Units 2 and 3 were also out of action from September to December 2015 and only Unit 4 was running in this period. Three of the four Dukovany units were in operation at the time of writing (May 2016). The losses from the unplanned outages are estimated at CZK 3–4 billion.

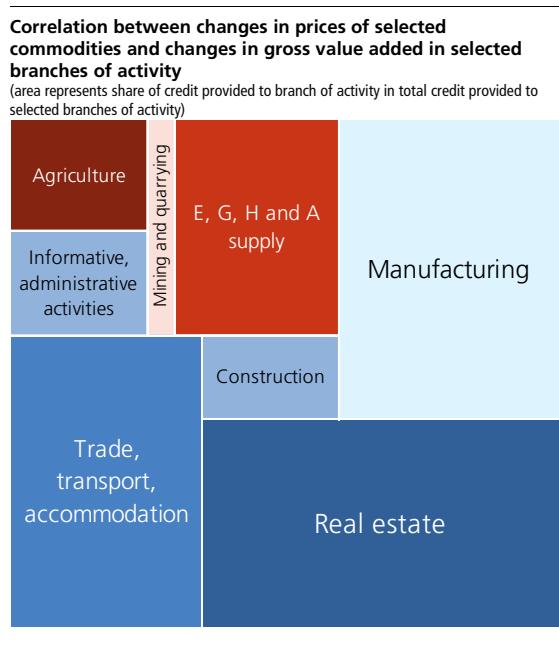
35 The excess coal stocks on the global market are due to increased shale gas output in the USA and declining demand for coal in emerging economies (China in particular).

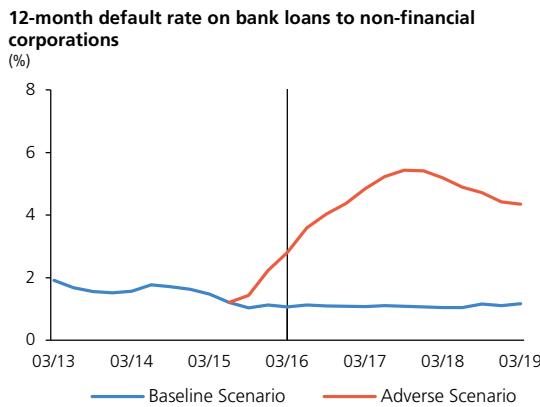
36 For example, an insolvency petition has been filed for the reorganisation of OKD at the time of writing (May 2016). The Czech banking system is exposed rather marginally to risks relating to loans to OKD. Banks in the Czech financial system account for around CZK 0.6 billion of the total debt of around CZK 17 billion.

**CHART II.31**

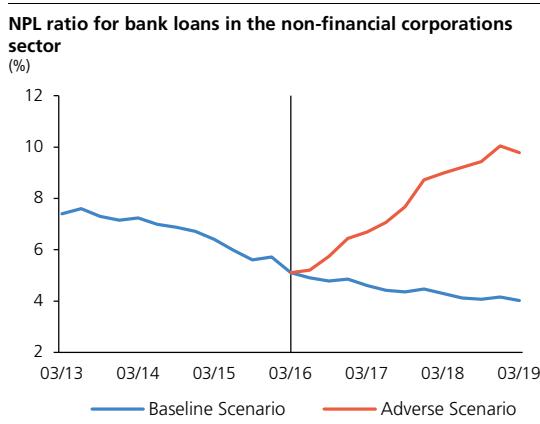


**CHART II.32**

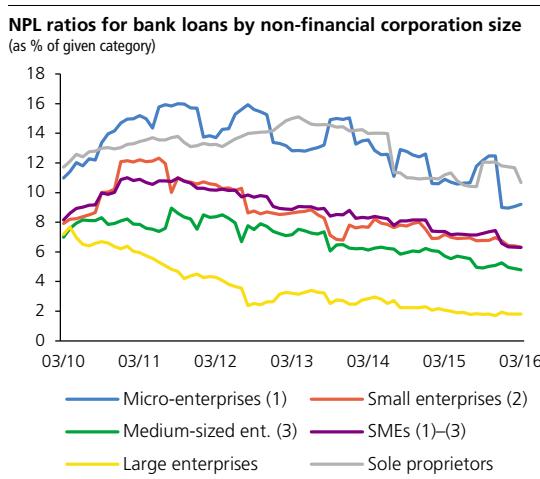


**CHART II.33**

Source: CNB

**CHART II.34**

Source: CNB

**CHART II.35**

Source: CNB

Note: The breakdown available in the CCR database does not allow entirely exact categorisation of corporations in accordance with the valid definitions. The categories are therefore approximated using the following criteria. Micro-enterprises: 1–9 employees + turnover < CZK 60 million; small enterprises: 10–49 employees + turnover < CZK 300 million; medium-sized enterprises: 50–249 employees + turnover < CZK 1 billion; large enterprises: the rest. Where only one of the two criteria is satisfied, the company belongs in the higher category.

sentiment.<sup>37</sup> A sharp decline in prices of some (mostly energy) commodities over the last two years can also be considered a favourable factor.<sup>38</sup> Energy commodities constitute production costs in most industries, so favourable prices foster greater performance (see Chart II.32). Conversely, this situation is having an adverse effect on the condition of the energy and mining and quarrying industries, where output prices depend heavily on the prices of such commodities (see also the discussion below). Overall, if prices of oil and other energy commodities were to surge in the near future, the NFC sector would be hit negatively, with spillovers to credit risk. However, this scenario is currently viewed as unlikely.<sup>39</sup>

**The sector's credit risk is decreasing overall...**

Credit risk, as measured by the 12-month default rate, decreased in 2015 as a result of the economic growth (see Chart II.33). The share of non-performing loans (NPLs) in total loans showed a similar trend, falling from 7.0% in 2014 to 5.9% (see Chart II.34). The number of petitions for insolvency proceedings and the number of bankruptcies also went down. If the *Adverse Scenario* were to materialise, credit risk would rise sharply. The 12-month default rate would increase significantly at the four-year horizon (see Chart II.33). It would start falling again during 2018, but the risk would remain elevated. An increase in the credit risk of NFCs would also be reflected significantly in the NPL ratio (see Chart II.34), which would almost double from 5.1% to 9.8% over the three-year test horizon.

**...but remains high for small enterprises and in energy and construction**

With the exception of sole proprietors, enterprises of all sizes recorded a further decline in credit risk in 2015 and early 2016 (see Chart II.35).<sup>40</sup> Despite the generally positive trend, significant differences in credit risk persist across the enterprise size categories. The level of risk in smaller enterprises is still well above its pre-crisis levels, while that in large enterprises has returned to a level comparable with its historical low (see Chart II.35). Differences in the level of credit risk can also be seen across sectors. Risk exposures to manufacturing have been falling since mid-2014. The NPL ratio in this sector was 10.7% in March 2016.<sup>41</sup>

37 The rate of slowdown of public investment connected with the slower start of investment under the new EU programme period remains an uncertainty in the domestic environment. However, this uncertainty is partly reduced by growth in real wages in 2015.

38 One example is Brent crude oil, which fell by around 70% in dollar terms between June 2014 and February 2016. Similar developments were recorded for other energy commodities, such as natural gas, coal and emission allowances, and hence for electricity, whose prices are derived from these variables in the Central Europe context.

39 An agreement among OPEC producers to regulate oil production would represent a big change. However, such an agreement is proving hard to reach given the current positions of individual OPEC members.

40 The number of declared bankruptcies of legal entities provides similar information. Despite a year-on-year decline of 21% for all entities, sole proprietors recorded a year-on-year increase of around 4%.

41 VW's problems have not so far affected the credit risk of the automotive industry (and manufacturing). Information about the total costs of covering the related damage will be of crucial importance. However, demand for VW cars seems to have been little affected so far.

Credit risk is showing a similar trend in the property developers segment (see Chart II.36), which accounts for more than 25% of all loans to the NFC sector. By contrast, construction has long been showing an elevated level of risk. Its NPL ratio was 25.1% in March 2016 (see Chart II.36). Given the observed slowdown in performance in construction, the credit risk outlook is unfavourable. This is evidenced by a falling volume of actual orders, a slow start to the new budget period for EU funds and current prices of construction work, which two-thirds of construction companies regard as undervalued.<sup>42</sup>

Businesses in the energy sector have also been showing an adverse trend in credit risk over the last two years. Risk exposures to this segment have been rising in recent years because of adverse conditions (see above). The NPL ratio recorded its most recent jump in the second half of 2015 (see Chart II.36). This indicator reached a historical high of 17.2% in March 2016. This maximum is three times higher than the figure for the NFC sector as a whole and almost six times higher than the December 2013 figure for the energy sector. Given the current outlook for energy commodity prices, credit risk in the energy sector is likely to increase further and affect the credit risk of the entire sector.<sup>43</sup> The slight deterioration in the external conditions in 2015 (see above) was also reflected in credit risk for the 1,000 largest exporters, whose NPL ratio increased slightly (see Chart II.37).

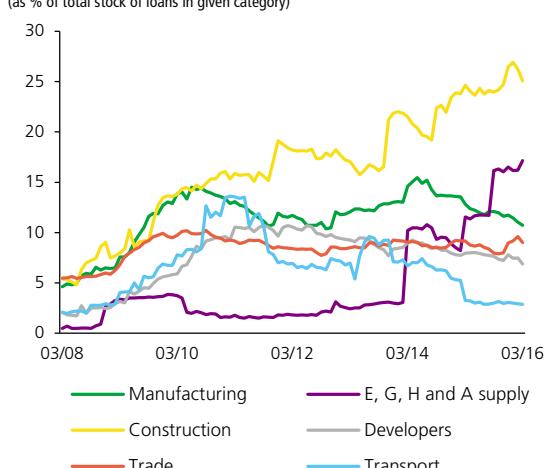
#### Individual data from corporate balance sheets are signalling a drop in the sector's credit risk

In addition to aggregate data, it is useful to monitor financial indicators at the level of individual corporations and to assess to what extent they may be signalling an increase in credit risk in the future. Thanks to newly available data from corporate balance sheets and profit and loss accounts at the CNB's disposal, corporate information can be linked with information about the risk categories of loans extended to those corporations.<sup>44</sup> By comparing the financial indicators of firms whose loans have been reclassified as NPLs with those of firms with standard loans, suitable indicators for the early identification of future credit problems can be determined.<sup>45</sup>

RoA and return on sales seem to be particularly significant indicators, as they display the biggest differences between firms with standard loans and those with loans reclassified as NPLs (see Chart II.38). Large

CHART II.36

NPL ratios for bank loans in selected branches of activity  
(as % of total stock of loans in given category)

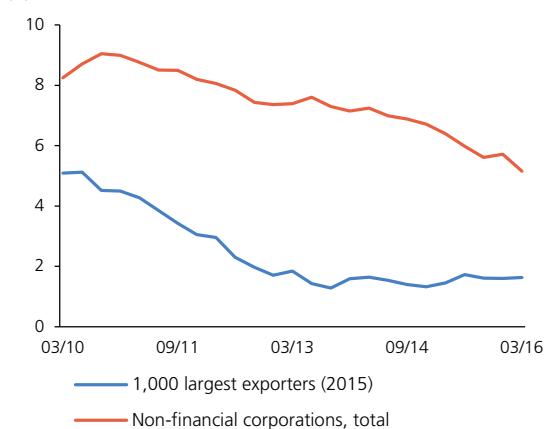


Source: CNB

Note: E, G, H and A are electricity, gas, heat and air-conditioned air. The developers category comprises NACE 411 (Development of building projects) and NACE 68 (Real estate activities).

CHART II.37

Non-performing bank loans ratio for the 1,000 largest exporters  
(%)



Source: CNB

Note: The structure of the 1,000 largest exporters changes over time, so for this series we give the year indicating the set of exporters to which the time series pertains.

42 This information is based on a quarterly analysis of the Czech construction industry (2016 Q1) conducted by CEEC Research, which surveyed 223 construction firms ([www.ceec.eu/research](http://www.ceec.eu/research)).

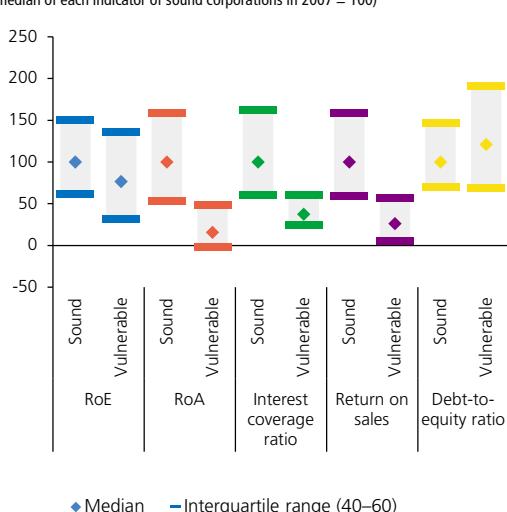
43 The ratio of bank loans to energy businesses to total bank loans to the NFC sector has been rising over the last eight years. It stood at 15.8% in March 2016, almost four times higher than its trough level in September 2008.

44 The information from NFCs' balance sheets is obtained from Bisnode. The information about loans to NFCs and their risk classification comes from the Central Credit Register.

45 Return on equity (RoE), return on assets (RoA), return on sales, the interest coverage ratio and the debt-to-equity ratio were selected as potentially suitable indicators. The period over which deteriorating indicator levels should lead to the materialisation of credit risk was set at two years. In 2016, therefore, the latest available data are for 2014.

**CHART II.38**

**Difference in selected indicators between sound and vulnerable non-financial corporations two years prior to risk materialisation**  
(median of each indicator of sound corporations in 2007 = 100)

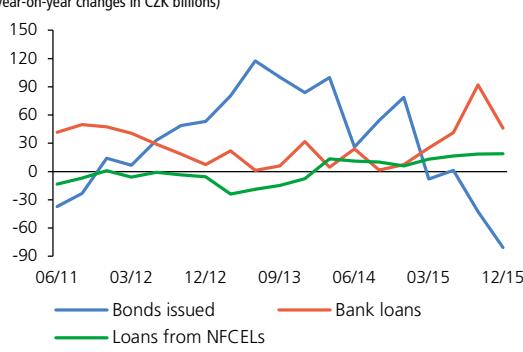


Source: CCR, CNB

Note: Risk materialisation means reclassification of a standard loan to the non-performing loan category. Sound corporations are those whose loans were not reclassified from the standard to the default category in 2009. Vulnerable corporations are those whose loans (at least one) were reclassified from the standard to the non-performing loan category in 2009.

**CHART II.39**

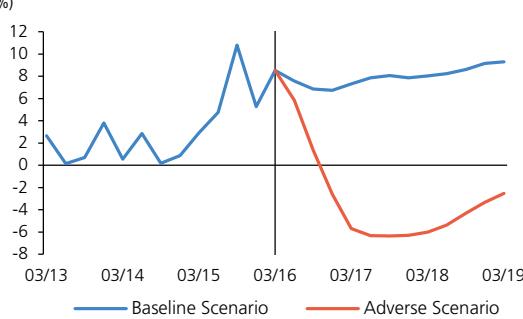
**Dynamics of selected sources of financing of non-financial corporations**  
(year-on-year changes in CZK billions)



Source: CNB

**CHART II.40**

**Year-on-year growth in bank loans to non-financial corporations**  
(%)



Source: CNB

differences are also observed for the interest coverage ratio.<sup>46</sup> The information value of these three indicators can be described as constant over time, as they indicate similar differences between the analysed categories of enterprises in different years. Given the improvement in RoA, return on sales and the interest coverage ratio, the latest available data suggests that the credit risk of the sector as a whole should decrease in 2016.

**Aggregate growth in loans and bonds is relatively subdued, and growth in the share of bond financing has halted**

Loans and bonds in the NFC sector are showing relatively subdued growth despite the favourable economic situation.<sup>47</sup> This type of financing recorded a year-on-year increase of 1.7% in 2015. The ten-year average is more than double that figure. As regards structure, the upward trend in the share of debt securities issues came to halt in 2015, after having increased gradually since the end of 2011 (see Chart II.39). The largest increases in issuing activity in recent years have been due to energy businesses. Given the negative outlook for this sector (see above), the strong sector concentration of bond financing may generate risks for Czech corporate bond holders. However, it is still non-residents that are primarily exposed to them.<sup>48</sup>

**The rate of growth of bank loans increased in 2015 but has started to lose momentum in recent months...**

NFCs' demand for bank loans started to rise more strongly at the end of 2014 than in previous quarters. After peaking in September 2015 (at 10.8%), the growth in bank loans started to slow slightly. However, the year-on-year growth rate went up again to 8.5% in March 2016 (see Chart II.40). According to the *Baseline Scenario* of the current round of stress tests, the growth rate of bank loans will stabilise in the quarters ahead at levels comparable with the ten-year average (6.3%). Credit growth will then start to rise above this level in 2017 Q1. If the *Adverse Scenario* were to materialise, the credit growth rate would only be positive in the first year and there would be a sizeable credit contraction at the three-year horizon (see Chart II.40).

Turning to the currency structure, the growth rate of foreign currency bank loans increased slightly in 2015. However, their share of the total remains relatively stable, standing at around 24.7% in March 2016.<sup>49</sup> This is 3.6 pp higher than the five-year average. It seems that the CNB's communications regarding its future exit from the exchange rate

46 The interest coverage ratio is defined as the ratio of interest paid plus pre-tax profit to interest paid.

47 These loans do not include cross-border loans between NFCs, which are calculated under the ESA95 methodology, i.e. on a net basis.

48 Domestic financial institutions' holdings of Czech corporate bonds have long been below CZK 40 billion. This represents less than 10% of the total issued. The high concentration of the corporate bond market is also evidenced by developments in the second half of 2015, when large issues of two industrial businesses, totalling around CZK 59 billion, were redeemed.

49 As regards natural hedging, the foreign currency loans of the 1,000 largest exporters accounted for about 25% of total foreign currency loans.

commitment is reducing the pressure for speculative borrowing in foreign currency and no major changes in foreign currency financing are being recorded.

### **...and indicators of new loans confirm the moderately slowing tendency**

Besides the stock of loans, it is also necessary to monitor growth in new loans in order to understand credit dynamics (see also Box 6 in section 4.2.2). The amount of new loans was rising from roughly mid-2014 until 2015 Q3, when it started to decline year on year (see Chart II.41). The evolution of new loans was in line with that of genuinely new loans<sup>50</sup> to NFCs. Faster growth was observed mainly for investment loans and to a lesser extent for operating loans as from December 2014.<sup>51</sup> As regards sectors, the largest increases were due mainly to manufacturing and services (see Chart II.42), whose financial results have improved significantly in recent years (see above). The growth rate of genuinely new loans to businesses in the real estate sector was relatively subdued in 2015, but credit growth surged in 2016 Q1. Given the rising property prices and the growing share of investment loans in total loans, this might have implied an increase in risk to financial stability (see section 4.2.2). By contrast, genuinely new loans are not increasing much in the riskiest sectors, i.e. energy and construction. As regards corporation size, the biggest increases in new loans in 2015 were recorded mainly by medium-sized enterprises and to a lesser extent by small and large ones. For the smallest (micro-)corporations, by contrast, the amount of genuinely new loans was almost unchanged.

### **The sector's total debt remains low and its debt servicing ability has improved**

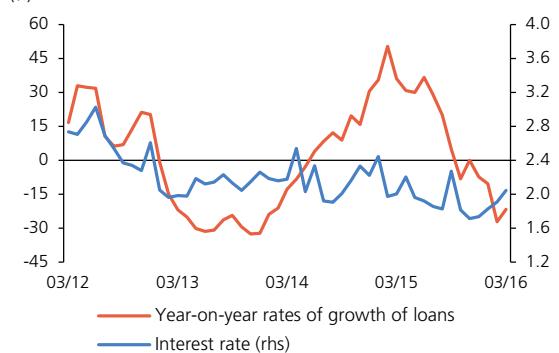
Despite the upswing in bank loans in 2015 and early 2016, the sector's total debt remains low by European standards. Improved financial results, coupled with the environment of low interest rates, are fostering the creation of new debt repayment funds. Despite the decreasing amount of interest paid, however, total repayments of bank loans are increasing (see Chart II.43). If interest rates were to go up, total repayments would rise further. This might represent a potential source of vulnerability for the sector in the future.

<sup>50</sup> Despite the term "new loans" used in the published statistics, such loans cannot always be viewed as genuinely new. A loan is reported as new in cases where the existing loan conditions are changed under a new agreement signed by the contracting parties, even though in reality it is the same (previously provided) loan. It is therefore necessary to monitor genuinely new loans, which consist solely of newly concluded loan agreements and agreements to increase existing loans.

<sup>51</sup> Investment and operating loans accounted for around 24% and 28% respectively in 2015. The remainder consisted of loans for current assets (24%), financial loans (22%) and other loans (2%).

**CHART II.41**

**New koruna loans to non-financial corporations (%)**

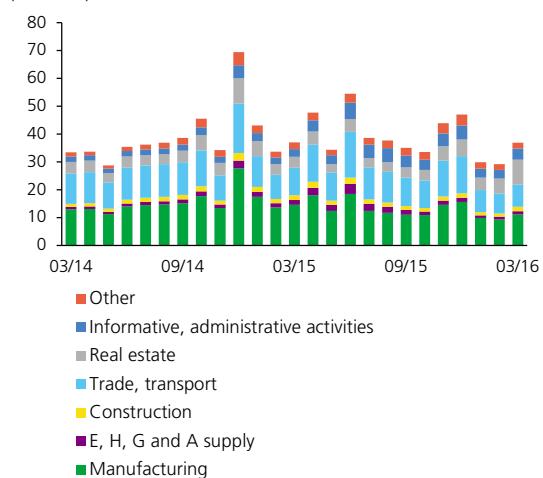


Source: CNB

Note: Year-on-year rates of growth are smoothed by the 3-month moving average.

**CHART II.42**

**Amount of actually new loans in selected branches of activity (CZK billions)**

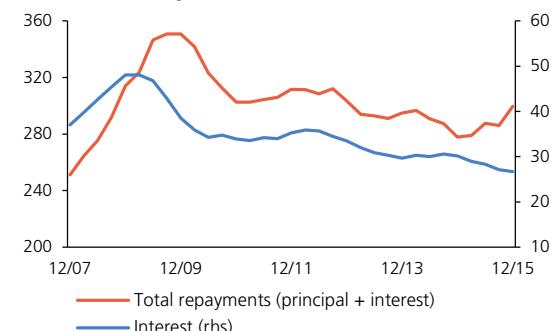


Source: CCR, CNB

Note: E, G, H, A and W are electricity, gas, heat, air-conditioned air and water. Genuinely new loans also include increases in existing loans.

**CHART II.43**

**Total repayments and repayments of interest on bank loans (CZK billions; annual moving totals)**



Source: CNB

Note: Total repayments are calculated on the basis of CCR data.

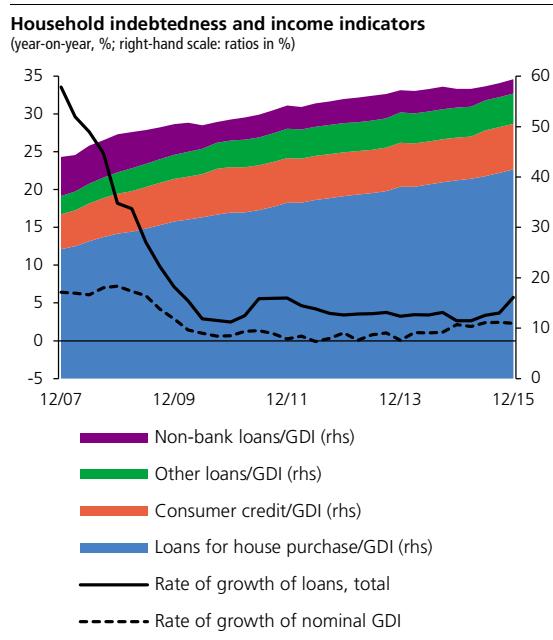
CHART II.44



Source: CNB

Note: The unemployment rate is seasonally adjusted. Dashed lines indicate the CNB's May 2016 predictions.

CHART II.45



Source: CNB

Note: Non-bank loans are loans provided to other financial institutions.

## 2.4 HOUSEHOLDS

The environment of very low interest rate is starting to be reflected in an increase in household debt. Genuinely new loans to households including increases (adjusted for refixations and refinancing) grew by more than 20% year on year in 2015. This trend continued into 2016 Q1. The growth was due to all types of loans, including consumer credit. Credit risk remained relatively low in all segments. If loan interest rates remain very low for a protracted period of time, the sensitivity of households to a potential income and interest rate shock may increase, which may be reflected in credit losses and a decline in economic activity.

### The labour market situation is improving significantly

The strong economic growth in 2015 and its continuation into 2016 Q1 were reflected in an improvement in the overall labour market situation. The unemployment rate declined by 1.6 pp year on year to 4.1% in 2016 Q1, close to its pre-crisis levels. The number of vacancies increased by more than a half year on year. Wage growth responded by accelerating – the average nominal wage increased by 3.9% at the end of 2015 (see Chart II.44). The outlooks for the next two years foresee further growth in nominal wages and a decline in the unemployment rate.

### The growth in household indebtedness is due largely to new mortgage loans...

Despite the marked improvement in the labour market situation, growth in total loans to households continued to outpace growth in households' income in 2015. This was reflected in a further increase in indebtedness (see Chart II.45). However, Czech households remain significantly less indebted (60% of gross disposable income, GDI) compared to the euro area average (100% of GDI; see Chart II.46). The higher indebtedness started to show up in the net interest burden of households, which increased in terms of annual totals in 2015 (see Chart II.47). This was due to a decline in interest income on deposits and a simultaneous increase in interest paid on bank loans. The rise in indebtedness was due largely to new loans for house purchase and, since the end of 2015, to new consumer credit (see Chart II.48). New loans for house purchase consist mostly of mortgage loans for residential property (around 75%), which recorded a year-on-year rise of more than 20% in 2015. They increased by an additional 15% year on year in 2016 Q1. Genuinely new loans (including loan increases) and refixed loans make up the bulk of new mortgage loans (with shares of around 50% and 35% respectively).<sup>52</sup> After adjustment of total new mortgage loans for refixed and refinanced loans, genuinely new mortgage loans (including loan increases) recorded

<sup>52</sup> New mortgage loans can be divided into genuinely new, refixed, refinanced loans and loan increases. Only the categories of genuinely new loans and loan increases represent a real increase in the banking sector's claims on households. In the remaining two cases, a new interest rate is only negotiated for the outstanding part of the loan – either with the borrower's original bank (refixation) or with another bank (refinancing).

year-on-year growth of around 30% in 2015 and an additional 20% in 2016 Q1.

### **...but the amount of new bridging credit from construction savings and consumer credit on real estate is also on the rise**

The remainder of new house purchase loans consists of consumer credit on real estate (around 12%) and credit from construction savings (around 13%).<sup>53</sup> While new credit from construction savings consist mostly of bridging loans (around 98%),<sup>54</sup> consumer credit on real estate is made up mainly of pre-mortgage loans (according to anecdotal evidence).<sup>55</sup> In 2015, building societies provided households with around 30% more in genuinely new loans (including increases) and banks with around 20% more in genuinely new consumer credit on real estate (including increases) in year-on-year terms (see Chart II.49). This year-on-year growth slowed to around 10% on average in 2016 Q1. New credit from construction savings are increasing despite their still significantly higher interest rate. The average rate on mortgage loans and consumer credit on real estate was around 2.2% and 2.6% respectively at the start of the year, whereas that on credit from construction savings was 4%. The growth in new credit from construction savings may be due to a shift in business model towards the provision of a larger amount of unsecured loans, a shift that some building societies have publicly declared.<sup>56</sup> By their very nature, unsecured loans are riskier than secured loans, a fact reflected in higher interest. Their riskiness might increase further if such loans are provided together with mortgage loans with higher LTV ratios.<sup>57</sup>

### **Growth in the average interest rate fixation period for new mortgage loans has halted**

The average fixation period for new mortgage loans stabilised at around 4 and 1/2 years in the second half of 2015 (see Chart II.50). This was due mainly to slower growth in the share of loans with fixation periods of between three and five years at around 60% and of between five and ten years at around 20%. The previous sharp decline in rates slowed at the same time (see Chart II.51). The interest rate on mortgage loans fell modestly again in 2016 Q1, primarily in a situation of lower bank funding

<sup>53</sup> Consumer credit on real estate is special-purpose credit provided to finance investment in owner-occupied housing. Credit from construction savings is also special-purpose credit, although it is provided solely by building societies to finance housing needs under Act No. 96/1993 Coll. on Building Savings Schemes.

<sup>54</sup> It is possible to apply for bridging credit from construction savings if one of the conditions for obtaining standard credit from construction savings is not met (e.g. the applicant has been saving for less than two years, has not deposited a sufficient percentage of the target amount to his account or has not attained the necessary rating score).

<sup>55</sup> Pre-mortgage loans are usually repaid within one year by means of a mortgage loan that must be negotiated simultaneously with the pre-mortgage loan. For this reason, this type of loan can be viewed practically as secured.

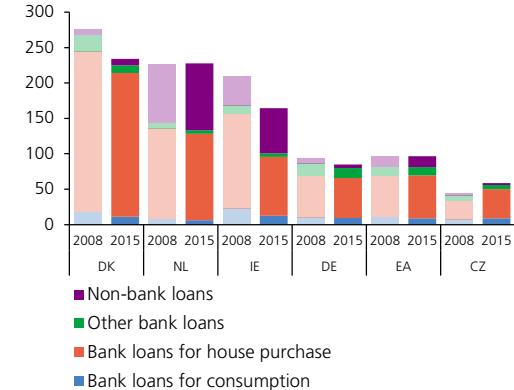
<sup>56</sup> Association of Czech Building Societies: Yearbook 2015; [www.acss.cz/cz/novinari-a-dobornici/vyroční-zprávy-acss/ročenka-2015](http://www.acss.cz/cz/novinari-a-dobornici/vyroční-zprávy-acss/ročenka-2015).

<sup>57</sup> The CNB therefore recommends banks not to circumvent the LTV limits through the concurrent provision of unsecured consumer credit relating to the residential property concerned above and beyond retail loans secured by residential property (see Recommendation on the management of risks associated with the provision of retail loans secured by residential property of 16 June 2015).

**CHART II.46**

#### **Household debt in relation to gross disposable income in international comparison**

(shares in %)



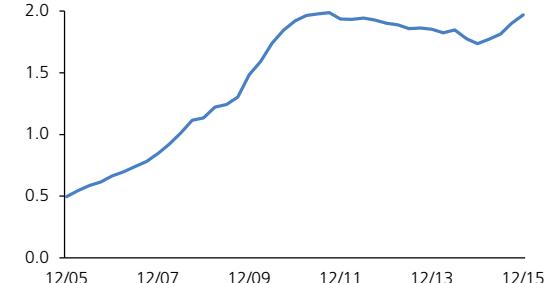
Source: BIS, ECB, CNB, Eurostat

Note: The data for 2008 are as of 2008 Q1 (the peak of the economic cycle in the euro area) and the data for 2015 are as of 2015 Q3. The comparison is performed with the most indebted European Union countries.

**CHART II.47**

#### **Net interest paid to banks by households in relation to gross disposable income**

(shares in %)



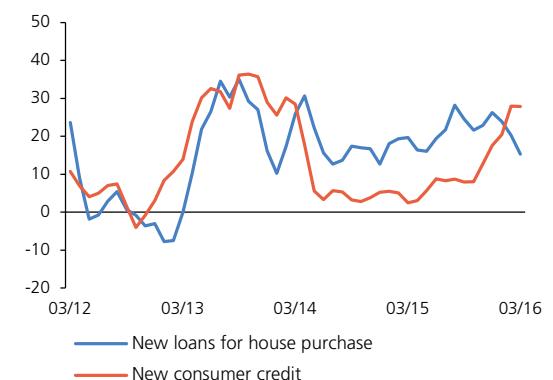
Source: CNB

Note: Net interest paid is the difference between households' loan interest costs and their interest income on bank deposits. The indicator is calculated as the share of annual moving totals.

**CHART II.48**

#### **Rates of growth of new bank loans for households**

(year-on-year, %)

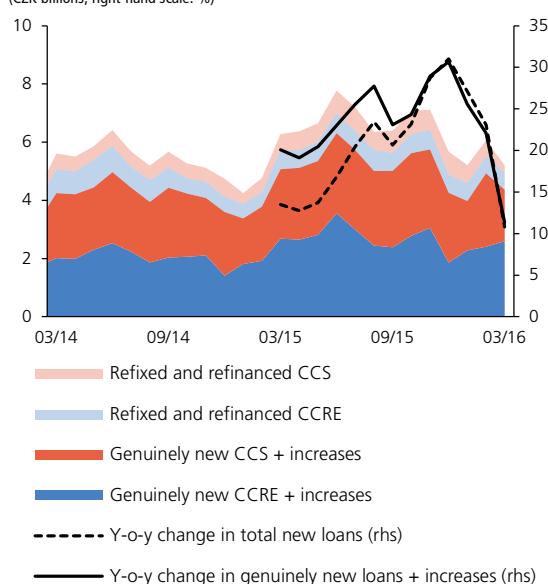
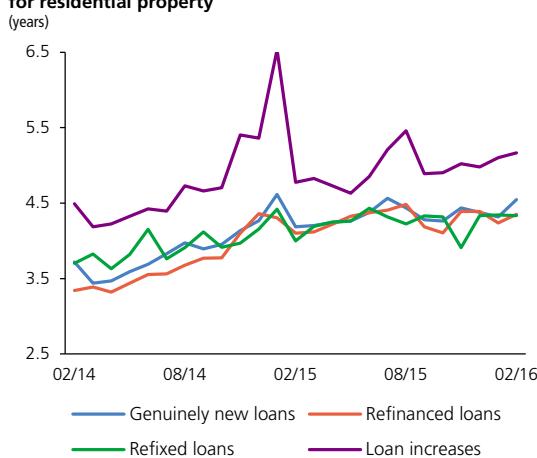


Source: CNB

Note: Year-on-year rates of growth are smoothed by the 3-month moving average.

**CHART II.49****Other categories of new loans for house purchase without mortgages**

(CZK billions; right-hand scale: %)

**CHART II.50****Average interest rate fixation periods for new mortgage loans for residential property (years)**

costs and strong competition. Should this trend reverse and the average fixation period for new mortgage loans start to decrease, households would become more sensitive to interest rate movements. In such case, if rates went up, households with mortgage loans with shorter fixation periods could quite quickly face higher loan instalments (see Box 1).

**BOX 1: HOW SENSITIVE ARE CZECH HOUSEHOLDS TO A RISE IN INTEREST RATES AND A DECLINE IN INCOME?**
**An assessment of the impact of a rise in interest rates is important for both monetary policy and financial stability**

Monetary policy analyses focus mainly on estimating the effect of a change in interest rates on aggregate expenditure, while financial stability analyses focus rather on estimating the impact on growth in credit risk. However, the two types of impacts cannot be assessed separately. A decrease in aggregate expenditure due to a rise in interest rates can have an adverse effect on the financial sector, which, in turn, will pass through to the real economy and subsequently the monetary policy stance. Presented below is a sensitivity analysis of a rise in loan interest rates coupled with a change in net income of households with mortgage loans. The analysis has the character of a reverse stress test. This test explores how interest rates and the net income of borrowers would have to change, *ceteris paribus*, for their debt service to increase to a level considered excessive.

Consistent with the May CNB forecast is a gradual rise in interest rates after the 2% inflation target has been reached and anti-inflationary pressures have faded away.<sup>58</sup> The scenario of stronger growth in rates, which might have a negative effect on borrowers' ability to repay, would thus be a consequence of an adverse external shock rather than domestic developments.<sup>59</sup> Similarly, if we consider an increase in unemployment associated with a decline in the net income of households, this would in all probability be a response to adverse developments in the Czech Republic's major trading partner countries (see section 2.1). Aggregate data on the household sector have only a limited information content in the case of estimating the impact of an interest rate or income shock. For this reason, the reverse stress test and sensitivity analysis are performed on individual data.<sup>60</sup>

58 For details, see *Inflation Report II/2016*.

59 In line with the *Adverse Scenario*, which assumes a sizeable decrease in economic activity in Europe, banks might revise their view of credit risk and respond by increasing risk mark-ups on interest rates on new loans. Those mark-ups might also increase to a much higher level due to a rise in long-term interest rates.

60 The analysis uses data from the Household Budget Statistics and the Survey of Income and Living Conditions (SILC).

### The mortgage repayment burden of households is comparable with the euro area average

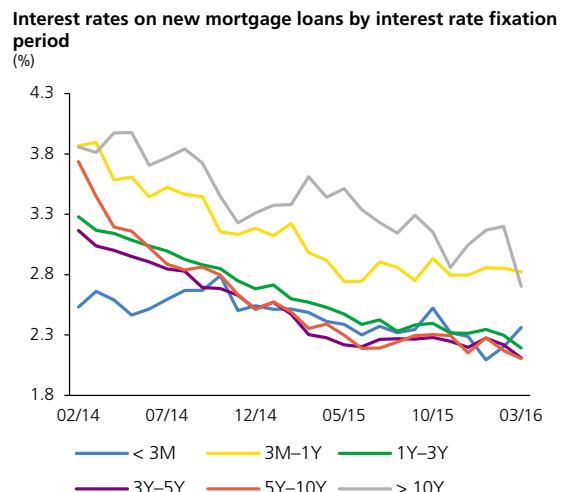
About 40% of Czech households have a loan, and half of them have a mortgage loan. In terms of amount, mortgage loans dominate, accounting for 65% of the total stock of household loans. This share has long been increasing. Czech households with mortgage loans pay out about 13% of their gross monthly income and 16% of their net monthly income in mortgage loan instalments.<sup>61</sup> These figures are in line with the levels observed in the euro area, where around 44% of households have a loan and 23% have a mortgage loan. Mortgage repayments account for around 16% of households' gross income.<sup>62</sup>

The growing amount of new mortgage loans provided by banks at historically low interest rates is increasing the sensitivity of households to a potential rise in loan interest rates not accompanied by growth in their income. For this reason, the presented sensitivity analysis addresses the issue of what income and interest rate shock combination would lead to an increase in households' debt burden to a level considered excessive at the five-year horizon. In this case, the debt burden is measured by means of the debt-service-to-income (DSTI) ratio.<sup>63</sup> Households with a DSTI exceeding 40% are considered to be highly sensitive to financial stress.<sup>64</sup> The speed of pass-through of an increase in rates to instalments depends, among other things, on the interest rate fixation period. Existing mortgage loans with floating rates or residual fixation periods of up to one year accounted for around 24% and mortgages with fixation periods of over one year and up to five years for another 57% at the end of 2015. Gradual refixation of 80% of the current portfolio over five years is thus considered.<sup>65</sup>

### Households with mortgage loans remain resilient to the simulated stress

Chart II.1 Box shows the combinations of the total change in net

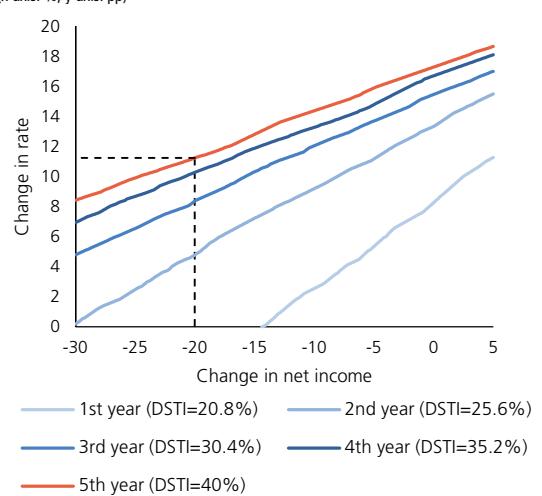
**CHART II.51**



Source: CNB

**CHART II.1 Box**

**Reverse stress test: Interest rate and income shock combinations over a five-year horizon**  
(x-axis: %, y-axis: pp)



Source: SILC, HBS, CNB, CNB calculation

Note: The curves depict the combinations of changes in income and low interest rates over a horizon of 1–5 years compared to the initial level which lead to a linear rise in the median DSTI ratio from its current level to a stress level of 40%. If, for example, we consider a 20% decrease in income over five years so that the median DSTI ratio rises to 40%, this shock would have to be accompanied by a gradual increase in rates by a total of around 11 pp (red curve).

61 The figures are calculated as the median.

62 ECB (2013): *Household Finance and Consumption Survey*.

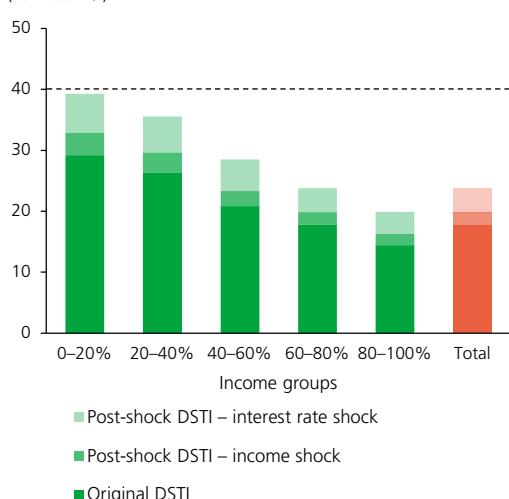
63 Data on monthly mortgage loan instalments are available for individual households from SILC data. Data on monthly consumer credit instalments were estimated using HBS data, which reveal that around 18% of households with a mortgage have also consumer credit.

64 A DSTI ratio exceeding 40% is generally considered excessive in the literature and in the publications of other central banks (such as the BoE and the NBP). However, other national and sectoral specifics must also be taken into account in such assessments.

65 Refixation occurs gradually, with 24% of the total mortgage portfolio being refixed in the first year and 14% in the second to fifth years (around a quarter of the 57% of mortgages with fixation periods of over one year and up to five years).

**CHART II.2 Box****Sensitivity of the DSTI ratio of households with a mortgage loan by income group**

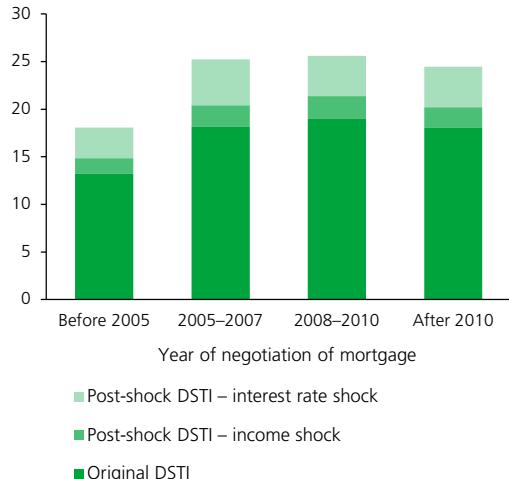
(DSTI ratio in %)



Source: SILC, HBS, CNB, CNB calculation

**CHART II.3 Box****Sensitivity of the DSTI ratio of households with a mortgage by year of negotiation of mortgage loan**

(DSTI ratio in %)



Source: SILC, HBS, CNB, CNB calculation

income and the increase in rates which would lead, under the given assumptions, to a rise in the median DSTI to 40% at the five-year horizon.<sup>66</sup> Some of these combinations are less likely, but they clearly illustrate the size of the shocks that would lead to the said DSTI being reached. If, for example, we consider the highly adverse scenario of a sizeable contraction in economic activity where income falls by 20% on average over five years (consistent with a decline of around 4.5% a year) due to growth in unemployment, rates on mortgage loans would have to go up by around 11 pp for the median DSTI of borrowers to reach 40%. However, this scenario is highly implausible, illustrating the current resilience of Czech households with mortgage loans to an income and interest rate shock. The information content of this analysis is reduced by the omission of last year's data on mortgages, where signs of riskier behaviour might be visible (see section 4.3).

The following analysis is based on a more moderate assumption of an increase in loan interest rates of 5 pp combined with a decline in net income of 10% over three years. In this case, households would not exceed 40% in any income group (see Chart II.2 Box). The overall median DSTI would increase by around 6 pp to just under 24%, due more to the interest rate shock than the income shock. Breaking down mortgage loans by their year of negotiation, the average sensitivity of households with a mortgage negotiated after 2005 is very similar. Only households with a mortgage negotiated before 2005 display lower sensitivity to the simulated stress (see Chart II.3 Box).

### Middle income groups cut back consumption expenditure the most in response to a rise in rates

In the case of net borrowers, a rise in loan rates results in an increase in debt servicing costs. This may be negatively reflected in their net disposable income<sup>67</sup> and consumption expenditure. The analysis<sup>68</sup> reveals that a rise in rates would have the greatest impact on the net disposable income of low-income households (see Chart II.4 Box). The same does not apply to the change in consumption expenditure, where households in the lowest and highest income groups react the least to growth in instalments.<sup>69</sup>

<sup>66</sup> A gradual linear increase in the DSTI to a target stress level of 40% at the five-year horizon is considered. The DSTI of borrowers thus increases by around 5 pp a year.

<sup>67</sup> For the purposes of this analysis, disposable income is defined as the household's net income less instalments, i.e. as income that can be used for consumption.

<sup>68</sup> This part of the sensitivity analysis tracks the change in households' net income and consumption expenditure solely in response to the interest rate shock. It thus abstracts from the income shock considered above. If the income shock were included, the effect would merely be multiplied.

<sup>69</sup> The specific impact on consumption is calculated on the basis of an estimate of the marginal propensity to consume of household income groups. The marginal propensity to

In the case of high-income households, the explanation is simple – consumption expenditure accounts for around 65% of their net income. Even if their loan instalments increase, these households have a sufficient financial surplus and do not have to reduce their consumption significantly. In the case of low-income households, consumption expenditure accounts for around 90% of their net income, and most of it is essential expenditure,<sup>70</sup> which cannot be reduced significantly.

### The growth rate of new consumer credit picked up at the beginning of this year

New consumer credit recorded average year-on-year growth of around 10% in 2015. The growth was driven by refixed and refinanced loans, which increased by almost 30% year on year. Genuinely new consumer credit (including increases) rose only by around 6% in 2015 compared to 2014. However, the year-on-year growth rates of total new consumer credit and genuinely new consumer credit (including increases) picked up significantly in 2016 Q1 (to 28% and 27% respectively; see Chart II.52). This was due mainly to large banks (around 60%). Faster annual growth was also observed in the other bank groups, which pushed interest rates down significantly at the same time (see Chart II.53). The results of the Bank Lending Survey in 2016 Q1 indicate that rates were squeezed in response to rising competition among banks and non-banks and banks' improved perceptions regarding the outlook for the overall economic situation and the creditworthiness of clients. Besides banks, non-banks are the second group engaged actively in providing consumer credit to households (see Box 2).

### BOX 2: NEW FORMS OF NON-BANK FINANCING

Other financial institutions<sup>71</sup> and entities with a trade licence for the provision or intermediation of consumer credit in the Czech Republic are involved in providing non-bank loans to households. To strengthen consumer protection and clean up the loan providers and intermediaries market for consumers, political representatives have decided to submit a bill on loans for

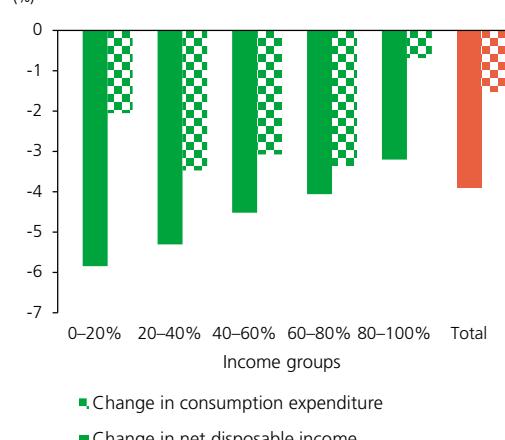
consume expresses the percentage change in consumption expenditure in response to a 1% decline in net income.

<sup>70</sup> Essential expenditure includes expenditure on food, housing, pharmaceutical products and transport.

<sup>71</sup> Other financial institutions include investment funds excluding money market funds, financial auxiliaries, captive financial institutions and non-bank financial corporations engaged in lending, of which in reality only non-bank financial corporations engaged in lending are involved in lending to consumers.

### CHART II.4 Box

Change in the net income and consumption of households with a mortgage loan in response to a rise in rates of 5 pp (%)

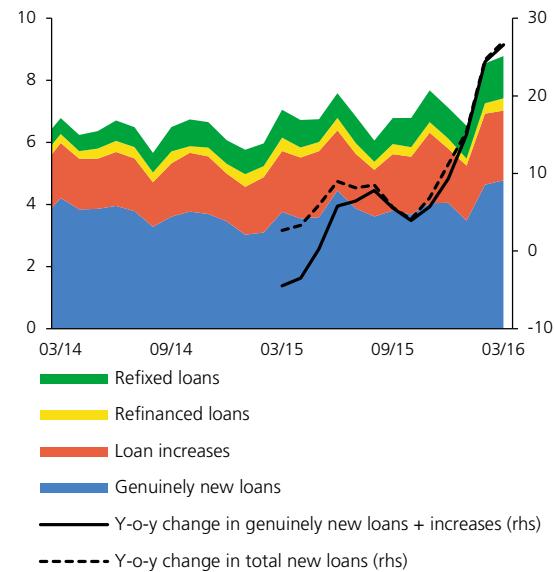


Source: SILC, HBS, CNB, CNB calculation

Note: The distribution into income groups (quintiles) is performed on the basis of the net income of all households.

### CHART II.52

New consumer credit to households  
(CZK billions; right-hand scale in %)



Source: CNB

Note: Year-on-year rates of growth are smoothed by the 3-month moving average.

CHART II.53

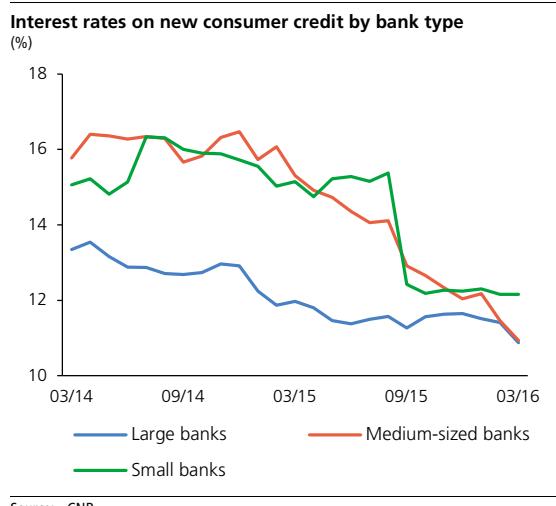
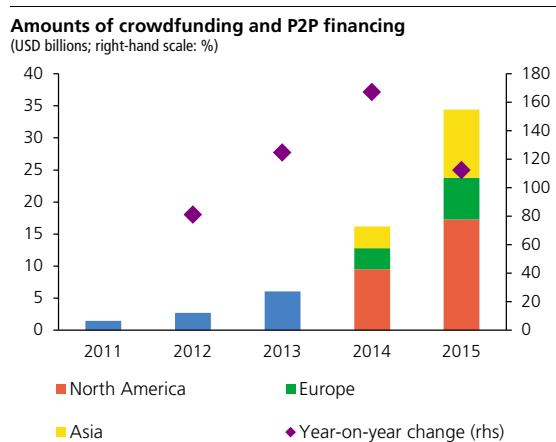


CHART II.5 Box



consumers and on the amendment of certain related acts. The statute will simultaneously implement Directive 2014/17/EU (the Mortgage Credit Directive, MCD).<sup>72</sup> The MCD regulates mortgage loans, which up to now have been exempted from the legislation on loans for consumers.

New credit products and forms of non-bank financing not covered by MCD are now appearing in the Czech market. In the area of loans for house purchase, these include reverse mortgages. This term is used for various business models in which the client sells a property while retaining lifelong rights to use it. The client usually receives a one-off payment for the sale of property together with a regular life annuity.<sup>73</sup> In the event of deferred gradual payments, the seller bears an increased risk that the full price of property will not be covered if the reverse mortgage provider goes bankrupt. In such a situation, the client might lose both the property and the life annuity. For this reason, the CNB considers reverse mortgages to be a risky product. However, the level of risk depends on the specific reverse mortgage model and on the specific way in which the reverse mortgage is offered. It should also be noted that the provision of reverse mortgages is not currently subject to CNB supervision.

New forms of non-bank financing have started to emerge in the Czech consumer credit market over the last three years. These include peer-to-peer (P2P) lending and debt and equity crowdfunding, based on the business models of companies that have been operating for a number of years in the USA and the UK.<sup>74</sup> However, the number of such platforms in the Czech Republic is low at the moment. Globally, P2P and crowdfunding lag well behind standard forms of financing in terms of their share of total credit, but they are showing dynamic growth in all major world regions (see Chart II.5 Box). This is partly due to base effects. Although, in general, new financial products and forms of financing can foster a more efficient market environment,<sup>75</sup> they

72 Directive of the European Parliament and of the Council No 2014/17/EU of 4 February 2014 on credit agreements for consumers relating to residential immovable property.

73 Depending on the type of reverse mortgage, ownership of the property passes to the new owner either when the contract is signed or after the client's death. As the sale of property is connected with the payment of a life annuity, a reverse mortgage is partly an insurance product and providers usually (in other countries, where reverse mortgages are more common) need to hold an insurance licence.

74 In standard P2P lending, a potential lender assesses loan applications and offers a loan to one specific applicant based on the auction principle. In debt crowdfunding, multiple lenders (investors) invest in a single applicant. In equity crowdfunding, investors can obtain shares in a company or project. Those shares may increase in value over time (if the business succeeds) or turn out to be worth nothing (if the business fails).

75 In the longer run, as financial intermediation moves outside the banking system, financial and technological innovations may lead to greater competition and efficiency inside the banking system. If this also leads to smoother financing of the real economy by a more diversified range of investors and institutions, it may be considered positive in terms of financial stability (BoE: *Financial Stability Report*, June 2012).

are potentially a source of risks. P2P and crowdfunding platforms behave like financial intermediaries but are not subject to the same laws and regulations as banks and other financial institutions. New forms of financing may also generate other risks relating to consumer protection, cybersecurity and money laundering.

### The credit risk of households has stabilised

Thanks to the favourable macroeconomic situation, the credit risk of households – as expressed by the 12-month default rate on bank loans – stabilised at around 3% in the second half of 2015 and 2016 Q1 (see Chart II.54). This was due to developments in both the consumer credit and loan for house purchase segments. The 12-month default rate on consumer credit to households fluctuated around 7% and that on loans for house purchase around 2%. According to the *Baseline Scenario*, the credit risk of households should not change significantly over the next three years. Were the risks in the *Adverse Scenario* to materialise, the 12-month default rate on loans to households would increase by around 4 pp at the three-year horizon. At the same time, lending activity would drop significantly and bank loans to households would show strongly negative year-on-year growth (see Chart II.55).

CHART II.54

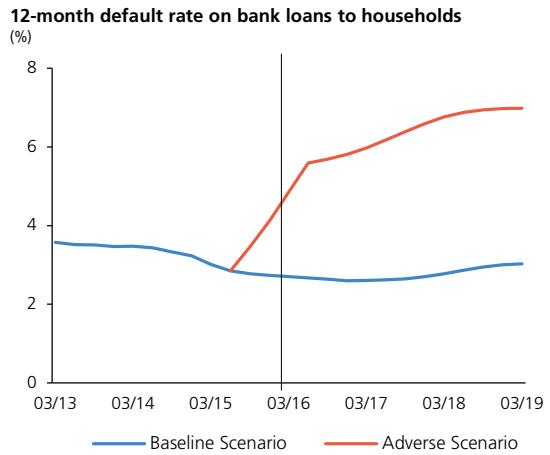


CHART II.55

