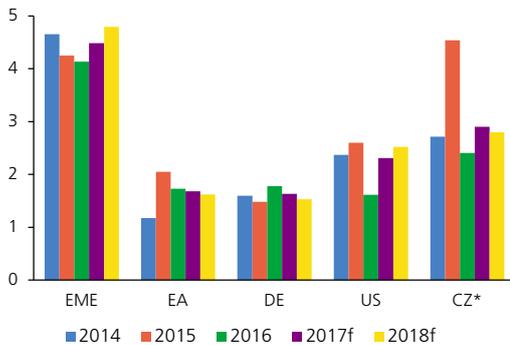


CHART II.1

Economic growth in selected countries

(year-on-year change in %)



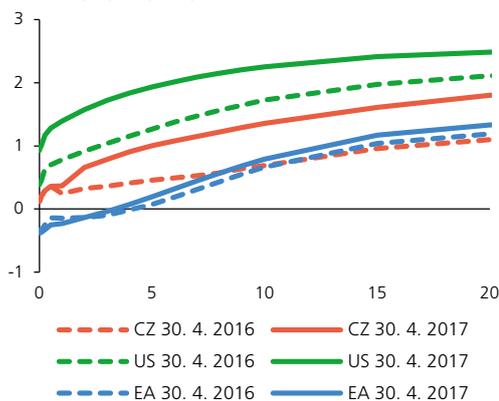
Source: IMF (World Economic Outlook, April 2017), CNB

Note: f. forecast; * The forecast for the Czech Republic is based on the CNB forecast published in Inflation Report II/2017.

CHART II.2

Movement of swap yield curves in selected economies

(x-axis: maturity in years; y-axis: yield in %)



Source: Bloomberg

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.3

World stock markets

(index; 1 July 2016 = 100)



Source: Thomson Reuters, CNB calculation

Note: The S&P500 was used for the US, the MSCI EUROPE for Europe and the MSCI EM for emerging markets.

2 THE REAL ECONOMY AND FINANCIAL MARKETS

2.1 THE MACROECONOMIC AND FINANCIAL ENVIRONMENT

The world economy is continuing to grow and the outlooks for the next two years are also optimistic. This is reflected in a gradual increase in market interest rates, especially for longer maturities. Increased optimism in an environment of still low interest rates may involve, as a side effect, excessive risk-taking in investment in financial assets and property, the prices of which are rising. The euro area economy also grew at a solid pace, but significant differences persisted across the euro area countries. In some euro area countries, low nominal GDP growth combined with a larger increase in interest rates could cause financial stress. Countries with high private and government debt thus continue to face the risk of a return to recession. Partly for this reason, the ECB's monetary policy remains highly accommodative.

The real growth of the Czech economy slowed to 2.3% in 2016 but is expected to rise to almost 3% this year and the next. Given sustainable fulfilment of the inflation target, the CNB discontinued its exchange rate commitment in early April 2017. The yield curve for interest rate swaps and Czech government bonds shifted upwards. From the perspective of long-term financial stability, this is a move in the right direction. Massive koruna positions had been accumulated by foreign investors, especially early this year, as the end of the exchange rate commitment neared. This was reflected in a marked rise in foreign exchange reserves and bank deposits at the CNB. The speed at which these positions are closed may significantly affect the volatility of the koruna exchange rate and Czech government bond yields in the short term. Marked growth in the share of non-residents in holdings of Czech government debt is generating a slight risk in the form of sudden repricing of bonds in domestic financial institutions' balance sheets.

2.1.1 THE EXTERNAL ENVIRONMENT

The world economy is experiencing a recovery...

Following a slowdown in 2016, the world economy is expected to accelerate this year and the next (see Chart II.1). The better outlook is evidenced not only by positive revisions of GDP growth estimates, but also by various leading indicators and confidence indicators.¹ The euro area economy grew at a solid pace in 2016 (by 1.8% year on year) and the current growth outlooks are also optimistic. Nonetheless, differences in economic growth persisted across the euro area countries. However, even in the case of the biggest euro area economy – Germany (GDP growth of just over 1.5%) – the growth rate is not expected to reach that of the US economy (just under 2.5%) or emerging economies (over 4.5%).

¹ Leading indicators and purchasing manager surveys have been relatively optimistic for several consecutive months. For example, the PMI for the world economy has been rising since July 2016 and is close to a six-year high. According to the IMF's April 2017 *World Economic Outlook*, global economic growth will reach 3.5% at the end of 2017.

...which is partly reflected in the global monetary conditions

The US Fed reacted to an increase in inflation pressures and a further improvement on the US labour market by raising monetary policy interest rates in December 2016 and again in March 2017.² Financial markets are expecting two further rises of 0.25 pp and an approaching end to the reinvestment of income on maturing bonds purchased by the Fed as part of its quantitative easing programme.³ The euro area monetary conditions remain easy, as inflation in the euro area is still below the ECB's target. The ECB re-emphasised that its key policy rates would remain at the current low levels for an extended period of time, and well past the horizon of the asset purchase programme.⁴ However, several changes occurred in ECB policy. The last auction of targeted longer-term refinancing operations took place in March 2017, with banks asking for four-year loans totalling EUR 233 billion. In April 2017, the ECB's monthly purchases were reduced by EUR 20 billion to EUR 60 billion. These changes were reflected in a rise in market rates (see Chart II. 2). The dollar yield curve recorded an almost parallel shift in the period under review. The slope of the euro curve increased slightly, but interest rates on new bank loans in the euro area are still very low. In April 2017, the average rate on new loans was 1.8% for loans for house purchase and 1.6% for corporate loans.

High financial asset prices may be a source of market risks

US stocks have been rising since December 2016 amid volatility in US government bond yields. Growing optimism is also visible in stock price movements in other markets (see Chart II.3) and in yield spreads on risky corporate bonds (see Chart II.4). These spreads returned to very low levels across the world. The change in market sentiment was driven mainly by improved economic activity outlooks. The planned measures of the new US administration, especially on fiscal expansion and foreign trade policy, are still an uncertainty. The fiscal measures may, on the one hand, boost business confidence, bolster investment and improve the financial results of non-financial corporations. On the other hand, they may lead to greater risk-taking in the already highly indebted corporate sector and to excessive growth in leverage.⁵ High prices on stock markets and corporate bond markets coupled with potentially underestimated financial risks thus remain possible sources of systemic risk from the global perspective.

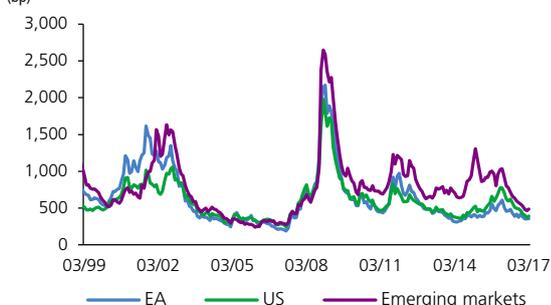
Debt-related risks in some euro area countries are postponing a return to conventional monetary policy

Overall market sentiment in the euro area and partly also renewed concerns about debt sustainability in some euro area countries affected the evolution and volatility of yields on European government bond

- The Fed raised its monetary policy rate for the first time since the financial crisis by 0.25 pp in December 2015. A further increase of 0.25 pp did not occur until a year later, reflecting the Fed's previous communications of a gradual tightening of monetary policy.
- The minutes of the March FOMC meeting indirectly show an intention to start reducing the Fed's balance sheet. Federal Open Market Committee: *Federal Reserve issues FOMC statement*, March 2017.
- The net asset purchases are to run until the end of December 2017, or beyond, if necessary, and in any case until the ECB sees a sustained adjustment in the path of inflation consistent with its inflation aim.
- For example, tax relief in the 1980s and a tax holiday in 2004 eventually led to increased risk-taking in the corporate sector and then to a turnaround in the financial cycle and a recession.

CHART II.4

Yield spreads on risky private sector bonds (bp)



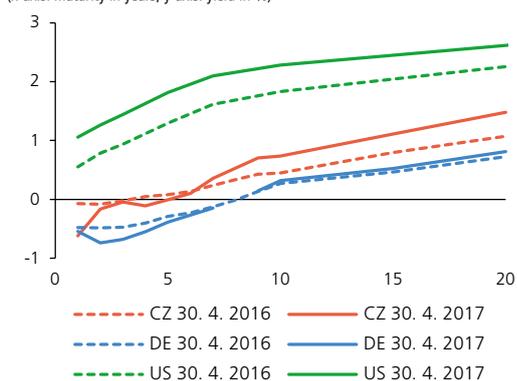
Source: Bank of America Merrill Lynch, CNB calculation

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.5

Movement of government bond yield curves in selected economies

(x-axis: maturity in years; y-axis: yield in %)

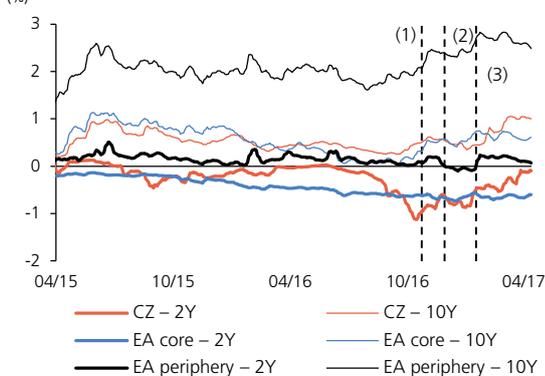


Source: Bloomberg

Note: The yield curves are derived from generic government bond yields.

CHART II.6

Government bond yields in selected countries (%)



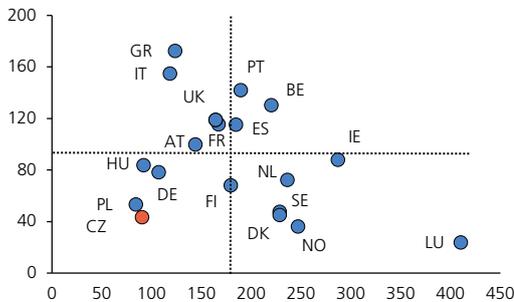
Source: Thomson Reuters, CNB calculation

Note: EA core comprises AT, BE, DE, FR and NL. Periphery consists of ES, IT and PT. 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 election of Donald Trump as US President in November 2016. (2) The Fed's rate hike in December 2016. (3) The resurgence of concerns about debt sustainability in highly indebted euro area countries at the start of February 2017.

CHART II.7

Private and government debt in selected EU countries in 2016

(% of GDP; x-axis: private debt; y-axis: government debt)



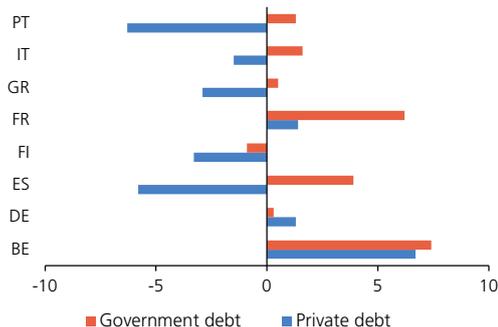
Source: BIS

Note: Data for 2016 Q3. 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 methodologies of other institutions. The dashed lines indicate the average in the given year.

CHART II.8

Change in private and government debt in selected EA countries

(change between Q4 2015 and Q3 2016; % of GDP)



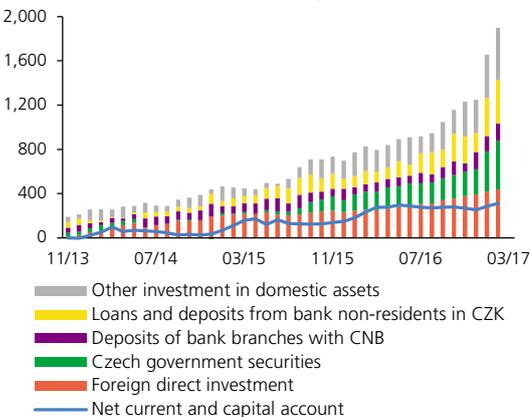
Source: BIS, CNB calculations

Note: The BIS debt calculation methodology may differ from methodologies of other institutions.

CHART II.9

Investment by foreign investors in domestic assets

(cumulative since start of interventions in CZK billions)



Source: CNB

Note: Other investment in domestic assets consists mainly of purchases of securities other than Czech government securities, as well as non-resident client koruna deposits, euro deposits in domestic banks and intercompany financing.

markets (see Charts II.5 and II. 6). Euro area government bond yields have been more volatile since the end of 2016. An increase in yields is apparent for longer maturities, as they are more strongly affected by fundamental factors such as sovereign issuer credit risk and inflation expectations.⁶ At shorter maturities, however, government bond yields are still being strongly affected by the ECB's asset purchases. In the core euro area countries, yields are still negative, whereas in highly indebted countries they are positive but very low (see Chart II. 6). A rise in yields reflected in higher debt servicing costs represents a potential risk of new credit losses, especially for countries with highly indebted public and private sectors. Although the exceptionally low interest rates in recent years have allowed for a reduction in relative indebtedness, the level of debt remains high in some countries (see Chart II.7). Credit growth is recovering in some countries, while others are experiencing partial deleveraging (see Chart II.8).⁷ Some countries have still not finished the process of stabilisation of banks' balance sheets. The need for decisive measures to reduce the current high NPL ratio and prepare for potential new growth in NPLs is therefore being emphasised in discussions between European authorities.⁸

2.1.2 THE DOMESTIC ENVIRONMENT**The economic recovery in the Czech Republic is continuing, but the external environment poses some risks**

The real growth of the Czech economy slowed to 2.3% in 2016. According to the CNB's forecast contained in Inflation Report II/2017, the growth rate should increase to almost 3% this year and the next.⁹ The favourable evolution of the Czech economy is due to rising domestic and external demand. Growth in domestic economic activity will be driven mainly by robust growth in household consumption, reflecting consumer optimism in an environment of continued growth in employment and wages. A potential deterioration of economic activity abroad (especially in the euro area) could be a source of risk to the Czech economy over the next two years. The results of elections in major euro area countries and the Brexit negotiations can be regarded as uncertainties.

The CNB's monetary policy has taken a step towards a neutral stance

Given sustainable fulfilment of the inflation target, the CNB discontinued the use of the exchange rate as an additional monetary policy instrument in early April 2017.¹⁰ The exit from the commitment represents a shift of monetary policy towards a neutral stance and the use of the standard instrument, namely interest rates. At its monetary policy meeting in May,

6 The ECB's March macroeconomic forecast increased the euro area inflation estimate for this year from 1.3% to 1.7% and that for 2018 from 1.5% to 1.6%.

7 The year-on-year growth rates of the stock of loans to non-financial corporations ranged from -7% in PT to 7% in BE and SK. As for loans to households, the range was even broader, from -4% in IE (-7% in GR) to 7% in LV and 13% in SK.

8 For example, the speech given by ECB Vice-President Vítor Constâncio: *Resolving Europe's NPL burden: Challenges and benefits* (2017), see: <https://www.ecb.europa.eu/press/key/date/2017/html/sp170203.en.html>.

9 CNB: Inflation Report II/2017, May 2017.

10 For details on the exit from the CNB's exchange rate commitment, see http://www.cnb.cz/en/monetary_policy/exit_exchange_rate_commit/index.html.

the Bank Board left interest rates unchanged at technical zero.¹¹ Consistent with the CNB forecast contained in Inflation Report II/2017 is an increase in market interest rates in 2017 Q3 and later also in 2018. However, the increase in market rates will be strongly dampened until around mid-2018 by the ECB's continuing quantitative easing.

An inflow of foreign capital led to a rise in the banking sector's excess liquidity

The Czech economy saw an increased inflow of foreign capital (see Chart II.9) and a rise in foreign exchange interventions by the CNB (see Chart II.10) between 2016 H2 and the end of March 2017 as the end of the exchange rate commitment neared. Non-residents – especially large international banks and their Czech branches – placed korunas in Czech government bonds (the amount held by non-residents rose by CZK 437 billion between November 2013 and February 2017), in short-term deposits with domestic banks (up by CZK 397 billion over the same period) or with the CNB (up by CZK 156 billion over the same period). As domestic banks gradually left the Czech government bond market and short-term liabilities to non-residents increased, the excess liquidity of domestic banks with the CNB increased (see section 4.2). In April 2017 it exceeded CZK 2.1 trillion (see Chart II.10).

The share of non-residents in holdings of Czech government securities increased again...

The share of non-residents in holdings of Czech government securities increased to 47% (see Chart II.11). Given their speculative motives, non-residents were mostly interested in short maturities. At the end of 2016, they held 55% of the securities with maturities of up to one year (5% in 2012). The increased demand from foreign investors was reflected in a rise in the significance of the portfolio component of the yield, causing the yield on Czech government securities to drop to negative levels.¹² For the one-year maturity, this component first exceeded all the others in 2015 (see Chart II.12). It peaked in late January 2017. The importance of the portfolio component started to decline for this maturity roughly a month and a half before the exit from the exchange rate commitment. Short-term yields began to rise from their historical lows. Yields at longer maturities have also risen since the start of the year and are already starting to reflect market expectations of future interest rate increases (see Chart II.13 and the rise in the risk-neutral yield and term premium).

...so the risk of a sudden repricing remains topical

The presence of non-residents and their relatively high share in holdings of domestic government bonds is causing the risk of spillover of external

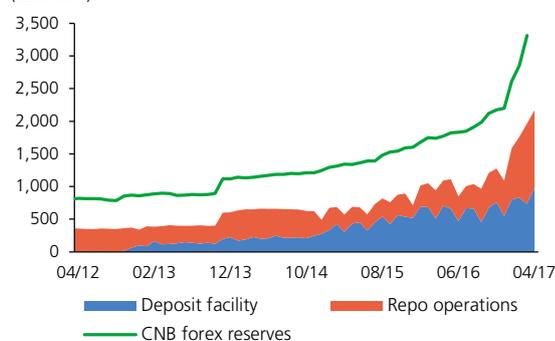
11 The two-week repo rate and the discount rate were set at 0.05% and the Lombard rate at 0.25% with effect from 1 November 2012.

12 The methodology used to decompose the Czech government bond yield is described in detail in the article *Decomposition of the Czech government bond yield curve* in this Report. The yield is decomposed into four components. (1) The risk-neutral yield ("risk-neutral expectations of yields") reflects expectations about future monetary policy and economic developments. (2) The term risk premium relates to the maturity of the bond and is compensation for interest rate risk. (3) The credit risk premium reflects the risk that bond coupons and principal will not be paid on time and/or in full. (4) The portfolio component is the residual (the yield minus the previous three components) and mainly reflects demand for bonds as an investment asset.

CHART II.10

Bank claims on CNB and foreign exchange reserves

(CZK billions)



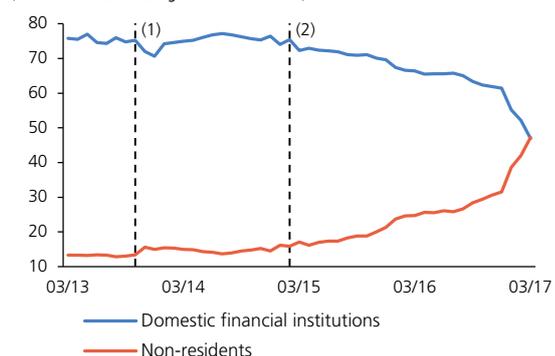
Source: CNB

Note: Repo operations represent the amount of funds deposited with the CNB in liquidity-withdrawing repo operations minus the amount of funds supplied by the CNB to the banking system in liquidity-providing repo operations.

CHART II.11

Holders of Czech government securities

(% of stock of Czech CZK government securities)



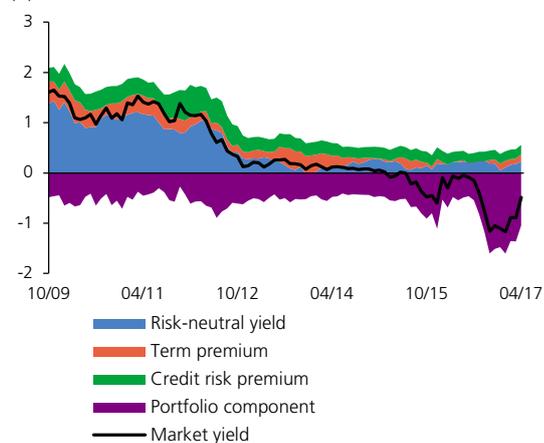
Source: MF CR, CNB calculation

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 launch of QE by the ECB on 9 March 2015.

CHART II.12

One-year Czech government bond yield decomposition

(%)



Source: CNB

CHART II.13

Five-year Czech government bond yield decomposition

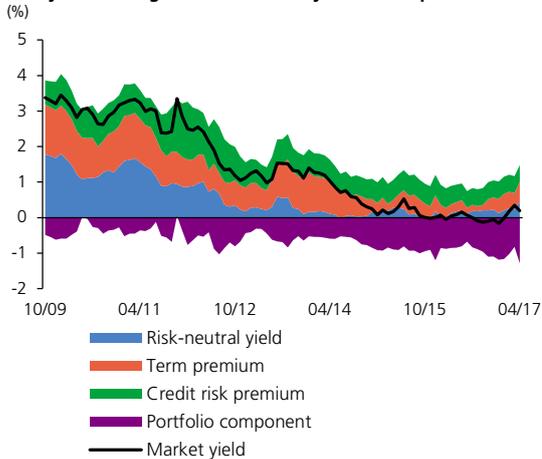


CHART II.14

Koruna-euro spot rate

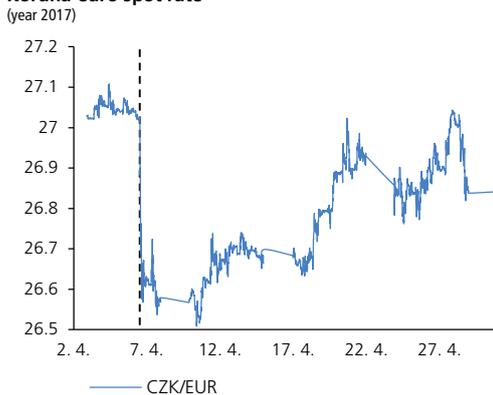
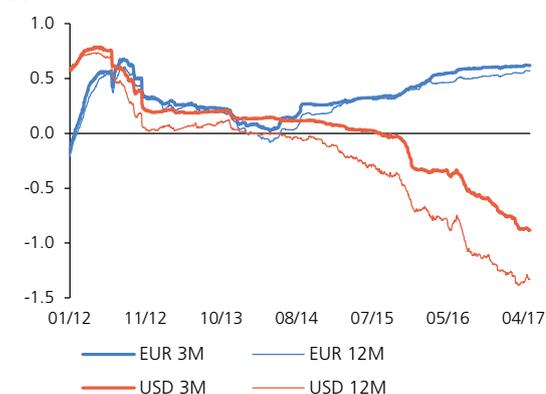


CHART II.15

Interest rate differentials of the koruna against the euro and the dollar



shocks to the domestic financial system to rise. The Czech government bond market is not very liquid and even a small amount of sales can significantly influence the price of bonds. Although trading in these bonds has not shown increased activity since the exchange rate commitment was discontinued,¹³ the risk of a sudden repricing remains topical. Falling interest in Czech government securities among non-residents can be expected for short maturities on the primary market. Demand from non-residents for securities with longer maturities increased when the ECB adopted its unconventional policies, and has not changed much since (see Chart II.13 and the portfolio component). Within the EU, Czech government bonds remain a relatively profitable and high-quality investment. Non-residents can therefore be expected to lower their holdings only gradually as they restructure their portfolios.

Volatility of the koruna exchange rate may be an elevated uncertainty...

Following the exit from the exchange rate commitment and an initial appreciation to CZK 26.5 to the euro, the koruna started to return gradually to its pre-exit levels (see Chart II.14). A sharper and more sustained appreciation of the koruna is currently being prevented by overboughtness of the koruna market, linked chiefly with speculative behaviour by foreign investors and hedging by domestic exporters before the exchange rate commitment was ended. By contrast, factors fostering appreciation of the koruna have long included the very easy monetary policy of the ECB, which is resulting in a positive short-term interest rate differential of the koruna against the euro (see Chart II.15). The effect of these contrary pressures represents increased uncertainty regarding the extent of exchange rate volatility, especially in the short run. Through their impact on economic activity and employment, large fluctuations of the koruna exchange rate could have an adverse effect on banks' loan portfolio quality and solvency indicators.

...but the importance of exchange rate risk in the domestic banking sector's balance sheet is low

Before the CNB introduced its exchange rate commitment in November 2013, the domestic banking sector had a positive net foreign exchange position (see Chart II.16). This position later started to close as short-term foreign currency loans provided to domestic banks, especially by their foreign parent companies, increased. In 2017 Q1 it turned negative (-3.4% of total assets on aggregate). However, the importance of exchange rate risk remains low compared to credit risk. The capital requirement for exchange rate risk has long been less than 0.5% of the aggregate Pillar 1 capital requirement of the domestic banking sector (see Table III.1 in section 3.1).

¹³ The first quarter of 2017 was characterised by above-average trading in Czech government bonds. The average daily volume of CZK 4.7 billion was twice the average for 2016 (CZK 2.3 billion). In January 2017, the volume of trading was the highest since December 2007. By contrast, the trading volumes after the end of the exchange rate commitment tended to be smaller. The average daily volume on the exit date (6 April 2017) was CZK 1,162 million and did not exceed the 2016 average. The trading volume in the following days was not unusually high either – the average daily volume for the seven days following the exit was CZK 1,970 million.

Financial institutions are regularly stress-tested for market risks

Potential sizeable volatility of the exchange rate or sudden repricing of fixed-income assets could have an adverse effect on the financial results of domestic financial institutions. Once a year, therefore, the CNB conducts stress tests to examine those institutions' sensitivity to market risks (see section 4.1).¹⁴ The amount of government bonds on financial institutions' balance sheets fell in both relative and absolute terms (see Chart II.17), but bonds still account for a large proportion of the portfolios. The amount of foreign currency investments on financial institutions' balance sheets stopped rising in 2016 as the date of exit from the exchange rate commitment neared (see Chart II.18). The systemic importance of foreign currency assets in the domestic financial sector is thus not increasing. Banks' foreign currency investments fell by CZK 8.2 billion in 2016. As for insurance companies, the share of foreign currency investments in total investments fell by 1.3 pp year on year to 23.7% in 2016. A downward trend is also visible for investment funds, where foreign currency investments accounted for 59.2% of investments at the end of 2015 but 57.5% as of 28 February 2017.

The shortening average residual maturity of Czech government debt may imply medium-term risks

Low or even negative yields and demand from non-residents enabled the government to finance itself under exceptionally favourable conditions. Czech government securities totalling CZK 182 billion were issued in 2017 Q1, more than three times the quarterly issuance in 2016 (CZK 56 billion). A total of 46% of the issues had maturities of one year or less (see Chart II.19). This led to a further decline in the average maturity of government debt, which was below five years in March 2017 (see Chart II.20). Although this is not a source of immediate risk for the time being, it would be beneficial from the financial stability perspective if the average residual maturity increased like in other countries. The creditor structure and average maturity are affecting the refinancing risk of Czech government debt and hence also perceptions of Czech sovereign risk. As domestic financial institutions remain major creditors of the Czech government, both indicators are monitored regularly for financial stability purposes (see section 4.4).

2.1.3 ALTERNATIVE ECONOMIC SCENARIOS

The *Baseline Scenario* assumes growth in economic activity...

A *Baseline Scenario* based on the CNB's macroeconomic forecast contained in Inflation Report I/2017¹⁵ was prepared for the stress tests contained in this Report. This forecast expected GDP growth to reach 2.8% this year and stay at similar levels in the next two years. The economy would be supported by continued growth in external demand and renewed growth in investment co-financed from EU funds. Wage growth would increase in line with the continued economic growth. The

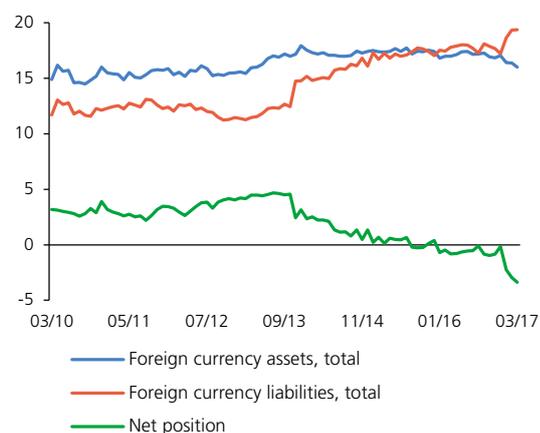
¹⁴ The results of this year's joint stress tests conducted by domestic insurance companies and the CNB are not included in this Report. They are expected to be published in the second half of this year on the CNB website under *Financial stability > Stress testing*.

¹⁵ The CNB's macroeconomic forecast contained in Inflation Report I/2017 is used in this Report solely for the purposes of the *Baseline Scenario* of the stress tests and the paths of the relevant variables based on this scenario. The analytical passages of the Report use information available as of the start of May, including the CNB's macroeconomic forecast contained in Inflation Report II/2017.

CHART II.16

Foreign currency assets and liabilities in the balance sheet of the Czech banking sector

(% of total assets)



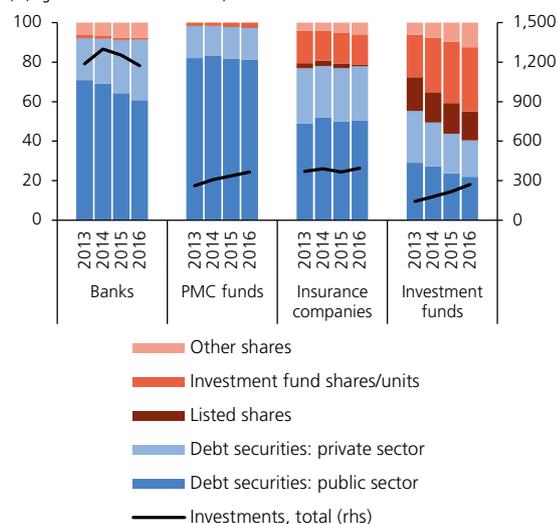
Source: CNB

Note: Excluding the book value of derivatives.

CHART II.17

Investments by type of investment instrument

(%; right-hand scale in CZK billions)



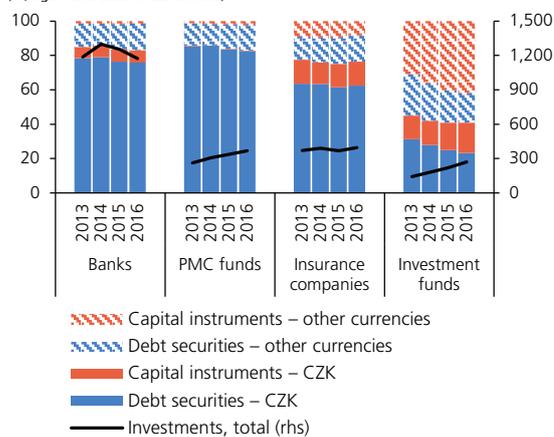
Source: CNB

Note: Debt securities issued by the public sector comprise government and municipal bonds and bonds issued by the European Investment Bank. Debt securities issued by the private sector also include mortgage bonds. As of the end of the year.

CHART II.18

Investments by currency

(%; right-hand scale in CZK billions)



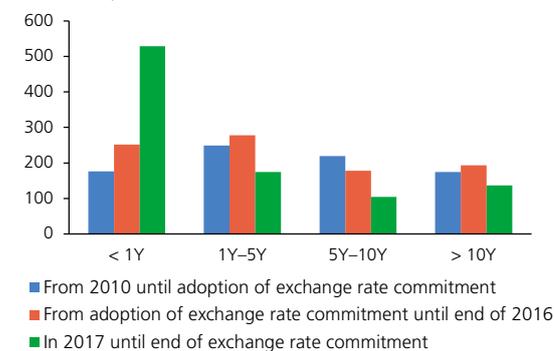
Source: CNB

Note: As of the end of the year.

CHART II.19

Excess demand in auctions of Czech government debt securities

(x-axis: maturity of issue; y-axis: demand from primary dealers relative to original supply from MF CR in %)



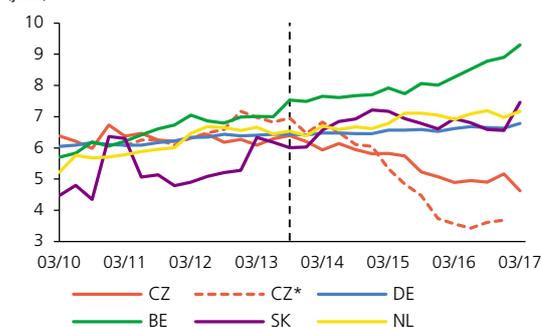
Source: CNB

Note: Weighted by original supply from MF CZ. Original supply means the centre of the indicative band of the issue size supplied to the auction by MF CZ.

CHART II.20

Average residual maturity of government debt in selected countries

(years)



Source: Bloomberg, CNB, CNB calculation

Note: CZ* stands for 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.

general unemployment rate would fall only slightly over the scenario horizon. Headline inflation would rise above the 2% inflation target and return to it at the end of 2017. Consistent with the forecast contained in Inflation Report I/2017 was stability of market interest rates at their current very low level until mid-2017 and an increase in rates from the second half of 2017 onwards.

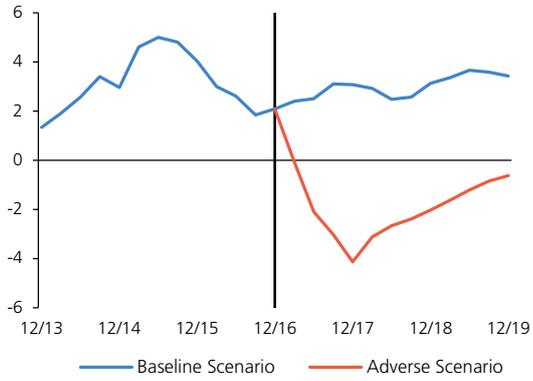
...while the *Adverse Scenario* assumes a return of the Czech economy to a V-shaped recession

The *Adverse Scenario* assumes a marked drop in economic activity in Europe. The Czech economy falls back into recession owing to a decrease in external demand. This leads to an increase in pessimistic private sector expectations about future economic developments and to deferral of household consumption and corporate investment. The combination of a downturn in external demand and then also in domestic demand cause a sizeable decline in economic activity in the Czech Republic and result in a V-shaped recession. In addition, a debt deflation scenario materialises, with deflationary pressures leading to real growth in private sector debt 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. 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 and the three-month PRIBOR stays very low over the entire test horizon. The exchange rate weakens. By contrast, long-term bond yields surge as global risk aversion increases and the quality of some assets is reassessed. At the same time, banks tighten their view of credit risk and increase their risk mark-ups on interest rates on new loans. Those mark-ups rise to a much higher level also due partly to an increase in long-term interest rates. The related rise in debt service together with the other impacts of the recession increase the default rate on loans to both households and non-financial corporations.

Charts II.21A–D show the evolution of the main macroeconomic indicators of the *Baseline Scenario* and the *Adverse Scenario*. The stress scenario represents very tough but still plausible adverse developments. Its settings are based on a need for stricter scenarios in a period of economic recovery accompanied by rapid growth in loans and rising asset prices, with sources of systemic risk forming invisibly in the background (see Box 2 in section 4.1). This is particularly true of the assumptions regarding property prices, where a risk of increasing overvaluation has been identified (see section 5.3).

CHART II.21A

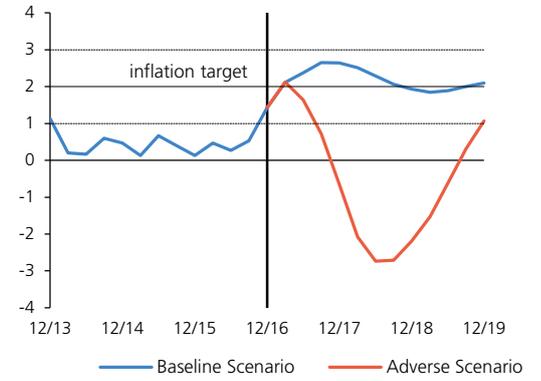
Alternative scenarios: real GDP growth
(year-on-year change in %)



Source: CNB

CHART II.21B

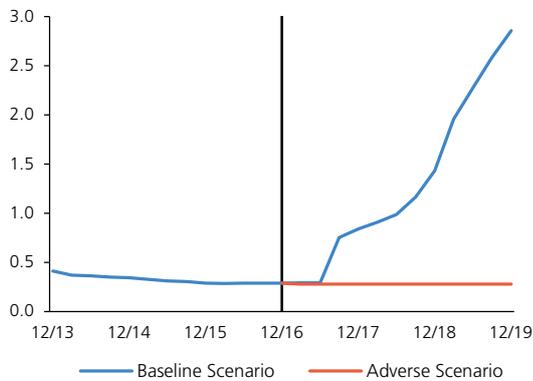
Alternative scenarios: inflation
(%)



Source: CNB

CHART II.21C

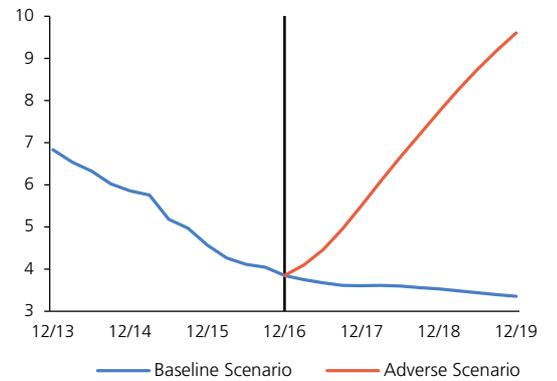
Alternative scenarios: 3M PRIBOR
(%)



Source: CNB

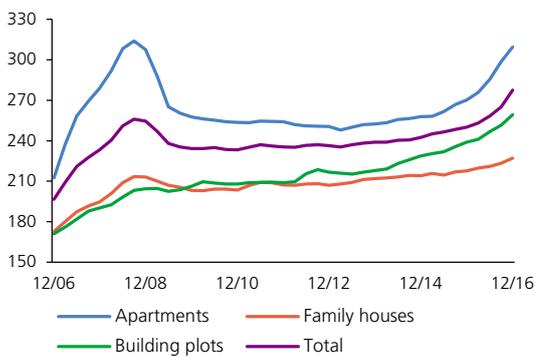
CHART II.21D

Alternative scenarios: unemployment
(%)



Source: CNB

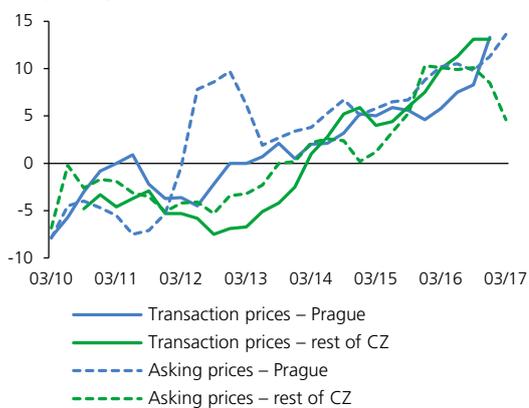
CHART II.22

Residential property prices – transaction prices
(1999 Q1 = 100)

Source: CZSO, HB index, CNB calculation

Note: The data for 2016 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).

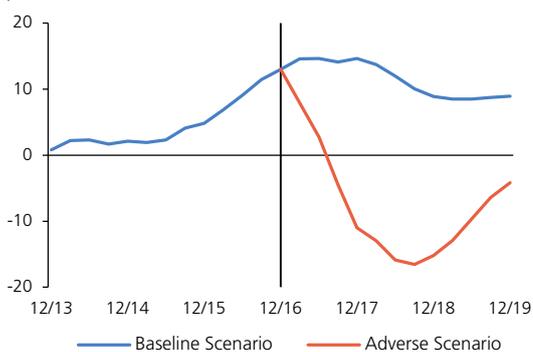
CHART II.23

Apartment prices – transaction and asking prices
(year-on-year change in %)

Source: CZSO, CNB calculation

Note: Transaction prices from tax returns according to CZSO. For 2016 calculated from quarter-on-quarter changes in CZSO survey-based transaction prices.

CHART II.24

Year-on-year property price growth
(%)

Source: CNB

2.2 THE PROPERTY MARKET

Residential property prices accelerated in 2016 and at the start of 2017. Apartment prices considerably outpaced wages, so the affordability of apartments deteriorated. Expectations of further price growth may contribute to the further development of the price spiral between property prices and loans for house purchase. Commercial property saw further growth in transactions and a fall in prime yields.

Residential property prices accelerated...

Residential property prices went up in many European countries in 2016. Residential property prices accelerated further last year in the Czech Republic. Year-on-year house price growth¹⁶ reached 11% in Q4. This was one of the highest figures in the EU. Transaction prices reached, or even exceeded, the previous cyclical high recorded in 2008 in all categories except apartments outside Prague (see Chart II.22). The price acceleration was due mainly to apartment prices, although growth in prices of building plots also surged. The rates of growth of transaction and asking prices of apartments in Prague and the rest of the Czech Republic were similar for most of 2016 (see Chart II.23). In late 2016 and especially in 2017 Q1, prices accelerated in Prague while slowing in the rest of the Czech Republic.

...but the pace of growth should slow in the coming years

Should the economy follow the *Baseline Scenario*, apartment prices would increase further if the historical relations between property prices and their macroeconomic fundamentals remain the same (see Chart II.24). However, the rate of growth of prices would be reduced by macroprudential measures adopted by the CNB and by an assumed tightening of the credit conditions.

The affordability of housing deteriorated

Housing affordability indicators are pointing to a deterioration in affordability but remain well below the highs recorded in 2008 (see Chart II.25). At the end of 2016, the price-to-income (PTI) ratio was up by 13.2% compared to its 2013 lows. The debt service-to-income (DSTI) ratio was up only slightly from its 2014 low, although this was mainly due to extremely low interest rates, which reduced instalments for most borrowers but could create the illusion of easy debt repayment in the future. Combined with expectations of further price growth, this may contribute to the further development of the price spiral between property prices and loans for house purchase (see section 5.3). Apartment rental returns rose slightly in 2016 despite a decline in yields on government bonds as an alternative investment (see Chart II.25).

¹⁶ This refers to transaction prices of apartments and family houses, including connected land, according to CZSO data based on Eurostat methodology. The CNB monitors various price indices, as each provides information about a specific aspect of the market. From the perspective of long-term assessment, apartment transaction prices are key. However, asking prices say a lot about the short- and medium-term dynamics.

The differences in housing affordability across regions are only partly reflected in loan amounts

Data from the *Survey of new loans secured by residential property* conducted by the CNB allow for regional analysis of housing affordability. The PTI and DSTI data confirm that there are differences in housing affordability in Prague and the rest of the Czech Republic (see Chart II.26). The growth in property prices across regions is leading to growth in total loans for house purchase. However, this growth is not proportionate. Households in regions with lower housing affordability compared to other regions pay a larger proportion of the purchase price from their own funds.

Supply-side constraints may push prices up rapidly and also protect the market from excessive construction

One of the factors behind the growth in residential property prices may be restricted supply. This applies especially to Prague, which accounts for about 15% of the residential property market in the Czech Republic as measured by the number of new loans for house purchase. The number of apartment starts in Prague in 2016 was about half of that in 2015. For the first time it was significantly lower than the growth in the number of households and was comparable with regions with substantial lower population growth. In Prague, the number of apartment starts was also significantly lower than the number of completions, while in other regions the numbers were similar (see Chart II.27). However, the cumulative number of completions since 2010 still exceeds the cumulative growth in the number of households¹⁷ (by 35% at the end of 2016; see Chart II.28). The existing barriers to new construction stemming from rigid building regulations in Prague may increase the upward pressure on prices. On the other hand, this factor may in the long term protect the market from excessive construction in reaction to investment or purely speculative demand. In some EU countries (e.g. Ireland and Spain) such demand in the past pushed construction above levels consistent with demographics, resulting in rapid growth in mortgages and overall household indebtedness.¹⁸ During the subsequent recession, the excess housing supply exacerbated the slump in residential property prices and the losses on loans for house purchase.

2016 saw record demand for commercial property...

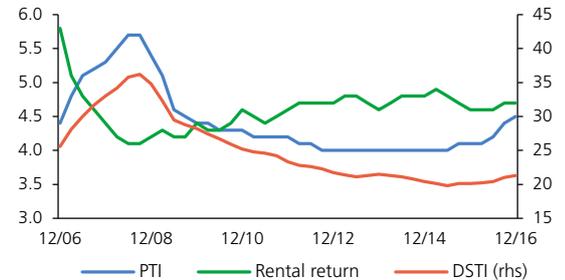
Prime yields on commercial property declined further during 2016. With rents stable, this implies an increase in commercial property prices (see Chart II.29). Yields were at their lowest level since 2000 in all the categories monitored. The biggest reduction was recorded for office

17 Growth in the number of households is estimated as population growth divided by the average size of the Czech household in the relevant year according to Eurostat. The average household size in regions is not available. If, however, the average household was smaller in Prague than in the rest of the Czech Republic, the real growth in the number of households in Prague in 2010–2016 would be bigger.

18 Maza, L. A., and Juan, M. (2011): *The residential investment adjustment in Spain: The current situation*, Economic Bulletin, Banco de España, January 2011. Kennedy, G., and Stuart, R. (2016): *Housing supply after the crisis*, No. 12/EL/16, Central Bank of Ireland, November 2016. European Systemic Risk Board: *Vulnerabilities in the EU residential real estate sector*, November 2016.

CHART II.25

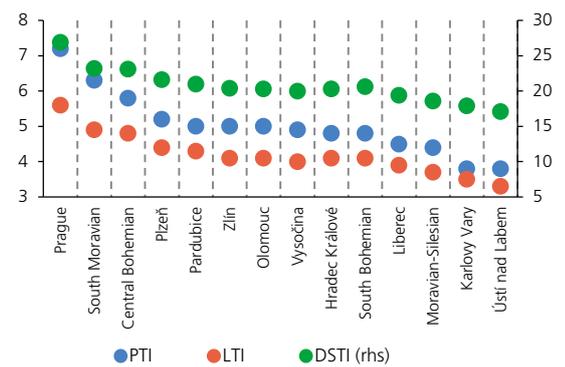
Housing affordability indicators
(PTI in years; yields in %; right-hand scale: %)



Source: CZSO, CNB calculation
Note: PTI and DSTI are obtained as the ratio of, respectively, the price of and monthly instalment on a 68 m² apartment to the moving average of the annual and monthly wage. A mortgage with an LTV of 77% and a repayment period of 20 years was considered for the DSTI calculation.

CHART II.26

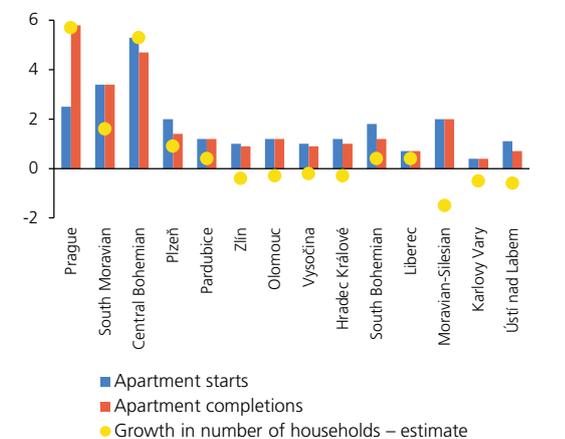
Housing affordability indicators in regions
(x-axis: regions; left-hand scale: years; right-hand scale: %)



Source: CNB
Note: PTI and LTI obtained from individual data on new loans secured by residential property in 2016 H2. Data calculated on a sample of loans for which the necessary data were available (purchase price data represented the biggest constraint). This sample accounted for around one-third of new loans provided in 2016 H2.

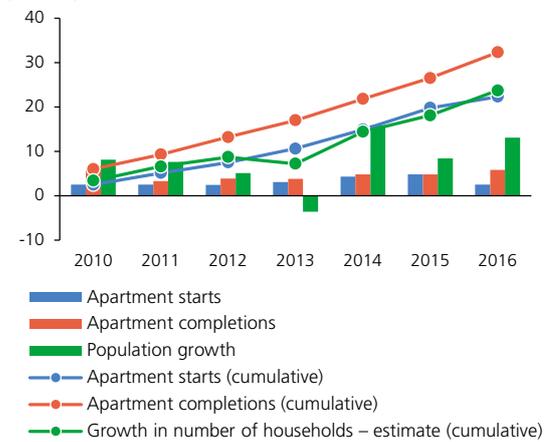
CHART II.27

Apartment construction and population growth in regions
(x-axis: regions; y-axis: thousands)



Source: CZSO, Eurostat, CNB calculation
Note: Growth in the number of households estimated as population growth divided by the average household size in the Czech Republic in the relevant year according to Eurostat.

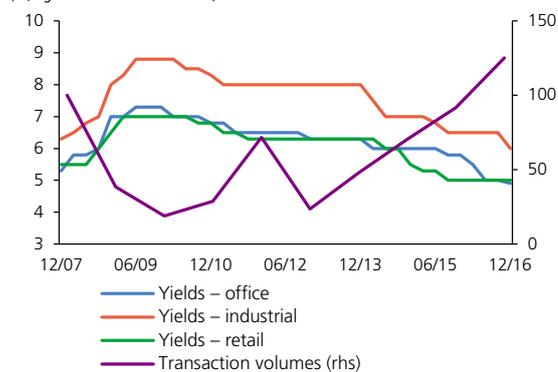
CHART II.28

Apartment construction and population growth in Prague
(thousands)

Source: CZSO, Eurostat, CNB calculation

Note: Growth in the number of households estimated as population growth divided by the average household size in the Czech Republic in the relevant year according to Eurostat. The sum since 2010 for cumulative values.

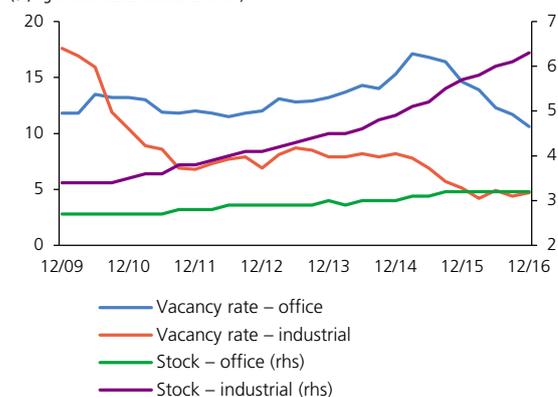
CHART II.29

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

Source: Jones Lang LaSalle

Note: Prime yields. Transaction volumes in annual frequency.

CHART II.30

Stock and vacancy rates for commercial property
(%; right-hand scale: thousands of m²)

Source: Jones Lang LaSalle

premises, which currently have the lowest yield of all the categories monitored. However, it is still higher than the returns on alternative assets or commercial property in Germany. At the same time, 2016 was a record year in terms of transaction volume, which exceeded the previous high recorded in 2007 by 25% (see Chart II.29). Foreign entities accounted for 75% and Czech entities 25% of the transaction volume.¹⁹ Demand for commercial property in the Czech Republic may also have been supported by political uncertainty in other countries preferred by investors in the past (such as the UK and the USA).

...but the supply of new premises was constrained by rigid building regulations

Despite record investment demand for most types of commercial property, the stock of newly completed premises fell or stayed at low levels in 2016. Office property in particular was negatively impacted by rigid building regulations. The stock of newly completed premises fell to a historical low of about one-fifth of the long-term average in 2016. Demand for new office rentals was high (net take-up rose by 15% in 2016 compared to 2015 and was the second highest in history), so the vacancy rate dropped sharply (see Chart II.30). In the coming year, construction of new office premises should recover to roughly its historical average and the vacancy rate should fall slightly further.

19 Jones Lang LaSalle: *Prague Office Market Pulse*, Q4/2016, 2016.

2.3 NON-FINANCIAL CORPORATIONS

Due to the slowdown of the Czech economy, the non-financial corporations sector recorded a slight fall in profitability. The riskiness of loans provided to non-financial corporations increased, but remains far below the level observed in the crisis years. The NPL ratio remains particularly high in the construction and energy sectors. Despite a modest slowdown, the rate of growth of bank loans to non-financial corporations remains strong and ranks among the highest in Europe. The amount of foreign currency bank loans increased significantly and their share of the total reached a historical high of 30.5% in March 2017. The highest growth was observed in the real estate and manufacturing sectors. This trend is linked mainly with natural hedging of firms against exchange rate risk and is therefore not a source of systemic risk.

The modest economic slowdown was reflected in the sector's overall condition

The overall performance of the non-financial corporations sector was broadly flat in 2016 due to the unwinding of one-off effects observed in the Czech economy in 2015. The sector's aggregate profitability decreased (see Chart II.31), due among other things to growth in firms' personnel costs. A slight decrease in profitability was recorded across all firm sizes with the exception of the smallest companies, which, however, had recorded very low profitability in previous years (see Chart II.32). The economic slowdown was also reflected in an increasing number of loss-making firms – for the first time since the return to economic growth. Although profitability decreased across all branches of activity in 2016, manufacturing (and especially the automotive industry) maintained a high return on equity compared to the rest of the sector (see Chart II.33). Renewed growth in prices of oil and other energy commodities stopped the drop in industrial producer prices in the energy sector and positively affected its profitability, which had been falling since 2013.

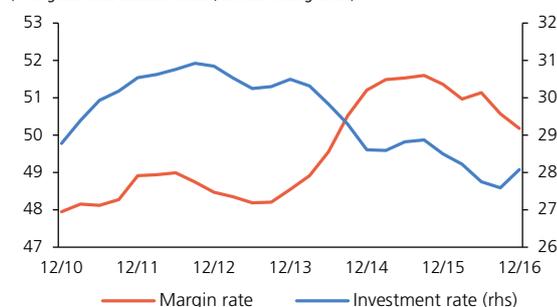
In parallel with the drop in the sector's profitability, the investment rate fell in 2016. This was mainly because of a slow start to investment projects co-financed from EU funds in the new programme period. The decline in government investment mainly affected the construction sector, which saw a year-on-year drop in production of 7.6% in 2016. This trend continued at the start of 2017. A survey conducted by the CNB and the Confederation of Industry for 2017 Q1 reveals that non-financial corporations expect only a modest rise in investment expenditure in the quarters to come. In this respect, the key factor is external demand, which has the strongest impact on gross fixed capital formation by non-financial corporations.²⁰ However, thanks to financial surpluses generated in previous years, even slightly higher investment growth should not represent a major risk to the sector's debt.

20 CNB: Inflation Report I/2017, Box 2, January 2017.

CHART II.31

Margin rate and investment rate

(% of gross value added of sector; annual moving totals)

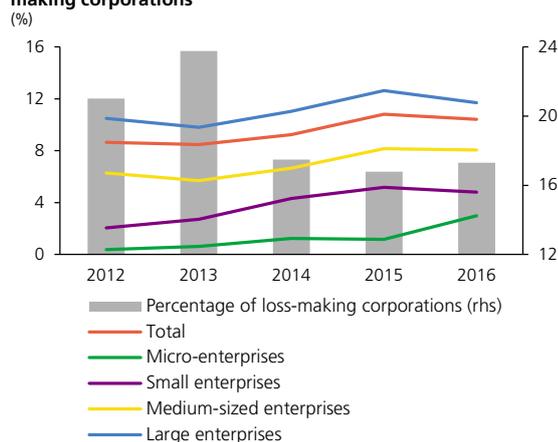


Source: CZSO

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

CHART II.32

After-tax RoE by enterprise size and percentage of loss-making corporations

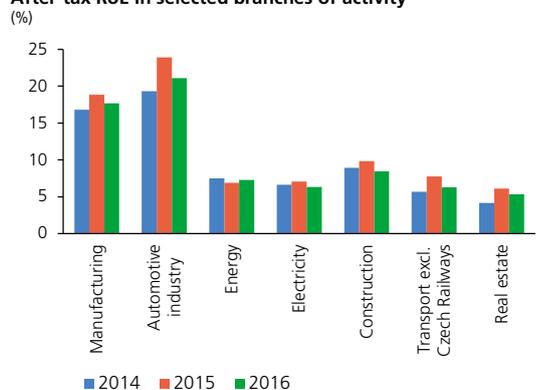


Source: CZSO, CNB calculation

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.33

After-tax RoE in selected branches of activity

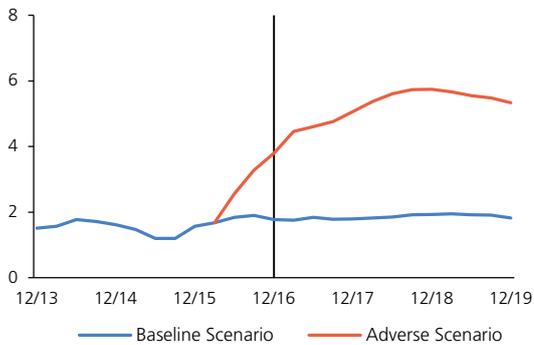


Source: CZSO, CNB calculation

Note: Energy comprises electricity, gas, heat and air-conditioned air. The results are based on a sample of corporations. The property development sector is included under construction.

CHART II.34

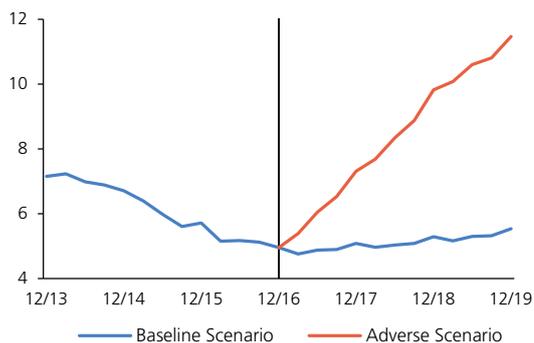
12-month default rate on bank loans to non-financial corporations (%)



Source: CNB

CHART II.35

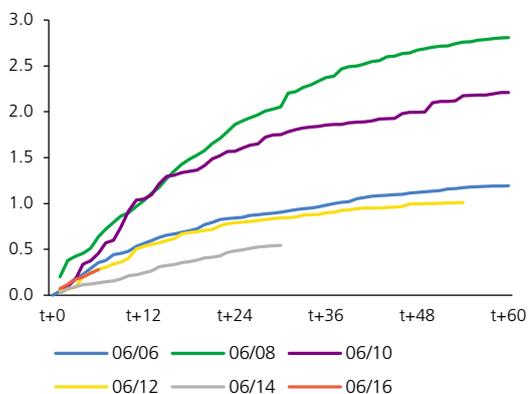
NPL ratio for bank loans in the non-financial corporations sector (%)



Source: CNB

CHART II.36

Riskiness of loans to non-financial corporations by date of provision (cumulative default rate in %)



Source: CNB

Note: The initial slope of the curve provides a relatively good signal about the subsequent evolution of the riskiness of loans provided in the given period.

Adverse external developments are the main source of risks to the sector; uncertainty may also be fostered by the koruna exchange rate after the exit from the CNB's commitment

Given the strong dependence of the sector's performance on export-oriented industries, adverse external developments are the main risk scenario for the non-financial corporations sector. The probability of this scenario materialising has risen slightly owing to a significant slowdown in year-on-year growth of goods and services exports in 2016 H2.²¹ However, the foreign trade data for January 2017 point to a return to the export growth levels seen in 2016 H1, and the observed slowdown can be viewed as a one-off drop and not as the start of a change in trend.

The exit from the CNB's exchange rate commitment in April also implies some uncertainty. However, non-financial corporations whose finances are sensitive to exchange rate movements have partly hedged themselves against exchange rate risk. This is evidenced by a significant increase in foreign currency borrowing (see subsequent sections). A slight rise in the coverage of exports by imports in 2016 H2 has also reduced the risks.

Credit risk increased slightly and has bottomed out according to the Baseline Scenario

Credit risk as measured by the 12-month default rate increased slightly in 2016 (see Chart II.34). As measured by the backward-looking non-performing loan (NPL) ratio, by contrast, it fell slightly further year on year (see Chart II.35). Consistent with the *Baseline Scenario* is stagnation of the NPL ratio in the first year and a slight increase in subsequent years. The slightly higher riskiness of loans to non-financial corporations granted in 2016 compared to previous years suggests that credit risk has bottomed out and could rebound (see Chart II.36). However, compared to the riskiness of loans provided in the crisis years, it remains significantly lower. If the *Adverse Scenario* were to materialise and a return to recession were to happen, the credit risk of the non-financial corporations sector would rise sharply for both monitored indicators (see Charts II.34 and II.35).

Credit risk remains elevated in construction and energy

The differences in performance and profitability across branches of activity are reflected in their credit risk (see Chart II.37). The construction sector has long been showing an elevated NPL ratio and its outlook remains negative.²² Businesses in the energy sector have also been showing an adverse credit risk trend over the last three years. Credit risk in this sector fell slightly in the second half of 2016, but rose again in 2017 Q1 and remains well above the level in the rest of the sector. The

21 The slowdown is a consequence of developments in the automotive industry, primarily subdued demand for new cars in Western Europe. CNB: Inflation Report I/2017, Box 3, January 2017.

22 This was mainly due to low investment activity in 2016 and shifts in the value of new orders, which fell by 3% year on year in 2016. The CZSO's March 2017 business survey largely confirms these trends. After 2015 and 2016 Q1, when it reached its highest levels since the crisis, the confidence indicator in the construction sector returned to the December 2014 level.

outlook for the sector remains rather negative owing to uncertainty surrounding prices of oil and other energy commodities.²³ The risk profile of the other sectors was little changed. As a result of improved profitability, the credit risk of the smallest firms decreased, whereas that of the largest ones increased slightly.

The credit risk of the 1,000 largest exporters increased considerably. However, this was largely due to the situation of several engineering companies.²⁴ The NPL ratio more than tripled between May 2016 and January 2017, reaching 5.6% in March 2017.

Despite a slight fall, bank lending growth remains strong

The year-on-year rate of growth in bank loans to non-financial corporations slowed slightly in 2016 and was at 4.7% in March 2017. The growth is relatively strong both from the historical perspective and in the international context (see section 5.2). Loans to corporations are growing fastest in the real estate and manufacturing sectors. According to the *Baseline Scenario* of the current round of stress tests, the growth rate of bank loans will increase in the quarters ahead and year-on-year credit growth should reach around 10% at the three-year test horizon (see Chart II.38). If the *Adverse Scenario* were to materialise, the credit growth rate would be positive only in the first year and there would be a sizeable credit contraction in the following years.

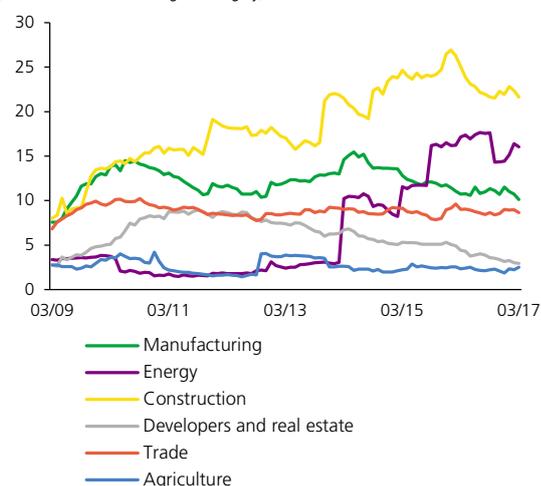
As for other funding sources, growth in debt securities issuance has been falling since 2015 Q3. This type of funding represented 11.9% of total external funds in 2016 Q4. The remainder consisted of loans from non-bank financial institutions and intercompany loans, the growth rate of which is comparable to that of bank loans.

The decline in new loans slowed in late 2016 and early 2017

Although the amount of new koruna loans to the non-financial corporations sector as a whole has been falling year on year since 2015 Q3, the decline slowed in late 2016 and early 2017. Genuinely new loans followed a similar pattern. Lending to real estate firms is moving in the opposite direction. According to CCR data, the growth rate of new loans in this category is rising sharply. Genuinely new loans to these firms account on average for more than a quarter of all new loans in the sector.²⁵ In addition to strong growth in loans to households for house

CHART II.37

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

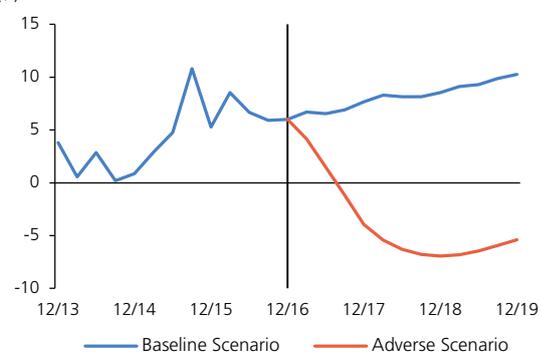


Source: CNB

Note: The developers category comprises NACE 411 (Development of building projects) and NACE 68 (Real estate activities).

CHART II.38

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



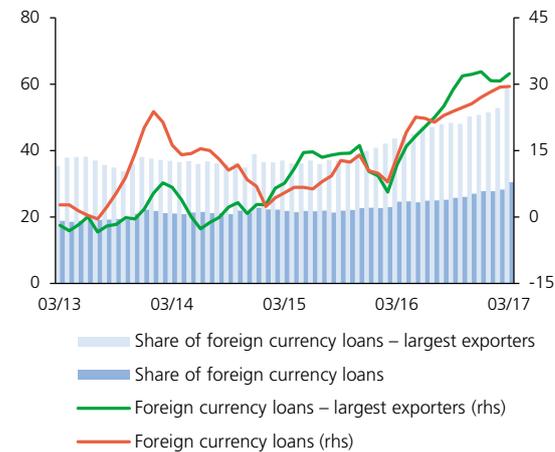
Source: CNB

²³ In November 2016, OPEC agreed to cap oil production. The Brent crude oil price reacted by recording its highest growth since early 2009. However, the limits only apply to 2017 H1. Oil price growth was fostered in 2017 Q1 by disruptions to production in Libya and by signals that OPEC might extend the output cap agreement into the second half of the year. However, growth in drilling activity and subsequently in shale oil production in the USA is expected to rise if the price significantly exceeds the current level. Market reports meanwhile suggest there is a significant oil surplus.

²⁴ As of March 2017, four subsidiaries of the Vitkovice Machinery Group had gone bankrupt – Vitkovice Power Engineering, Vitkovice Gearworks, Vitkovice Envi and Vitkovice Revmont. The Czech banking sector is exposed to risks relating to loans to these companies. *Report of the Insolvency Trustee on the State of the Insolvency Proceedings in Vitkovice Power Engineering* of 9 November 2016.

²⁵ A similar percentage share is observed for the stock of credit. In February 2017, loans to real estate firms accounted for roughly 29% of total loans to non-financial corporations.

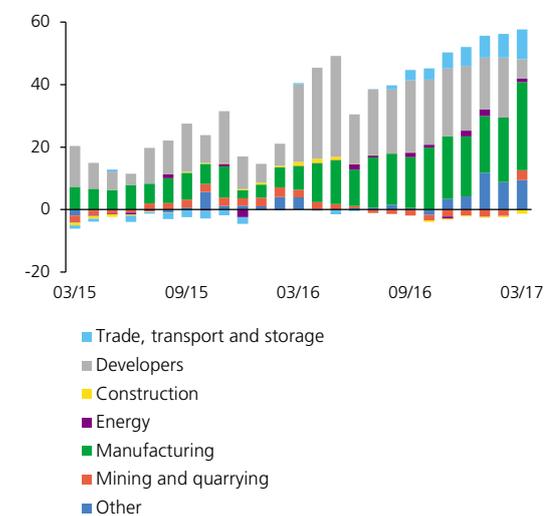
CHART II.39

Year-on-year growth in foreign currency loans and their share in total bank loans of sector (%)


Source: CNB

Note: Foreign currency loans are smoothed by the 3-month moving average. The largest exporters category comprises the 1,000 largest exporters in the Czech Republic in 2016.

CHART II.40

Absolute year-on-year changes in foreign currency loans in selected branches of activity (CZK billions)


Source: CNB

purchase (see section 2.4), the concentration of loans to the real estate sector is rising substantially. This is increasing the Czech banking sector's vulnerability to adverse developments in this market. From the perspective of the purpose of lending, financial and investment loans rose year on year, whereas shorter-term operating loans declined (see Chart V.15 in section 5.2).

The amount of foreign currency bank loans rose significantly

Year-on-year growth in foreign currency loans rose significantly during 2016, reaching 29.6% in March 2017 (see Chart II.39). Between January 2016 and March 2017, the share of foreign currency loans in total bank loans in the sector rose by 7.8 pp to a historical high of 30.5%. An even larger change in the currency structure of loans is apparent in the category of the largest exporters, where foreign currency loans make up more than half of all loans obtained. Exporters traditionally use foreign currency loans as a means of hedging against exchange rate risk. A CNB analysis based on a sample of the largest exporters reveals that exporting firms are quite well hedged in this respect. The highest growth was observed in the manufacturing and real estate sectors (see Chart II.40). The observed growth in foreign currency borrowing was thus linked mainly with natural hedging of firms against exchange rate risk before the expected exit from the CNB's exchange rate commitment.²⁶

²⁶ Developers report most prices in euro, so foreign currency borrowing in this segment may also involve natural hedging of sales.

2.4 HOUSEHOLDS

The income situation of households, including low-income households, improved. Positive perceptions of income growth and the favourable economic outlook are boosting consumption and investment and leading to growth in the sector's indebtedness. Bank loans for house purchase are accelerating, and, after several years of stagnation, consumer credit is rising sharply, too. Thanks to the low interest rate environment and favourable income trend, debt servicing costs are staying at a sustainable level. However, the expected interest rate growth may increase households' sensitivity to income shocks and cause repayment problems to rise. Credit risk fell slightly across all loan categories and is expected to rise modestly in the period ahead.

An improvement in the labour market situation was reflected in faster income growth...

The economic growth in 2016 and early 2017 helped further improve the overall labour market situation. At the end of February 2017, the general unemployment rate fell to 3.5%, the lowest level in the EU. The growing labour demand led to an increase in vacancies and positively affected wage growth (see Chart II.41). The growth rate of the median wage is higher than that of the average wage, indicating a shift to higher wages, especially in low-income households. The CNB's macroeconomic forecast contained in Inflation Report II/2017 suggests that the labour market is now close to the situation seen at the peak of the business cycle in 2009, so only a marginal decline in unemployment can be expected going forward. However, as excess labour demand can be observed in many sectors, the forecast assumes continued buoyant growth in income.

...and positive economic perceptions are leading to growth in indebtedness

The growing consumer confidence and optimistic income outlook led to a renewed upswing in debt growth, which considerably outpaced growth in disposable income in 2016 (see Chart II.42). This was reflected in a further increase in the debt ratio. By international comparison, however, the total indebtedness of Czech households is still relatively low. Moreover, its rate of growth has not been as dramatic as in countries that did not undergo deleveraging in previous years (see Chart II.43). However, in certain segments, especially bank loans, the growth rate of loans remains above the EU average. Loans for house purchase recorded the highest growth. In year-on-year comparison, around 15% more genuinely new loans for house purchase (including increases) were granted in 2016, and the growth accelerated further in early 2017 (see also Chart V.15 in section 5.2). In the case of new loans for house purchase, the share of genuinely new loans is flat at around 60%. Likewise, the shares of loans refinanced by banks and loans with new fixation periods were also stable (at just above 10% and just under 30% respectively). According to the *Baseline Scenario*, the rate of growth of bank loans to households should stay close to 8% (see Chart II.44). The main factor counteracting credit growth will be the stricter LTV ratio set in the *Recommendation on the management of risks associated with the provision of retail loans secured by residential property* as from April

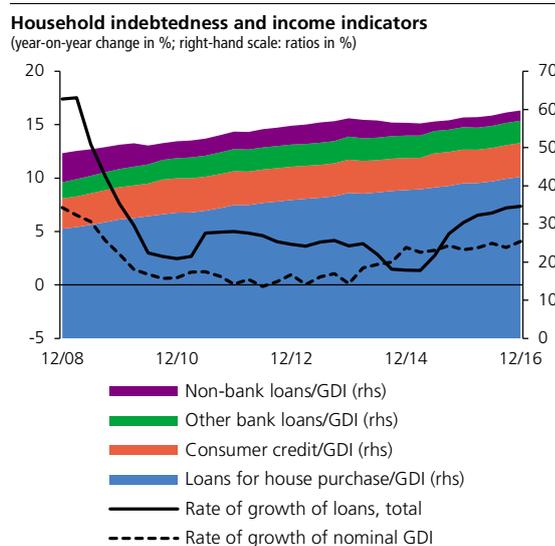
CHART II.41



Source: CNB

Note: The unemployment rate is seasonally adjusted. The vertical line divides the observed values and the CNB's official predictions in Inflation Report II/2017.

CHART II.42

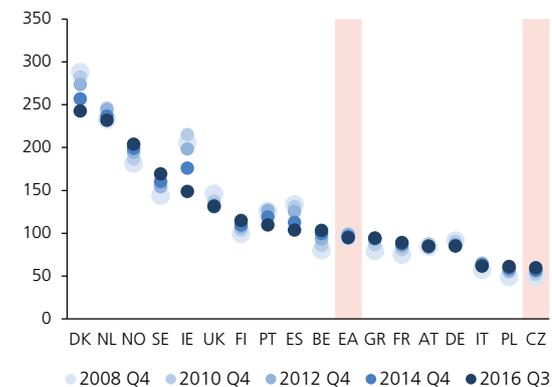


Source: CNB

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

CHART II.43

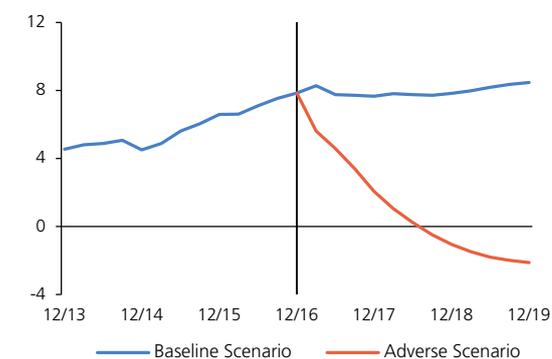
Household debt in relation to gross disposable income in international comparison (%)



Source: CNB

CHART II.44

Year-on-year growth in bank loans to households (%)



Source: CNB

2017. However, if the macroeconomic conditions of the *Adverse Scenario* were to materialise, credit growth would start declining sharply and would be negative at the three-year horizon.

Low interest rates and rising income are having a favourable effect on debt servicing

Despite the rising level of total household debt, the ratio of net interest costs to disposable income stayed just under 2% (see Chart II.45). This was due to both growing income and very low interest rates, which, however, are likely to have reached a trough at the end of 2016 (see Chart II.46). The effects of a reversal of the interest rate trend could be partly neutralised by increasing fixation periods (see Chart II.45). The growth in debt servicing costs will therefore impact first on loans with fixation periods that are coming to an end²⁷ and on consumer credit with short maturity. In an environment of higher loan funding costs, debt servicing will be more sensitive to changes in the income situation of households (see section 4.3). However, data from the Household Budget Statistics show that loans were granted mainly to higher-income households, which are less sensitive to rises in rates and drops in income (see Chart II.47, left-hand panel). In a less favourable scenario, debt servicing costs should therefore stay at a sustainable level for most households. Nevertheless, in the event of a significant increase in interest rates, some low-income households could be exposed to increased risk. Loans provided to households in the lowest income quartile account for a relatively small share of total loans, but they consist mainly of higher-risk consumer credit. This is evidenced by greater problems with regular repayments and an increased risk of such problems occurring in periods prone to drops in income (see Chart II.47, right-hand panel).

The credit risk of households decreased

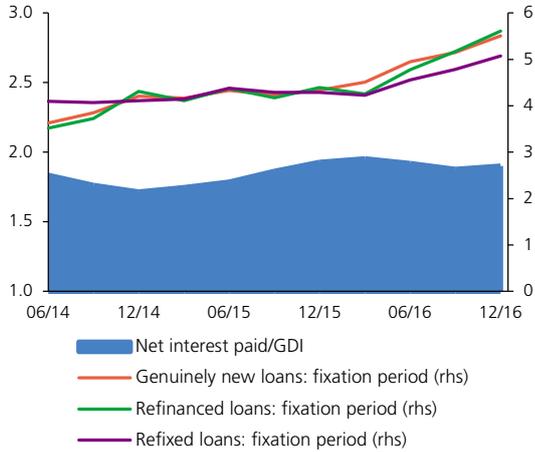
Thanks to the observed macroeconomic developments, credit risk indicators fell across all loan categories during 2016. The 12-month default rate on bank loans to households fell to 2.2% (see Chart II.48). A downward trend was seen for both loans for house purchase (1.6%) and consumer credit (4.7%). The 12-month default rate on non-bank loans was higher but falling slightly. The favourable credit risk trend is confirmed by a falling ratio of non-performing bank loans to total loans, which amounted to 3.1% in February 2017 (loans for house purchase 1.9%, consumer credit 8.8%). According to the *Baseline Scenario*, the credit risk of households should rise slightly in 2017, mainly on the back of a slight deterioration in the consumer credit portfolio. If the *Adverse Scenario* were to materialise, the 12-month default rate on loans to households would start to rise sharply, reaching 6% at the end of the three-year horizon. This is more than double the expected rate.

²⁷ However, in the case of some loans with longer rate fixation periods which will be refixed in the coming years, interest rates will probably continue to decline compared to when the rates on such loans were last fixed.

CHART II.45

Debt servicing costs and average loan fixation period

(%; right-hand scale: average fixation period in years)

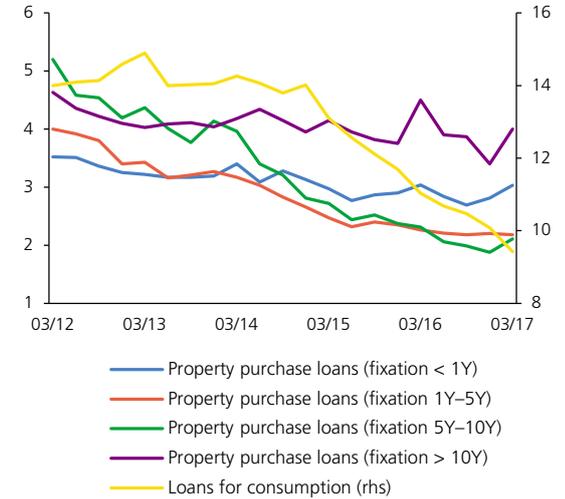


Source: CNB
 Note: Net interest paid is the difference between households' loan interest costs and their interest income on bank deposits. GDI stands for gross disposable income of households.

CHART II.46

Interest rates on new koruna loans to households

(%)

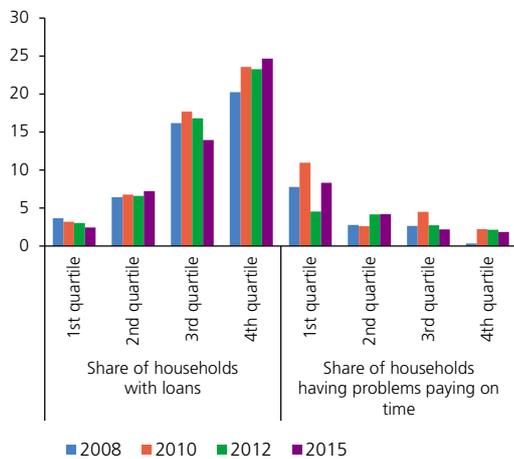


Source: CNB

CHART II.47

Selected characteristics broken down by income quartile

(%)

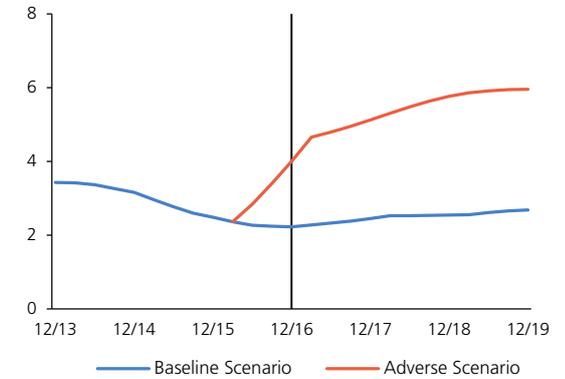


Source: CZSO, CNB calculation
 Note: Income quartiles are determined according to households' total net income for the year.

CHART II.48

12-month default rate on bank loans to households

(%)



Source: CNB