2 THE REAL ECONOMY

2.1 THE MACROECONOMIC ENVIRONMENT

The world economy entered 2011 with optimistic expectations. However, economic growth in advanced countries weakened as the year progressed, mainly because of the euro area debt crisis, and this trend looks set to continue in 2012. In response to this, monetary policies remain very loose, suppressing potential growth in credit risk due to the elevated real costs of servicing the accumulated debt. This applies above all to households, which are facing an adverse labour market situation and worse labour income dynamics. Negative supply-side shocks in the form of rising energy prices and taxes are also adversely affecting household income. From the perspective of the Czech economy, the main risk scenario remains a sharper economic contraction in Germany and other countries that are major trading partners of Czech corporations. The weakening international position of the Czech economy, due largely to growth in domestic public debt, may become a risk factor in the longer term.

Global economic growth was slower than expected…

Following a relatively robust recovery in 2010, the global economy recorded a modest slowdown in 2011, although the outcomes were very uneven across regions and countries. The year-on-year decline in GDP growth was larger than expected (see the third and fourth columns in Charts II.1 and II.2). Globally this was partly due to falling output in Japan linked with the natural disaster there. The overall situation in the euro area was a positive surprise, with actual economic growth in Germany significantly exceeding forecasts. However, growing differences emerged across the euro area member countries.

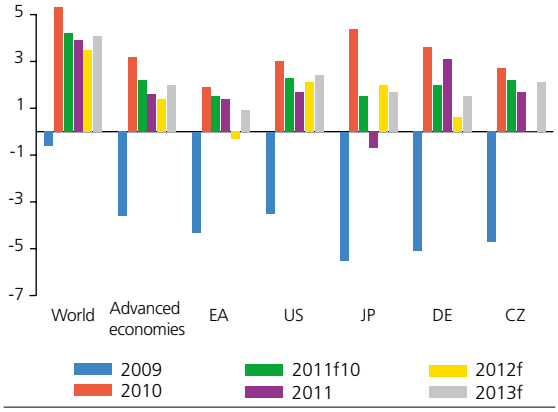
…and the prospects for the next two years remain unfavourable

A further slowdown of global economic growth is expected for 2012. Some institutions, for example the IMF[1], even expect a slight decline in euro area output. The euro area should return to modest economic growth in 2013 provided that households stop creating additional precautionary savings and increase their consumption. The high debt burden of the private and public sectors is reducing consumption, and the uncertainty surrounding future developments is limiting investment in fixed capital. The emerging economies are also expected to slow slightly. Despite weak demand pressures, inflation all over the world remains slightly elevated owing to rising commodity and energy prices. The escalation of the debt crisis in the euro area in 2011 H2 led to a sharp increase in financial market volatility, and the *Asymmetric Developments* stress scenario contained in FSR 2010/2011 gradually materialised. Some elements of this scenario were therefore used in the *Europe in Depression* stress scenario in this Report (see the end of section 2.1).

1 In its May forecast the CNB predicts that effective GDP growth in the euro area will stay positive in 2012 (at 0.5%).

Chart II.1

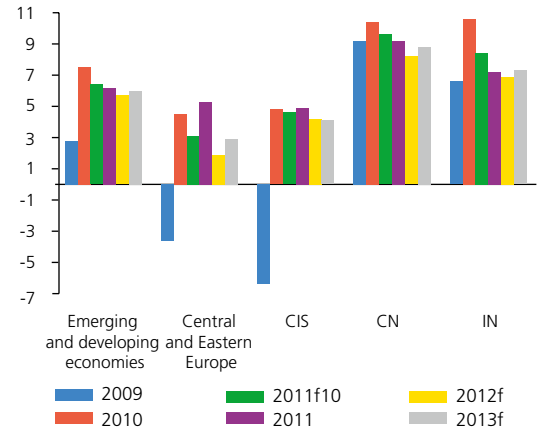
Economic growth worldwide and in the advanced economies
(year-on-year growth in %; outturns and October 2010 and April 2012 forecasts)



Source: IMF (World Economic Outlook, April 2012) and CNB (May 2012 macroeconomic forcast)
Note: 2011f10 is the October 2010 forecast for 2011.

Chart II.2

Economic growth in emerging and developing countries
(year-on-year growth in %; outturns and October 2010 and April 2012 forecasts)



Source: IMF (World Economic Outlook, April 2012)
Note: 2011f10 is the October 2010 forecast for 2011.

The domestic economic recovery gradually halted

Czech economic growth also slowed gradually during 2011 and the domestic economy started to stagnate at the year-end. The real GDP growth figure of 1.7% recorded for the year as a whole was due solely to external demand. The current CNB forecast expects GDP to stay at the previous year's level in 2012. Net exports will be the main driver of growth, amid subdued aggregate domestic demand. In connection with the expected more marked recovery of economic growth abroad, the forecast foresees growth of 1.9% in 2013. Average annual CPI inflation should increase to 3.6% in 2012 as a result of an increase in the reduced VAT rate, whereas monetary-policy relevant inflation (i.e. inflation adjusted for the first-round effects of changes to indirect taxes) should stay in the upper half of the tolerance band around the inflation target. Both inflation rates are expected to be slightly below the target in 2013.

Monetary policies remain easy…

Central banks in advanced countries continue to pursue easy monetary policies. Monetary policy rates remain at minimum levels, with only the ECB lowering its main refinancing rate back to 1% after raising it temporarily to 1.5%. The CNB has held its two-week repo rate at 0.75% since May 2010. Maintaining easy monetary conditions is consistent with the absence of demand-pull inflationary pressures resulting from weak economic activity and difficult labour market conditions. In addition to standard monetary policy instruments, the Federal Reserve and the Bank of England continued their quantitative easing policies (see the Glossary and also FSR 2010/2011, Box 1). At the end of 2011, the ECB complemented its instruments with extraordinary three-year liquidity-providing operations (long-term refinancing operations, LTROs), through which the balance-sheet liquidity of euro area banks obtained from central banks was increased by about EUR 500 billion on a net basis, representing 1.5% of euro area bank liabilities (see section 3.1). The effects of these operations are similar to those of quantitative easing. The aim of the easy monetary policies is to keep money market rates, and subsequently also rates on loans and other sources of external financing, at low levels (see Chart II.3). This should stabilise the balance of cash flows of corporations and households, allowing them more easily to reduce the considerable debt they racked up in the pre-crisis years.

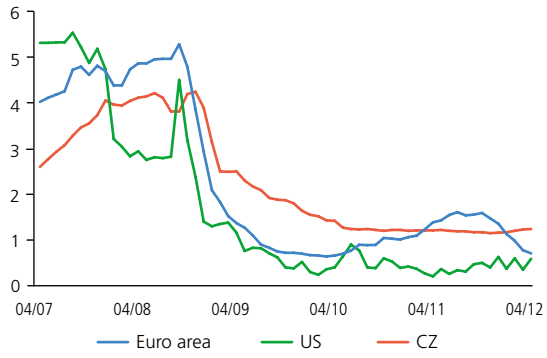
…but growth in lending is subdued

Thanks to the economic recovery, loans to the private sector rose slightly in 2011 and the first months of 2012 in the Czech Republic and most other EU countries (see Chart II.4). However, the situation often differs significantly across economies. Lending growth is still relatively strong in Scandinavia, for example, but the total stock of loans is gradually falling in many of the countries hit by the financial crisis (e.g. Ireland and Spain). The subdued lending reflects not only high debt ratios in most advanced countries, but also pessimistic expectations regarding macroeconomic developments in the years ahead. Countries in which households and corporations are highly indebted are seeing a sharp fall in credit demand and subsequently also in consumer and investment

CHART II.3

Three-month interbank market rates since the start of the financial turbulence

(%)

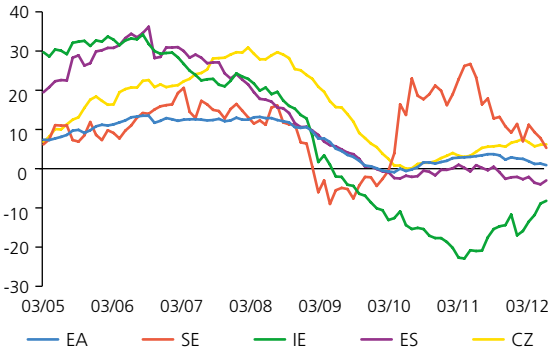


Source: Thomson Datastream

CHART II.4

Year-on-year growth in loans to the private sector

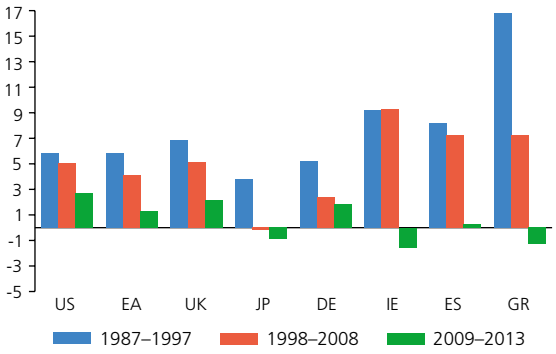
(%)



Source: Thomson Datastream, CNB

Chart II.5

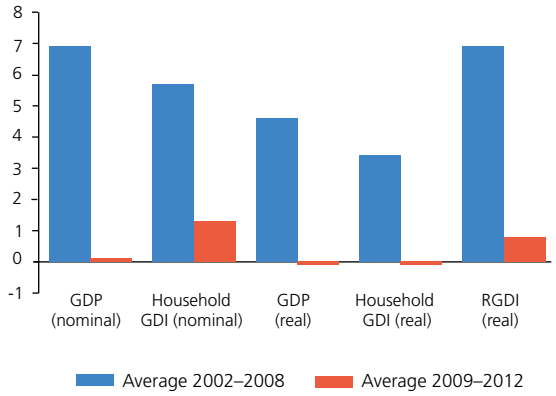
Nominal GDP and nominal GDP forecasts for selected countries
(average year-on-year growth in %)



Source: OECD

Chart II.6

Macroeconomic income aggregates in the Czech Republic
(average year-on-year growth in %)



Source: CZSO and CNB forecast
Note: GDP – gross domestic product, GDI – gross disposable income, RGDI – real gross domestic income (GDP adjusted for change in terms of trade).

demand. Elevated credit risk on the part of financial institutions and concerns of their clients about their debt repayment ability are negatively affecting both the demand and supply sides of the loan market. At the end of 2011, concerns arose in the euro area that the deleveraging process (see Box 1 and section 5.1) would be accompanied by a sharp tightening of credit conditions and worse availability of loans for the private sector, which would adversely affect economic growth. These concerns were exacerbated by a virtual halt of growth in lending to the euro area private sector at the end of 2012 Q1. In the first few months of 2012, deleveraging in the euro area began to be seen as a major risk to financial stability in Europe.

Debtors face a sharp change in the macroeconomic environment

The drastic change in the macroeconomic environment is becoming an increasingly significant factor affecting growth in both the real economy and the financial sector. Economic agents in advanced economies are starting to accept that weak economic growth may – despite supportive macroeconomic policies – be a long-term phenomenon. Expectations regarding future corporate and household income have been revised quite markedly. This in itself represents a strong shock. The pre-crisis growth in nominal income – approximated by nominal GDP growth of 5–10% a year – has been replaced by a period of very low to slightly negative growth (see Chart II.5). Real income growth, however, is also undergoing a fundamental change. The real GDP growth expectations of corporations, households and governments were at historical highs before the crisis. For several years now they have been confronted with much lower real output and income levels. Overall, current nominal and real income in most advanced countries is well below the levels expected in the pre-crisis period, during which economic agents quickly ran up big debts. Given this unexpectedly adverse trend, many agents may have problems paying their debts, and creditors may be exposed to much higher credit risk.

Indebted households are being hit hardest

The "jobless recovery" hypothesis, i.e. the assumption that the financial condition of corporations will soon improve after the crisis while the labour market situation will remain unfavourable for a long time, especially in Europe, was confirmed in 2011.[2] Firms have optimised their operations, cut their personnel expenses and thereby increased their profitability (see section 2.2). Given the sluggish economic growth, however, investment is flat, new jobs are being created to a minimum extent, and employees' wages are rising – in the better case – very slowly. The upshot of this is that credit risk is stabilising in the case of corporate loans while rising in the segment of loans to households (see also sections 2.3 and 4.1).

2 According to the April 2012 IMF economic outlook, the unemployment rate at the end of 2012 will be 2 pp above the 2008 level in advanced countries (up from 5.8% to 7.9%) and a full 3 pp above the 2008 level in the euro area (up from 7.7% to 10.9%).

The difficult income situation is increasing credit risk in the Czech Republic as well

Despite a partial recovery of the real economy and some improvements in the labour market, the Czech economy was exposed to the consequences of adverse income trends (see Chart II.6). Although the registered unemployment rate fell from 9.3% to 8.7% during 2011, households' real disposable income decreased by 1.8%. The CNB's May 2012 macroeconomic forecast assumes that the real disposable income of households will continue declining in 2012 (-0.6%) and return to growth in 2013 (1.5%). On the one hand, the subdued income growth is preventing unit labour costs from rising and is therefore maintaining the price competitiveness of Czech output, but on the other hand it is being reflected in the credit risk of the household sector, which recorded a further increase in non-performing loans in 2011 (see section 2.3). However, the credit risk of corporations and the government may also start rising again in the coming quarters. Czech economic agents which, for example, borrowed money immediately after EU entry on the assumption that potential real GDP would rise by 5% a year on average are facing the consequences of a dramatically different situation. If real GDP grows in future years according to the *Europe in Depression* stress scenario (see the end of section 2.1), the gap between actual and originally estimated potential GDP will reach a full 23% by the end of 2013 (see Chart II.7).

Rising real debt servicing costs still pose a risk

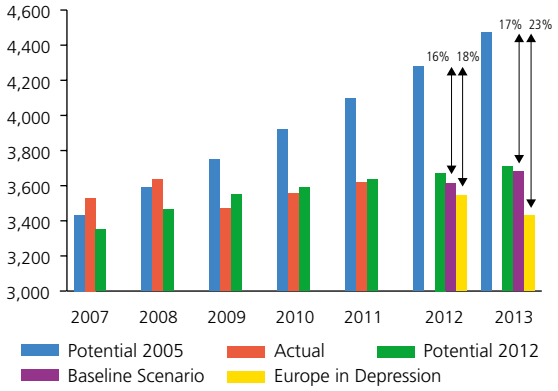
Loan interest rates in advanced countries have remained low in the last two years, thanks to sufficient or even surplus global savings, loose monetary policies and stabilisation measures in banking sectors. The same goes for both the main bank loan categories in the Czech Republic, i.e. loans to households for house purchase and corporate loans (see Chart II.8). If, however, debtors were exposed to a sharp fall in income growth, the increased real debt servicing costs could become too high. Particularly in the housing loan segment, even a small change in the parameters affecting the debt burden could – given a combination of falling property prices and decreasing wages – have a relatively large effect on debtors' ability and motivation to service their debts. This also applies, however, to corporate loans, as the feasibility of investment projects depends on the existence of low interest rates given the declining rate of return caused by slowing economic growth. In the current economic situation, a large proportion of potential investment projects could – in some countries – make sense only with significantly negative real interest rates (see Box 1).

Households and corporations may also be hit by the sovereign debt crisis

Besides the fact that long-term loans are gradually being renewed and refinanced at the new interest rate level, interest rates on new loans are an important factor of debt servicing costs (see Chart II.9). These rates have been falling constantly in the Czech Republic over the last two years. The lower debt servicing costs may moderate the adverse trend in nominal disposable income growth and become a stabilising factor of credit risk in the domestic economy (see section 2.3). By contrast, loss

CHART II.7

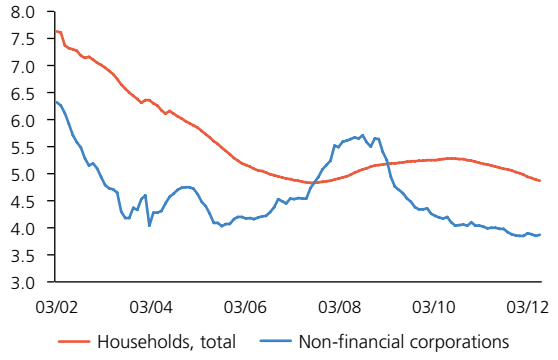
Potential GDP according to 2005 expectations and current predictions and real GDP compared with alternative scenarios
(CZK billions; constant prices)



Source: CNB

CHART II.8

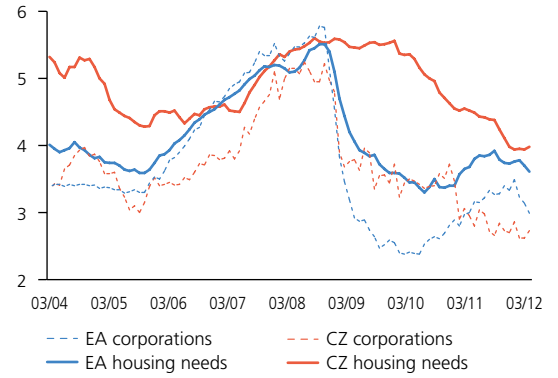
Interest rates on loans
(% p.a. on total stock of loans)



Source: CNB
Note: Interest rates on overdrafts are not included in the case of households.

CHART II.9

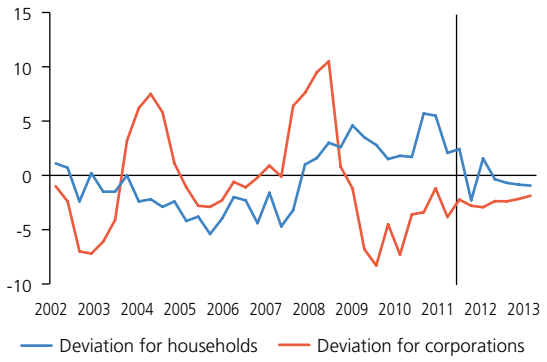
Interest rates on new loans in the Czech Republic and the euro area
(% p.a.)



Source: ECB, CNB
Note: Bank overdrafts and revolving loans are excluded.

Chart II.10

Approximation of the deviation of real debt servicing costs from the long-term average
(% p.a.)



Source: CNB
Note: The vertical line separates past values from CNB predictions.

of confidence in public debt sustainability may become a destabilising factor. The crisis in the euro area led to a rise in interest rates on new loans in 2011 (see Chart II.9), creating an adverse procyclical effect at the least opportune moment. If this trend persists, some economies could ultimately be exposed to the danger of debt deflation and balance-sheet recession (see Box 1).

Owing to the developments in 2011, the interest rate conditions of Czech households converged to those of corporations

The sizeable fall in interest rates on new and refinanced house purchase loans (see section 2.3) caused nominal and real interest rates in this segment to converge towards the corporate loan category. An approximation of real debt servicing costs (i.e. real interest rates[3] on corporate loans[4] and on loans for house purchase) suggests that the costs in both segments converged towards their long-term averages in 2011 and will continue to do so in the next two years (see Chart II.10).

BOX 1:
BALANCE-SHEET RECESSION – A LIKELY SCENARIO FOR THE CZECH REPUBLIC TOO?

One of the pessimistic scenarios for future development that was frequently discussed in the European context in 2011 is an adverse interaction between the macroeconomic environment, credit growth and credit risk. Besides debt deflation, representing growth in the real value of existing debts due to falling nominal income, this type of scenario also includes balance-sheet recession. This term was popularised by Richard Koo, chief economist at the Nomura Research Institute, in publications focused on developments in Japan after the bubble burst in the 1980s.[5] The attribute "balance-sheet" is meant to distinguish recession accompanied by deleveraging efforts among economic agents from an ordinary – cyclical – recession.

3 Real interest rates are approximated for the two main categories of loans of Czech banks (loans to households for house purchase and loans to corporations). Interest rates on loans for house purchase are adjusted for year-on-year growth in households' gross disposable income, which approximates wage inflation. Interest rates on loans to corporations are adjusted for industrial producer price inflation. The average is calculated for 2002–2011 and the outlook for 2012–2013 is created by using *Baseline Scenario* data by keeping interest rates constant at the December 2011 level.

4 Real interest rates calculated as the difference between current rates on loans to corporations (or corporate bond yields) and current producer price inflation are, as in previous years, a very rough approximation of real corporate debt costs and are not fully comparable with real rates for households. In economies that import energy commodities, an increase in the prices of these commodities can favourably overstate the actual growth in producers' selling prices. This increase is reflected most of all in prices of producers at the early stages of the production chain, whereas other producers at subsequent stages may not be able to offset the rise in input prices by increasing their output prices. This effect may be quite sizeable in the Czech Republic, where manufacturing is an important sector.

5 Particularly popular is his book Koo, R. (2009): *The Holy Grail of Macroeconomics: Lessons from Japan's Great Recession*, John Wiley & Sons, 2008. Koo (2011) repeatedly gave a presentation on *The World in Balance Sheet Recession: What Post-2008 U.S., Europe and China Can Learn from Japan 1990–2005*. He also gave a lecture on *How to Avoid a Third Depression* in the US House of Representatives.

A Japanese-style balance-sheet recession happens after a debt-financed bubble bursts and prices of property and assets traded on the capital market collapse. In this situation, many economic agents record a drastic deterioration of the ratio between the market prices of assets and liabilities (asset prices fall while the original debts used to purchase them remain unchanged). The agents react to this balance-sheet disequilibrium by trying to quickly repair their balance sheets by paying down debt instead of by maximising profits. This increases the supply of savings but is not accompanied by any rise in investment demand. If this rational reaction is adopted simultaneously by a large number of economic agents, it will lead to surplus savings and a sharp contraction of aggregate demand. Under such conditions, monetary policy has limited options for compensating for the reduction in aggregate demand, as overindebted agents are not interested in obtaining new loans even if nominal interest rates are very low and instead focus on repaying their old debts. Such a recession can be protracted. Some economists (for example Paul Krugman[6]) therefore recommend that governments of advanced countries should compensate for the surplus supply of private savings in a period of deleveraging by maintaining high public finance deficits.

In his articles and public presentations Koo tries to demonstrate that after the collapse of Lehman Brothers a whole range of symptoms characteristic of Japan in the 1990s can now be seen in other countries, including some European ones. Although the balance-sheet recession hypothesis ignores many aspects of economic growth, a more detailed look at relative demand for savings may be beneficial in the Czech case as well. Here, however, the main incentive to save more would be a worse ratio of the discounted value of future debt payments to the discounted value of future income rather than a bursting of the bubble.[7] If they expect this ratio to worsen, economic agents will be motivated to reduce their liabilities even though the present evolution of their net financial assets does not indicate unsustainable balance-sheet imbalances and the debt of households and non-financial corporations is not too high by international comparison (see the Annex: Selected Indicators).

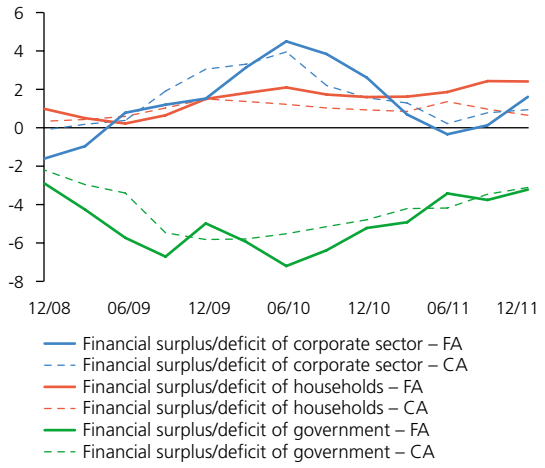
Data on quarterly financial surpluses/deficits are used to identify the signs of balance-sheet recession (as in Koo, 2011). These show the amount of surplus funds that each sector is able to lend in the given period or, conversely, the amount it has to

6 See, for example, Eggertsson, G., Krugman, P. (2012): *Debt, Deleveraging, and the Liquidity Trap: A Fisher-Minsky-Koo Approach,* New York Fed.

7 The share of financial assets traded on the capital market in total assets is relatively low in the Czech private sector, and the fall in property prices was not dramatic by international comparison. A worse outlook for the ratio of the discounted value of future income to the discounted value of future debt payments therefore represents a potential source of a more moderate type of balance-sheet recession.

Chart II.1 box

Financial surpluses/deficits by sector
(annual moving totals as a ratio to GDP, %)



Source: CNB, CZSO
Note: FA and CA refer to the balancing item on the financial account and capital account respectively.

borrow to fully cover its consumption and acquire non-financial assets. In national accounting terms this variable can be identified with the financial account balancing item, net lending/net borrowing, or with the capital account balancing item of the same name.[8] The above data suggest that from the start of the financial crisis until mid-2010 the corporate sector (non-financial corporations and financial institutions) recorded quite strong increases in financial surpluses, which, to some extent, truly reflected a reduction in debt or at least a reduction in the growth rate of liabilities (see Chart II.1 Box). However, the period of deleveraging was then replaced by a similarly fast decline in the financial surpluses of corporations. This is consistent not with sustained conditions characterising balance-sheet recession, but rather with a traditional cyclical recession, with the onset of economic recovery being accompanied by a gradual reversal in the saving rate and investment rate. The financial surplus of the household sector is relatively stable over time, while the general government deficit practically mirrored the net lending/borrowing of the corporate sector. This implies that the corporate and household sector surpluses were sufficiently used by the general government via deficit[9] financing, hence there were no falls in aggregate demand beyond the framework of a cyclical recession.

The above results therefore do not show that the balance-sheet recession scenario materialised in the Czech Republic. An excess supply of funds is not observed in the long run, and any financial surpluses are spent by the general government. This also means that from the point of view of the domestic supply of savings there is no room in the economy for increased public finance deficits if a crowding-out effect is not to occur via rising interest rates or if external government debt is not to increase. Given the uncertain economic outlook, however, the future emergence of financial surpluses – which could reduce aggregate demand – cannot be ruled out. For this reason it is necessary to continue to monitor balance-sheet balances.

8 The two balancing items should be equal in theory, as they track the same thing from different perspectives. Whereas the capital account balancing item can be viewed in a very simplified way as the difference between saving and investment rates, the financial account balancing item shows how this difference will manifest itself in a rise or decline in financial instruments. The differences between the balancing items are due solely to statistical discrepancies.

9 The government deficit is defined here as net borrowing of the general government, so it is not equal to the officially reported EDP deficit, which excludes some financial instruments transactions.

The rise in commodity prices coupled with the VAT rate increase is a negative supply shock

Economic growth and financial stability can also be adversely affected by other external factors. The renewed economic growth in 2011 gave rise to a further increase in commodity prices. The average year-on-year change of the GSCI Total Return index was 16.5%, compared to just 9.6% in 2010. This rise was due, among other things, to strong growth in economic activity in Asian emerging economies, where economic development is still unfolding largely in commodity-intensive industries (see section 3.1 for more details). The current increases in the VAT rate on some consumer basket items represent a similar negative supply shock for the Czech economy and for other European countries. Growth in electricity prices resulting from the large-scale support of photovoltaic projects is a supply shock specific to the Czech economy. The CNB's May 2012 forecast is based on the assumption that negative supply shocks will be present also in 2012.

The risk of fundamentally unjustified appreciation of the koruna has decreased

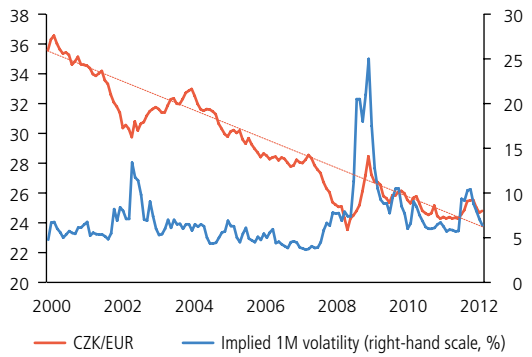
In connection with investors' search for yield, potential strong pressures for fundamentally unjustified appreciation of the koruna were identified as one of the risks in previous Financial Stability Reports. In 2011 and the first few months of 2012, the koruna's exchange rate was relatively stable at somewhat weaker levels (see Chart II.11). According to prevailing market expectations, the koruna will remain stable in the period ahead, with a very modest appreciation tendency. A survey of forecasts of world analysts and forecasters published in Foreign Exchange Consensus Forecasts in April 2012 revealed that the koruna-euro exchange rate is expected to be 24.62 at the end of April 2013 and 24.34 at the end of April 2014 (and the koruna-dollar exchange rate 19.11 and 19.02 respectively). Given these expectations, the above risk can be assessed as low at present. This is chiefly due to improved awareness among analysts and investors of the characteristics of the Czech economy and a better ability to assess the risks of individual economies in the region on the basis of fundamentals.

Czech economy's external balance indicators are sending out signals of deterioration

By international comparison, the Czech economy still has quite a strong external position, but its gradually weakening tendency should not be ignored. The characteristics of the investment position and balance of payments mostly deteriorated in 2011. The long-term trend of a worsening investment position continues. The investment position excluding foreign direct investment is still positive, but remains on a downward trend (see Chart II.12). The external debt-to-GDP ratio also increased noticeably (see Chart II.13). At the end of 2011, it was close to 50% of GDP and was only 53% covered by banking sector assets, compared to more than 57% coverage at the end of 2010. A similar deterioration was recorded for the ratio of the net external assets of the financial sector to external debt. The increase in external debt and the deterioration in the investment position are largely due to a rise in Czech government debt to non-residents. It increased from CZK 289 billion

CHART II.11

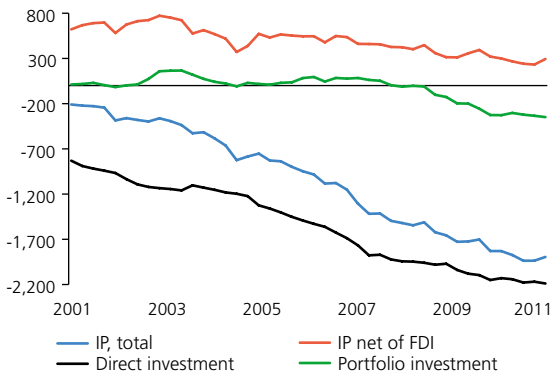
The koruna exchange rate and its volatility



Source: CNB calculation based on CNB data
Note: The dotted line shows the long-term trend.

CHART II.12

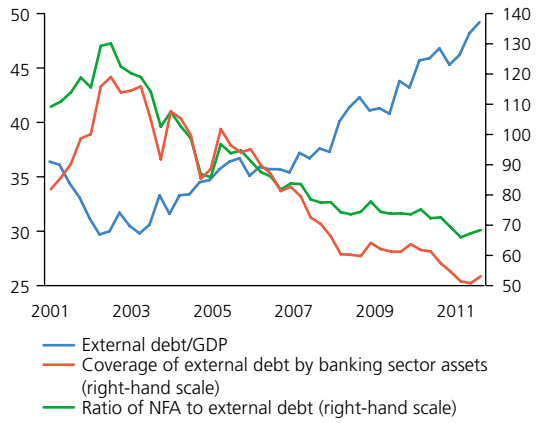
The investment position of the Czech Republic
(CZK billions)



Source: CNB

CHART II.13

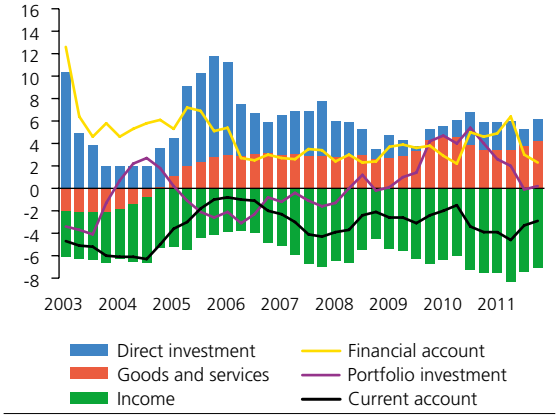
Ratio of the gross external debt of the Czech Republic to GDP and its coverage by the external assets of financial institutions
(%)



Source: CNB
Note: External assets of the banking sector (including the CNB) from the balance of payments statistics and net external assets of MFIs from the monetary survey.

Chart II.14

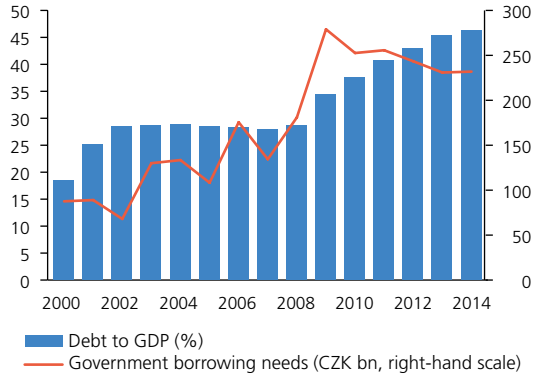
The balance of payments
(% of GDP)



Source: CZSO, CNB
Note: Annual moving totals of balance of payments components and nominal GDP.

Chart II.15

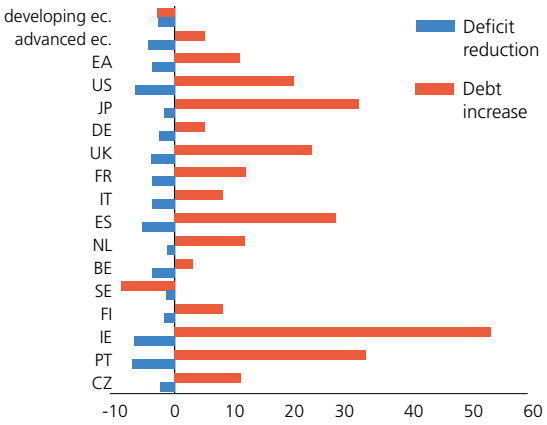
Government debt-to-GDP ratio and gross government borrowing needs



Source: CZSO, CNB, MF CR
Note: CNB estimates used for the debt-to-GDP ratio for 2012–2014 and MF CR estimates used for central government borrowing needs.

Chart II.16

Change in fiscal deficits and public debt in selected countries
(2009–2013; % of GDP)



Source: IMF (Fiscal Monitor, April 2012)

(almost 8% of GDP) at the end of 2008 to CZK 474 billion (almost 12.5% of GDP) at the end of 2011. In 2012, this debt component will increase by further tens of billions of koruna.[10] The balance of payments sub-indicators also worsened (see Chart II.14). The current account recorded a year-on-year deterioration and the goods and services surplus was not sufficient to cover the income deficit. The financial account surplus was broadly the same as last year, but the balance of foreign direct investment (FDI), which is part of the financial account balance, was flat year on year at much lower levels than before the crisis. This was predominantly due to a change in the Equity capital and reinvested earnings item on the asset side of the FDI account, which dropped by CZK 40.6 billion year on year.

The risks related to Czech public finance are rising only slowly

Thanks to still positive, albeit very subdued, GDP growth and measures taken on both the expenditure and revenue sides of public budgets, the Czech public finance deficit recorded a year-on-year decline from 4.8% to 3.1% of GDP in 2011. According to the CNB's May forecast, the continuing fiscal consolidation should deliver a further deficit reduction to 3% of GDP in 2012. Under these assumptions, the public sector debt-to-GDP ratio should reach 45.2%. This means an increase of almost 17 pp compared to the start of the financial crisis (see Chart II.15). The gross government borrowing need was CZK 256 billion in 2011, but is expected to decline slightly in 2012 and 2013 according to Finance Ministry data. Like the Czech Republic, other advanced countries are gradually reducing or will reduce their budget deficits compared to the crisis period (see Chart II.16). Despite this, the public debt ratios of most of these countries will continue to go up in the next two years (see Chart II.16). In some highly indebted countries this may generate an unfavourable financial market reaction and continued manifestations of debt crisis (see section 3.1 and the thematic article *Impacts of the sovereign default crisis on the Czech financial sector*).

If one compares public budget flows and stocks with the advanced European economies, the position of the Czech economy looks relatively good. The share of short-term government debt, which is generally regarded as being more difficult to refinance than long-term debt, is low as well. The tolerance of investors in government bonds is, however, generally higher for large and advanced economies than it is for smaller and less advanced ones, among which foreign investors usually rank the Czech Republic. Investors may thus assess the public debt as unfinanceable even at a level of, say, 50% of GDP.[11] The still relatively high cyclically adjusted primary public budget balance and

10 In February 2012, the Ministry of Finance issued a sixth publicly syndicated euro-denominated issue of EUR 2 billion (roughly CZK 50 billion). This accounts for 68.6% of the maximum foreign issuing activity within the financial programme for 2012.

11 The debt limit of 60% of GDP contained in the Maastricht criteria cannot be regarded as a reliable measure of public finance sustainability. The economists Rogoff and Reinhart have documented in detail that sovereign bankruptcies usually occur below the level of 60% of GDP. Numerous countries have run into difficulties at the 40% level. For details see Rogoff, K., Reinhart, C. (2009): *This Time Is Different: Eight Centuries of Financial Folly*, Princeton University Press.

the large and rising share of mandatory expenditures, which prevent flexible management of public finances over the business cycle, indicate the presence of structural problems in domestic public finance.

Financing the Czech public finance deficit abroad is no solution

A gradual stabilisation of public budgets is vital also because the Czech economy – unlike some other advanced countries – does not have a structural savings surplus at present (see the last paragraph of Box 1). If the Czech government were to obtain funds for fiscal expansion from abroad, the Czech economy's international position would worsen further (see Chart II.13). This would later be reflected in an increase in the sovereign risk premium and a rise in lending rates, as is currently happening in the euro area (see Chart II.9). Fiscal expansion would thus ultimately be counterproductive. Being aware of such risks, the Czech Ministry of Finance has long preferred the conservative option of public debt financing on the domestic market and in the domestic currency. The share of Czech government debt held by foreign entities is currently less than 30%, whereas in the original euro area countries the figure ranges between 40% and 70%. Foreign currency debt accounted for around 11% of the total debt in 2012 Q1, and a strategic limit of 15.0% has been declared for 2012. Nonetheless, this ratio has been creeping up from the level of 4.6% recorded at the end of 2008. A continuation of this trend could pose significant risks in the longer term.

Alternative economic scenarios

Potential alternative future macroeconomic paths together with the risks identified became the basis for alternative economic scenarios. These scenarios are used mainly in section 5.2 to test the resilience of the Czech financial sector. The paths of key variables in each scenario are shown in Charts II.17A–D.[12] 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[13] and property prices) is presented in the following sections of this Report.

The *Baseline Scenario* is based on the CNB's official May macroeconomic forecast published in Inflation Report II/2012.[14] It predicts that the Czech economy will switch to stagnation this year. In 2013 it will recover, showing growth of almost 2%. The general unemployment rate will rise slightly during 2012, reaching 7%, and then fall slightly in 2013 in line with the gradual economic recovery. The forecast also expects headline inflation to be well above the inflation target this year owing to changes to indirect taxes. Monetary policy-relevant inflation is expected to be

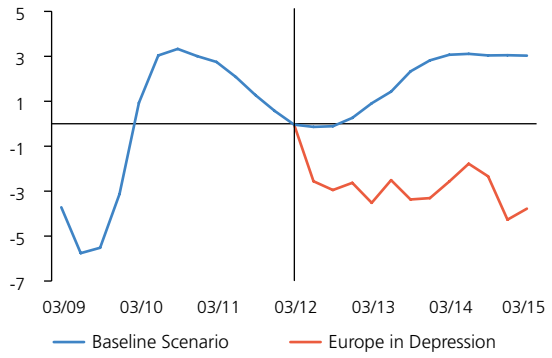
12 The paths for the *Baseline Scenario* in the first two years are based on the CNB's official prediction; beyond this horizon they are extended towards the assumed long-term equilibrium values.

13 Both the default rate and the NPL ratio relate to an identical event, i.e. a breakdown in a debtor's payment discipline. 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.

14 The paths of the variables in the *Baseline Scenario* in the first two years are based on the CNB's official prediction. Beyond this horizon they are extended towards the assumed long-term equilibrium values.

CHART II.17A

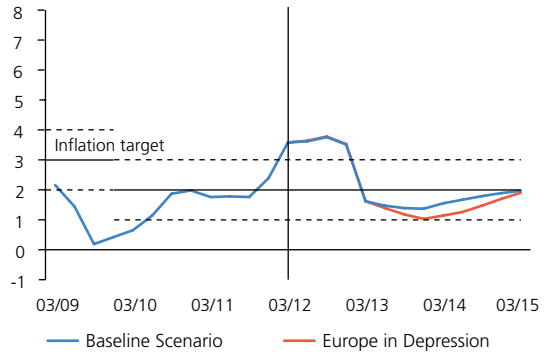
Alternative scenarios: real GDP growth
(%)



Source: CNB

CHART II.17B

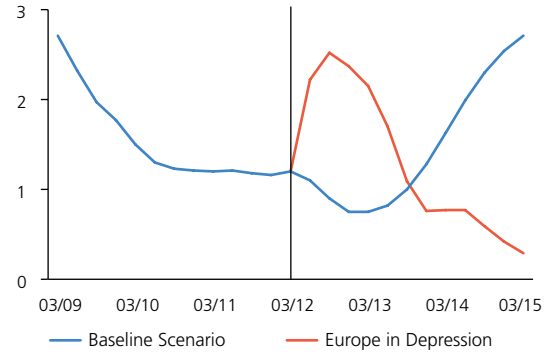
Alternative scenarios: inflation
(%)



Source: CNB

CHART II.17C

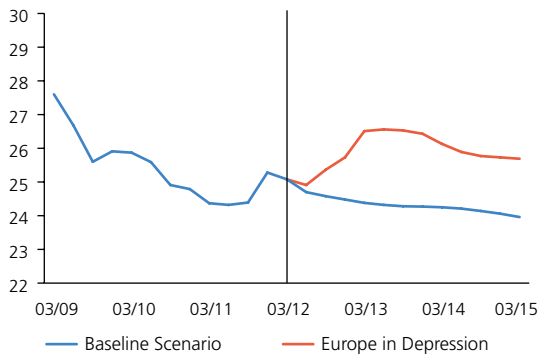
Alternative scenarios: 3M PRIBOR
(%)



Source: CNB

Chart II.17D

Alternative scenarios: exchange rate
(CZK/EUR)



Source: CNB

in the upper half of the tolerance band around the target. In 2013, after the strong effects of the indirect tax changes made at the start of 2012 subside, both headline and monetary policy-relevant inflation will be slightly below the target. The current inflationary pressures from import prices will subside gradually over the forecast horizon. By contrast, gradual wage growth amid the currently subdued demand will lead to a gradual resurgence of domestic inflationary pressures. However, these pressures will remain contained over the entire forecast horizon. Consistent with this CNB forecast is a decline in interest rates in the remainder of this year, followed by a modest rise in rates as from 2013 H2.

The *Europe in Depression* stress scenario assumes a long-lasting adverse trend in economic activity in Europe as a result of persisting uncertainty regarding a credible resolution of the debt crisis in the euro area, intensive deleveraging, and new regulations curbing the credit supply of the banking sector. In this scenario, the environment of high uncertainty is exacerbated by a surge in oil and energy commodity prices and, last but not least, by a rise in consumer prices as a result of escalating geopolitical uncertainty and continuing growth in demand from Asian economies, to which supply does not react quickly enough. On the other hand, slowing growth in China and the other BRIC countries reduces investment demand for imports from Europe, further weakening its economic activity. The combination of these factors will generate a strong and persistent recession that will also affect the Czech economy.

The adverse international situation will manifest itself in the Czech Republic as a sustained decline in GDP over the entire three-year time scale of the scenario. Households are hit hardest by the adverse developments. Their wages are flat and their real income decreases because of the rising prices generated by the external developments, depreciation of the exchange rate and a further increase in indirect taxes. Rising unemployment and the difficult income situation of households lead to substantial loan repayment problems. The deterioration in household and corporate solvency will cause the banking sector to suffer considerable losses.

2.2 NON-FINANCIAL CORPORATIONS

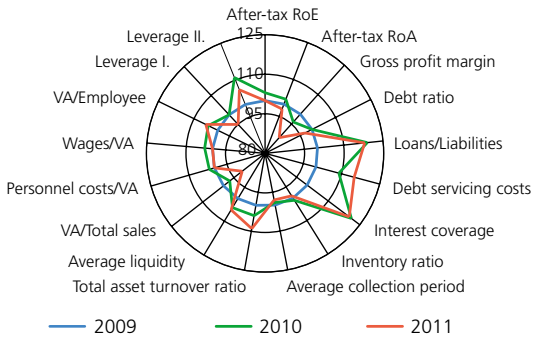
The non-financial corporations sector recorded comparable financial results in 2011 as in 2010, despite signs of a slowdown in H2. A gradual increase in risks reflecting the uncertainty regarding future demand is complicating further investment decision-making and leading to the postponement of investment projects. The sector's relatively satisfactory results primarily reflected the good performance of export-oriented manufacturers, as corporations dependent on domestic demand faced considerably worse economic conditions. Branches funded from public budgets remain exposed to the risk of subsidy cuts or deferred implementation of investment as a result of continued fiscal consolidation. Branches which face price-elastic demand and whose performance is determined by the income situation of households can also be expected to stagnate. Given the persisting dependence on exports, a deterioration of the economic situation in EU countries remains the main risk factor going forward. If the debt crisis was to escalate, the credit market situation was to worsen and economic activity was to fall, financial indicators would deteriorate significantly and credit risk would increase sharply. The large share of trade credits in the sector's balance sheet and sizeable intra-sectoral exposures would then foster a further deterioration of the situation, resulting in an increase in secondary insolvency.

Corporations' financial results in 2011 suggest stagnation ahead…
The post-crisis economic recovery started to falter during 2011 and the favourable results of non-financial corporations observed in the first half of the year gradually deteriorated. Nevertheless, the monitored indicators recorded similar levels for 2011 as a whole as they did in the previous year (see Chart II.18). Weak domestic demand and slowing export growth dragged down profit margins, resulting in a slight decline in profitability and a fall in the share of value added in total sales. Uncertainty regarding future developments and low investment returns are currently the key risk factors affecting corporations' investment decisions.[15] In this situation, corporations are expecting investment cutbacks accompanied by a slight reduction in the number of jobs in 2012. In addition, wage growth will probably remain flat. Corporations held wage growth at low levels already in 2011. This was reflected in a decline in the share of wages and total personnel costs in value added. Labour productivity edged up in parallel.

Despite some recovery in bank lending, the debt ratio of corporations was broadly unchanged year on year and remains relatively low by international comparison. It was affected by a decline in intra-group loans from foreign corporations and a decrease in domestic inter-company loans.[16] The debt ratio may to some extent reflect efforts

CHART II.18

Key financial indicators for non-financial corporations
(2009 = 100; increase in index means improvement)



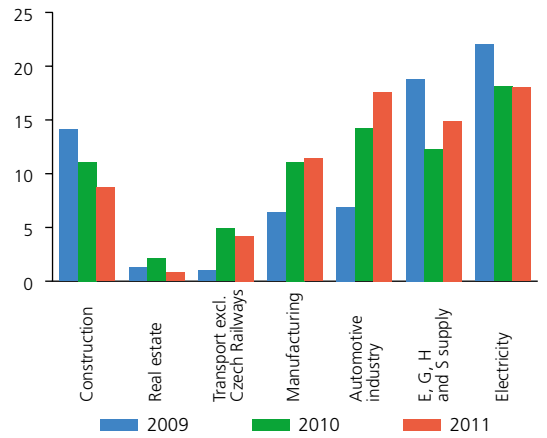
Source: CZSO, CNB

15 These results are in line with the quarterly survey of non-financial corporations conducted by the Czech National Bank together with the Confederation of Industry. The survey results show that the weak domestic demand is being felt most strongly by construction firms, while the uncertain export outlook is primarily affecting manufacturing. The pilot round of the Bank Lending Survey produced similar results.

16 However, inter-company loans do not include trade credits arising from current trade (deferred maturity after delivery of goods, payments on account), which by contrast recorded an increase in the period under review.

Chart II.19

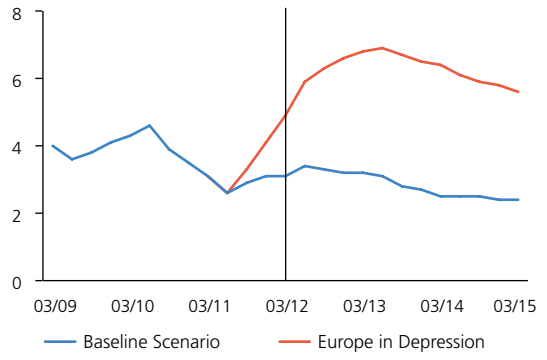
After-tax RoE in selected branches of activity
(%)



Source: CZSO, CNB
Note: E, G, H and S are electricity, gas, heat and sewerage.

Chart II.20

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



Source: CNB

by non-financial corporations not to take on more debt (see Box 1). However, the main determining factors are weak demand, uncertainty regarding future developments and thus also very low demand for investment. A positive difference between the gross saving rate and gross investment fostered some reduction in liquidity risk and an improvement in the liquidity position of corporations. Declining interest rates were reflected in lower debt servicing costs.

…but there are large differences in profitability across industries

The sustained modest growth in value added was due mainly to export-oriented manufacturing. Within this branch of activity, manufacturers of cars, spare parts and accessories recorded surprisingly good results thanks to successful expansion on European and non-European markets. The automotive industry's contribution to total value added in the sector and to Czech exports rose further, increasing the economy's sensitivity to cyclical developments in this industry in the longer term.

Unlike manufacturing, construction recorded a further contraction; its performance is being undermined by a downturn in demand for large civil engineering structures and for home ownership (see section 3.2). The situation in construction is also associated with one of the largest declines in jobs in the non-financial corporations sector. In addition to construction, low domestic demand is affecting the service sector, which also recorded a year-on-year fall in sales. This fall was most visible in architectural and engineering services, i.e. services dependent on the construction industry.

The varying economic condition of individual industries was reflected in different levels of profitability (see Chart II.19). Profitability in the automotive industry rose significantly year on year, contributing to the solid result of manufacturing as a whole. The electricity, gas and water supply industry has long maintained high profitability due to its low-competition environment, the single European energy market and price inelastic demand. The transport industry has so far maintained a satisfactory level of profitability, aided by subsidy programmes in addition to rising sales. However, rising fuel prices and higher tolls, accompanied by an expansion of the toll road network, represent a source of potential problems in this industry. Given its high reliance on subsidies, the risks may intensify as a result of fiscal austerity measures. Although developments in the construction industry heralded a further decline in the sector's profitability, it remained relatively high and the sector as a whole generated a profit. The real estate sector again seems to be in the worst condition in terms of profitability, having recorded the lowest return on equity in three years. Property rental and management revenues declined. Estate agents and developers also recorded year-on-year falls in sales related to a decline in apartment prices and a further deterioration in sales of residential development projects (see section 3.2).

Credit risk is currently falling, but may see a reversal in the near future

After peaking in early 2010, the 12-month default rate gradually declined and fluctuated around 3% during 2011 (see Chart II.20). Nevertheless, the latest (estimated) values of this indicator are showing the first signs of an interruption of the favourable trend, signalling possible stagnation or a slight increase of credit risk during 2012 in line with the expected economic slowdown. A partial improvement in the level of credit risk is evidenced by a declining NPL ratio (see Chart II.21); in contrast to the default rate, however, any negative signs will emerge with a lag due to the inertia of this indicator. A significant rise in the two monitored indicators would be triggered by fulfilment of the conditions of the *Europe in Depression* scenario. If this scenario were to materialise, credit risk would surge in 2012 and start to edge down only in 2013 H2 with the onset of the economic recovery.

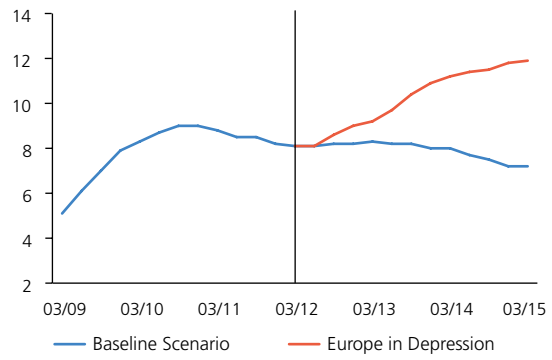
Despite the generally favourable evolution of credit risk in 2011, the hardest hit industries recorded growth in such risk (see Chart II.22). This goes especially for construction, but a further deterioration was also observed in the real estate segment. Compared to other industries, there was also a noticeable increase in credit risk in mining and quarrying firms, but the overall result may have been affected by the relatively low number of units in this sector.

The level of credit risk vis-à-vis banks does not give full information on the riskiness of all the debt exposures of corporations. Other accounts payable, whose share in liabilities recorded a year-on-year rise, remain a key form of financing for the sector in the long term. The rise in other accounts payable was due largely to their key component – trade credits and advances received.[17] With economic growth virtually flat, this can be explained by banks' declining willingness to provide operating loans, which subsequently spills over to worsening payment discipline vis-à-vis suppliers and to late payments (see Table II.1). On the other hand, it may also reflect signs of secondary insolvency risk, corresponding to a steadily rising number of insolvency petitions and bankruptcy declarations. Despite the stable level of credit risk vis-à-vis banks, these variables are at record levels and represent an additional source of information about the riskiness of the sector's debt exposures. Notwithstanding the above trend, secondary insolvency risk was not mentioned by corporations as a serious risk in the survey and obtained below-average marks in the assessment of current risk factors. Lengthening payment periods and signs of secondary insolvency cannot yet be traced in liquidity risk either. Nevertheless, the importance of this factor is steadily increasing over time in exposed industries (see Table II.1) and, should the trend continue, may pose serious risks for the entire sector in the future.

17 The issue of inter-sector financial exposures and the simulation of shocks in the form of default on trade credits is described in more detail in the thematic article *Contingent claims analysis and the inter-sector transmission of credit risk* in this Report. Although direct credit risk is relatively low, contagion arising from inter-sector exposures (e.g. in the form of secondary insolvency risk) might significantly increase this risk.

Chart II.21

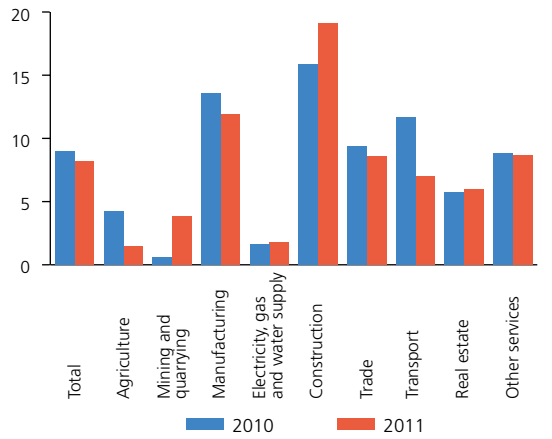
NPL ratio for bank loans in the non-financial corporations sector
(%)



Source: CNB

Chart II.22

NPL ratios in selected branches of activity
(%)



Source: CNB

Table II.1

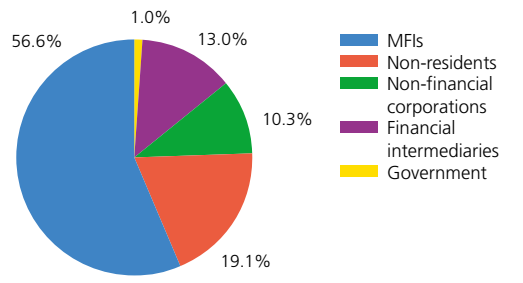
Payment discipline and insolvency from the perspective of suppliers

	03/11	06/11	09/11	12/11	03/12
Trade payables paid within 10 days after due date (%)					
All branches	52%	50%	49%	49%	46%
Limiting factors of firm – secondary insolvency (1–5)					
All branches	2	2	2	2.1	2.2
Construction	2	2.7	2.3	2.6	2.7
Manufacturing	2.1	2	2	2.1	2.3
E, G, H and S supply	1.3	1.8	1.6	2.1	2.1
Mining and quarrying	1.6	1.9	1.9	1.5	1.5
Transport and storage	2.3	1.9	2.2	2.2	1.9

Source: CNB
Note: E, G, H and S are electricity, gas, heat and sewerage. In the assessment of the importance of limiting factors, 1 is the minimum score and 5 is the maximum score.

Chart II.23

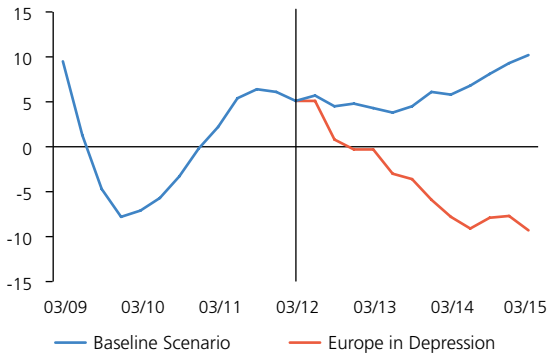
Loans granted to non-financial corporations by creditor
(%, stock as of 31 December 2011)



Source: CNB

Chart II.24

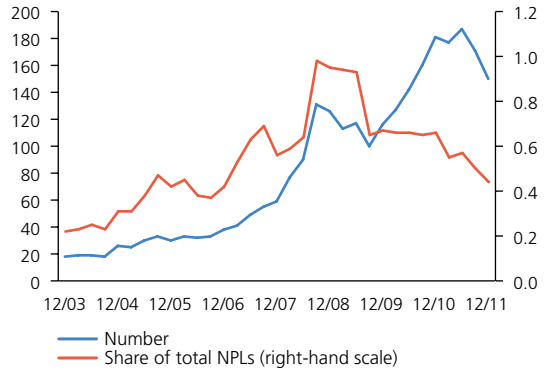
Year-on-year growth in bank loans to non-financial corporations
(%)



Source: CNB

Chart II.25

NPLs with extended maturity
(number; right-hand scale in %)



Source: CNB
Note: Number calculated as 20% truncated moving 12M average.

The structure and amount of the debt seem acceptable

The creditor and maturity structure of corporate debt still seems sustainable and is currently not generating visible causes for the formation of systemic risks. Most loans are obtained from the domestic banking sector, whose role strengthened in 2011 at the expense of the other creditor sectors (see Chart II.23). Although the share of foreign currency bank loans edged up, the risks associated with the exchange rate and its impact on the value of the debt remain low, since these loans continue to be drawn mainly by exporters. By contrast, foreign currency loans provided by foreign parent companies and affiliates recorded a decline as a result of faster repayment. This was partly motivated by the liquidity difficulties of foreign companies within groups, which, if the liquidity problems intensify, may convert this type of credit exposure into a risk channel leading to the siphoning-off of a large proportion of funds from domestic corporations. The maturity structure of corporate debt was favourable, with the debt again being restructured slightly towards more stable long-term financing.

Loan availability is good, interest rates are at historical lows

Renewed growth in new loans to non-financial corporations can be observed in year-on-year comparison, but the credit recovery is not likely to gain much momentum despite the continuing decline in interest rates (see Chart II.24). Lending to corporations is currently being affected mainly by demand for loans, reflecting the low rate of investment and flat financial performance. This is in line with the results of a survey of non-financial corporations signalling good availability of bank loans and an absence of credit-supply constraints. By contrast, corporations expect some change in banks' behaviour in the next 12 months owing to expected economic developments, which will lead to a tightening of credit standards. This was already visible in 2011, when there was a decline in the number of non-performing loans for which the debt was restructured and the original maturity extended (see Chart II.25). The change in credit conditions is not likely to take the form of significantly higher interest rates and the cost of debt financing will therefore remain low.

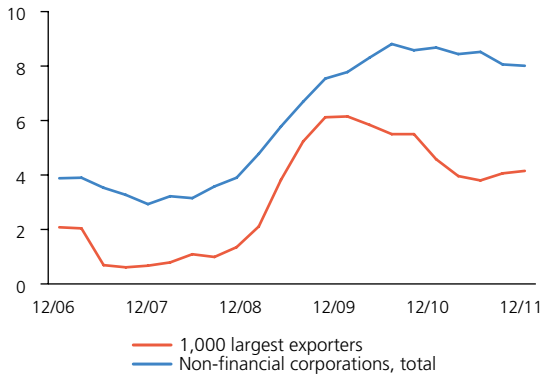
The sector remains dependent on the situation in the euro area

The export segment achieved above-average financial results compared to other non-financial corporations and kept the overall performance of the Czech economy in positive territory. The return on equity of the 1,000 largest exporters was around 3 pp above the sector average, and their credit risk indicator was significantly better as well (see Chart II.26). On the other hand, this may further increase the Czech economy's dependence on the economic situation in trading partner countries. This situation may become a source of acute risks, since future developments in the euro area, where more than 80% of total exports go, are subject to great uncertainty. The risk of excessive orientation on the markets of EU countries was reduced only marginally in year on year terms. Exporters achieved some success on Russian and Chinese markets, for which a significant increase in export growth was recorded. However, the overall value of exports outside the European

market remains low. The level of exchange rate risk can be assessed as fairly stable in terms of the hedging behaviour of exporters. The share of exports hedged by derivatives is broadly constant over time and the indicator of natural hedging (the share of foreign currency loans) is also steady.

Chart II.26

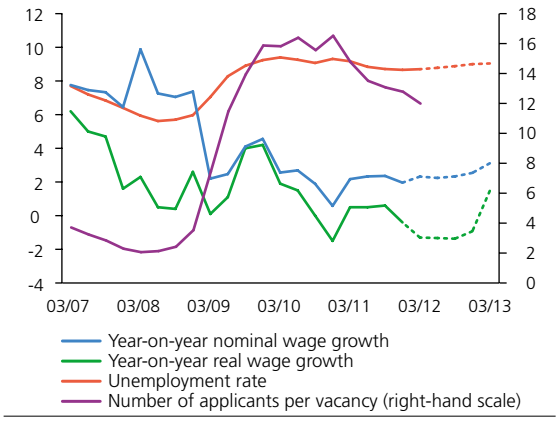
Non-performing bank loans ratio for the 1,000 largest exporters
(%)



Source: CNB

Chart II.27

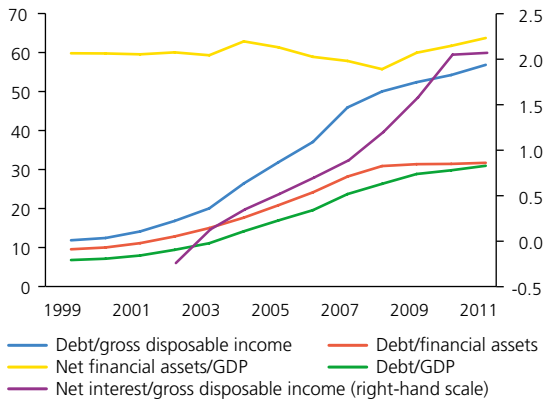
Nominal and real wage growth, the unemployment rate and the number of job applicants per vacancy
(% on left-hand scale; number of persons on right-hand scale)



Source: CNB
Note: The unemployment rate and the number of applicants per vacancy are seasonally adjusted. Dashed lines indicate CNB predictions. The number of applicants per vacancy in 2012 is only approximate.

Chart II.28

Household debt ratios
(%)



Source: CNB, CZSO
Note: The net interest payments data do not cover non-bank financial intermediaries.

2.3 HOUSEHOLDS

The economic recovery and decline in unemployment did not improve the income situation of households much in 2011, since real wages rose very slowly. The credit risk of households broadly stabilised for both consumer credit and loans for house purchase. This was aided by exceptionally low interest rates. The household debt ratio increased further, albeit only moderately. Owing to expected weaker economic growth, a rise in the overindebtedness of low-income households can be expected in 2012. If the economy were to develop in line with the Europe in Depression *scenario, the rise in overindebtedness might be significant. However, given the low absolute indebtedness of low-income households, the impact on the balance sheets of financial institutions should be limited even in this scenario.*

The income situation of households deteriorated despite a fall in the unemployment rate

Despite a fall in the registered unemployment rate in 2011, the income aggregates of households developed unfavourably. Although wages rose by 2.2% in nominal terms, the real growth of 0.3% was among the lowest in recent history (see Chart II.27) and was accompanied by a decline in real money income of 2.2%.[18] Growth in both the nominal and real income of households is likely to remain very subdued in 2012 given the expected growth in the unemployment rate (see Chart II.27). The difficult situation on the labour market is also evidenced by the number of job applicants per vacancy, which recorded a decrease but is still more than four times higher than before the crisis.

Household indebtedness continues to rise slowly

Household indebtedness, as measured by the value of loans from financial institutions, rose by 4.9% year on year (see Chart II.28). This is very sluggish growth compared to the pre-crisis period. Households with loans account for 38% of the total number of households. This is quite a low level in the European context. Higher-income households have a loan more frequently (see Chart II.29). The ratio of household debt to financial assets was virtually unchanged. The ratio of debt to gross disposable income increased from 54.2% to 56.8% (see Chart II.28). This is also slow growth relative to the long-term trend. The debt-to-GDP ratio increased by less than the debt-to-gross disposable income ratio. This is because the gross disposable income of households was flat in 2011 (up by 0.03% year on year), while nominal GDP increased (by 0.9%). As household consumption also rose in nominal terms in 2011 (by 1.4%) despite the unfavourable trend in disposable income, households recorded a lower saving rate than in 2010 (9.1%).

The adverse income trend is becoming a major risk

The ability of households to meet their obligations might be worsened by an adverse trend in their income rather than by a high debt level. This will be linked not only with weak economic growth, but also

18 Source: CZSO 2011 Household Budget Statistics.

with a falling ratio of gross disposable income of households to GDP. A possible future increase in interest rates is also a risk if it is not accompanied by a recovery in wage and disposable income growth. The low interest rates (especially on loans for house purchase) resulted in an only negligible rise in the ratio of net interest paid to gross disposable income[19] (see Chart II.28), fostering a stabilisation of credit risk. The structure of households' financial assets was little changed from 2010. Currency and deposits remained the dominant item, accounting for 56.8% of total financial assets. It is worth mentioning that households used part of their assets to purchase government saving bonds and also converted part of their time deposits into current deposits for precautionary reasons.

Loans from non-banks stopped declining, but are getting more risky

Having declined by almost one-half over the previous three years, loans to households from non-banks fell only slightly in 2011 (see Chart II.30). The stagnation of loans from non-banks can be assessed as a positive trend in terms of financial stability, as these institutions generally focus on less creditworthy clients with a higher probability of default and subsequent seizure of property.

Credit growth was driven by mortgages and their refinancing…

Growth in loans to households was driven by continued interest in house purchase loans. Thanks to favourable lending conditions, demand was concentrated mainly in mortgages.[20] In addition to new mortgages, low interest rates fostered a further increase in the number of refinanced loans in 2011. The share of refinancing in new mortgages was around 20%[21] (see Chart II.31) and that in contracts with terminating fixations was around 30%.[22] A further pick-up in the refinancing volume can be expected in 2012 thanks to a record-high number of mortgages with terminating fixations. Their estimated value (CZK 145 billion) will be about 40% higher than that of loans with terminating fixations in the previous year. As regards refinanced loans, banks have more information about clients relative to new applicants and are thus able to assess credit risk more precisely. Moreover, in the current low interest rate environment, refinancing – and rate refixation in general – is happening under more favourable terms, giving successful applicants greater scope for creating repayment reserves than in previous years. This can be assessed as a stabilising factor fostering lower interest expenses and subsequently also lower credit risk. If the current favourable lending

19 The ratio of net interest paid to gross disposable income showed a significant change in trend in 2011. In previous years it had gone up on the back of growing indebtedness and partly also rising interest rates, whereas in 2011 it was little changed despite a slight rise in indebtedness, thanks to favourable interest rates.

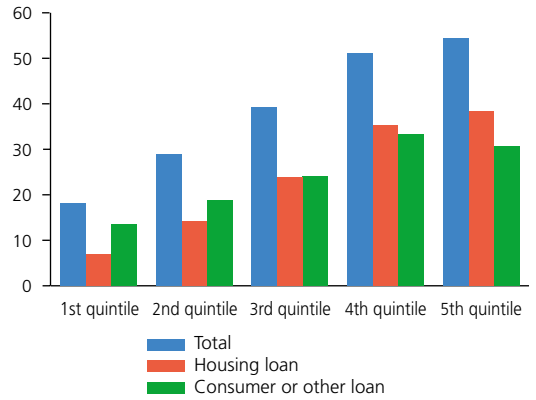
20 Around 21% of households have a mortgage, although low-income groups have almost no mortgages.

21 The CNB's internal estimate is at the lower bound of the range determined in the pilot round of the Bank Lending Survey, based on which the share of refinanced loans can be estimated between 20% and 50%. The presented estimate is therefore quite conservative and the true share may be higher.

22 This estimate is based on CNB and Fincentrum (Hypoindex) data. The evolution of contracts with terminating fixations is proxied by the value of mortgages signed *i* years ago, where *i* denotes individual fixation periods. This value is reduced by the predicted amount of principal repaid.

Chart II.29

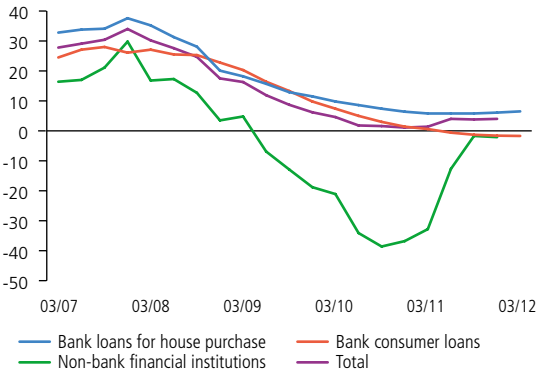
Shares of households with loans by income quintiles
(%)



Source: CZSO Household Budget Survey 2010

Chart II.30

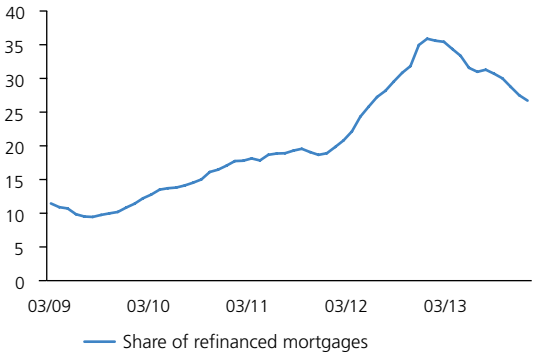
Year-on-year growth in loans to households
(%)



Source: CNB

Chart II.31

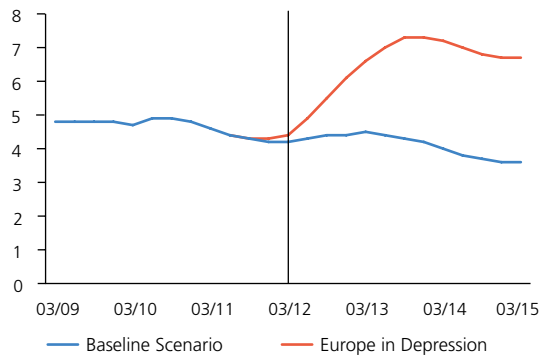
Estimated share of refinanced mortgages in new mortgages
(%)



Source: CNB, Hypoindex, CNB calculation
Note: Share calculated as 6M moving average from estimated values.

Chart II.32

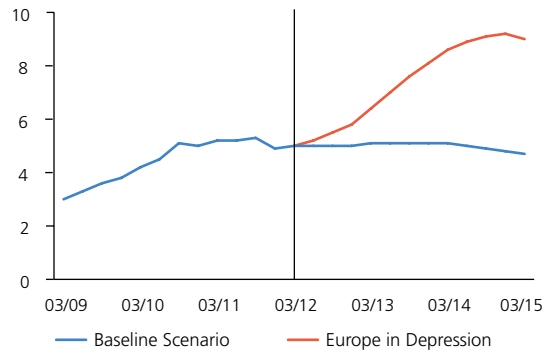
12-month default rate on bank loans to households
(%)



Source: CNB

Chart II.33

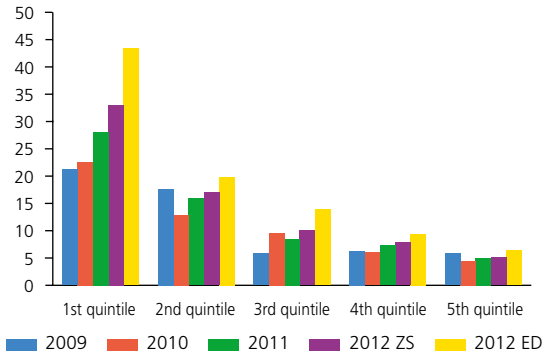
NPL ratio: households
(%)



Source: CNB

Chart II.34

Shares of insolvent households in total number of indebted households broken down by income category – simulation results
(%)



Source: CZSO Household Budget Survey, CNB calculation
Note: The figures for 2011 and 2012 are based on estimates. BS means *Baseline Scenario* and ED *Europe in Depression* scenario.

conditions are maintained, a rate as much as 1.5 pp lower on average than that before the expiration of the current fixation, and interest savings of around CZK 3.5 billion, can be expected in 2012–2013. On the other hand, a scenario where most loans for house purchase are refixed at a low interest rate level in future years and where a period of significantly higher rates follows after the fixation period expires, may give rise to some concerns. However, the risks of this scenario are limited to a situation where the elevated interest rate level does not reflect higher wage inflation. This might arise primarily as a result of a loss of confidence in public finance sustainability (see the *Loss of Confidence* scenario in FSR 2009/2010 and partly also the *Europe in Depression* scenario in this Report), which would lead to an increase in credit premiums and interest rates even in a situation of adverse developments in economic activity and income (see the euro area interest rates in Chart II.9).

… amid an increasing frequency of variable rate mortgages

In addition to the growing interest in refinancing, the popularity of mortgages with variable interest rates is on the rise. This option is relatively advantageous for high-income households, since the expected mean interest payment is usually lower in a situation of relative stability than for loans with longer rate fixations and such households are able to cover temporary upward fluctuations in the variable rate from their reserves. However, variable rates pose certain risks to low-income households, since such households may not be able to cope with a sharp rise in repayments and often assess the affordability of a mortgage only in terms of the amounts of the next few repayments. An increase in this risk in 2011 is evidenced by a gradual decline in the spread between the fixed and variable rate, which might narrow further or even reverse as a result of an increase in variable rates if the risks of the *Europe in Depression* scenario materialise. The risk is reduced to a certain extent by the possibility of switching to a fixed rate, although the fixed rate may be considerably higher than its current level at the time of the change. Given the still very small share of variable mortgages in the total value of mortgage loans (around 1%), the current situation poses no serious threat to banks.

Permanent life insurance, permanent disability insurance and loss of employment insurance are ways of mitigating credit risk for variable and other mortgages. The share of loans secured in this way is growing over time and is currently around 30–40%. Households increasingly make use of mortgage insurance, since a large proportion of the cost of the insurance is offset by a lower interest rate due to better collateral. However, it should be noted that loss of employment insurance covers fewer cases than loan applicants generally assume. This may give a false sense of security, which is not positive for future stability.

The credit risk of households has stabilised

The adverse income situation of households in 2011 has not yet affected credit risk, the level of which has stabilised. This goes for both the 12M default rate and the NPL ratio (see Charts II.32 and II.33). If the *Baseline Scenario* materialises, the NPL ratio should be 5.0% and

the 12M default rate 4.4% at the end of 2012. The predicted increase in credit risk can generally be assessed as moderate, with a negligible impact on banks' balance sheets. However, the conditions in the *Europe in Depression* scenario could take the two indicators to levels of around 7% in mid-2013, which would have a significant effect on banks' financial condition (see section 5.2).

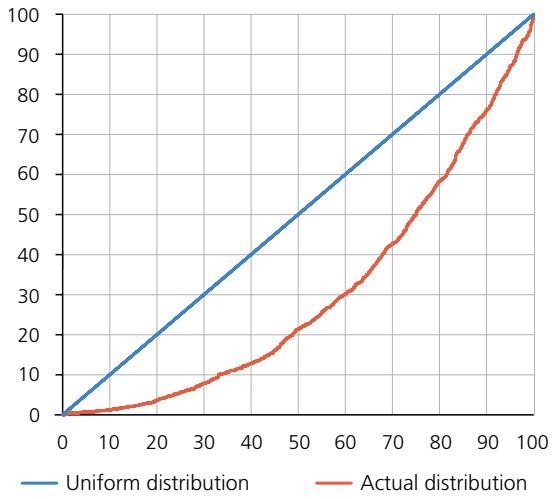
BOX 2:
HOW HOUSEHOLDS ARE STRESS-TESTED[23]

The aim of the stress tests is to examine households' ability to meet their obligations in the exceptionally adverse economic situation given in the *Europe in Depression* stress scenario, which is described in section 2.1. The overindebtedness ratio is used to examine whether a household is overindebted and therefore potentially unable to meet its obligations. This is defined as the ratio of the amount of repayments of the household to its income net of essential expenditure on food, housing, energy, health and transport. A household is classified as overindebted if this ratio exceeds 50%. The evolution of all the above variables is simulated on the basis of the stress scenario. The modelled changes in households' labour market position (a head of household may be employed, unemployed or outside the labour market) are a very important channel for estimating changes in overindebtedness. These positions will change with a certain probability on the basis of "transition matrices". To estimate them, data on previous labour market developments are used. The transition matrix values differ according to the education level of the head of household. The stress scenario assumes a rise in unemployment of 1.4 pp in 2012. In order to better identify weak spots in the household sector, a rise in the unemployment rate of 2.8 pp was assumed. This is roughly equivalent to growth in the unemployment rate of heads of households of 2.0 pp, since heads of households are usually less likely to lose their job than other members of the household. Other things being equal, the modelled rise in unemployment implies a decline in net income. It is assumed that essential expenditure falls with net income, but not to the same extent. This means that the overindebtedness ratio goes up. In line with the scenario's assumption of a 0.6% decline in nominal wages, the simulation included a corresponding average decrease in the net income of households of 1.7%. The overall across-the-board growth in essential expenditure was 3.4% on average. This includes the effects of the increased VAT rate on some consumer basket items, and rent deregulation. Given the assumptions of approximately constant interest rates and constant household debt (in the above scenario), the same repayments were assumed as in 2011. The input data were

23 Preliminary results of CNB Research Project C1/11 (Galuščák, Hlaváč, Jakubík).

Chart II.35

Lorenz curve: income distribution of repayments
(% on both axes)



Source: CZSO Household Budget Survey 2010, CNB calculation
Note: The x-axis shows the cumulative share of households arranged in rising order of income and the y-axis shows the cumulative share in repayments.

the data on around 2,900 households included in the CZSO's 2010 Household Budget Statistics. The results of the test for 2011 were generated by applying the changes in the aggregate variables reported for 2011 to the CZSO's 2010 Household Budget Statistics. The results for 2012 were then generated by the above simulation applied to the 2011 results.

Low-income households show high sensitivity to the stress scenario
To better account for income structure, households were divided into income quintiles in the stress test. Three basic facts can be determined from the stress test results: in general, low-income households are more overindebted, the overindebtedness has a rising tendency across the quintiles over time, and the sensitivity of households' overindebtedness to the stress scenario is the greatest for the lowest-income households (see Chart II.34). The average overindebtedness in the stress scenario increased from 10.3% in 2010 to 14.9% in 2012.

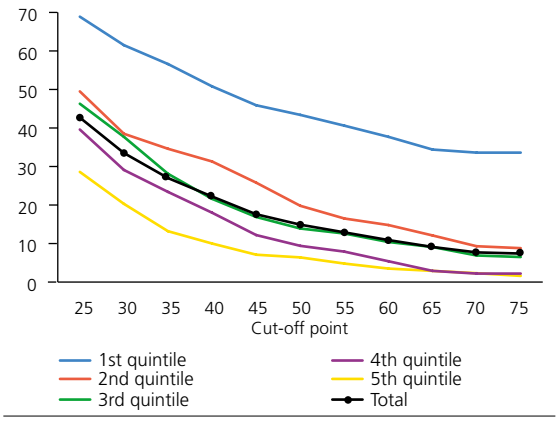
Overindebtedness depends not only on income
The overindebtedness of households depends not only on their income, but also on demographic characteristics. The more overindebted groups currently sensitive to adverse economic developments include young families, whose overindebtedness rose from 11.3% to 16.3% between 2010 and 2012 in the stress scenario. The simulation results also indicate that the stress scenario would be reflected in an increase in overindebtedness from 9.1% in 2010 to 15.8% in 2012 among people with secondary education without a school leaving certificate. Households headed by an unemployed person are also at risk. Were the stress scenario to materialise, the groups affected would also include the self-employed, a category that contains a large proportion of less-qualified workers who would have great difficulty finding full-time employment. Generally, sensitivity to the stress scenario increases as overindebtedness rises.

The impact of high overindebtedness of low-income households on banks' balance sheets would be mitigated by a low absolute amount of loans granted
The overindebtedness of low-income households, which would exceed 40% in the stress scenario, signals a risk of a further significant deterioration in their current financial situation. However, the impact on the financial sector would be mitigated by the fact that low-income households owe far less than other households in absolute terms. The uneven income distribution of households' repayments is shown by the Lorenz curve (see Chart II.35). It tells us that the 20% (50%) of households with the lowest income will have to repay only 3.5% (21.3%) of the sector's repayment sum. Another reason why

the possible impact of the potentially high share of overindebted low-income households can be viewed in a rather more sober light is the high degree of arbitrariness in the selection of the cut-off point indicating overindebtedness for the overindebtedness ratio.[24] A sensitivity analysis (see Chart II.36) reveals that if this cut-off point was moved from 50% to 60%, the proportion of overindebted households in the 1st quintile would fall by 5.7 pp. Despite that, the risk of rising overindebtedness needs to be constantly monitored in the current phase of the economic cycle.

Chart II.36

Share of overindebted households in relation to overindebtedness cut-off point
(% on both axes)



Source: CZSO Household Budget Survey, CNB calculation
Note: Figures apply to *Europe in Depression* scenario.

24 In Bičáková, A., Prelcová, Z., Pašaličová, R. (2010): *Who Borrows and Who May Not Repay?* CNB Working Paper 10/2010, the authors derived a cut-off point of 29%. However, when calculating the overindebtedness ratio, they deducted the living minimum, not essential expenditure, from net income. The value derived in this manner is in line with our cut-off point on average.