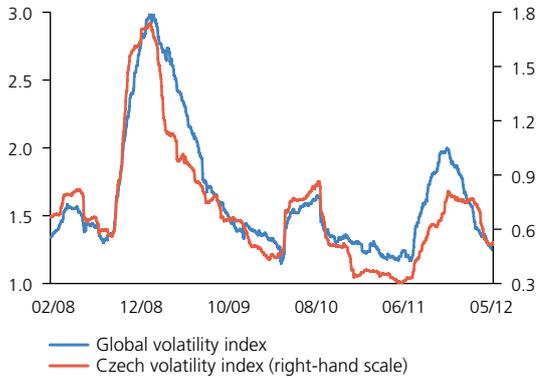


CHART III.1

### Volatility on domestic and foreign financial markets (historical volatility for last 90 days)

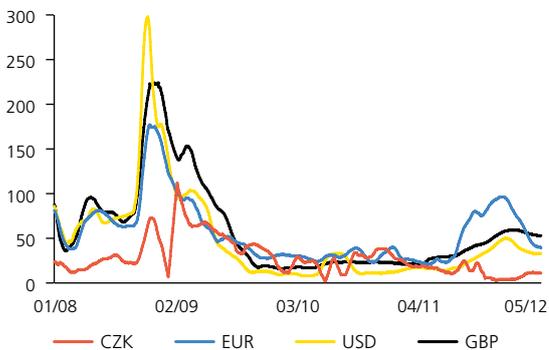


Source: Thomson Reuters, CNB calculation

Note: The Czech volatility index is the sum of the historical volatility of the PX, the CZK/EUR rate, the 10Y government bond yield and the 3M PRIBOR. The global volatility index is the sum of the historical volatility of the S&P500, the DJ Stoxx50, the USD/EUR and JPY/USD rates, and 10Y DE and US government bond yields.

CHART III.2

### Risk premiums in the interbank market (bp; 1M moving average)

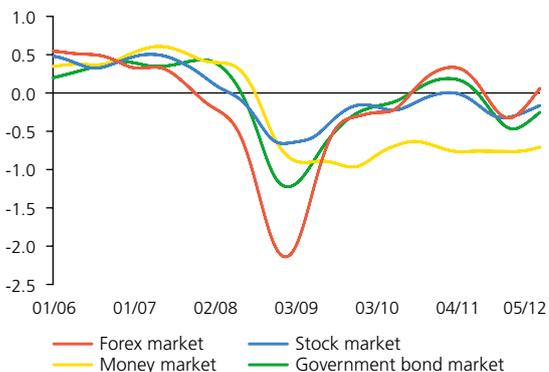


Source: Thomson Reuters, CNB calculation

Note: Difference between the 3M interbank rate and the 3M OIS of the relevant currency.

CHART III.3

### Market liquidity indicators for individual Czech markets



Source: Bloomberg LP, CNB, CNB calculation

Note: See FSR 2007, Box 4 for the calculation of the indicators.

## 3 ASSET MARKETS

### 3.1 THE FINANCIAL MARKETS

International financial markets continue to be subject to a high degree of uncertainty, increased risk aversion and volatility in reaction to the waves of policy measures adopted in the euro area. The ECB's longer-term refinancing operations in late 2011 and early 2012 calmed the extreme volatility in European markets on both the short and long-term funding market and the equity market. However, the longer-term effectiveness of the unconventional policy measures is uncertain, as credit and liquidity risk in financial systems has remained elevated. The fluctuations observed in European financial markets affected the Czech financial market to a limited extent in 2011. However, despite the low sovereign risk of the Czech state and the robust Czech financial sector, larger impacts on prices of domestic financial assets cannot be ruled out if the high volatility in foreign financial markets is renewed.

#### Short-term financing conditions are not improving...

Considerable uncertainty continued to prevail in financial markets in 2011, and the situation worsened even further in the second half of the year. This can be seen in sharply rising aggregate volatility of domestic and foreign financial markets (see Chart III.1). Short-term and long-term credit markets in euro area countries recorded the highest tension. The risk premium in the advanced countries' interbank market reached its highest levels since the 2008 financial crisis (see Chart III.2). The main factors of this rise were a decrease in bank balance-sheet assets eligible as collateral for secured markets, expected large-scale refinancing of banks and the public sector,<sup>25</sup> uncertainty about the impact of the then unclear agreement to restructure Greek sovereign debt, and a sizeable deterioration in the availability of funding sources for European banks in US and European markets. Credit market financing became generally more expensive and these markets remained closed to some banks. Market liquidity worsened in the unsecured euro market while remaining unchanged in the secured market. Volumes remained low compared to the pre-crisis period, with short operations with maturities of up to one month prevailing.<sup>26</sup> This indicates a high level of caution in the financial sector and a persisting lack of counterparty confidence.

#### ...in the Czech interbank market, either

The Czech money market continues to be affected by the transmission of tension from abroad. A lack of counterparty confidence and low market liquidity also persist here (see Chart II.3). The buy-sell spread remains wide at all maturities. The differences between market rates and the CNB's monetary policy rate are not shrinking and are very volatile at longer maturities (see Chart III.4).

<sup>25</sup> According to Bloomberg, large EU banks should refinance around EUR 600 billion of longer-term debt in 2012 and 2013. In 2012, Italy also has to refinance more than EUR 287 billion and Spain around EUR 140 billion (as of 13 April 2012).

<sup>26</sup> ECB (2011): Euro Money Market Survey, ECB.

Activity in the money market remains lower than before the crisis. The unsecured market is dominated by transactions with overnight maturities and maturities of up to one week, while the secured market is dominated by transactions with maturities of up to three months.<sup>27</sup> However, the money market is a supplementary source of financing in the Czech financial system, which is characterised by excess liquidity and conservative financing preferences. This is evidenced among other things by the low take-up of the extraordinary liquidity-providing facility introduced to support the functioning of the interbank market<sup>28</sup> (see Chart III.5). Moreover, a new regulation for the banking sector classifies short-term interbank market funding sources as less stable (the second liquidity standard in the Basel III proposal – the net stable funding ratio). This may motivate the banking sector to gradually use the unsecured interbank market less. However, this market has no substitute as a quick source of funds, and a return to normal operation is highly desirable.

#### Persisting concern about the transmission of risks between the banking and fiscal sectors...

Recurring tensions in the balance sheets of the European banking sector and euro area governments linked with the constant refinancing needs put the money market and the government bond market under pressure in some periods (e.g. April 2011 and February 2012). These two markets affect each other because of the interconnectedness of the two sectors' balance sheets, which gives rise to negative feedback.<sup>29</sup> The existence of a relationship between government and bank balance sheets, accompanied by frequent bad news about the possibility of stabilising the public finances of some euro area countries, together with uncertainty regarding the "voluntary" exchange of the Greek debt and the effectiveness of CDS contract hedging, resulted in a surge in government bond yields in November 2011 (see Chart III.6). At the same time, some sovereign ratings were downgraded (see Chart III.7), giving rise to the risk of withdrawal of assets of sovereigns with low ratings from market portfolios. Swap and government yield curves thus diverged at the end of 2011, with the spread falling to highly negative values for most countries (BE, IT and ES; see Chart III.8).

#### ...is being offset by measures introduced by central authorities

The ECB implemented a series of measures in an effort to ease the difficult liquidity situation and sharply rising volatility of euro area markets (see Chart III.9). It provided extraordinary monetary liquidity to the financial system in two three-year refinancing operations (LTROs) with full allotment at a rate equal to the average monetary policy rate

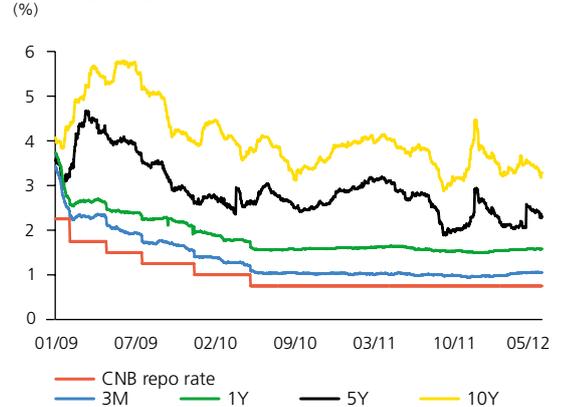
27 [http://www.cnb.cz/en/financial\\_markets/money\\_market/mm\\_turnover/A\\_MM\\_obraty\\_11.html](http://www.cnb.cz/en/financial_markets/money_market/mm_turnover/A_MM_obraty_11.html).

28 [http://www.cnb.cz/en/financial\\_markets/money\\_market/param\\_liquidity-providing\\_repo.html](http://www.cnb.cz/en/financial_markets/money_market/param_liquidity-providing_repo.html).

29 Janáček, K., Hlaváček, M., Komárek, L., Komárková, Z. (2012): *Impacts of the Sovereign Default Crisis in the Czech Financial Sector*, FSR 2011/2012.

CHART III.4

#### Monetary policy rate and market rates in the Czech Republic (%)

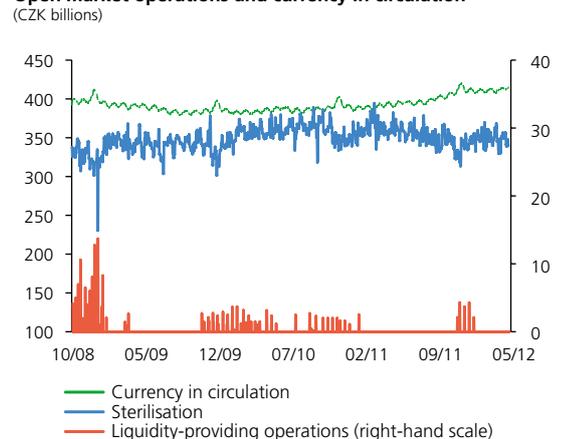


Source: Thomson Reuters

Note: 3M and 1Y = 3-month and 1-year PRIBOR; 5Y and 10Y = 5-year and 10-year generic government bond yield.

CHART III.5

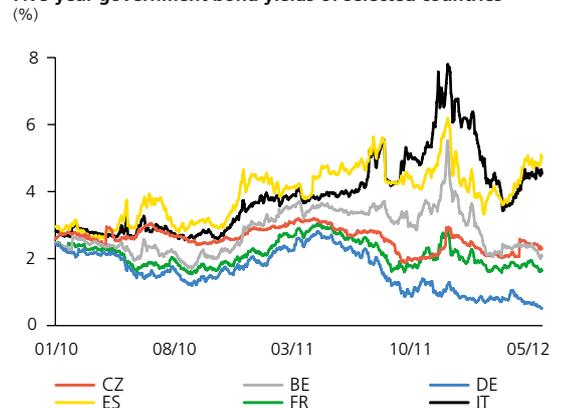
#### Open market operations and currency in circulation (CZK billions)



Source: CNB

CHART III.6

#### Five-year government bond yields of selected countries (%)



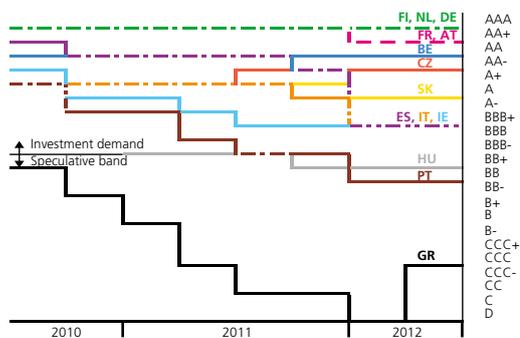
Source: Thomson Reuters

Note: 5Y generic government bond.

CHART III.7

### Sovereign ratings of selected countries

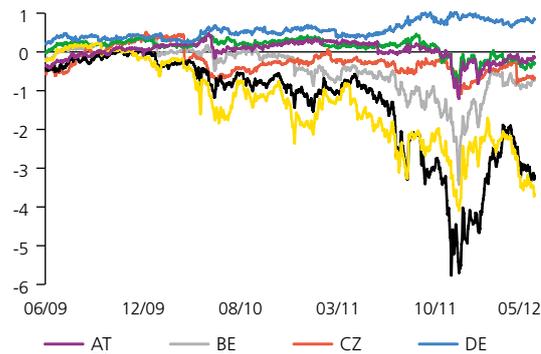
(long-term foreign currency rating)



Source: Standard & Poor's  
Note: Data as of 10 May 2012.

CHART III.8

### Difference between the five-year interest rate swap yield and the government bond yield of the relevant country (%)

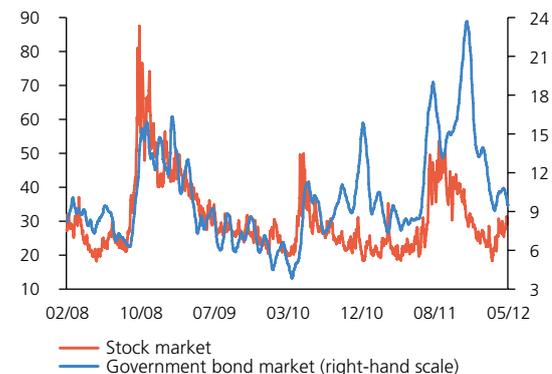


Source: Bloomberg LP, CNB calculation  
Note: In normal market conditions the difference between the swap yield curve and the government bond yield curve (the asset-swap spread, ASW) is positive and expresses the credit quality of government debt.

CHART III.9

### Volatility on European financial markets

(price index; 1M moving average)



Source: Bloomberg LP, CNB calculation  
Note: The VSTOXX volatility index was used for the stock market. The 10-day volatility of the price indices of 10-or-more-year AT, BE, DE, ES, FR, IE, IT, NL and PT government bonds was used for the government bond market.

over the duration of the contract<sup>30</sup> (see Box 3). At the same time, the ECB further expanded the range of eligible collateral, lowered the key monetary policy rate, reduced the minimum reserve requirement and, together with some other central banks, agreed with the Federal Reserve System to lower the pricing on temporary US dollar liquidity swap arrangements, which made short-term dollar sources of financing cheaper for euro area banks.

In an effort to reduce the high risk premiums, authorities are also focusing on the credit part in addition to the liquidity part. At the end of March 2012, euro area representatives agreed on the European Stability Mechanism (ESM), the successor to temporary solutions in the form of the EFSF and the EFSM,<sup>31</sup> and on a change to its originally envisaged parameters. The ESM's<sup>32</sup> lending capacity remains at EUR 500 billion in addition to the EUR 192 billion committed under the EFSF to programmes in Greece, Ireland, and Portugal. The ESM fund has been ensured the top rating by a capital structure consisting of EUR 80 billion of paid-up capital and EUR 620 billion of disposable capital. The contributions of individual countries will be distributed according to the ECB's existing key (see Table III.1). If a country is unable to contribute, it forfeits its voting right in decisions on the provision of assistance and on changes in parameters. Countries may obtain assistance from this rescue mechanism not only in the form of a credit line or loan,<sup>33</sup> but also in the form of purchases of government bonds in the primary and secondary markets or assistance in recapitalisation of financial institutions.<sup>34</sup> However, such assistance is conditional on extensive fiscal consolidation, with compliance assessed on an ongoing basis between tranches.

#### BOX 3: EXTRAORDINARY LIQUIDITY-PROVIDING REPO OPERATIONS

In an effort to mitigate the impacts of the financial market tensions on the financial sector, some central banks (CBs) have introduced extraordinary liquidity-providing measures during the current crisis. The CBs' decisions have been led mainly by concerns about contagion within the domestic financial sector, from the external to the local financial sector, or from the financial sector to public finance and on to the real economy. An extraordinary liquidity-providing repo operation is preferred if the CB is aiming to affect market rates or market risk premiums. The transmission

30 According to ECB (2012): Monthly Bulletin (Box 3), the first three-year LTRO of 21 December 2011 provided EUR 489.2 billion to 523 credit institutions and the second one of 29 February 2012 provided EUR 529.5 billion to 800 credit institutions. In addition, EUR 6.5 billion was allotted in a three-month LTRO and EUR 29.5 billion in the main refinancing operation. A total of EUR 565.5 billion was provided in February.

31 FSR 2010/2011 contains a basic description of the EFSF and EFSM rescue mechanisms.

32 The ESM, which – unlike its predecessor the EFSF – will take the form of an international institution, will start up on 1 June 2012.

33 Candidates for assistance from this programme should be signatories to the Treaty on Stability, Coordination and Governance.

34 The cost of assistance, or the debt service costs, should in future cover only the costs associated with the provision of this financial assistance, as in the case of the EFSF.

channel of a stabilising liquidity-providing repo operation takes the form of direct provision of liquidity to financial institutions' balance sheets in order to improve their balance-sheet liquidity. This, in turn, indirectly affects market liquidity, especially in the market for assets eligible as collateral and in the interbank market. These measures are also intended to break the adverse "liquidity spiral" between market and balance-sheet liquidity that is typically present in liquidity crises, and thereby relatively quickly mitigate the consequences of market failure. However, the instrument does not help identify and remove the causes of systemic risk and crisis. Its effectiveness depends largely on there being a functioning interbank market. This is a necessary condition for redistribution of the additional liquidity from banks – which can make use of extraordinary repo operations – to other financial market institutions. Moreover, extraordinary operations with non-standard settings (e.g. a too wide range of eligible collateral or a full allotment regime at a very low rate) can in the long term tempt the financial system to engage in undesirable activities in the form of riskier investment or less diversified portfolios. The overall impact of an extraordinary instrument on the system as a whole may not be unambiguously positive, so such instruments tend to be used only in the short term.

The introduction of an extraordinary operation is closely linked with the rate on the extraordinary liquidity and with the eligible collateral policy. The application of a penalty rate, i.e. an interest rate above the marginal lending facility rate, should discourage insolvent financial institutions from using CB assistance to stay in business and postpone their bankruptcy and thereby increase the costs to society. On the other hand, a too high penalty rate may imply high costs for illiquid but solvent financial institutions and thereby exacerbate the crisis in the system. Since the central bank is aiming to rescue the illiquid bank, the penalty rate should not be so high that it leads to a negative interest rate spread between banking assets and liabilities. That would only speed up the insolvency of the financial institution concerned. This means that the only condition that should apply when setting the penalty rate is that the CB should be in the position of the last, but not preferred, creditor. The eligible collateral policy, i.e. the decision on the classification of an asset as eligible collateral, and the setting of haircuts affect the amount and value of eligible assets held in financial institutions' balance sheets. By including an asset in the eligible collateral category the central bank sends out a signal about the rating of the asset. When creating rules for the collateral accepted in extraordinary operations, the CB must consider the wider impact of the collateral policy on the financial system. The CB thus cannot focus solely on protecting itself against counterparty credit risk or the market risk associated with the collateral as it does when pursuing monetary policy. On the other hand, the range of eligible collateral is limited by the asset quality threshold, which is constant over time. The CB can

TABLE III.1

Shares of individual euro area countries in the capital of the ESM (%)

Country	Share	Country	Share
Germany	27.15	Finland	1.80
France	20.39	Ireland	1.59
Italy	17.91	Slovak Republic	0.82
Spain	11.90	Slovenia	0.43
Netherlands	5.72	Luxembourg	0.25
Belgium	3.48	Republic of Cyprus	0.20
Greece	2.82	Estonia	0.19
Austria	2.78	Malta	0.07
Portugal	2.51		

Source: ECB

thus flexibly respond to market needs, where highly liquid assets can suddenly turn illiquid despite remaining of good quality.

Making extraordinary liquidity too cheap in exchange for a list of eligible collateral that is too benevolent can give rise to a risk of moral hazard or adverse selection. The risk of moral hazard can arise if the provision of liquidity against non-standard eligible collateral gives financial institutions a false expectation that they are hedged against virtually all types of risk. Such expectations can motivate financial institutions to make riskier investments or to reduce their liquidity buffers. Since the financial system tends to behave in a pro-cyclical manner, such false perceptions about holdings of sufficiently large and high-quality liquidity buffers can result in a systemic problem. The risk of adverse selection can arise if the CB provides emergency liquidity at the penalty rate without distinguishing in advance between illiquid and insolvent counterparties to the refinancing transaction and exposes itself to the risk of insolvent financial institutions primarily requesting the facility. At times of crisis, illiquid financial institutions can be pushed out of private credit markets for either precautionary motives (liquidity hoarding) or speculative motives (predation). Such financial institutions then have two options: either to ask the CB for liquidity, or to sell their assets at a discount. If the costs of raising liquidity from the sale of assets are higher than the penalty rate on credit from the CB, the illiquid financial institution will opt for the extraordinary facility. A risk to financial stability can arise when the financial institution is not only illiquid, but also insolvent, since the provision of an extraordinary facility to an insolvent financial institution sends out a signal to the market about the CB's willingness to rescue problem banks as well. Such willingness on the part of the CB encourages the financial system to engage in the moral hazard described above.

The CNB had concerns about cross-border contagion in 2008 after activity in the government bond market fell sharply, spreads widened and parent banks took measures to manage risk in the interbank market. In October 2008, in response to this situation, the CNB started to provide liquidity to Czech banks in regular liquidity-providing two-week (or three-month) refinancing operations against the standard collateral accepted in open market operations (including government bonds). The above risks and potential negative consequences of operations of this type are low for the Czech Republic. The CNB's rules for such operations are stricter than those in some other countries, and banks make very limited use of this facility. In addition, the CNB supervises the financial system. When actively assessing the use of the instrument, it is able to recognise which financial institutions are illiquid and which are already insolvent. Financial institutions that are illiquid and insolvent in the long term are subject to a different policy than the standard facility policy (a liquidity-providing repo tender or Lombard repo).

### The situation improved temporarily after the measures...

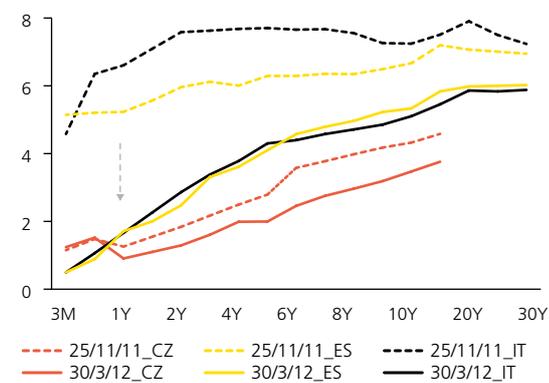
The two types of measures introduced in the euro area were welcomed by the markets. The extraordinary three-year LTROs led to a decline in risk premiums in all markets. The provision of cheap monetary liquidity into the financial system and the acceptance of a wider range of collateral (e.g. government-guaranteed bonds issued by Italian banks) improved the overall market sentiment. Market tensions eased after the reopening of funding liquidity (see Charts III.2, III.6 and III.9), especially in the interbank market. In addition, extraordinary monetary operations encouraged the euro area banking sector to purchase short-term securities, especially those of their governments, e.g. Italian and Spanish ones. A particularly strong impact was recorded at the short end of the yield curve, but the curve shifted downwards along its entire length (see Chart III.10). The change in some yield curves was fairly significant and sudden. It is difficult to judge at this stage whether these developments, or the “extraordinary” maturity measure used, will have a lasting impact on the stability of the creditors of the above countries’ debt.

### ...but their long-term effectiveness is uncertain, since liquidity and credit risk in the system remain elevated

The market situation has improved, but developments in recent months suggest that the improvement was only temporary and sudden deviations in prices can still be expected. The Spanish bond market came under pressure again in April 2012 because of bad news about the economy and the soundness of the banking sector.<sup>35</sup> At the same time, the markets are closely watching other countries – slight growth in yields is being recorded by France and also by the Netherlands, which faced difficulties in drafting the budget for next year and in complying with the EU’s 3% limit. The markets seem to have been calmed only partially by the measures adopted, and risk aversion remains elevated. This is mainly because of a persistently high level of liquidity and credit risk in the financial system. From the short-term perspective, the effectiveness of some measures, in particular the ESM rescue mechanism, which is aimed at reducing sovereign risk, is limited. This measure can be expected to have a positive impact on the financial system only in the longer term, since a permanent reduction in the relatively high sovereign risk is a matter of years rather than months (see Chart II.16). Moreover, governments’ fiscal consolidation efforts are largely conditional on developments in the real economy. Similarly, the positive market impact of the ECB’S two three-year facilities cannot be considered permanent. First, the provision of liquidity will not reduce the existing credit risk in the system (see Box 3) and second, the maturity of funds in the financial system is not lengthening much. It is this short-term maturity – associated with a need for frequent refinancing of the high debt of individual sectors – which is one of the main factors indicating permanently higher systemic liquidity risk.

CHART III.10

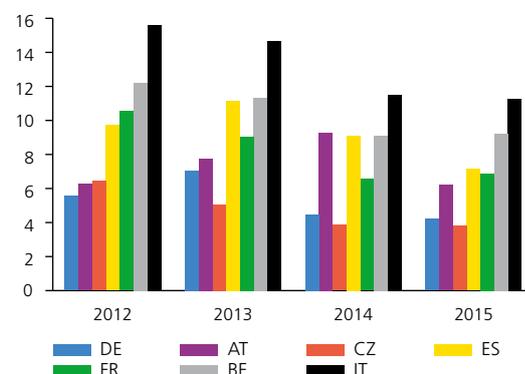
#### Fall in government yield curves of selected countries (%)



Source: Bloomberg LP

CHART III.11

#### Maturity profile of government debt of selected countries (% of estimated GDP for 2012)



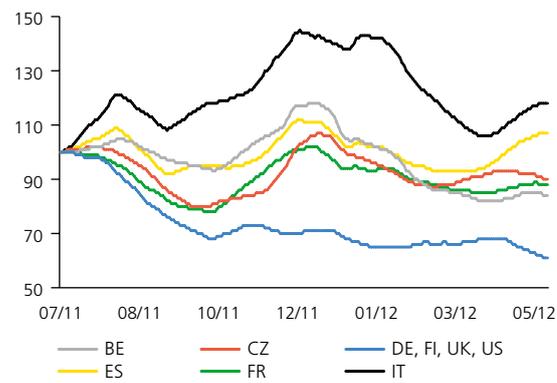
Source: Bloomberg LP, Eurostat, CNB calculation  
Note: Data as of 10 May 2012.

<sup>35</sup> A sharp contraction of the Spanish economy is expected. This is also reflected in the evolution and condition of public finances – the budget deficit last year amounted to 8.5%, well above the limit set by the EU; public debt is expected to increase to 79.8% of GDP and the banking sector is showing a rise in the proportion of problem loans – to 8.2% in February (giving rise to concerns about the need for state assistance).

CHART III.12

**Decoupling of long-term yields for selected countries**

(1M moving average; 1 July 2011 = 100)



Source: Thomson Reuters, CNB calculation

Note: 10Y government bond yields. The group consists of countries whose time series correlated at a level greater than 0.9; their mean is presented.

Fundamental factors (debt levels, primary deficits, economic outlooks, funding maturity and balance-sheet recession in the banking sector) will continue to prevail, reducing the effectiveness of the measures introduced. Increased market volatility and repeated changes in the slope of, or even shifts in, government yield curves can still be expected, especially for countries with negative economic outlooks. The biggest concerns are currently being generated by the situation in Spain and Italy, where there is a need to refinance at least 15% and 13% respectively of their current debt this year (around 12% and 17% of GDP respectively; see Chart III.11) amid a growing yield (see Chart III.6). Moreover, home bias – where the debt of domestic governments is purchased mainly by domestic financial institutions – has been observed recently. Given the amount of government debt, this introduces uncertainty regarding the absorption capacity of domestic markets. For the above reasons, some central banks may provide further liquidity assistance to prevent extreme volatility and an escalation of the debt crisis.

**A combination of low returns on, and high demand for, quality assets...**

Besides the effort to keep government debt yields low despite growing sovereign risk and to evoke an extra effect regarding the “relative” credit quality of domestic assets, a flight to quality, liquidity and security has been observed in markets for several years now. These effects are causing decoupling of yields (see Chart III.12) in financial markets. The pressure to hold high-quality risk-free assets rose further in 2011, owing mainly to prudential policy. At the same time, however, their potential supply is recording a relative decline as assets are continually moved out of this category (e.g. GR, HU, IE and PT; potentially ES and IT). An imbalance is starting to emerge between the quality supplied and demanded in the markets. On the one hand, this is causing excessive growth in prices of relatively high-quality assets and a decline in their yields regardless of their fundamental credit risk (e.g. DE, US, UK and JP; see Charts III.12 and III.13). On the other hand, relatively lower-quality assets (e.g. ES and IT) are seeing alternate bulk purchases and sales, giving rise to big swings in their prices (see Charts III.6 and III.8). The flight to quality has a macroeconomic and macroprudential dimension. If more countries with large and liquid government debt markets lose their top ratings and their government bonds lose the status of highly liquid collateral, demand for such collateral will shift to the government debt of the remaining top-rated countries. As a result, interest rates in countries with high-quality debt might drop to levels that are not consistent with maintaining price and financial stability in the long term.

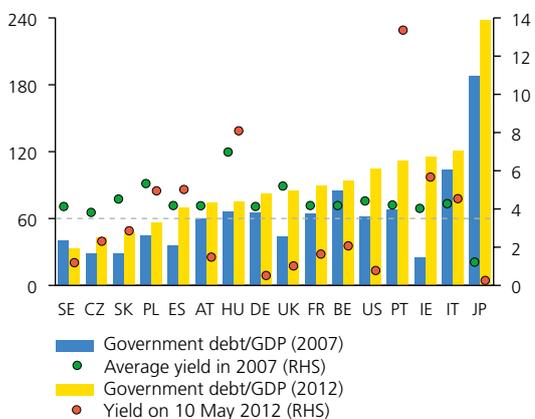
**...is putting long-term investors at a disadvantage...**

The volatility in prices of relatively high-quality government bonds is creating tensions in the balance sheets of investors with long-term liabilities, such as pension funds and insurance companies, whose investment decisions are guided by an emphasis on maintaining asset value. A long period of excessively low yields or constant volatility of government bond prices may in the future limit these investors’ demand for such securities beyond the scope of the regulatory requirements.

CHART III.13

**Comparison of government debts and their yields for selected advanced economies**

(%)



Source: IMF, Thomson Reuters, CNB calculation

Note: Average yield for 2007 for SK since 12 April 2007. The average yield is calculated from the 5Y generic benchmark government bond of the relevant country. RHS – right-hand scale.

In such a market environment, and amid a growing present value of benefits paid, pension funds and insurance companies may be motivated to invest in riskier assets. Their investment strategies might converge towards those of banks, which would mean a change in the distribution of individual types of risk in their balance sheets. Governments and other institutions would also have less opportunity to issue long-term maturity debt (see section 4).

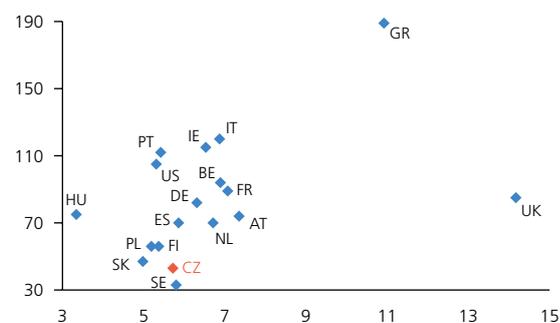
#### ...and adversely affecting small countries with conventional policy

Keeping some countries' long-term yields low through often "artificial" demand for their assets regardless of sovereign risk can have adverse side effects on small countries with largely conventional policy. Spillover of tensions from abroad is evident in the Czech government bond market (see Charts III.1, III.6 and III.8). Yields are still slightly higher than those assigned by the market to countries with similar or worse public finance positions and outlooks (see Chart III.13). The Czech government bond market is small and relatively illiquid due to the Czech Republic's lower debt and its main creditors' preference for holding government debt to maturity.<sup>36</sup> Most Czech debt is held by domestic financial institutions, usually to maturity (see section 4). Foreign investors hold less than 30%, usually as available for sale. This to some extent contributes to the sensitivity of the Czech bond market to the transmission of market shocks from abroad and to higher volatility in the absence of purely fundamental causes. The Czech government bond market is clearly vulnerable to aggregate market risks and contagion risks (see Box 4), even though the Czech Republic was one of only two EU countries to have their ratings upgraded last year amid mass downgrades (see Chart III.7). Demand for primary issues of Czech government bonds has long exceeded supply and the average maturity – currently almost six years – is gradually increasing (see Chart III.14).

At a time of protracted uncertainty in financial markets, and given large refinancing needs, large advanced countries with accommodative monetary policies and advanced liquid markets can crowd out smaller countries and create an illusion of unwillingness among investors to invest in long-term bonds of smaller yet fiscally stable countries. For this reason, it is not necessarily appropriate for small stable countries to increase their limits on short-term government debt. Instead, it is better for them not to reduce the share of the long-term component and to time their issues appropriately with regard to large or highly indebted countries. Spreading the total nominal government debt over the longest possible period (see the UK in Chart III.14) reduces the planned gross borrowing requirement in individual years, allows more stable repayments, and to some extent protects the debt against the market tension and random volatility typical of times of crisis.

CHART III.14

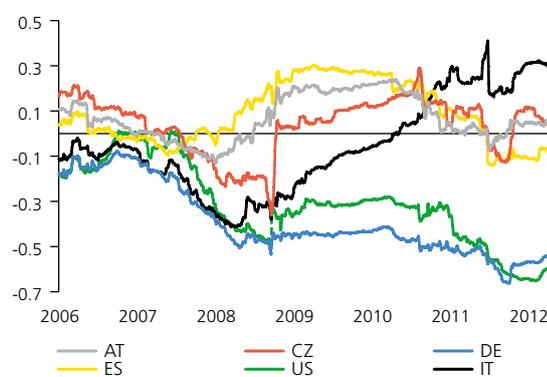
**Average government bond maturity versus government debt**  
(x-axis: average maturity in years as of 10 May 2012; y-axis: estimated ratio of government debt to GDP for 2012 in %)



Source: Bloomberg LP, IMF

CHART III.15

**Correlations between weekly yields on government bonds and stock indices**



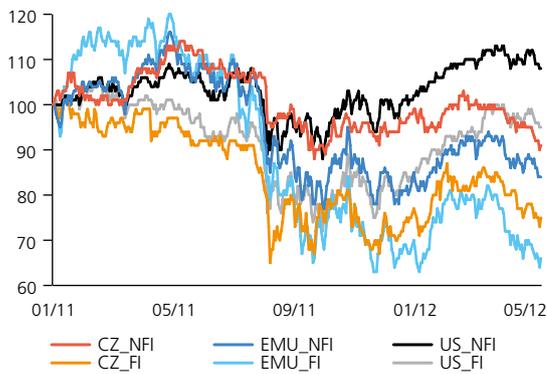
Source: Thomson Reuters, CNB calculation  
Note: Rolling correlation with a window of 500 observations. Correlation between yields on stock indices and price indices of 10Y generic government bonds of the relevant countries. Last observation 10 May 2012.

<sup>36</sup> In July 2011, the Czech Ministry of Finance launched the MTS Czech Republic electronic platform, which should further promote trading in the secondary Czech government bond market. The government bond market should see an increase in transparency and efficiency, since MTS enables foreign domestic market makers to be added to the group of primary dealers. This should lead to an increase in liquidity in the Czech government bond market.

CHART III.16

**Financial and non-financial sector stock indices**

(3 January 2011 = 100)



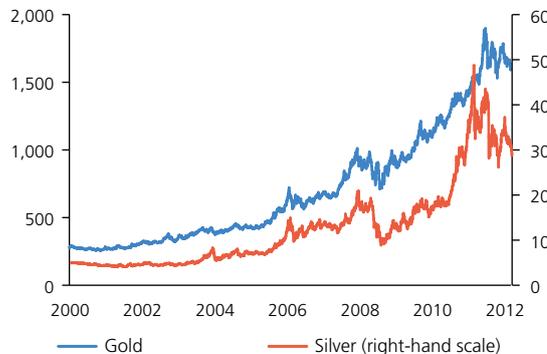
Source: Thomson Reuters, CNB calculation

Note: NFI is non-financial sector (non-financial corporations), FI is financial sector.

CHART III.17

**Gold and silver prices**

(USD/Troy Ounce)



Source: Thomson Reuters, CNB calculation

Note: Gold Bullion LBM US/Troy Ounce and Silver Fix LBM Cash Cents/Troy Ounce. Last observation 10 May 2012.

Longer bond maturities depend largely on the absorption capacity of institutional investors (see section 4, Box 5) and households. The Czech Ministry of Finance has implemented a pilot issue of government saving bonds, the results of which confirmed the expected interest of Czech nationals in saving through Czech government debt, although so far only for short-term maturities.<sup>37</sup> A major benefit of government debt holdings in the balance sheets of investors with long-term liabilities is that they are not subject to frequent and sudden changes, unlike short-term debt held in the balance sheets of banks and investment funds. Increased volatility of government bond yields and repeated attacks on government balance sheets, amid a high volume of government debt held by the banking sector, is clearly documented by the current euro area debt crisis.

### The volatility in banks' balance-sheet liquidity and sovereign risk is affecting other markets...

The tensions in fixed income asset markets in some euro area countries (IT and ES in particular) are also documented by the strength of the correlations between weekly returns on long-term government bonds and shares (see Chart III.15). For instance, the correlation of Italian shares and bonds has clearly separated from the correlations observed in Germany and the USA, as the correlation coefficient turned positive in 2010. This change is due mainly to falling prices of Italian bonds. By contrast, the negative correlation of German shares and bonds, as well as US ones, showed that investors are interested in assets perceived as safe and liquid. Turning to the Czech Republic, the correlation was temporarily negative in 2011 H2. Investors started to distinguish in more detail between the credit risks of individual countries and showed greater interest in Czech government debt, while stock market returns declined.

All stock markets recorded falls in 2011 H2 (see Chart III.16). The decline was more pronounced on European markets, reflecting not only negative expectations regarding future economic growth, but also considerable uncertainty regarding the euro area debt crisis. A decline in expected earnings due to exchanges of Greek bonds and to the assumed necessary recapitalisation of some banks meant that the largest decreases were recorded by European financial institutions, including Czech ones. Most stock markets returned to growth in late 2011. The return of investor interest was also reflected in lower index volatility (see Chart III.9), although large differences can be observed across markets. The best performers are US non-financial stocks, whose upward trend can be attributed to positive expectations of future economic growth (for more details see section 2.1 and Chart II.1), low yields on US government bonds or overly optimistic perceptions of developments in some non-financial sectors. On the other hand, financial corporations in euro area countries are being strongly affected by the ECB and the measures it has introduced.

37 <http://www.sporicidluhopisy.cz/cs/grafy-a-statistiky.html>.

### ...but gold remains a popular safe asset

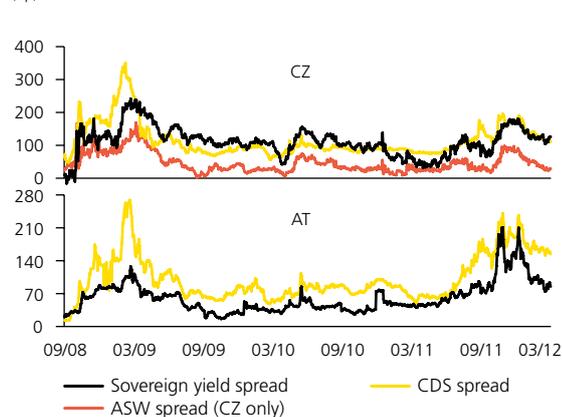
The general global uncertainty is reinforcing perceptions that precious metals are a store of value and a safe asset, often without much regard to their market risk. The high demand for gold (see Chart III.17) is being driven by low or negative real yields, for example, in the USA and some euro area countries, as well as in China, India and Turkey. The high demand is also due to central banks of emerging economies, which, in diversifying their growing foreign exchange reserves, have changed from being net sellers of gold to net buyers since the start of the crisis. The gold market is relatively small but accounts for 11% of the safe asset market.<sup>38</sup> In light of the continuing crisis and the existence of negative real rates on some financial products, demand for gold can be expected to remain higher over the next few years.

#### BOX 4: ANALYSIS OF SOVEREIGN CDS AND THEIR RELATIONSHIP TO THE CZECH GOVERNMENT BOND MARKET

The interest of debt securities holders in marketable insurance against debtor default in the form of credit default swaps (CDS) increased with the onset of the global financial crisis. As a market indicator of credit risk, the CDS spread started to represent an alternative to the previously predominant definition of the risk premium as the difference between the yields on a debt security and a risk-free benchmark (the “sovereign yield spread”; e.g. the yield on Czech government debt versus that on German government debt). Theoretically, the two premiums should be equal as a result of arbitrage, but developments on the two markets usually reflect more factors (aggregate risks, contagion risks, etc.) than just sovereign risk. This causes them to temporarily decouple sometimes. However, the question remains which of the two premiums/markets is the leader, and under what conditions. Empirical studies<sup>39</sup> analysing the relationship between the two premiums – primarily on euro area government bond markets – have found that the government bond market usually plays the leading role for low-yield bonds (fiscally stable countries), while the CDS market plays a leading role for high-yield and fiscally troubled countries. The main reasons given are (i) high and different sensitivity of prices of the both markets to joint market factors (e.g. a change in market conditions), and (ii) significant market barriers and structural changes, which limit arbitrage and slow the movement of capital and thus the fast equalisation of sovereign premiums on the two types of markets.

CHART III.1 BOX

#### Credit premiums on the government bond and CDS markets of the Czech Republic and Austria



Source: Bloomberg LP, CNB calculation

Note: The credit premium on the government bond markets of the countries under review is calculated as the sovereign yield spread, i.e. the difference between the 5Y government bond yield of the relevant country and the German equivalent. In the case of the Czech Republic it is supplemented by the difference between the 5Y Czech government bond yield and the 5Y IRS in CZK (the ASW spread). Owing to the non-existence of a 5Y benchmark bond for the Czech Republic its yield was approximated between August 2009 and the start of 2010.

CHART III.2 BOX

#### Credit premiums on the government bond and CDS markets of Belgium and Spain

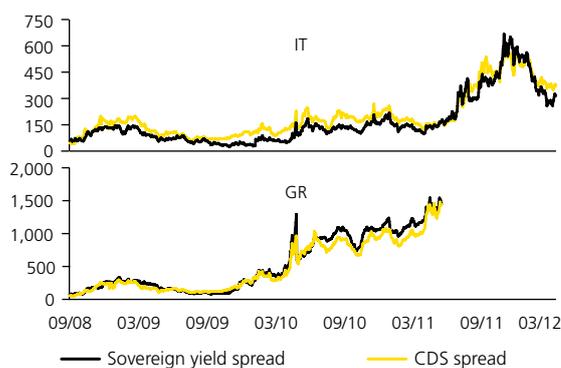


Source: Bloomberg LP, CNB calculation

<sup>38</sup> IMF (2012): *Global Financial Stability Report*, April 2012

<sup>39</sup> See, for example, Coudert, V., Gex, M. (2011): *The Interactions between the Credit Default Swap and the Bond Markets in Financial Turmoil*, CEPIL, No. 2011-02; Delatte, A.-L., Gex, M., López-Villavicencio, A. (2010): *Has the CDS Market Amplified the European Sovereign Crisis? A Non-linear Approach*; Fontana, A., Scheicher, M. (2010): *An Analysis of Euro Area Sovereign CDS and Their Relation with Government Bonds*, ECB WP No. 1271; Zhu, H. (2004): *An Empirical Comparison of Credit Spreads between the Bond Market and the Credit Default Swap Market*, BIS, WP No. 160.

CHART III.3 BOX

**Credit premiums on the government bond and CDS markets of Italy and Greece**  
(bp)


Source: Bloomberg LP, CNB calculation

Note: For GR, the entire period under review ends in May 2011.

TABLE III.1 BOX

## Results of leading relationship analysis

	Entire period under review	Financial crisis period	
	VECM model	VECM model	Granger causality test
	(15/09/08–31/03/12)	(15/09/08–15/09/09)	
<b>CZ</b>	CDS market	CDS market	Bond => CDS
<b>AT</b>	Equal	CDS market	
<b>BE</b>	CDS market		Bond => CDS
<b>ES</b>	CDS market		
<b>GR</b>	CDS market		Bond => CDS
<b>IT</b>	Bond market	Bond market	

Source: CNB calculation

Note: The Granger causality test was conducted if no cointegration relationship was found between the variables for the given period. "Bond => CDS" means that we reject the hypothesis that changes on the bond market do not cause changes on the CDS market at the 5% significance level. For GR, the entire period under review ends in May 2011. For CZ, the financial crisis period is shortened to July 2009 for data reasons.

The aim of this box is to analyse the relationship between these premiums using the example of the Czech Republic and to try to identify whether the leading sovereign premium in the Czech Republic is determined by the Czech government bond (cash) market or by the Czech sovereign CDS market. The leading ability of these markets was tested on five-year generic government bonds and five-year sovereign CDS spreads in 2008–2012 for the Czech Republic (and for comparison also for AT, BE, IT, ES and GR). The German bund is considered the risk-free benchmark for the analyses of euro area countries and the swap yield curve for the Czech Republic.<sup>40</sup> Since, in theory, there should be a close long-term relationship between the two markets, a cointegration method applying a VECM<sup>41</sup> was used, as in the foreign studies mentioned above.<sup>42</sup> Based on this method, or equations (Fontana and Scheicher, 2010), two key coefficients were obtained for the long-term cointegration relationship between sovereign premiums from the sovereign CDS and cash markets. The direction of the dependence and the significance and magnitude of the coefficients determined the speed of return to the long-term relationship between these premiums and thereby the leading position of one of them. To determine the relative significance of the two coefficients obtained using this method, the Gonzalo-Granger ratio – taking values in the range of 0 to 1 – was then used. In simplified terms, this ratio takes values higher (lower) than 0.5, the sovereign CDS market (bond market) is the leading market.

The plots of the two premiums over the entire period under review reveal a close long-term relationship (see Charts III.1 Box–III.3 Box) but quite frequent divergences in their levels, indicating limited arbitrage between the two markets. The largest difference occurred after the failure of Lehman Brothers, when market and funding liquidity fell sharply. This period was characterised by a flight to liquidity, with fast sales of some assets (including selected government bonds), and by an increase in aggregate risk aversion. As a result, the number of arbitrageurs fell significantly (Fontana and Scheicher, 2010). A flight to security rather than a flight to liquidity started to emerge in spring 2010. Investors, especially foreign ones, started to diversify more

40 As the Czech Republic is not a euro area country, the swap yield curve, which is also routinely used in literature as the risk-free benchmark, was used as an alternative to the bund. The swap yield curve can be used because it lies below the government yield curve. The difference between the yield on a representative government bond and the yield on the German bund of the same maturity is called the sovereign yield spread, and the difference between the yield on a representative government bond and the IRS yield of the same maturity is called the asset swap spread (ASW spread).

41 Vector error correction model.

42 Cointegrated series of two variables (the premium determined by the CDS market and the premium determined by the government bond market) return quickly to their long-term relationship if one of them deviates. If one of the variables deviates from the other, either the latter must move very quickly in the same direction or the former must move back very quickly.

between Central European countries and ranked the Czech Republic among the countries with a more stable fiscal outlook. The difference between the premiums under review therefore shrank in the Czech Republic.

The results for the Czech Republic for the entire period under review put the Gonzalo-Granger ratio at 0.76, indicating that the sovereign CDS market is the leading market (see Table III.1 Box). By contrast, the Gonzalo-Granger ratio of 0.5 for AT indicates that the two markets were equal in strength. For more indebted countries (BE, ES and GR), the results showed the sovereign CDS market to be the leading market. The exception is IT, with a leading cash market. The model was estimated separately for the financial crisis period, which in Central and Eastern Europe was characterised by growth in foreign investor risk aversion towards this region as a whole due to an insufficient ability to distinguish between individual countries. For the Czech Republic and AT a cointegration relationship was found between the sovereign CDS market and the cash market and market events were clearly led by the sovereign CDS market. This relationship was not confirmed for the other countries analysed, except for IT with its leading cash market. This does not mean, however, that in BE and GR the two markets were completely independent of each other. The Granger causality test indicated that a change in the risk premium in the cash market of these two countries caused a change in the premiums on their sovereign CDS market in the financial crisis period. These results are in line with the fact that foreign investor aversion during the financial crisis was particularly visible in Central and Eastern Europe. This was reflected in the dominance of the CDS market in this period.

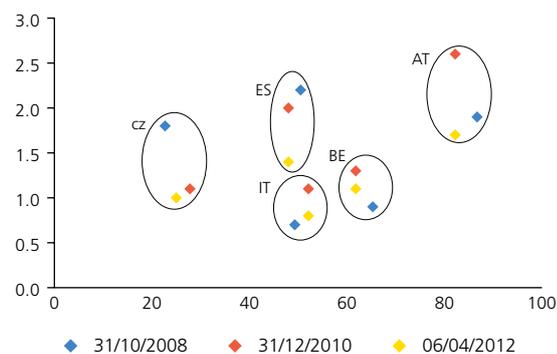
The leading position of the sovereign CDS market in the Czech Republic can be explained by means of several factors. The first factor, which can be more or less generalised for any country, falls into the category of aggregate risks. The bond price is affected by interest rate, default and liquidity risk, while the sovereign CDS spread is mostly affected by the default risk of the bond issuer and the credit risk of the counterparty to the contract. And it is market liquidity, or the flight-to-liquidity or flight-to-quality effects, that can foster increased interest in government bonds and a decline in their yields and the risk premium, even though the sovereign default risk remains unchanged according to fundamentals. The opposite applies for a decline in market liquidity. Market liquidity is not aided by the fact that a large part of government debt is held to maturity and hardly enters the secondary market at all.

Another possible factor, which is more a country-specific risk, is market size and market participant type. As a country's government debt grows, its sovereign risk premium rises and

CHART III.4 BOX

#### Sovereign CDS net notional amounts outstanding versus government bonds held by foreign investors

(%; x-axis: share of government bonds of given country held by foreign investors; y-axis: share of net notional amounts in total government debt)



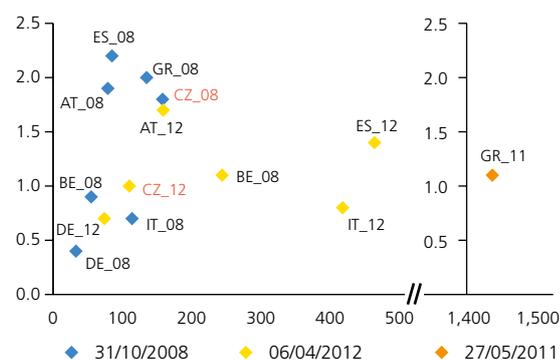
Source: DTCC, Eurostat, EIU

Note: Owing to the unavailability of current data on debt held by foreign investors, the figure for 2010 is used for both 31/12/2010 and 06/04/2012, with the exception of CZ (2011 Q4). The figures for Greece and Germany are not available.

CHART III.5 BOX

#### Credit premiums on the sovereign CDS markets of the countries analysed

(x-axis: sovereign CDS spread in bp; y-axis: share of CDS net notional amounts outstanding in total government debt in %)



Source: Bloomberg LP, DTCC, EIU, CNB calculation

the motivation of debt holders to hedge against this risk should increase. On the other hand, if the debt is held mostly by domestic entities (the “home bias effect”), which are less motivated to hedge, it can be assumed that sovereign CDS premiums are created mostly by foreign entities. AT has a relatively high share of government bonds held by foreign investors, and interest in hedging Austrian debt differs from that in the Czech Republic (see Chart III.4 Box). The Czech Republic recorded a relatively significant decline in net CDS hedging as a percentage of total government debt compared to the start of the global crisis, while the value for AT initially increased with the onset of the debt crisis. Increased interest in hedging with the onset of the debt crisis is also visible for IT and BE. No data on the share of debt held by foreign entities were available for DE, but it can be seen (see Chart III.5 Box) that it was the only one to record increased interest in hedging with rising sovereign CDS spreads. This may indicate an increasing share of German debt held by foreign entities.

Market participant type is also associated with another factor affecting the difference in the premiums, namely contagion risk. The crisis has shown that the Czech sovereign CDS market responds to bad market news abroad more quickly and strongly than the government bond market. This is due partly to its relatively small size (see Charts III.4 Box and III.5 Box) and partly to foreign entities’ higher sensitivity to uncertainty about global developments and their unwillingness to distinguish between individual countries in detail. A negative market shock can thus transmit between countries relatively quickly and without fundamental causes.

### 3.2 THE PROPERTY MARKET

Apartment prices on the residential property market continued to decline in 2011, although at a slower pace than in the past. The decline in prices was combined with a drop in the number of property transactions and a further deterioration in sales of new apartments in residential development projects. This was reflected in a rise in the NPL ratio in the property development sector. At the same time, however, growth in mortgage loans picked up pace, perhaps indicating the onset of a recovery on the market. An assessment of the property market situation using simple price sustainability indicators suggests slightly undervalued prices. However, this is largely due to the backward-looking nature of these indicators. Flat or slightly falling apartment prices can thus still be expected in the future given the expected evolution of the real economy. The downside risks stem mainly from the possibility of apartment foreclosures and a deterioration in the income situation of households. The commercial property segment saw a substantial rebound in investment demand, a decrease in vacancy rates and a recovery in new supply. It remains to be seen whether this rebound will lead to an overheating of the market.

#### Property prices fell for the third consecutive year in 2011

Following a marked decline in property prices in 2009–2010, 2011 was the third consecutive year in which the transaction prices of most types of property fell (see Chart III.18). Transaction prices of apartments fell most (by 1.2% at the end of the year) and are now about 20% down from the peak recorded in late 2008. Building plot prices also decreased (by 0.5% year on year; 1.3% below their peak). However, the decline in prices was smaller than in previous years, and family house prices actually rose (by 2% year on year at the end of 2011 H1; 2.3% below their peak). The downside risk assumed in FSR 2010/2011 was therefore confirmed.

Apartments, which have the most dynamic prices as well as probably the most representative index<sup>43</sup> and the most alternative sources of price data available, saw a slowing year-on-year decline in transaction prices<sup>44</sup> in 2011 (see Chart III.19). By contrast, the declines in asking prices deepened for most of the year, so the difference between the two types of prices narrowed. As regards regional developments, the property price decline in 2011 was stronger in Prague than in the rest of the Czech Republic. Given Prague's role as apartment price leader, this may signal lower prices in the other regions in the near future.<sup>45</sup>

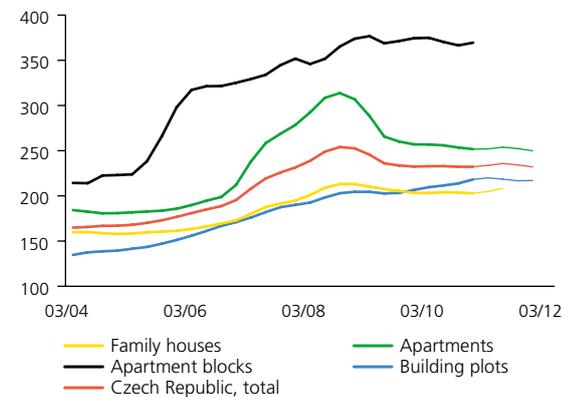
43 Apartments are more homogeneous than other types of property, so it is easier to construct an index for them (than, say, for family houses). The building plot price index is affected by the fact that around 85% of building plot transactions form part of complex property sales, which can involve tax optimisation and price distortion. The index of apartment block prices is affected by the relatively small number of transactions in that segment (about 18 times lower than for other property types).

44 Since last year the CZSO has been publishing two types of data on property transaction prices: traditional transaction prices based on data from the cadastre and, newly, data from a CZSO survey of estate agencies. See the Glossary for details.

45 However, the larger decline may be partly due to base effects, as apartment prices outside Prague fell more markedly than those in Prague in 2009.

CHART III.18

Property prices – transaction prices  
(absolute index; 1999 Q1 = 100)

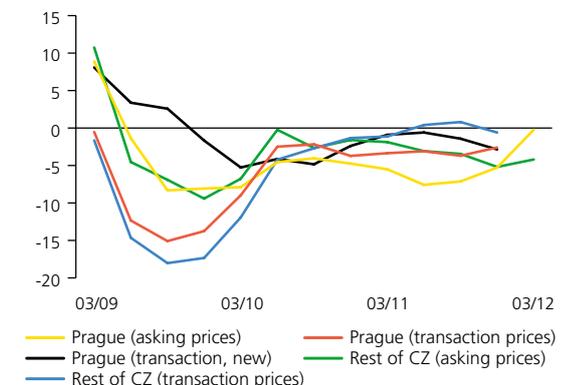


Source: CZSO, CNB calculation

Note: 2011/2012 data preliminary or calculated from asking prices.

CHART III.19

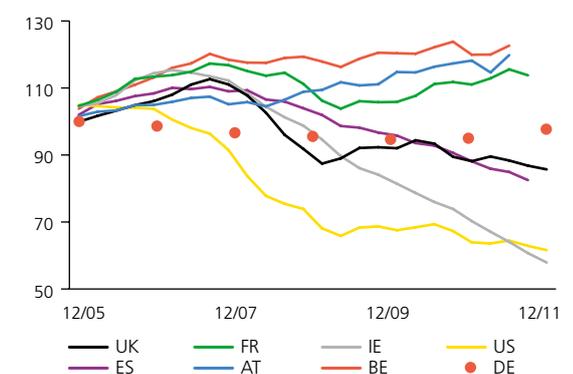
Property prices – transaction prices and asking prices  
(y-o-y indices)



Source: CZSO

CHART III.20

Property prices – international comparison, advanced countries  
(prices in real terms; absolute index; 2005 average = 100)

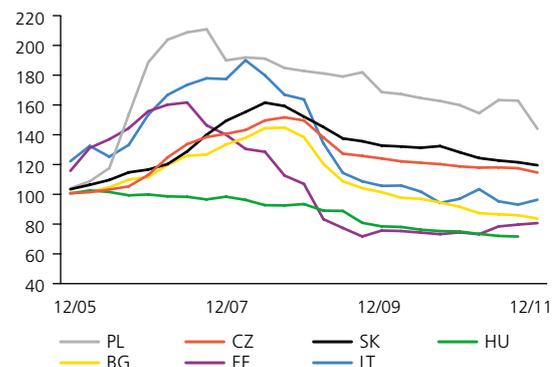


Source: BIS, S&P (US), Nationwide (UK), national statistical offices

CHART III.21

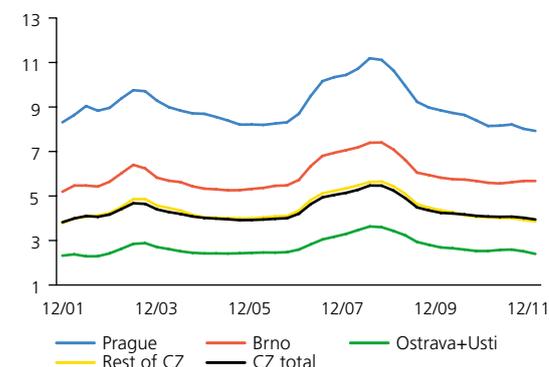
**Property prices – international comparison, selected EU countries**

(prices in real terms; absolute index; 2005 average = 100)



Source: BIS, national statistical offices and central banks

CHART III.22

**Price-to-income ratios**(ratio of price of 68 m<sup>2</sup> apartment to moving sum of wage for last four quarters)

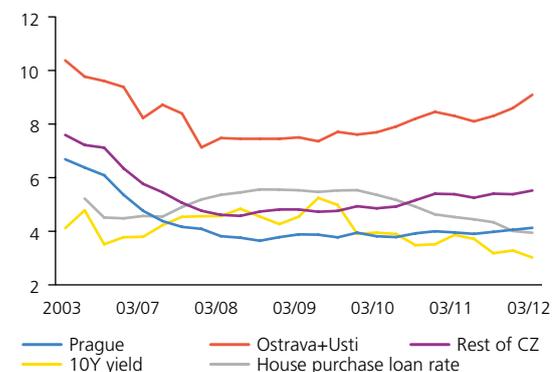
Source: CZSO, CNB calculation

Note: 2011 data preliminary or calculated from asking prices.

CHART III.23

**Rental returns**

(averages for period in %; 2003–2006 yearly data, then quarterly)



Source: IRI, CNB

Note: Comparison with 10Y government bond yields and house purchase loan rates.

On the other hand, asking prices in Prague recorded a surprising 3.8% quarter-on-quarter rise in early 2012. This was probably linked with the increase in VAT on property on 1 January 2012 (from 10% to 14%) and will therefore probably be one-off in nature. However, it could also be a sign of stabilisation on the apartment market.

**Property prices abroad are mixed**

Property prices in the Czech Republic moved in line with prices abroad, as in many countries the real property market declines continued mostly at a slower pace than at the time the financial crisis escalated (see Charts III.20 and III.21). Price declines deepened in countries where the financial crisis was aggravated by debt crisis (real decreases of 17.8% in Ireland, 9% in Spain and 6.3% in Greece in 2011). Property prices started to rise in some countries that had recorded subdued price growth in the previous decade (by 3% in Austria, 2.8% in Germany and 6.3% in Switzerland). Property price movements were more or less predictable immediately after the onset of the financial crisis, with larger falls occurring in countries that had recorded the fastest price growth in previous years, whereas the developments over the last two years have been rather mixed. Therefore, it is difficult to predict in which countries problems due to property price overvaluation might arise.<sup>46</sup> Such problems could happen in countries where the property price declines have not fully reversed the rapid pre-crisis growth (e.g. France or Sweden), but also in countries where the growth was relatively moderate in individual years but prices rose to relatively high levels (Austria, Belgium and Italy). From the point of view of the Czech banking sector and potential cross-border contagion, it is alarming that there is talk of overvalued prices in the countries of the parent banks of the biggest Czech financial institutions (Austria, Belgium and France).

Most countries in the group of developing EU states saw similar property price developments as the Czech Republic, although their real price declines were slightly more pronounced (10% year on year in Poland, 8.7% in Bulgaria, 6.8% in Slovakia and 4.9% in Hungary, compared to 3.5% in the Czech Republic). In the Baltic states, which had recorded the sharpest price decreases during the financial crisis (to one-half of their previous peaks), prices stabilised, and in Estonia they actually rose (by 8.4%).

**Property price sustainability indicators improved**

Property price sustainability indicators improved further, primarily on the back of the aforementioned price decline. Overall, these indicators point to slightly undervalued property prices. The price-to-income ratio for the entire Czech Republic fell by 3.3% on average over the course of the year and was 27.9% down from its mid-2008 peak (see Chart III.22). In most regions, this indicator is below or very close to the level observed in 2005 H2, i.e. before the last major price increase.

46 For a discussion of this issue, see also *Global Economic Outlook*, April 2012, CNB.

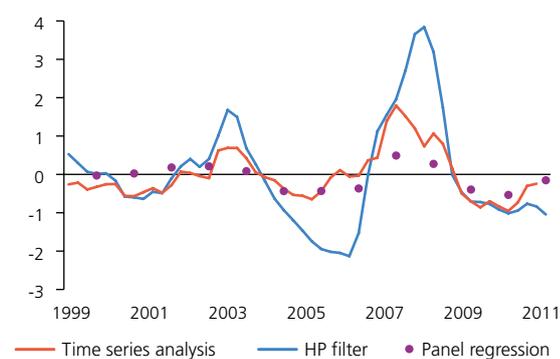
The apartment rental return (see Chart III.23) rose in year-on-year terms in all the monitored regions (by 0.2 pp on average). Given a concurrent drop in yields on alternative assets (yields on ten-year government bonds were down by 0.8 pp) and a decline in interest on house purchase loans, apartment rental returns exceeded these interest rates in all regions. On the one hand, this implies low pressure for a further decline in apartment prices, but on the other hand it opens up the possibility of speculative property purchases financed by mortgages, which are recording record-low interest rates. In the context of relatively rapid growth in new house purchase loans (see section 5.1), it cannot be ruled out that such purchases have already been going on to some extent during 2012. Although the negative effects of mass speculative property purchases are generally smaller at a time of falling prices than in a period of buoyant price growth, there is a risk of a property bubble emerging from below (i.e. prices stay constant while the fundamental value of property is driven down by adverse economic developments). In future, both the rental return and the price may be affected ongoing rent deregulation<sup>47</sup> coupled with the possibility of growth in the supply of apartments as a result of that deregulation and the none-too-good financial situation of many households (see section 2.3).

As in previous years, property prices were affected above all by the labour market situation in 2012. Although the registered unemployment rate fell by about 0.7 pp and the number of vacancies rose by 17%, the overall income situation of households was unfavourable, with real wages rising at a record-low pace and real disposable income falling (see section 2.3). Turning to the demographic determinants of property prices, natural population growth fell further (by 82.3% year on year) and is nearing zero. Population growth due to migration rose slightly (by 7.9%) but remains very low (the second lowest increase since 2002). Moreover, it is driven by a decrease in emigration, while immigration continued to fall and reached the lowest level since 2001. Despite the above explanation of the property price decline in 2009–2011 having stemmed from a deterioration in the price determinants, part of the decline remains unexplained, probably because of the negative outlooks for households, which are difficult to capture in the data. This fact was reflected in the “statistical” undervaluation of property prices according to most of the methods considered (in addition to the gaps shown in Chart III.24, this includes the property price sustainability indicators discussed above). However, the extent of the undervaluation was relatively modest and decreased towards the end of the year. Given the expected macroeconomic developments

CHART III.24

#### Apartment price gaps in the Czech Republic – deviations of actual prices from estimates

(CZK thousands per m<sup>2</sup>; positive values overvaluation, negative values undervaluation)

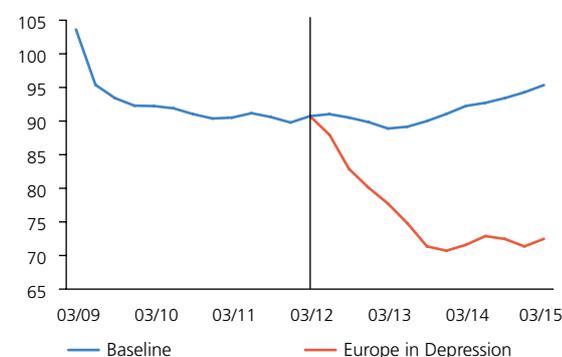


Source: CZSO, CNB calculation (WP 12/2009)

CHART III.25

#### Property price index according to different scenarios

(2007 Q4 = 100)



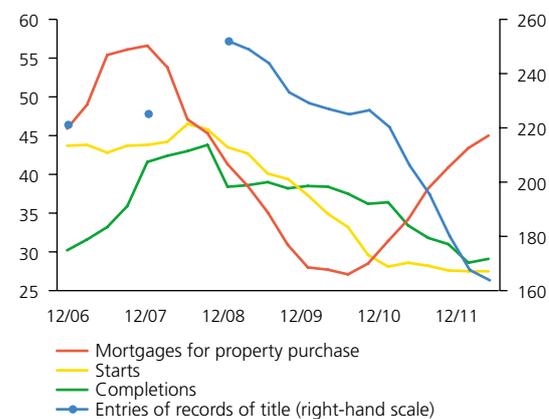
Source: CNB

<sup>47</sup> The existing regulation was abolished for around 400,000 apartments on 1 January 2011, and rents in these apartments should now be determined on a contractual basis. In the remaining roughly 300,000 apartments (in regional capitals excluding Ústí nad Labem and Ostrava and in large municipalities in Central Bohemia), the existing regulation will remain in place until 1 January 2013. However, as regulated rents are already close to market rents (the ratio of market to regulated rents is 1.04 in Prague), most of the deregulation was already reflected in rents in 2012.

CHART III.26

### Numbers of transactions in the property market

(thousands of transactions, moving sums for the past year)



Source: CZSO, COSMC, FINCENTRUM HYPOINDEX

Note: Entries of records of title to buildings and apartments only.

and the deterioration in the financial situation of households, the *Baseline Scenario* continues to assume flat or slightly falling apartment prices, although they could begin to rise in 2013 H2 (see Chart III.25). However, this scenario is subject to considerable risks. In addition to the impacts of rent deregulation and adverse macroeconomic developments, foreclosures affecting overindebted households or developers with loan repayment problems remain a downside risk to prices. The *Europe in Depression* stress scenario, which reflects the risk of a substantially negative macroeconomic outlook, estimates a drop in property prices of up to 22%. On the other hand, the higher profitability of speculative property purchases and partly also the increase in VAT on newly completed apartments may be sowing the seeds of a short-term speculative bubble.

### The number of property market transactions is falling

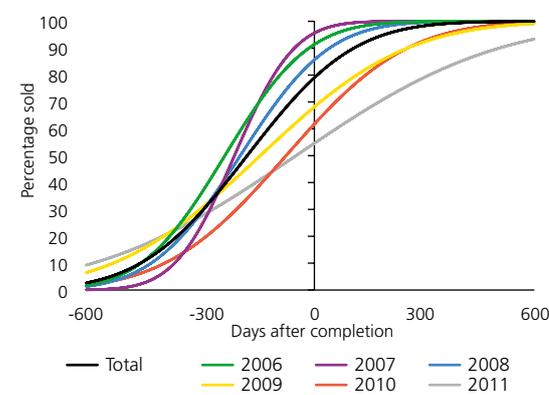
The property price decline was also associated with a decrease in the number of property market transactions due to lower demand among households and smaller supply of new apartments (see Chart III.26). The number of entries of records of title to houses and apartments in the cadastre<sup>48</sup> and the number of newly completed apartments (which reacted with a lag to an earlier drop in apartment starts) declined quite quickly. On the other hand, the mortgage market recovered, as the number of mortgages increased (see Chart III.26) and the average mortgage amount also went up slightly. This recovery was due largely to substitution between mortgages and building society loans,<sup>49</sup> a rise in the share of refinancing in new mortgages (see section 2.3) and a one-off recovery in demand for new apartments linked with the VAT increase. Given that past changes in the number of mortgages have preceded changes in the number of transactions, this can be regarded as a sign of stabilisation on the apartment market.

### Significant risks associated with residential developments persist

The decline in property market activity in 2011 also had an adverse effect on progress with the sale of residential developments, where there was a further increase in the time it takes to sell new apartments (see Chart III.27). Before the onset of the financial crisis, almost 95% of all the apartments in a typical development were sold prior to completion, whereas in 2011 the figure fell to 54%.<sup>50</sup> This is increasing the financing needs of developments, as well as reducing their profitability and their ability to repay loans. The increase in the time it takes to sell new apartments in residential developments may reflect, among other things, the low transparency of developers, with households postponing purchases in response to the increased credit

CHART III.27

### Progress with the sale of residential developments



Source: CTU, CNB calculation

Note: Estimated S-curves (cumulative normal distributions) with minimum deviations from individual projects (see Hlaváček, Prostějovská and Komárek, 2011)

48 However, the total number of entries of records of title increased in late 2011/early 2012, from 402,600 to 411,200.

49 Given the significant decrease in interest rates on new mortgage loans and the relatively rigid interest rates on building society loans, mortgage loans are currently cheaper.

50 The methodology for estimating progress with the sale of a typical development is described in the thematic article *An Analysis of Progress with the Sale of Residential Developments* in FSR 2010/2011.

risk they would otherwise have to bear. At the same time, however, marked differences in the success of individual developments are apparent, as customers differentiate more between developments according to their quality and price. The worse progress with sales is also in line with the rise of around 4.3% in the number of unsold completed apartments in 2011 (Trigema data). However, 2011 H2 saw a recovery in demand for residential developments, with the number of apartments sold in Prague rising by 30% year on year (Ekospol data for developments of more than 50 apartments). This was associated with the one-off VAT increase from 10% to 14% in early 2012 and also with a decline in apartment prices in developments, which occurred with a lag compared to older apartments (see the time series of transaction prices of new apartments in Chart III.19).

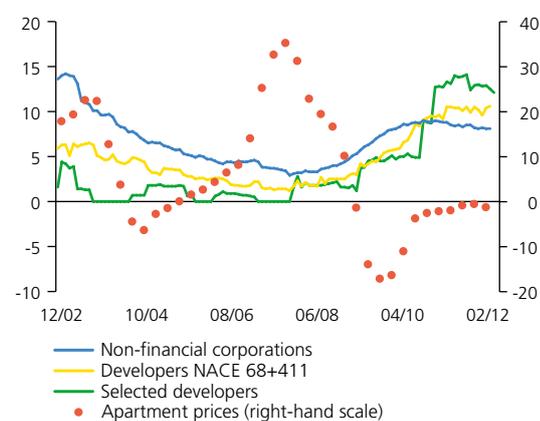
The longer apartment sale periods for developments and the decline in apartment prices were reflected in relatively rapid growth in the ratio of non-performing loans to developers. This ratio increased by 1.4 pp during 2011 and 2012 Q1 despite a 0.7 pp decrease in NPLs in the non-financial corporations sector as a whole (data for corporations in the property sector and developers in NACE 68 and 411; see Chart III.28).<sup>51</sup> The NPL ratio is thus about 2.5 pp higher than in the non-financial corporations sector. The NPL ratio for selected developers is even higher, still exceeding 12% despite a decrease in the second half of the year.

### The commercial property sector recovered

Following previous declines, the commercial property sector saw a substantial recovery in investment activity in 2011 (see Chart III.29). Total investment in commercial property reached around EUR 2.07 billion in 2011, i.e. roughly 2.6 times the figure recorded in 2010. Retail was the most active segment (accounting for about 50% of investment). Commercial property take-up (the volume of renting) also recovered. For example, gross take-up of office property rose by 52% year on year. The share of renegotiations in gross take-up fell from 42% in 2010 to 29.7%,<sup>52</sup> so net take-up increased even faster. The vacancy rate for office property declined by 1.2 pp to 12% in 2011 (see Chart III.30). Similarly, the vacancy rate for industrial property decreased to 6.7% (down by 12 pp from the record high recorded in 2009 Q2) and that for retail fell to 5.0% (from 6.4% in 2009). The recovery in new supply continued above all for office buildings, where total floor area increased by 3.8% year on year, and for industrial property (a rise in floor area of 8.6%). The recovery in take-up was also reflected in higher prices and a related annual drop in yields on commercial property

CHART III.28

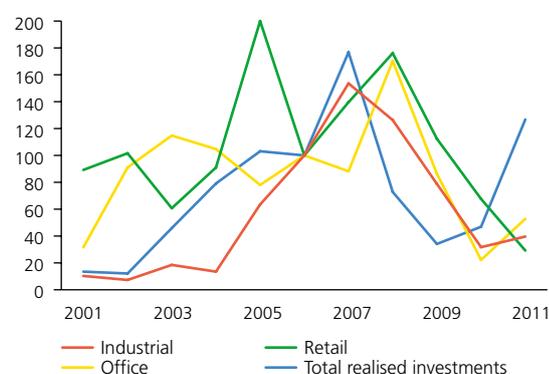
**NPL ratios in the property development sector**  
(%; year-on-year growth for apartment prices)



Source: CZSO, CNB

CHART III.29

**Planned supply and realised demand on the commercial property market**  
(2006 = 100)



Source: Jones Lang LaSalle

Note: Supply of industrial, retail and office property calculated from new supply in m<sup>2</sup>; realised investments from data in EUR.

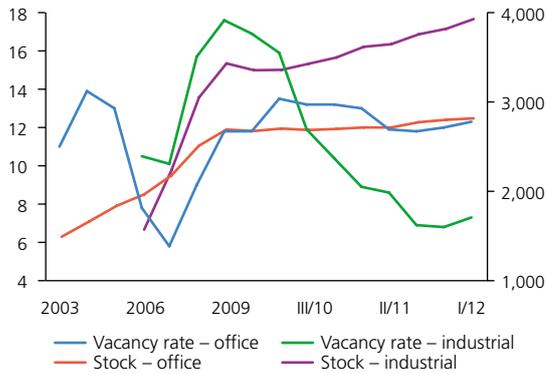
<sup>51</sup> The NPL ratio for developers in Chart III.28 is calculated in two ways; both use the CNB's Central Credit Register as the source of data. The first method is based on selected (the largest) developers and related companies (about 1,000 entities). The second series shows loans granted to all corporations in the categories "Real estate activities" (NACE 68) and "Development of building projects" (NACE 411). Owners' associations and housing cooperatives were excluded.

<sup>52</sup> Jones Lang LaSalle data.

CHART III.30

**Total stock and vacancy rates**

(vacancy rate in %; stock in thousands of m<sup>2</sup> on right-hand scale; 2003–2009 yearly data, then quarterly)



Source: Jones Lang LaSalle, Prague Research Forum

(of around 0.25 pp for most types of commercial property). However, the decline in the return on speculative assets was even sharper, which again opens up the possibility of speculative property purchases. There is a question as to whether the recovery in investment activity – driven mainly by foreign entities – and the related rise in new supply reflect a search for yield without being linked to the domestic economic situation. This could lead to an overheating of the market and an increase in the vacancy rate, something that already partially occurred in 2012 Q1 (see Chart III.30).