

## IMPACTS OF THE SOVEREIGN DEFAULT CRISIS ON THE CZECH FINANCIAL SECTOR

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*This article discusses the experience of countries hit by debt crises as well as the channels of contagion of sovereign default risk to the financial system. It focuses primarily on identifying channels of contagion that might represent a relevant threat to the Czech economy and discusses their significance. Although sovereign default risk is currently relatively low for the Czech Republic thanks to its low level of government debt, an escalation of this risk would have significant impacts on the financial system given the comparatively high proportion of government bonds in banks' balance sheets. The article also illustrates the significance of cross-country contagion to sovereign credit premiums. Here, the transmission from the countries hit hardest by the debt crisis has weakened, but the Czech Republic's credit premium is diverging from the most stable countries at a time of market stress. The risk of heightened sensitivity of credit premiums to a country's debt may increase the costs of irresponsible fiscal policy in the future. It is therefore another factor that should be covered by financial stability analysis.*

### 1. INTRODUCTION

Sovereign default risk is an old type of risk that has been brought back into the spotlight by the persisting financial (debt) crisis in advanced economies. The materialisation of this risk can be described in the narrower sense as a situation in which a central authority (usually a national government) is unable to honour its pre-agreed financial obligations unaided and the country therefore defaults. In the wider sense, an escalation of sovereign default risk can be seen as an excessive rise in the costs of financing government debt, manifesting itself either in repayment difficulties or in secondary macroeconomic costs of resolving the situation. In the strict sense, sovereign default risk should not arise, because central authorities (central banks) can print money in order to pay their debts. This solution, however, generates macroeconomic destabilisation in the form of escalating inflation, which can grow into hyperinflation with negative impacts on long-term economic prosperity. There have been many cases of sovereign default in history. The most recent include Argentina (2001), Russia (1998) and Ukraine (1998). Crises in Mexico (1982), Greece (2011), Iceland (2008) and other countries have also had strong features of debt crisis. However, the current problems associated with the euro area debt crisis have increased perceptions of sovereign default risk, as the existence and threat of transmission of sovereign default risk pertain to a group of countries (the euro area) of greater economic strength than was the case in the past. At the same time, the current debt crisis in some euro area countries shows that there can be a strong interaction between the sovereign default risk situation

and the situation of the financial sector. On the one hand, an escalation of sovereign default risk causes difficulties for financial institutions. On the other hand, the need to rescue ailing financial institutions can lead to sizeable government expenditures and to an increase in sovereign default risk.

The purpose of this article is to summarise countries' experience of tackling sovereign default risk and to point out potential channels of contagion that represent a real threat to the Czech economy. The article is structured as follows. Section 2 briefly summarises the experiences of individual countries for which sovereign default risk turned into a fundamental risk and also contains a general assessment of the extent of sovereign default risk in the Czech Republic. Section 3 describes the channels through which sovereign default risk propagates and discusses their relevance to the Czech Republic. Section 4 provides a summary and recommendations.

### 2. THE PHENOMENON OF SOVEREIGN DEFAULT RISK

The history of modern debt crises<sup>2</sup> shows that contagion very often spreads internationally from the country of origin of a crisis to geographically and economically similar economies. Asset (and especially housing) price bubbles have played a significant role in the escalation of crises. For many countries dependent on commodity exports (for example Russia) crises have been caused by, among other things, falls in the world (dollar) prices of those commodities. Both over-regulation of financial sectors and precipitous

<sup>1</sup> The opinions expressed in this article are those of the authors and do not necessarily reflect the official position of the CNB.

<sup>2</sup> An overview of individual episodes can be found, for example, in Reinhart and Rogoff (2009).

abandonment of such regulation have contributed to the escalation of crises. Sovereign debt crisis have often been by triggered by currency crises, especially following attacks on fixed exchange rate regimes, or by a combination of currency and banking crises. The most recent crises (Iceland and Ireland 2008–2011) have shown that sovereign debt crises can stem from previous excessive growth of the financial sector, from an excessively large financial sector relative to the size of the economy, and from excessive links to other countries. Analyses of public sector debt sustainability (see, for example, Gray et al., 2008) point to, among other things, the role of uncertainty and non-linear changes in credit risk and account for the market value and currency composition of debt. Studies attempting to predict debt crises (see, for example, Manasse et al., 2003) emphasise the role of macroeconomic variables (such as high foreign debt levels, debt-servicing measures and profiles, low GDP growth, current account imbalances and tight liquidity and monetary conditions), fiscal variables (such as the ratio of debt to GDP) and political economy variables (political uncertainty and the effect of the political cycle on the economy). The consequences of sovereign debt crises tend to last longer and be more persistent than those of currency crises.

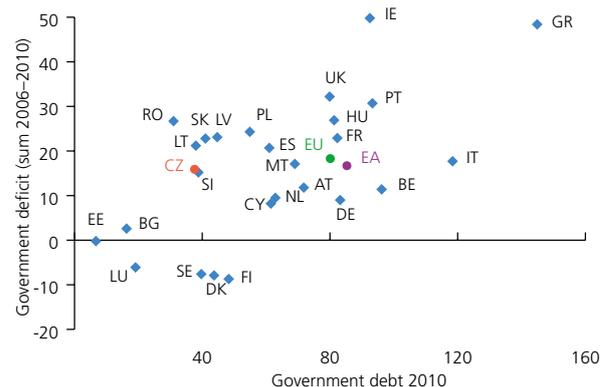
The ways of eliminating sovereign default risk range from bankruptcy declaration (Argentina), to forced debt restructuring (Ukraine 2000, Pakistan 2001, Uruguay 2003) to debt forgiveness by London and Paris Club<sup>3</sup> creditors (Poland and Hungary in the early 1990s as well as, for example, Montenegro). Another method – and, in a way, also a means of preventing sovereign default – is for an international financial institution to provide financial assistance. This approach has been applied in countries that were still relatively solvent but were illiquid at a particular point in time (Mexico 1994–95, South Korea 1997–98, Brazil 1999 and 2002, Turkey 2001, Uruguay 2002 and the recent example of Iceland). Nevertheless, empirical studies (see, for example, Cruces and Trebesch, 2011) show that debt restructuring is associated with a long period of restricted access to global financial markets for the countries concerned, as there is a link between haircut size and bond spreads after a crisis.

In the history of the independent Czech Republic (as well as its predecessor, Czechoslovakia) sovereign default risk

has been negligible (there has been no sovereign default since the establishment of Czechoslovakia in 1918). Even now this risk is relatively slight in the Czech Republic, thanks mainly to its relatively low level of debt (see the position of point CZ in the left-hand part of Chart 1; the Czech Republic has the fourth-lowest debt-to-GDP ratio in the EU, although the recent debt dynamics are not optimistic). However, the transmission of a shock caused by a debt crisis in another country would certainly have a non-zero impact on the Czech economy. Note also that although the Czech Republic’s debt level is relatively low, easy fiscal policy could significantly worsen this situation in the medium run via the accumulation of government deficits. And if financial markets are sufficiently forward-looking, a change in situation (a deterioration in public finances, i.e. an increase in the public finance deficit) may be more important for them than the current relatively good ratio of public debt to GDP. It is also important to realise that the current low debt level is due in part to past privatisation revenues, which will not be repeated. Conversely, the implicit public debt linked with the deferral of several key reforms (in particular pension system reform<sup>4</sup>) and with projected population ageing<sup>5</sup> can be expected to materialise over the next few decades.

CHART 1

**PUBLIC FINANCE SUSTAINABILITY RATIOS IN EU COUNTRIES**  
(in % of GDP)



Source: Eurostat

3 The London Club is an informal group of around 1,000 international commercial banks which negotiates as a creditor with debtor countries regarding private loans (without public guarantees). The Paris Club is currently a group of 19 creditor governments whose role is to negotiate debt restructuring and debt relief.  
 4 The pension system reform is scheduled to enter into force in 2013 (see Box 5).  
 5 According to the CZSO's demographic predictions, the proportion of over-65s is set to rise from the current 15.9% to 33.0% in 2060.

TABLE 1

**BOND MARKET PRICING OF SOVEREIGN DEFAULT RISK  
(EU country groups)**

Country	Rating	Govt debt/ GDP (%)	Credit premium volatility	5Y govt bond yield
SE	1	33	29.3	1.3
FI	1	50	24.1	1.4
DE	1	82	28.0	0.8
UK	1	85	40.9	1.1
CZ	3	43	63.3	2.0
AT	2	74	57.1	1.8
FR	2	89	57.0	1.7
BE	3	94	89.1	2.4
PL	6	56	90.8	4.9
ES	6	70	130.0	3.6
IT	8	121	134.3	3.4
HU	11	75	174.4	8.3
IE	8	115	276.5	5.2
PT	12	112	354.7	17.2
GR	23	189	1,026.3	54.9

Source: Eurostat, Bloomberg LP

Note: S&P rating conversion scale: 1 = AAA, 6 = A, 11 = BB+, 23 = D. Country abbreviations according to list of abbreviations. Highlighting indicates country groups ("SE, FI, DE, UK" together, etc.). Credit premium volatility is measured with the aid of CDS spreads by the standard deviation on the data set from 10 August 2006 to 29 February 2012.

Other indicators besides the debt level itself are important in assessing the level of sovereign default risk. In Table 1, selected EU countries are classed into groups with similar levels of sovereign default risk (this classification is then used for the analysis in section 3.2). It is evident from the table that although some countries are much more indebted than the Czech Republic, the depth, size and liquidity of their markets, assisted by their currencies accepted as reserve currencies, help them achieve lower risk premiums (e.g. DE and UK; the same goes for US and JP). According to the criteria in Table 1, the Czech Republic is in the same group as France, Austria and Belgium, whose sovereign default risk is assessed by the markets as being similar to that of the Czech Republic. In this classification, Poland could be classed alongside Spain and Italy, and Hungary alongside Ireland and Portugal, but they are analysed separately because they are both in the Central European region.

### 3. SOVEREIGN DEFAULT RISK CONTAGION CHANNELS

In this section we identify – on the basis of CGFS (2011) – eight main types of sovereign risk transmission channels affecting the cost and availability of bank funding. These channels can also be triggered purely by external events and their effects can be significantly reinforced by international transmission. We also try to identify the relevance of each contagion channel to the situation in the Czech Republic and we start with the channels that are relevant to the Czech Republic (sections 3.1–3.3). Special attention is given to the channel of cross-country contagion via CDS markets (section 3.2). In line with CGFS (2011), our discussion of sovereign risk contagion channels also covers channels of contagion linked primarily with banks' funding costs (sections 3.4–3.8). Given the specific conditions of the Czech banking sector (in particular its surplus liquidity) most of these channels are not currently relevant to the Czech Republic, but any major escalation of sovereign default risk could lead to them being activated.

#### 3.1 The channel of sovereign debt in the financial sector's asset holdings

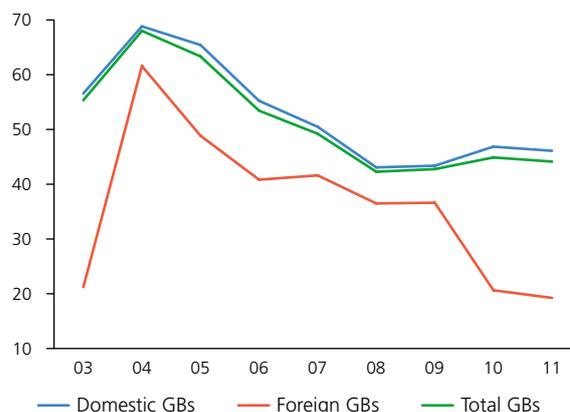
The close relationship between the financial sector and the government sector has proved to be a growing systemic problem in recent years (OECD, 2012). The financial sector – consisting largely of the banking sector – is a major government creditor. Increases in sovereign default risk can therefore affect banks through direct holdings of sovereign debt in balance sheets. Losses on government bond portfolios weaken banks' balance sheets and expose them to increased risks, especially on the funding source side. The impact on individual banks' balance sheets depends on how banks value their government bonds – i.e. at market prices or at amortised cost. If a bank holds government bonds for trading, it revalues them at market prices and a fall in their value has a direct effect on its profit-and-loss statement and on its equity and funding sources. If, however, a bank holds government bonds to maturity, it values them at amortised cost and a change in value is recorded only if the securities become permanently impaired (e.g. when sovereign restructuring or default becomes highly likely). Nonetheless, even these exposures may affect bank funding conditions well before a negative public finance event occurs. Acting out of caution and on the basis of historical experience, banking sector creditors may revise their investment plans and initiate a run on the bank or restrict their credit lines over concerns about the solidity of a banking sector that is over-exposed to the public sector.

Since 2007, the Czech banking sector has been holding roughly half of its government bonds to maturity (see Chart 2). This is a quite a low level compared with other countries (CGFS, 2011).<sup>6</sup> The comparatively high average share of government bonds held to maturity by European banks may be linked with the current debt crisis, as the increased uncertainty in primary and secondary government bond markets in some euro area countries together with the constant fear of spillover of this uncertainty to other countries (see the international contagion channel below) may be motivating the European banking sector to hold a larger proportion of its government bonds in held-to-maturity books. Nevertheless, this may be masking existing problems. It should be said in this context, however, that the share of bonds held to maturity in the Czech Republic is significantly lower for riskier foreign bonds than for domestic bonds (see Chart 2).

In advanced economies, the banking sector mostly holds domestic government bonds (CGFS, 2011). Insufficient risk diversification in banking sector balance sheets – especially during a crisis – can increase the risks of illiquidity and insolvency and start a vicious circle between the banking sector and the government sector. On the one hand, the banking sector is a major government creditor and often uses government bonds as security in money markets. On the other hand, during a crisis some banks may need help from their home government in the form of guarantees and recapitalisation (OECD, 2012). The government's ability to help the banking sector during a crisis depends on it having high enough budget revenues in relation to the size of the banking sector and a sustainable level of government debt.<sup>7</sup> Otherwise, helping the banking sector would involve excessively high costs in the form of excessive debt (excessive growth in debt as a percentage of GDP) accompanied by unsustainably high debt servicing costs (excessive growth in debt interest). The government, being unable to issue new debt and facing a rapid fall in the market value of previously issued government bonds, could become insolvent. As said earlier, the principal government bond holder is the banking sector, to which these problems would feed back. In simple terms, while the government can try to help some ailing banks, the situation

**CHART 2**
**SHARE OF GOVERNMENT BONDS HELD TO MATURITY BY THE CZECH BANKING SECTOR**

(in % of total government bond holdings in balance sheets)

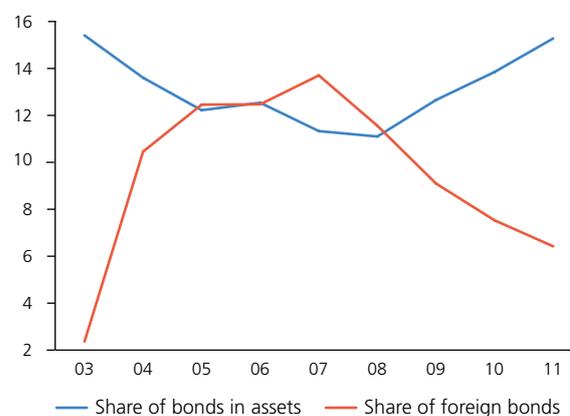


Source: CNB

Note: Values as of last day of month for 2003–2011.

**CHART 3**
**CONCENTRATION OF THE DOMESTIC GOVERNMENT BOND PORTFOLIO IN CZECH BANKS' BALANCE SHEETS**

(in % of total assets of banks holding domestic government bonds)



Source: CNB

Note: Values as of last day of month for 2003–2011.

<sup>6</sup> According to CGFS (2011), the average share of government bonds held to maturity in total government bond holdings in the EU is just above 80% (p. 12, Graph 13).

<sup>7</sup> Ireland is an example of a small country which has a large banking sector relative to its public budget and whose banking sector has needed help. On the other hand, Greece is an example of a country which had an extremely high debt level, exposed its banking sector as the main creditor to difficult liquidity conditions, and became unable to help its banking sector in any way. In the first case the adverse spiral went from the banking sector to the public sector, whereas in the second case it went in the opposite direction. An adverse spiral arises between these two sectors due to the inability of neither of them to absorb the credit risk of extreme debt. Both countries were forced to seek international financial assistance.

can lead to a systemic crisis across the entire banking sector due to subsequent sovereign debt unsustainability or even government insolvency.

The empirical evidence shows that the escalation of contagion between the banking sector and the government sector depends to a large extent on the size of the banking sector's exposures to the public sector (CGFS, 2011). Derivatives market data show an increased correlation between the CDS spreads of some European banks and those of ailing countries to which those banks had high exposures, or for which the risk of sovereign debt concentration in their balance sheets was high.<sup>8</sup> The transmission of foreign public sector funding problems to the local banking sector through open exposures is another potential channel of contagion (see the international contagion channel below). Nonetheless, by its nature it, too, belongs in the first channel of shock transmission via sovereign debt holdings. However, there can be a difference from the point of view of the implications of shocks for the local banking sector. The local banking sector may get into a difficult liquidity situation as a result of holding troubled countries' government bonds. If, however, its domestic public sector does not have problems (i.e. its public finances are sustainable), it can help the local banking sector with liquidity in emergencies and fend off contagion from abroad.

The Czech banking sector is also a major government creditor and inclines strongly towards holding domestic sovereign debt (see Chart 3). At present, the local banking sector holds around 44% of domestic sovereign debt (Quarterly Financial Accounts data for Q3), which makes up around 15% of its total aggregate balance sheet (see Chart 3).<sup>9</sup> In the case of the Czech Republic, the channel of propagation of sovereign risk via government debt holdings is clearly relevant but is not acute at the current ratio of government debt to GDP (around 40%). A protracted financial crisis may motivate the banking sector to flee to quality, i.e. to prefer government bonds to more risky assets. Chart 3 shows that the share of government bonds in the balance sheets of the Czech banking sector began to rise (and the share of foreign bond holdings began to fall) when the debt crisis erupted in 2009.

### 3.2 The cross-country contagion channel

Due to the close links among the financial markets of advanced economies, distress of one sovereign can spill over indirectly but quickly to other countries and their financial institutions. Key roles – in addition to direct holdings of foreign government bonds (see the channel of sovereign debt in the financial sector's asset holdings) – are played by banks' cross-country exposures, banks' claims on foreign non-financial entities and the vulnerability of other public sectors to foreign sovereign risk shocks. Global interbank exposures are particularly large for banks in key advanced economies. Banks with sizeable exposures to the banking sector of a country in distress are more exposed to contagion risk, since on the asset side they face increased credit risk stemming from potential default and on the liability side they face increased funding risk (the high risk of counterparties holding bad debt can make interbank markets too expensive or cause them to freeze up). Both these risks expose banks with international exposures to a more difficult liquidity position. Cross-country contagion can also spread through banks' irrecoverable claims on non-financial corporations in troubled countries. However, this contagion is longer term in nature. Both these indirect cross-country contagion effects play only a minor role in the Czech Republic, because the Czech banking sector's exposures to the financial and real sectors in other countries are currently low.

Cross-country transmission of sovereign risk can also occur through contagion among sovereign markets of countries whose public sectors are perceived to be vulnerable. Some studies have found that the transmission of shocks from one sovereign market to another strengthens considerably in periods of turbulence (Diebold and Yilmaz, 2010). This transmission channel may therefore be relevant to any country, including the Czech Republic. During the recent crisis, the correlation between European sovereign CDS premiums increased sharply, albeit temporarily, after the collapse of Lehman Brothers, owing mainly to psychological contagion (BdF, 2009). After a time, negative sovereign risk perceptions transferred to countries, such as the Czech Republic, whose financial systems had been hit either not at all or only marginally by the crisis. Several empirical studies (Schuknecht et al., 2010; Ebner, 2009) attempt to quantify cross-country contagion. The transmission of negative shocks to the Czech Republic is analysed by Vašíček et al. (2012). Using a method based on a vector

<sup>8</sup> This relationship strengthened after the publication of the CEBS stress test results in July 2010.

<sup>9</sup> This is one of the highest shares in the EU.

autoregression model, they conclude that up to 44% of the dynamics of Czech credit premiums can be explained by the dynamics of foreign premiums.

Another contribution of our article is that it shows – using quantile analysis following IMF (2009) and CNB (2011) – to what extent fiscal problems in other countries can spill over to the Czech government bond market, or to what extent the Czech sovereign debt default risk is affected by the default risk of other countries. As the analysis in question is conducted on a data sample covering “only” the current crisis, we follow the transmission of fiscal problems from the euro area periphery. The reason for analysing contagion using quantile analysis is that there is a non-linear relationship between the sovereign risk of individual countries in different periods.<sup>10</sup> It is clear from Charts 4–7 that the co-movement of the risk premiums of the Czech Republic and the selected countries (see the country groups in Table 1) is non-linear, as in the period of higher credit risk (expertly described as the crisis period; see Charts 5 and 7) the credit premiums of the Czech Republic react more or less than proportionately in relation to the credit premiums for the other countries/country groups by comparison with the

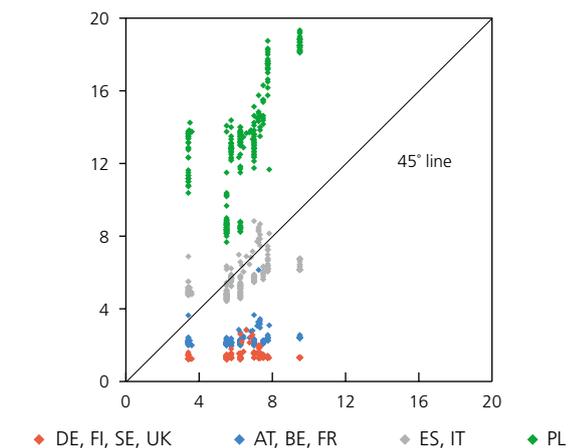
period when the credit risk level is lower (expertly described as the period of calm; see Charts 4 and 6).

Charts 4–7 show that the slopes of the notional regression functions between the Czech risk premium (x-axis) and European sovereigns’ premiums (y-axis) became steeper during the crisis. This increasing co-movement can be explained to some extent by rising market volatility in crisis periods. Nonetheless, the magnitude of the change in slope across countries and time is also significant. The charts clearly show a flatter slope of the notional regression equation for fiscally stable countries (DE, FI, SE, UK) and a small change in that slope across periods, and conversely a steeper slope for fiscally troubled countries (GR, IE, PT) or potentially fiscally troubled countries (ES, IT) and a relatively large change in slope across periods. A stable relationship between periods can be seen for regionally related countries (HU, PL). Their credit premiums are higher than the Czech ones, but it is evident from this simple dependence that the slope of the notional regression function between Czech and Polish/Hungarian premiums has not been significantly affected by the current euro area debt crisis.

CHART 4

**PRE-CRISIS RELATIONSHIP OF SOVEREIGN CDS SPREADS BETWEEN SELECTED COUNTRY GROUPS AND THE CZECH REPUBLIC**

(bp; x-axis: CZ; y-axis: selected country groups; August 2006–August 2007)

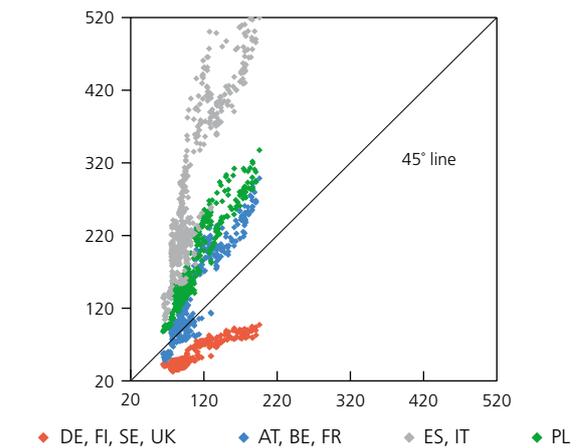


Source: Bloomberg LP, CNB calculations  
Note: 5Y CDS spreads of sovereign debt of relevant countries or mean for country group.

CHART 5

**RELATIONSHIP OF SOVEREIGN CDS SPREADS BETWEEN SELECTED COUNTRY GROUPS AND THE CZECH REPUBLIC DURING THE CRISIS**

(bp; x-axis: CZ; y-axis: selected country groups; March 2010–February 2012)



Source: Bloomberg LP, CNB calculations  
Note: 5Y CDS spreads of sovereign debt of relevant countries or mean for country group.

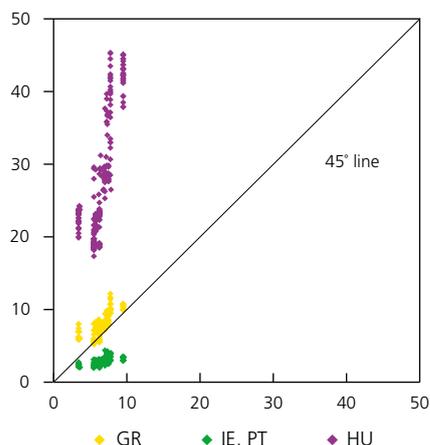
10 Quantile analysis is a suitable technique that can explain the apparent non-linearities in the data. Standard regression can only provide information about the mean relationship between the variables over the entire period of analysis and does not yield additional information on any change in the relationship within a non-standard time period such as a financial crisis. This situation manifests itself in an increased difference between the relationship obtained in the 1st–5th quantile relative to the 95th–100th percentile, or in a greater deviation from the mean of the distribution function.

# IMPACTS OF THE SOVEREIGN DEFAULT CRISIS ON THE CZECH FINANCIAL SECTOR

CHART 6

## PRE-CRISIS RELATIONSHIP OF SOVEREIGN CDS SPREADS BETWEEN SELECTED COUNTRY GROUPS AND THE CZECH REPUBLIC

(bp; x-axis: CZ; y-axis: selected country groups; August 2006–August 2007)



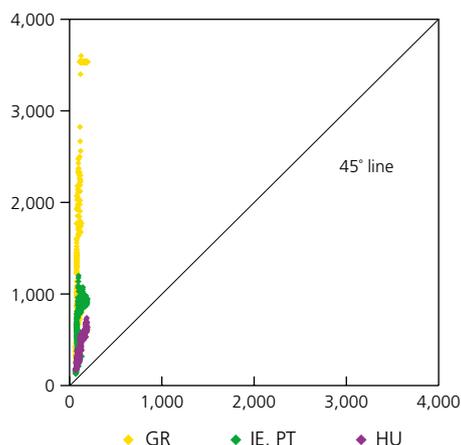
Source: Bloomberg LP, CNB calculations

Note: 5Y CDS spreads of sovereign debt of relevant countries or mean for country group.

CHART 7

## RELATIONSHIP OF SOVEREIGN CDS SPREADS BETWEEN SELECTED COUNTRY GROUPS AND THE CZECH REPUBLIC DURING THE CRISIS

(bp; x-axis: CZ; y-axis: selected country groups; March 2010–February 2012)



Source: Bloomberg LP, CNB calculations

Note: 5Y CDS spreads of sovereign debt of relevant countries or mean for country group.

To obtain a more precise knowledge of the relationships between the credit premiums of the countries under review across periods we applied the regression equation<sup>11</sup> separately for five separate quantiles (IMF, 2009, Box 2.2) and estimated the risk transmission parameter. In simple terms, this parameter expresses how the sovereign risk of a particular country or country group affects (directly or indirectly) Czech sovereign risk in the individual quantiles.

TABLE 2<sup>12</sup>

## CO-MOVEMENT OF SOVEREIGN CREDIT RISKS OF VARIOUS COUNTRY GROUPS AND THE CZECH REPUBLIC

Country group	Quantile				
	5th	25th	50th	75th	95th
DE, FI, SE, UK	0.82	0.75	0.69	0.61	0.42
AT, BE, FR	0.80	0.76	0.67	0.61	0.58
ES, IT	0.80	0.79	0.70	0.64	0.59
GR, IE, PT	0.59	0.54	0.45	0.43	0.41

Source: Bloomberg LP, CNB calculations

Note: The results are significant at the 1% level.

The results of the analysis confirmed a non-linear regression relationship between the monitored risk premiums across quantiles (see Table 1), while in the period of calm (defined as the 5th percentile) the regression coefficients turned out to be higher across all the relationships analysed than for the case of market stress (defined as the 95th percentile). The co-movement of the sovereign default risk of the Czech Republic and that of the other countries under review decreases with increasing percentile number. The Czech premium reacts differently to the selected countries, i.e. it displays different sensitivity to the current adverse market situation compared to the other countries under review. This can be interpreted in simple terms as meaning that the Czech Republic is viewed neither as a “safe haven” (e.g. DE, FI, SE, UK), nor as fiscally troubled (e.g. GR, IE, PT and ES, IT). The onset of the crisis was accompanied by the market effects of flight to quality and liquidity by investors, and the government bond markets of fiscally stable countries (e.g. DE, FI, SE, UK) faced increased demand by comparison with other countries, giving rise to a sharp decline in their credit premiums. On the other hand, countries with a high future probability of debt

11 The estimated equation took the form  $CDS_{CZ} = \alpha + \sum_k \beta_{\tau,k} R_k + \beta_{\tau,j} CDS_j$ , where the credit premium for Czech sovereign debt ( $CDS_{CZ}$ ) is expressed as a function of the credit premium for the sovereign debt of the other country under analysis ( $CDS_j$ ) after correcting for the effect of common aggregate risk factors ( $R_k$ ) for different quantiles ( $\tau$ ). Among the common aggregate risk factors we included a volatility index to proxy for general market risk aversion and a combination of different spreads by maturity or different types of markets to proxy for the market liquidity and credit premium (similarly as in IMF, 2009, Chapter 2, p. 16).

12 The co-movement parameters for the individual quantiles were also estimated for HU and PL. The results were similar to those obtained for the Czech Republic, therefore supporting the above contention that these regionally related countries have reacted similarly to the current debt crisis.

restructuring or potential fiscal problems (e.g. GR, PT and IT) saw an increase in their risk premiums. However, it should also be borne in mind that co-movement can also be affected by market factors such as market liquidity as well as by the size of the country and the soundness of its financial sector (see section 3.1).

From the information above one can tentatively conclude that the shock arising from the current debt crisis will transmit to the Czech sovereign credit premium, but only to a limited extent. The fundamental or market factors explaining its level still dominate. Nonetheless, this market channel of sovereign risk transmission is clearly relevant and would probably increase in significance if market perceptions of the Czech Republic's sovereign default risk were to take a turn for the worse.

### 3.3 The channel of change in the attitude to risk

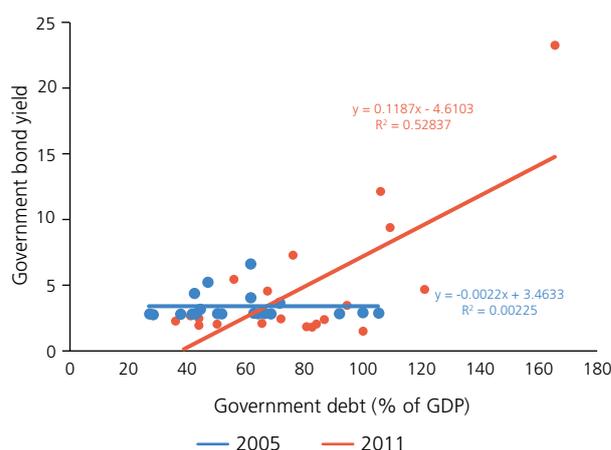
Sovereign tensions may cause a rise in investors' risk aversion, which in turn may increase the risk premiums demanded on sovereign and bank securities and reduce banks' funding availability. An increase in risk aversion can, in the short run, cause a decline in asset prices, reflected in lower profits or in losses for banks. Heightened risk aversion can also be expected to have a larger effect on banks than on non-financial corporations, as the former are more leveraged than the latter. Empirically, changes in the attitude to risk can be followed by means of the difference between the banking sector's stock market returns and options, which represent risk-neutral behaviour. Sovereign default risk problems can also lead to complete loss of availability of the "risk-free asset" on whose existence most market risk management models are based. A loss of power of such models can in turn lead to a further increase in risk aversion and to knock-on effects on banks' portfolios.

As the Czech Republic is a small, open economy strongly dependent on external developments, and given that most foreign investors view it as quite a risky country, the channel of change in the attitude to risk and the impact of heightened risk aversion are important for its financial sector. As is clear from Chart 8, the link between government bond yields and government debt

has increased significantly in the EU countries during the current financial crisis. In 2005 this relationship was insignificant, whereas during the crisis financial markets started to put a higher price on sovereign default risk.<sup>13</sup> So, although the current level of public debt in the Czech Republic is relatively low (see Chart 1), the comparatively high rate of growth of debt, in combination with these stronger perceptions of sovereign default risk, may significantly increase the costs of poor budget discipline (see the relatively high government deficits in recent years).<sup>14</sup>

**CHART 8**

#### RELATIONSHIP BETWEEN THE GOVERNMENT BOND YIELD AND GOVERNMENT DEBT



Source: Thomson Reuters, Eurostat, CNB calculation

### 3.4 The sovereign and bank rating channel

Sovereign ratings are important for commercial banks in two main respects. Sovereign downgrades have direct negative repercussions on the cost of banks' debt and equity funding and also often lead to downgrades of domestic banks. Sovereign ratings generally represent a ceiling for the ratings of domestic banks. Rating downgrades cause banks to pay higher spreads on their bond funding, which, in the event of large downgrades,

<sup>13</sup> Nonetheless, as stated in De Grauwe and Ji (2012), whereas before the crisis markets wrongly neglected government debt when pricing sovereign risk, now they might be overreacting.

<sup>14</sup> However, the link between the sovereign default risk and the debt-to-GDP ratio of an economy may be non-trivial. On the one hand, there are sovereigns with extremely high debt ratios which do not affect their funding costs (mostly countries whose currencies are regarded as reserve currencies, such as Japan with its government debt of over 220% of GDP). On the other hand, sovereign default risk has escalated in the past even in countries with relatively low debt ratios (Argentina 2001).

may reduce access to funding in financial markets. Sovereign downgrades also affect the behaviour of institutional investors, who are restricted by regulations to investing in high-quality securities. This narrows the set of securities eligible as collateral, which are therefore more in demand. It would seem at first glance that this channel has not been active in the Czech Republic so far during the current financial crisis. The Czech Republic is one of the only two EU countries whose rating has been upgraded during the financial and debt crisis; most other EU countries have seen theirs downgraded.<sup>15</sup> However, given the Czech banking sector's strong international ownership links (96% of the assets of the Czech banking sector are controlled by foreign owners), there has been contagion from sovereign ratings to bank ratings via downgrades of parent banks. So, although the Czech banking sector has been stable over the course of the financial crisis, the potential costs of funding Czech banks through bond markets are going up. On the other hand, it is fair to say that the real impacts of these increased funding costs have so far been minimal, because the Czech banking sector traditionally has surplus liquidity and does not need bond funding. Recently, moreover, the relationship between the rating and the credit premium has become less close.

### 3.5 The channel of assets as collateral

Sovereign securities are used extensively by banks as collateral to secure funding from central banks and repo markets. Increases in sovereign risk and haircuts can both cause the value of collateral to fall. Increases in sovereign risk reduce the availability or eligibility of collateral, and hence banks' funding capacity. The haircuts applied to sovereign securities are determined by collateral valuation uncertainty, market liquidity and credit risk. The central bank's liquidity-providing policy, and in particular its eligible collateral policy, plays a significant role here. The central bank faces a dilemma – on the one hand it may face problems with insufficient liquidity in some financial institutions, but on the other hand it should not take on the credit risk associated with such liquidity provision. However, given the liquidity surplus in the Czech banking sector, and given that the CNB's liquidity-providing facilities introduced in 2008 are used to only a limited extent, this channel is currently not very relevant to the Czech Republic.

### 3.6 The channel of the effects of government guarantees on bank funding

Explicit and implicit government guarantees can significantly affect banks' funding options. Systemically important financial institutions have traditionally had implicit government guarantees, which have lowered their funding costs relative to other institutions. After the escalation of the financial crisis, authorities have also explicitly codified these guarantees in law. The worsening of sovereign fiscal positions could reduce the value of both implicit and explicit guarantees. The potential liabilities of deposit insurance funds, which generally do not have enough money to cover the majority of insured deposits, can also be regarded as an implicit government guarantee. Disruption of the perceived risk-free nature of insured deposits could undermine depositors' confidence in the local banking sector and lead to massive outflows of deposits abroad or into cash.<sup>16</sup> Although this risk is not very likely to materialise in the Czech Republic given its relatively low government debt level and the sound condition of the Czech banking sector, a sharp deterioration of public finances coupled with a downturn in the banking sector could lead to a change in the current environment of surplus bank liquidity and activate other currently inactive sovereign risk contagion channels.

### 3.7 The channel of the impact on banks' non-interest income

Sovereign tensions may also negatively affect banks' fee and trading income. Higher sovereign risk is associated with greater investor risk aversion and lower asset prices and financial market transactions, which together reduce banks' revenues. The effect of higher sovereign risk also reduces the value of the portfolios which banks manage on behalf of customers, which implies lower bank income from fees from clients. This effect may be exacerbated by investors rebalancing their portfolios towards low-risk assets, which have lower management fees. However, given that investors in the Czech Republic are already very conservative and that most bank fees already tend to be associated with traditional banking products (loans, deposits and money circulation), this channel is unlikely to play a major role in the Czech financial sector. It may, however, manifest itself in slower development of the use of modern financial instruments and in lower competitive pressures in the financial sector.

<sup>15</sup> In August 2011, S&P upgraded the Czech Republic's long-term foreign currency rating by two notches to AA-, whereas between 2008 and 2012, for example, it downgraded Greece by 14, Portugal by eight, Ireland by seven, Spain by five and Hungary by two notches. French and Austrian government bonds were also downgraded.

<sup>16</sup> For example, Greece recorded an outflow of deposits from the banking sector of more than 20% in 2011. According to the Financial Times, Greeks transferred as much as EUR 200 billion abroad.

### 3.8 The channel of crowding-out effects on banking sector debt issuance

The rise of sovereign issues may crowd out private debt issuance by increasing the cost or reducing the availability of funding. This effect is not limited to the banking sector, but could be more relevant for banks given their sizeable funding needs. The extent of crowding out depends on whether investors view government bonds as substitutes for bank debt, and on the overall supply of savings. Given the aforementioned liquidity surplus, however, Czech banks do not currently need bond market funding, so this channel is also not relevant to the Czech Republic for the time being.

## 4. CONCLUSION

Sovereign default risk is currently low for the Czech Republic thanks to its relatively low level of government debt, but it is not zero and may increase in the future. An escalation of this risk would have significant impacts on the financial system given the comparatively high proportion of government bonds (mostly domestic ones) in the balance sheets of Czech banks. In this article we show that government debt funding costs are a relatively significant channel of cross-country contagion for the Czech Republic. Our analysis demonstrated that in the period of calm the Czech sovereign credit premium reacted similarly to the premiums of Germany, Finland, France, Sweden and the United Kingdom, whereas at the time of market stress it diverged from these stable countries. On the other hand, however, the co-movement of Czech sovereign risk and the risk of troubled countries also decreased (in the period of calm only around 50% of the effect transmitted from Greece to the Czech Republic, and in the crisis period the figure was only 40%). The most stable relationship of Czech credit premiums can be observed with countries such as Belgium, Italy and Austria, which are more indebted than the Czech Republic but have more liquid and deeper financial markets. This means that the Czech sovereign credit premium is affected more by market conditions and effects than by concerns about possible debt restructuring.

The sovereign risk transmission channels which, owing to the observed liquidity surplus in the Czech financial sector and the conservatism of Czech investors, are not very relevant include, for example, the effect of sovereign risk on collateral value, the bank downgrading channel, the effect of government guarantees, the reduction in banks' non-interest income and the crowding-out of banking sector debt issuance. The likelihood of an escalation of

sovereign default risk is also reduced by the relatively small imbalance in the currency structure of assets and liabilities on both the government side (a relatively small amount of foreign currency bonds) and the side of local financial institutions.

The change in global investors' attitude to sovereign default risk, reflected, among other things, in increased sensitivity of credit premiums to sovereign debt, may significantly increase the costs of irresponsible fiscal policy in the future. This is another factor which has a role in the monitoring of financial stability. The interconnectedness of the various risk transmission channels both within single countries and across national boundaries means that sovereign default risk can have significant implications for systemic risk.

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