

COULD THE CZECH INSURANCE SECTOR BE A SOURCE OF SYSTEMIC RISK?

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A debate about the systemic dimension of the insurance sector and its role in the stability of the financial system has been going on within the European System of Financial Supervision for months now. This article assesses (i) the function of this sector in the financial system and in relation to the rest of the economy, (ii) the risks which insurance companies face and which shape their business, and (iii) developments in the regulation of insurance companies (Solvency II) from the financial stability perspective. We argue that Czech insurers are not a significant source of systemic risk in the Czech Republic thanks to their focus on traditional insurance products, limited mismatch between the durations of their assets and insurance obligations, and the conservative composition of their investment portfolios. The article nonetheless identifies a number of areas where they could contribute to financial instability.

1. MAIN CHARACTERISTICS OF THE INSURANCE SECTOR

The insurance sector fulfils a specific role in the economy by providing protection against all sorts of risks. In their core function, insurance companies take on the idiosyncratic risks of individual economic agents (such as the risk of damage to property or the risk of financial losses in non-life insurance and the risk of death in life insurance) and thereby reduce overall uncertainty in the economy. They contribute to smoothing of the consumption of households and the net income of firms, to the functioning of various industries (e.g. air and sea transport) and to the execution of transactions (such as mortgage lending). The stable long-term household savings that life insurers manage can act as a source of long-term financing for the economy. As major institutional investors, insurers thus enhance the efficiency of financial markets.

The assets of Czech insurance companies¹ amount to 12% of GDP, which is low compared with the EU average of around 60%. As in other EU countries, however, insurers form the second-largest financial sector in the Czech Republic, with assets totalling CZK 479 billion. Life insurance accounts for almost three-quarters of this figure and non-life insurance for the rest. This view, however, understates the importance of non-life insurance to the economy. Non-life insurance accounts for over half (55%) of total annual premiums in the Czech Republic.² In EU

countries, however, life insurance dominates even in terms of premiums paid (up to 60% of the total). Life insurance makes up 6% of the financial assets of Czech households, well below the EU level of around 30%. This ratio has been flat in recent years in the Czech Republic and the EU alike.³ The size of the life insurance sector and insurance penetration are also greatly influenced by the supply of substitute products from other financial institutions (e.g. pension companies and investment funds), by pension system legislation and by tax policy. The more significant is the pay-as-you-go pension system and the greater are the tax incentives applying to insurance products in a country, the more significant is life insurance there (Gollier, 2015). The significance of non-life insurance is influenced by the general orientation of the economy and by natural conditions, i.e. by the importance of sectors with high demand for insurance, such as agriculture and sea transport.

The key aspect of insurers' business model lies in setting the right premium rate. The rate must make the product attractive to customers while guaranteeing that the insurer is ceaselessly able to meet its insurance obligations and make a profit. In the case of non-life insurance, the company must be able to pay claims even if its loss experience turns out to be worse than expected (for example due to more frequent insured events, above-average losses or repeated natural disasters). In other words, premiums are set on the basis of expected losses and the insurer is exposed to premium risk, i.e. the risk that the premiums it receives will not cover its losses and related costs. The insurer uses premiums not paid out in the current year to create and manage technical provisions for use in

1 In this article, the term "Czech insurance companies" refers to insurance companies headquartered in the Czech Republic.

2 The asset size view differs from the premium size view because of the different nature of provisions in the two insurance segments. In non-life insurance, premiums are used mostly to settle current-year claims. Only a small proportion are used to create technical provisions, mainly for protection against an adverse loss experience. In life insurance, by contrast, most of the premiums go into technical provisions to be ready for claims coming later (sometimes even after several decades).

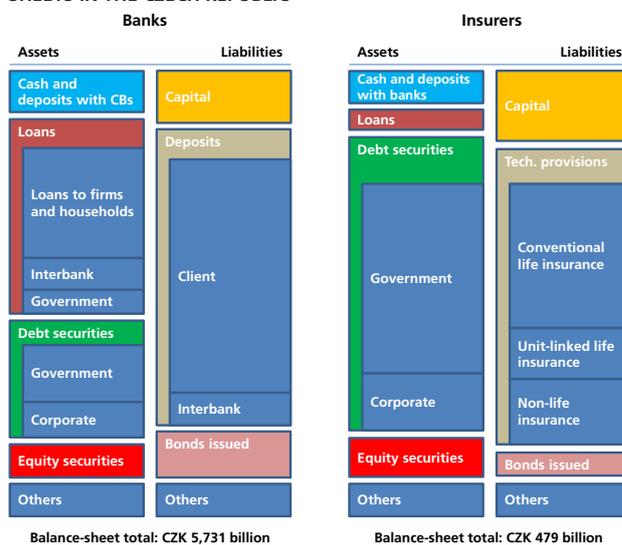
3 The stagnation of life insurance in the Czech Republic is also evidenced by a 25% fall in the number of life insurance policies since 2008.

future years to meet its policy obligations. However, the size and timing of fulfilment of these obligations is not known in advance. The risk of insufficient technical provisions is therefore another major insurance risk. The main insurance risks in life insurance are mortality risk, longevity risk, morbidity risk and lapse risk.

Insurance companies invest their technical provisions primarily in financial assets, which make up almost the entire asset side of their balance sheet (see Chart 1). The main investment instruments are debt securities, which account for around 60% of the assets of Czech insurers and 45% of those of European insurers. Insurance companies invest more than banks in corporate bonds, equities and mutual funds in relative terms. Investment in equity securities accounts for around 20% of assets in the Czech Republic. Despite growth in recent years, this is still below the European average of over 30%. Investment in less liquid assets such as real estate and direct lending to firms⁴ are relatively low – around 8% in the EU and well below 1% in the Czech Republic.

Investment by insurers is typified by a strong emphasis on safety and market liquidity. Nonetheless, insurers are exposed to investment risks: market risk and credit risk (including concentration risk). The main market risks are interest rate risk and equity risk. It is clear from the proportion of government bonds in their portfolios that insurers have high concentrations of sovereign credit risk. They are also exposed to credit risk due to credit derivative holdings, exposures to reinsurers and claims on policyholders. For some insurance products, both policyholders and insurers are exposed to investment risk. Two types of life insurance with a saving component are usually offered – unit-linked and conventional, or a combination of the two. In unit-linked life insurance, the investment risk is borne not by the insurer, but by the policyholders, who participate directly in the gains and losses on invested assets covering insurers' technical provisions. In conventional life insurance, claims are guaranteed in the form of a minimum or fixed return. This sort of guarantee can be viewed as an embedded option linked to the liability side of the insurer's balance sheet. For this type of insurance, the policyholder is protected against investment risk by the insurer.

Insurers face interest rate risk on both sides of the balance sheet. In the case of traditional life insurance, it is therefore

CHART 1
COMPARISON OF BANKING AND INSURANCE SECTOR BALANCE SHEETS IN THE CZECH REPUBLIC


Source: CNB

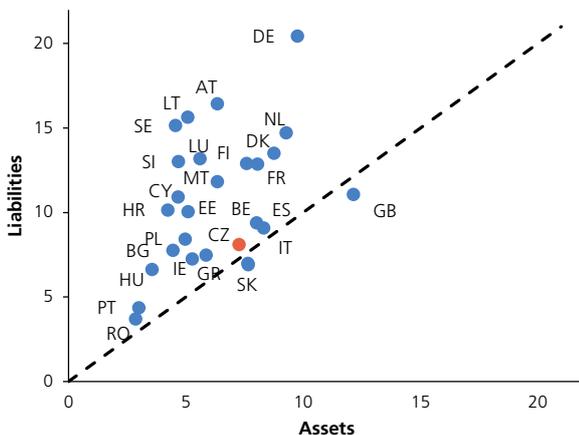
Note: To make the chart readable the proportions of the individual asset and liability classes are depicted only approximately. Corporate bonds are bonds of financial institutions and non-financial corporations. Mortgage bonds make up 75% of the corporate bonds held by banks and 33% of the corporate bonds held by insurers. Equity securities consist of shares and units. Balance-sheet totals as of 30 September 2015.

vital for them to manage their net interest position well and to set a sufficiently prudent guaranteed rate of return. A drop in market interest rates reduces their future interest margins, so the returns on newly invested assets may be low relative to the guaranteed benefits agreed in the past. Reinvestment risk will rise if the low-interest-rate environment persists. Conversely, a rise in market interest rates may lead to increased cancellation rates as more attractive investment opportunities become available elsewhere, especially for policies with a much lower guaranteed return than the current market rate.⁵

It is clear from the above that the risk exposures of insurers and banks differ considerably (see Chart 1). Insurers have significant risk exposures on both sides of the balance sheet (investment risk on the asset side and insurance risks and interest rate risk on the liability side), while banks face risks primarily on the asset side. There is also a substantial difference in balance-sheet liquidity risk. Insurers' liabilities

⁵ This risk can be reduced by setting regulations that penalise policyholders for terminating policies prematurely. In the Czech Republic, contributions originally exempted from tax are taxed if, for example, policyholders cash in their savings early or cancel their policies. Tax benefits received in the last ten years must also be returned if life insurance contributions were claimed as tax deductible in the past.

⁴ Czech insurance companies do not currently provide loans to firms.

CHART 2
DURATION MISMATCH OF ASSETS AND LIABILITIES OF EUROPEAN INSURERS
 (average duration in years)


Source: EIOPA Stress Test Report 2014, CNB, authors' calculations

have a longer average duration (around seven and half years in the Czech Republic; see Chart 2) due to the long-term nature of life insurance policies, whereas banks' liabilities are very short and dominated by demand deposits (see section 3.1 of this Report). Banks are therefore more sensitive to funding risk.

2. SOURCES OF SYSTEMIC RISK IN THE INSURANCE SECTOR

A financial institution can generally contribute to the formation of systemic risk⁶ through procyclical behaviour (the cyclical component of systemic risk) or through interconnectedness with other financial institutions (the structural component of systemic risk).⁷ However, the relationship between the insurance sector's behaviour and systemic risk is less direct than in the case of the banking sector. Thanks to their very long-term obligations, life insurers are less vulnerable to short-term swings in market prices and thus less sensitive to temporary systemic liquidity crises. The insurance sector can also act countercyclically in

6 The basic definition of systemic risk is the risk of disruption in the financial system with the potential to have negative consequences for the internal market and the real economy (ESRB, 2015).

7 Systemic risk has two main dimensions: time and cross-sectional. The time dimension reflects the build-up of systemic risk over time and its source is procyclicality in the behaviour of financial institutions. The cross-sectional dimension reflects the existence and distribution of systemic risk at any given moment in time and its source lies in mutual and chained exposures among financial situations. For more on systemic risk, see Frait and Komárková (2011).

the financial system and absorb short- to medium-term shocks to some extent. In certain conditions, however, it can contribute to a build-up (and, in extreme cases, materialisation) of systemic risk. Insurers can influence the real economy indirectly through the asset side of their balance sheets due to their interconnectedness with other financial institutions. They can have a direct influence through the liability side, which consists mainly of liabilities to households and non-financial corporations.

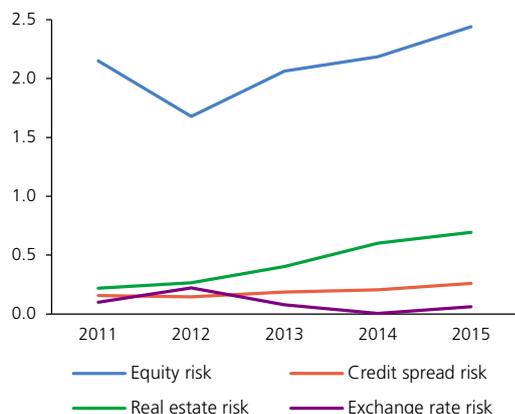
Insurers may act procyclically with their investment allocation. This is driven by herding behaviour stemming from similar balance sheet and business model structures, similar rules and regulations, and mechanical reliance on benchmarks (such as the UFR; see section 3 of this article) and credit ratings. A typical example of insurers amplifying price bubbles is "search for yield". In such situations, insurers that are obliged to achieve a guaranteed yield try to make up for generally low returns on safe assets by searching for riskier investment opportunities (such as equities, real estate and long-duration bonds). Such behaviour can drive up the prices of those assets and contribute to a systemic build-up of equity or credit spread risk. A large and unexpected drop in asset prices may conversely motivate insurers to sell off their risky assets en masse, thereby magnifying the fall in prices and increasing the financial stress. Procyclical behaviour by insurers may also be amplified by the specific products they provide within the financial system, such as security loans, bank deposits and secured financing. Insurers' willingness and ability to provide liquidity (in the form of deposits or repos) and the amount of available collateral rise in the upward phase of the financial cycle and fall in the downward phase (Dingová et al., 2014).

Insurers can also act procyclically in the pricing and underwriting of insurance itself. This is especially true of credit insurance, which can cause policyholders to underestimate credit risk and, in the case of mortgage insurance, real estate risk. This increases the optimism of creditors and borrowers in the upward phase of the credit cycle. As soon as the cycle turns, with property prices falling and the probability of default rising, insurers may exacerbate the downward phase by raising their premium rates or cutting the supply of credit insurance. The same applies to the sale of credit default swaps.⁸ With such products, insurers have to pay out if the issuer of the debt security that is the underlying asset of the derivative

8 Czech insurers do not currently have any credit default swaps.

CHART 3

RESULTS OF THE JOINT STRESS TESTS CONDUCTED BY SELECTED INSURERS AND THE CNB FOR SELECTED RISKS SINCE 2011
(decrease in % of total assets due to shocks to asset prices)



Source: CNB, authors' calculations

Note: The results were calculated for the same shock values over time to ensure comparability. The selection of results was therefore limited to risks for which results could be back-calculated. Assumed shocks to asset prices: equities -40%, real estate -20%, CZK/EUR +13%, corporate bonds -0.2% to -7.7% depending on rating and residual maturity. The data cover the ten insurers participating in the CNB's joint stress tests, representing 80% of the sector's assets.

defaults. In providing credit insurance, insurers are exposed to a risk that is strongly correlated with the economic cycle. Faced with increased payouts due to materialisation of credit risks, insurers may start reacting on financial markets as described in the previous paragraph, reinforcing the downward phase of the credit cycle.

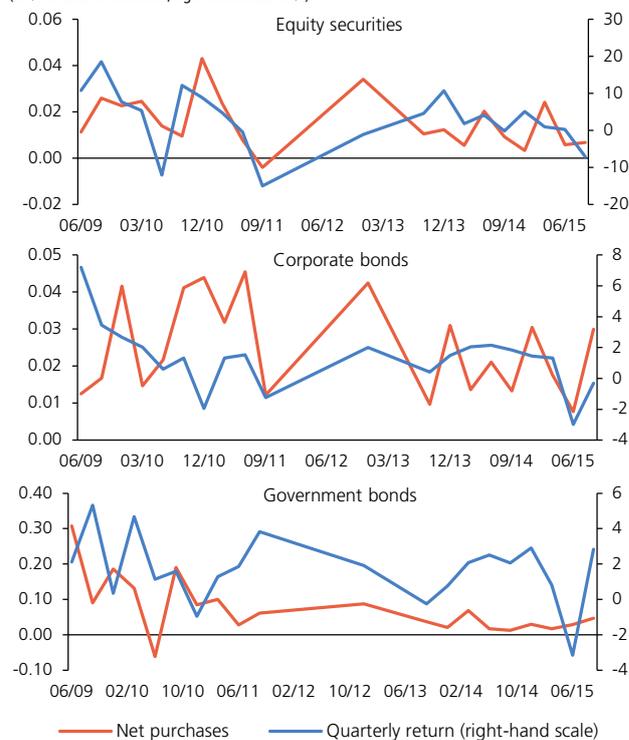
Analyses by the Bank of England (2014) and Duijm and Bisschop (2015) have found evidence of procyclical behaviour by some insurers after the dotcom bubble or after the financial crisis of 2008 and the subsequent euro area debt crisis. We can also see some procyclicality in the behaviour of the Czech insurance sector since about 2012, when market interest rates fell sharply. The sustained environment of very low or even negative yields on safe assets (see section 2.1 of this Report) is motivating insurers in the Czech Republic to gradually reallocate their portfolios in favour of equities, real estate and corporate bonds (see Chart 3).⁹

To test for procyclicality in the allocation of financial assets by domestic insurers, we looked at the relationship between

⁹ Czech insurers have also long been cutting the supply of traditional insurance products with long-term yield guarantees and focusing more on products with declared guarantees, where the insurer adjusts the guaranteed return at regular intervals, and unit-linked life insurance products. The share of unit-linked life insurance (as a percentage of investments) has risen from 14% in 2011 to around 17% at present.

CHART 4

INVESTMENTS OF CZECH INSURERS FOR SELECTED ASSET CLASSES IN RELATION TO RATES OF RETURN
(in % of total investments; right-hand scale in %)



Source: Bloomberg L.P., CNB, authors' calculations

Note: Net purchases represent the difference between purchases and sales of the given type of security at book value. Cases where bonds mature and disappear from the balance sheet are classed as sales transactions. Bonds represent debt securities and therefore include Treasury bills.

the return on investment in securities and the net value of transactions in those securities. All transactions in equity securities and corporate and government debt securities in the period from March 2009 to September 2015 were analysed.¹⁰ The resulting time series are shown in Chart 4. The correlation coefficient and the linear regression results indicate a statistically significant relationship between the equity index return and the value of transactions in equity securities (which include fund units as well as shares). However, the economic significance of this relationship is quite small, as a 10% month quarterly rise in the value of shares gives rise to an increase in net purchases of equity securities of just 0.006% of insurers' total investments on

¹⁰ In these three categories, the values of the transactions in the previous quarter were summed so that transactions resulting in an increase in the number of the security in the portfolio entered with a positive sign and transactions leading to a reduction entered with a negative sign. The resulting sum was normalised by the total period-end value of the investments. The return on each asset class was approximated by the quarterly increment in financial indices.

average. The value of those assets meanwhile rises by 0.013% of the value of total investments on average in the same period. For the other two asset categories, we observed no statistically significant relationship in the whole period under review. The results for individual insurers and for a limited time period also show a relationship for these types of assets, albeit a negative one in some cases. For example, the return on investment on bonds issued by Czech entities declined in 2009–2011 as a consequence of the European debt crisis. However, many Czech insurers (and banks) bought such assets in that period and thus showed countercyclical investment behaviour.

Insurers can also contribute to structural systemic risk, which stems primarily from their systemic importance, their interconnectedness and concentration of their business (Komárková et al., 2012). Contagion of any problems experienced by insurers depends on the strength of the specific linkages inside and outside the system and on the systemic importance and number of counterparties affected (see Chart 5). Where an insurer is a dominant service provider inside the system, its failure can cause policyholders, creditors and shareholders to incur large losses and hence pose a risk to the smooth functioning of the system with knock-on effects on the real economy. This situation is often linked with the case of a small number of insurers offering complex products falling into the area of investment banking, for which it is difficult to estimate all the associated risks and hence also the level of premiums (an example being the American insurer AIG as regards the sale of credit default swaps).

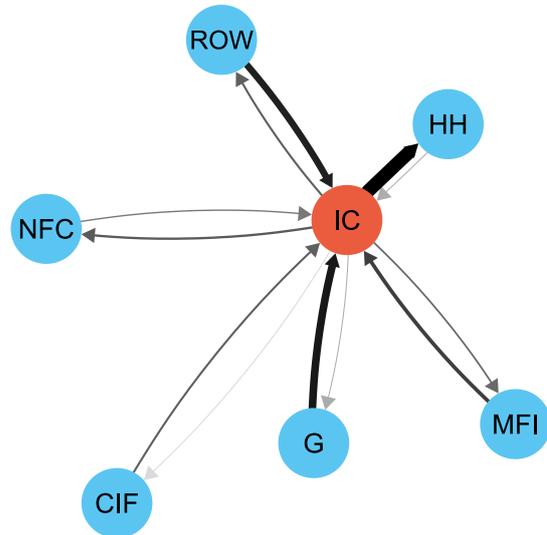
An insurer's business can become concentrated as a result of aggressive pricing gradually driving its competitors out of the market for specialised insurance products. Failure of a price-aggressive insurer can disrupt the provision of some types of commercial insurance, which, in turn, can have impacts on the real economy. Some types of insurance are vital or even mandatory, especially in the transport and construction industries. The likelihood of this scenario depends on the speed and ease with which competitors can pick up the interrupted business of the failed insurer. Complex regulatory and institutional conditions (such as a long licensing process) and/or exacting staff specialisation requirements in certain insurance segments may act as barriers. However, given the constant high demand for mandatory insurance, profitability can also play a role in attracting new players.

In Europe, higher concentration levels can generally be seen in the non-life insurance market. Concentration is highest

CHART 5

INTERCONNECTEDNESS OF INSURERS IN THE CZECH FINANCIAL SYSTEM

(decrease in % of total assets due to shocks to asset prices)



Source: CNB

Note: IC – insurance companies, HH – households, G – government, NFC – non-financial corporations, CIF – collective investment funds, MFI – monetary financial institutions, ROW – rest of the world. Arrows indicate the direction from the borrower to the creditor. The width of the arrows corresponds to the size of the exposure. Insurers' assets consist of deposits, securities, loans and reinsurance claims. Insurers' liabilities comprise insurance obligations (technical provisions). Of the insurers' claims on the rest of the world, investments account for CZK 143 billion and claims on reinsurers for CZK 37 billion. Data as of 30 September 2015.

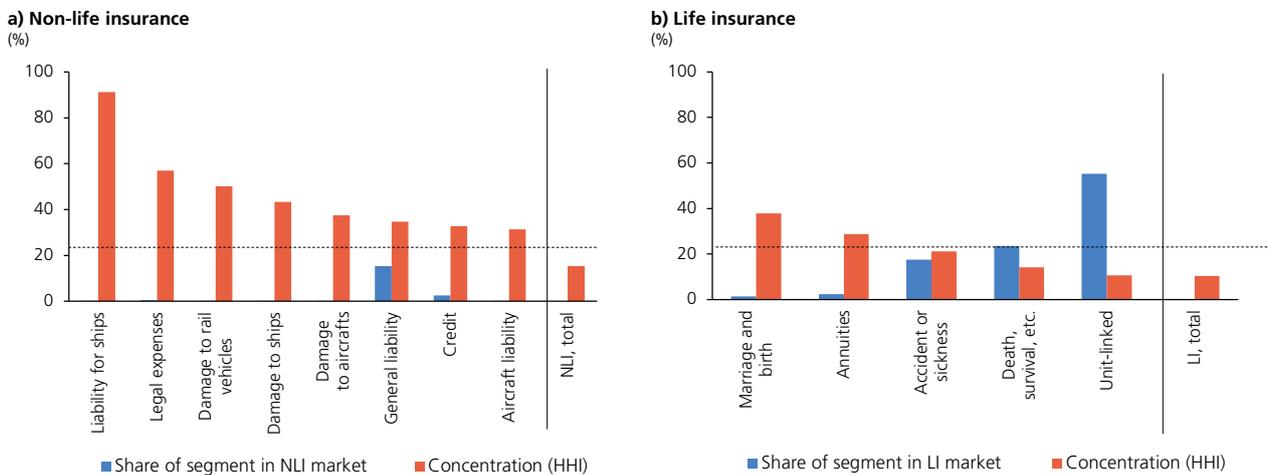
for credit products (ESRB, 2015).¹¹ The non-life insurance segment is more concentrated in the Czech Republic, too. This is apparent for several products (see Chart 6a). However, the shares of those products in the total non-life insurance market are relatively small. Among segments with higher concentration levels, general liability insurance (for example insurance against damage resulting from operating activities) and credit insurance have the largest shares. For other products, representing more than 80% of the market, elevated concentration levels were not identified. On the life insurance market, increased concentration can be seen only in the marriage and annuities segments. However, they are not systemically important either (see Chart 6b).

Insurers can theoretically also spread financial contagion indirectly through the sell-off of assets covering technical provisions. On markets where trading activity is low in relation to the size of insurers' holdings, such sell-offs can cause a sharp drop in prices. This, in turn, can further

¹¹ Credit products comprise policies offered to debtors to secure their ability to service a loan (e.g. a mortgage) and policies offered to creditors to protect loans granted (e.g. trade credits) against non-performance.

CHART 6

CONCENTRATION IN SELECTED SEGMENTS OF THE CZECH INSURANCE MARKET



Source: CNB, authors' calculations

Note: Concentration as measured by the Herfindahl–Hirschman index (HHI), expressing the sum of the squares of market shares based on gross premiums written. The selection only includes categories with the highest concentration. The dashed line indicates the 25% level symbolising excessive concentration threshold.

worsen the situation of insurers and increase the risk of them failing, but it can also induce problems in other financial institutions. The overall vulnerability of insurers to investment risks can be reduced by portfolio diversification. In times of financial crisis, however, prices of financial instruments tend to be correlated and any diversification towards riskier assets will tend to generate large losses. Large swings on financial markets can give rise to increased capital volatility via market revaluation of assets in insurers' balance sheets, and sustained massive contractions can even cause insufficient coverage of technical provisions and lead to insolvency (examples being German life insurer Mannheimer Lebens-versicherung with its high proportion of equities, and California's Executive Life with its investments in risky corporate bonds).

The European insurance sector has very strong links to the sovereign sector and other financial institutions. Insurers operating in the Czech Republic hold almost 11% of Czech government bonds in their balance sheets (MFCR, 2016, Chart 7). If they were to start selling off those bonds, they could, under certain circumstances, significantly affect the entire financial system via revaluation losses and increased funding costs, especially for the government. The impact via equity securities or the corporate bond market would be substantially smaller. However, their importance in insurers' balance sheets is growing slightly. Insurers are also interconnected directly with the banking sector through deposits. In Europe, bank deposits make up around 8% of insurers' assets. In the Czech Republic, the figure is about

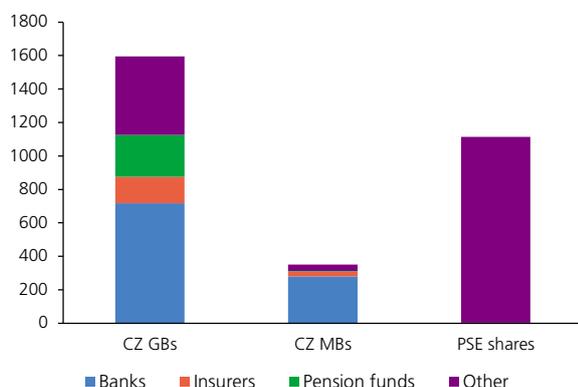
5%. The share of insurance company deposits in total bank deposits is small – only around 1% in the Czech Republic and around 3% in the euro area. These credit lines are closed very quickly at times of market stress. Banks therefore do not regard them as a stable source of financing and assign high outflow weights to them in their liquidity risk management processes (Komárková et al., 2016).

A more likely scenario than the failure of a single important insurer is the outbreak of serious collective problems in insurers with similar risk exposures. The resilience of the sector as a whole is therefore regularly assessed in stress tests. The European Insurance and Occupational Pensions Authority (EIOPA, 2014) tests the resilience of European insurers to a "double-hit" scenario. This feared scenario assumes that shocks hit both sides of insurers' balance sheet simultaneously. A typical example is a decrease in asset prices in insurers' portfolios coupled with an increase in the book value of technical provisions for life insurance due to the very low interest rates used to price them.¹² For non-life insurance companies, a decrease in asset prices is combined with repeated natural disasters. The CNB has been using similar scenarios to stress test Czech insurers since 2010

¹² The reason why sustained low rates cause liabilities to rise in value is linked with the valuation technique. The estimated value of future benefits guaranteed in policies is discounted by the current risk-free rates of return. A decrease in rates thus leads to an increase in the present value of the benefits. In other words, at lower rates of return it is more costly for the insurer to fulfil its future obligations.

CHART 7
SHARES OF THE CZECH FINANCIAL SECTOR IN HOLDINGS OF CZECH SECURITIES

(CZK billions; as of 30 September 2015)



Source: CNB, MF CR, PSE, CNB calculations

Note: Czech insurers hold 1.8 billion, banks 578 million and pension funds 346 million of the shares listed on the Prague Stock Exchange (PSE). The "other" item includes non-financial corporations and non-residents as well as other Czech financial institutions.

(Komárková and Gronychová, 2012). It assesses asset and liability management from both the microprudential and macroprudential perspectives. The tests conducted to date indicate that the sector as a whole is highly resilient to the simulated shocks (see the Financial Stability Reports from 2009 onwards).

3. FINANCIAL STABILITY AND SOLVENCY II

The EU's Solvency II directive (SII) entered into force in January 2016. SII aims to introduce a harmonised, risk-oriented regulatory framework for European insurance companies. One of the main changes in the quantitative area (i.e. in Pillar 1) is the derivation of the capital requirement from the insurer's risk profile. The previous framework (Solvency I) derived the capital requirement solely from the amount of premiums written and technical provisions, whereas the new one also takes account of risks arising from investments and the riskiness of the insurance business. This is meant to ensure that insurers facing higher investment risk hold higher capital.

A second major change is the abolition of national authority requirements regarding the composition of insurers' investment portfolios.¹³ Insurers can now invest freely

¹³ In the Czech Republic, those requirements were governed by CNB Decree 434/2009. For example, investments in listed shares were not allowed to exceed 10%, investments in real estate, listed municipal bonds and bonds issued by non-financial corporations 20%, investments in bank deposits and listed bonds issued by banks (including mortgage bonds) 50% and

subject to the "prudent person principle". In other words, they may only assume investment risk that they can manage and cover with sufficient capital.

A third significant change concerns the method for valuing assets and liabilities. Market-consistent revaluation of the insurer's entire balance sheet, i.e. including obligations arising from insurance policies, is now required for regulatory purposes.¹⁴ Market-consistent valuation enables an insurer's current position to be assessed in the event of a need to realise its assets and liabilities. However, this change may lead to higher volatility of the insurer's regulatory and available capital and amplify the procyclicality in its business, since even a temporary decline in asset prices will be fully reflected in a decrease in its solvency, which could lead to the sector reacting in the ways described in the previous section. SII therefore introduces several measures to mitigate these unintended consequences (ESRB, 2015a). Of particular note are the method for constructing the risk-free yield curve and the Long-Term Guarantee Package.

3.1 Concept of the risk-free yield curve and the Ultimate Forward Rate

The SII approach to creating technical provisions consists in calculating a best estimate of the present value of obligations arising from insurance policies and a risk margin. A single reference risk-free yield curve compiled and published monthly by EIOPA is used to discount the estimated cash flows associated with insurance obligations. The curve is derived from market prices, although during its construction emphasis was placed on maximum adjustment for the market risk premium. Given the possible non-zero premium for the risk of low market liquidity, a basket of financial instruments whose markets satisfy strict requirements for sufficient depth, liquidity and transparency was put together in cooperation with national authorities. Koruna interest rate swaps with maturities of 1–15 years were selected to instrument the reference yield curve for the Czech koruna.¹⁵ Owing to a lack of liquid instruments for most currencies (including the Czech koruna) the curve is extrapolated for the purposes of discounting cash flows at longer maturities using a single method proposed by EIOPA.

investments in government bonds 100% of the value of technical provisions.

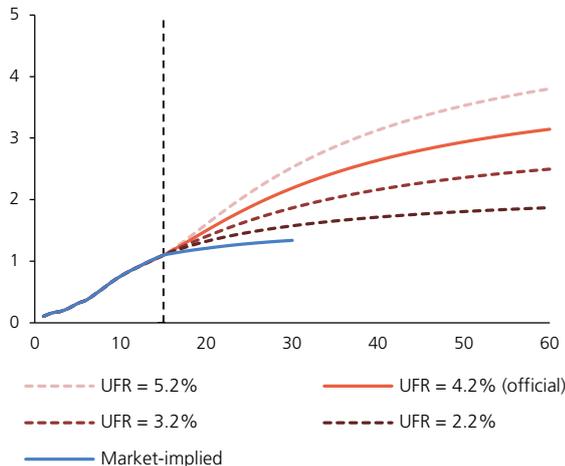
¹⁴ As of December 2015, Czech insurance companies' portfolio valued on a non-market basis (at amortised cost) stood at CZK 65 billion, which is equivalent to 30% of their total bond portfolio.

¹⁵ The CNB was involved along with other national authorities in selecting the basket of instruments from the liquidity perspective in a DLT assessment coordinated by EIOPA. 11Y, 13Y and 14Y swaps were disregarded in the resultant selection due to an absence of trades (EIOPA, 2015).

CHART 8

COMPARISON OF THE CZK REFERENCE CURVE FOR VARIOUS UFRS

(x-axis: maturity in years, y-axis: %; data as of 30 October 2015)



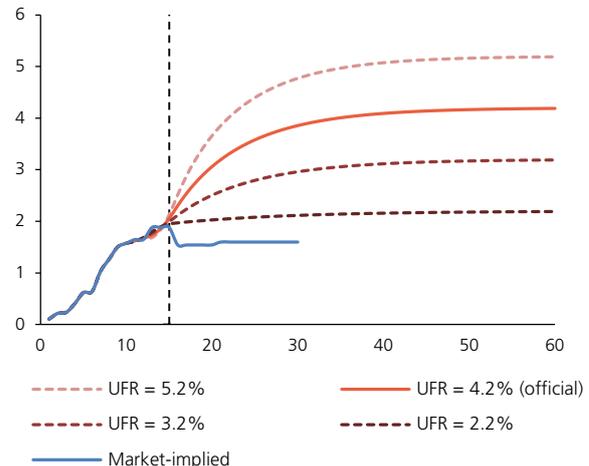
Source: EIOPA, Bloomberg L.P., CNB calculations

Note: The vertical dashed line denotes the last maturity that was taken from the market in all cases (the LLP; 15 years). The red curves are constructed according to the EIOPA methodology. The "market-implied" curve uses traded maturities up to 30 years, with constant forward rates assumed for the individual intervals between traded maturities (the Fama-Bliss method). Consistently with the reference curve, the input quotations are lowered by 10 bps (CRA) to address interbank market credit risk.

CHART 9

COMPARISON OF THE ONE-YEAR FORWARD CURVE IMPLIED BY THE CZK REFERENCE CURVE FOR VARIOUS UFRS

(x-axis: maturity in years, y-axis: %; data as of 30 October 2015)



Source: EIOPA, Bloomberg L.P., CNB calculations

Note: The vertical dashed line denotes the last maturity that was taken from the market in all cases (the LLP; 15 years). The red curves are constructed according to the EIOPA methodology. "Market-implied" represents the curve using traded maturities up to 30 years, with constant forward rates assumed for the individual intervals between traded maturities (the Fama-Bliss method). Consistently with the reference curve, the input quotations are lowered by 10 bps (CRA) to address interbank market credit risk.

The extrapolation method is based on a basic assumption of a flat forward curve from 60 years maturity onwards. At this horizon, the forward curve is fixed at the "Ultimate Forward Rate" (UFR). For the Czech koruna and most other European currencies, including the euro, the UFR is set by expert judgement at 4.2%. This figure is based on the average long-term real interest rates of selected key currencies observed over the last 50 years (2.2%) and on the expected inflation rate (the ECB's inflation target of close to 2%).

Although the UFR describes the behaviour of the reference curve in the very distant future, according to CNB estimates the entire reference curve is highly sensitive by construction to the choice of UFR level (see Charts 8, 9 and 10). At maturities of 15–60 years, the curve converges quite quickly to the UFR and the calculation even slightly affects the liquid part of the curve at maturities of up to 15 years (see Chart 9). The level of the UFR has a non-negligible impact on the value of the liabilities of insurers operating in the Czech Republic. A higher UFR increases the discount rate and hence reduces the present value of estimated future insurance obligations. In other words, if the actual rate of return on risk-free assets was lower in the future than the rate of return given by the reference yield curve, the technical provisions would be undervalued. This gives rise to a risk that the insurer will not be able to meet its

obligations, especially in an environment of sustained low returns.

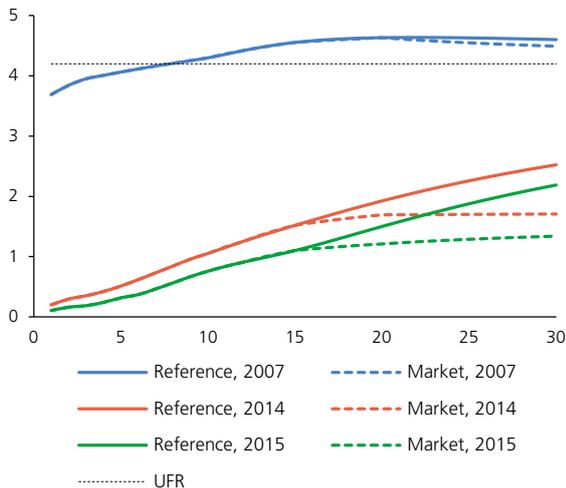
Charts 8 and 9 show the effect of the UFR level (and hence of a potential error in the set UFR parameter) and the overall koruna yield curve. Chart 11 illustrates the effect of the choice of UFR on the present value of Czech insurers' insurance obligations. It is clear that the size of this risk is not critical at the moment in the case of Czech insurers, as the value of Czech life insurers' insurance obligations with residual maturity of over 15 years is low relative to the values in other European economies (see Chart 2). However, it can be expected that this state of affairs is only temporary and the life insurance market in the Czech Republic will continue to converge gradually towards the markets of Western European economies as the length of life insurance policies increases.

Given the ongoing discussion about this methodology, EIOPA is to review the UFR level and may thus change it in the future. However, it has stated that it will leave it at the current level at least until the end of 2016.

CHART 10

COMPARISON OF THE CZK REFERENCE AND MARKET CURVES OVER TIME

(x-axis: maturity in years, y-axis: %; October of relevant year)



Source: EIOPA, Bloomberg L.P., CNB calculations

Note: UFR Denotes the spot rate to which the reference curves converge. The "reference" curves are constructed in accordance with the EIOPA methodology with an official UFR = 4.2. The "Market" curve uses traded maturities up to 30 years, with constant forward rates assumed for the individual intervals between traded maturities (the Fama-Bliss method). Consistently with the reference curve, the input quotations are lowered by 10 bps (CRA) to address inter-bank market credit risk.

3.2 Long-Term Guarantee Package

As for asset-side valuation, under Solvency I insurers were able to value debt securities held to maturity on a non-market basis, at amortised cost.¹⁶ In the case of Czech insurers, this concerned government bonds issued by the Czech Republic or by countries with an equal or higher rating. In SII, though, this option has been abolished for regulatory purposes. Instead, the European implementation of SII contains other measures to mitigate the sensitivity of insurers' balance sheets to certain market risks. These measures, referred to jointly as the Long-Term Guarantee Package, include a matching adjustment (MA) and a volatility adjustment (VA).

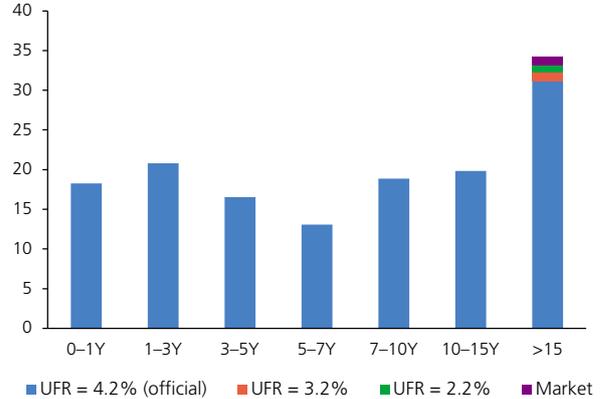
The MA protects insurers against market price volatility by allowing them to adjust the risk-free yield curve in selected parts of their balance sheets so that it better reflects the yields on assets used to cover their liabilities (life insurance technical provisions). Application of the MA is subject to

¹⁶ Valuation at amortised cost involves determining the effective interest rate at the time of the purchase which, when used for discounting, causes the purchase price to equal the present value of the cash flows (coupons and principal) generated by the instrument. The book value of the instrument then rises (or falls) at this rate. Realised outgoing cash flows will then be deducted from this value. The effective interest rate reflects market conditions at the time the instrument is purchased but not changes in market conditions over its lifespan.

CHART 11

MATURITY PROFILE OF LIFE INSURANCE OBLIGATIONS IN THE CZECH REPUBLIC AND THE EFFECT OF THE UFR

(x-axis: residual maturity in years, y-axis: CZK billions; data as of 31 December 2014)



Source: CNB

Note: Values on the y-axis represent the present value of future obligations falling into the relevant maturity basket using the various risk-free curves depicted in Chart 8. The choice of UFR has a minimal effect on the maturity basket up to 15 years, so the effect of the UFR is visible only for the maturity basket above 15 years. The data cover the ten insurers participating in the CNB's joint stress tests, representing 80% of the sector's assets. Unit-linked life insurance is excluded.

prescribed criteria on expected cash flows from the insurer's relevant assets and liabilities and must be approved by the national supervisory authority.

The VA likewise allows insurers to adjust the risk-free yield curve so that it reflects developments on markets in the financial assets used to cover technical provisions. The VA is derived from the spread between the yield of the risk-free curve used and the yield on a reference portfolio representing the overall composition of the investments made by insurers in a given Member State (EIOPA, 2015). Unlike the MA, therefore, it is common to all insurance companies in a given country with a given currency. The adjusted risk-free curve is calculated and published each month by EIOPA.

However, this method for making additional adjustments to the regulatory rules may give rise to new specific risks. In particular, the VA may, by construction, have a unilateral impact on the capital position of insurers. As the VA-adjusted reference yield curve is almost always higher than the unadjusted curve, the adjustment tends to release available capital at times of economic contraction (when risk premia are increasing and hence the spread between yields on risky and risk-free assets and thus the VA itself are also rising) without reducing available capital in a corresponding way at times of economic growth. On average, therefore, insurers will be able to hold less capital through the cycle than without this measure.

Another potential unintended consequence of the VA is distortion of insurers' investment strategies as a result of efforts to use the VA to optimise profits. As the VA is computed as the spread between the average yield on the portfolio of the entire insurance sector and the risk-free yield, individual insurers may maximise the capital relief arising from the VA when their portfolios are maximally conservative relative to the aggregate portfolio of the sector as a whole. This is because an insurer in such a situation achieves the same gain as its competitors from the difference between the true market value of its liabilities and the value obtained when applying the VA, but unlike its competitors it has its assets invested more safely and therefore has lower capital requirements. In this case, however, the VA does not really reflect the volatility in the prices of that insurer's assets and thus does not perform its original function. If multiple insurers pursue this strategy, this distortion in decision-making may theoretically lead to a significant deviation from the originally optimal allocation of financial assets. Although a conservative investment structure is generally positive from the perspective of financial stability and supervision, it would probably constitute an unintended consequence from the perspective of the regulator.

The third debatable element is the option of applying internal models for estimating the VA one year ahead. Given that internal models for determining the solvency capital requirement generally work with an assumption of a decline in the prices of financial assets, the VA will in most cases be higher one year ahead.¹⁷ And since a higher VA implies a lower value of technical provisions, the use of such models gives insurers an opportunity to systematically reduce their capital requirements by comparison with those applying the standard formula.

4. MACROPRUDENTIAL MEASURES

The introduction of the new SII regulatory framework has significantly reduced the room for national authorities to apply discretion. Under the previous approach (SI), national authorities were able to influence insurers by means of (1) investment limits, (2) obligatory provisioning to cover risks related to low interest rates, (3) a ceiling on the technical

interest rate used for valuation, (4) the choice of a valuation method that does not require revaluation based on market developments and (5) an increase in the minimum capital requirement. Some countries (the USA, Switzerland, and six EU countries) have used these tools in the last ten years (ESRB, 2015a). National authorities are now losing the option of applying them both on the microprudential level and for supporting financial stability.

The national supervisory authority is supposed to check whether the risks undertaken by an insurer are appropriately reflected in the capital requirement calculated using the standard formula. If not, the supervisory authority may order the introduction of an internal model or apply an additional capital requirement for the institution. However, SII – even in Pillar 2 – does not allow this additional capital requirement to be created to cover systemic risks.

Besides the potential lack of scope for discretionary measures from the macroprudential policy point of view, this situation was identified by the ESRB as a risk of regulatory arbitrage. For example, in financial groups containing banks and insurers there could be undesirable transfers of risky assets to the insurance sector. Macroprudential tools to help mitigate systemic risks (see section 2 of this article) and risks of regulatory arbitrage in the insurance sector are therefore being proposed in the European supervisory authorities. These include tools to raise capital above the microprudential requirements (such as the SIFI buffer and the CCyB), restriction or ring-fencing of non-traditional business activities, enhanced liquidity monitoring and the introduction of a single recovery and resolution regime. These proposals more or less copy the macroprudential tools already applied in the banking industry but are currently at an early stage of development (ESRB, 2015).

5. CONCLUSION

The insurance sector takes on the idiosyncratic risks of individual economic agents, thereby reducing overall uncertainty in the economy and contributing to economic development on the general level. Unlike some of the innovative risky activities of insurers (such as the sale of credit default swaps), the activities of insurers based on traditional insurance business models do not themselves represent a major source of systemic risk. Under certain circumstances, however, homogeneous behaviour by insurers may be procyclical, especially as regards investment allocation in periods of sustained very low or even negative interest rates. Another possible source of risk is high

¹⁷ A decrease in the price of risky financial assets implies an increase in the required returns on those assets due to growth in the risk premium. In the internal model, therefore, there is a further increase in the difference between required returns on risky assets and the risk-free return and hence also growth in the VA.

concentration in certain segments of the insurance market, as any disruption in the provision of some types of mandatory commercial insurance could have a serious impact on the real economy. Our analyses reveal that Czech insurers are not currently a significant source of systemic risk. This is mainly because of their focus on traditional insurance products, limited mismatch between the duration of their assets and insurance obligations and the relatively conservative composition of their investment portfolios. Turning to the portfolios of individual institutions, insurers are trying to make up for the generally low returns on safe assets in the current environment of low interest rates by changing their product structure and searching for higher-yield but riskier investment opportunities. A potential downturn in the prices of those assets combined with an increase in the value of liabilities (as a result of sustained low interest rates or repeated natural disasters) could have a negative impact on their finances. Resilience to such scenarios is regularly assessed in stress tests conducted by the CNB and EIOPA. The tests conducted to date indicate that the Czech insurance sector as a whole is highly resilient to the simulated shocks. These tests also serve as a tool for testing the impact of ongoing regulatory changes, in particular changes in asset and liability valuation, and their unintended consequences.

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