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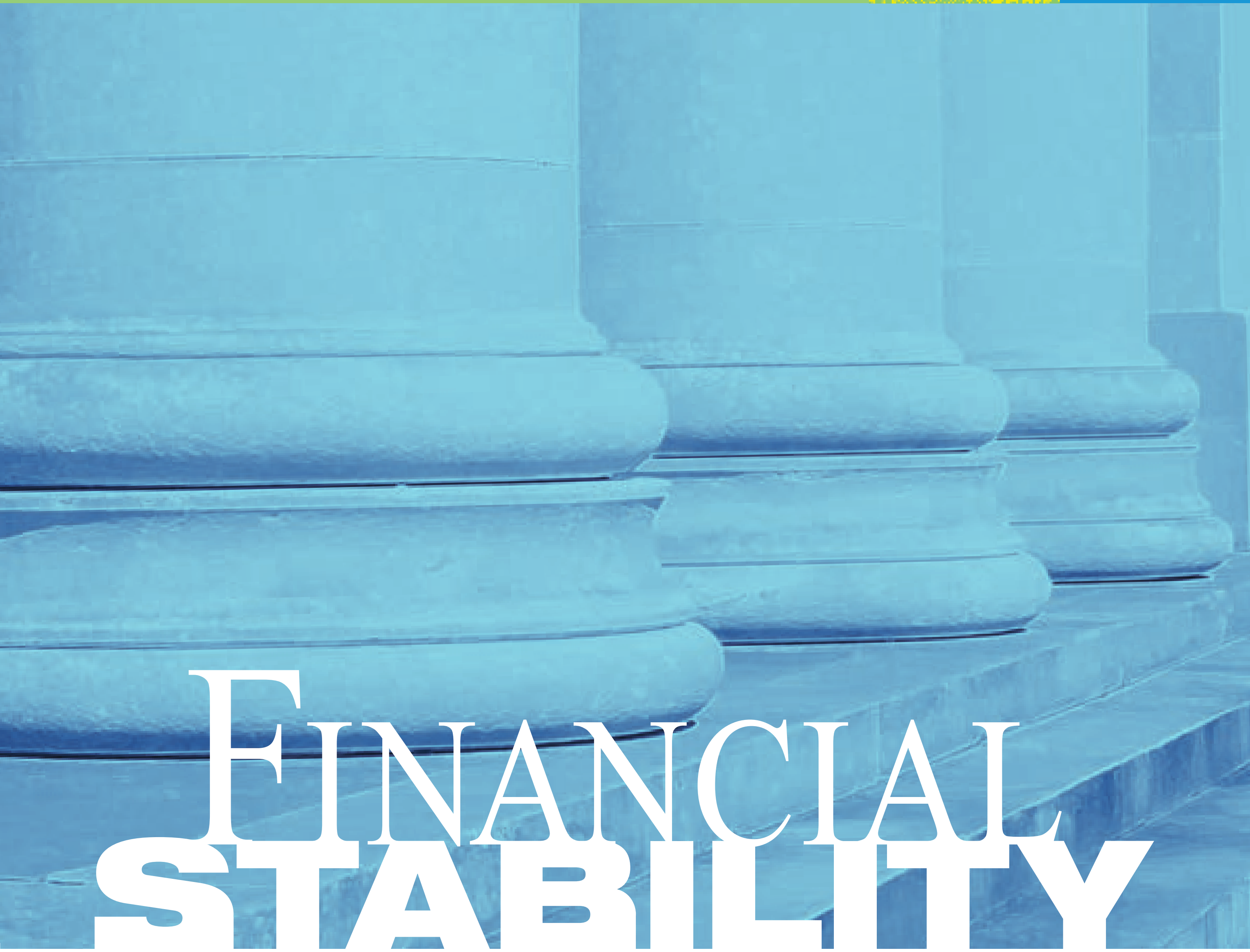

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Contents

Overall assessment of the main risks and challenges to financial stability policy 5

Macroeconomic environment 8

Box 1 Credit default swap (CDS) market 16

Government sector 19

Household sector 23

Real estate 30

Non-financial corporate sector 33

Box 2 Decomposition of changes in profitability of non-financial corporations in Croatia by means of the Jeon-Miller decomposition 38

Box 3 Comparative analysis of debt of the EU non-financial corporate sector by activity 42

Banking sector 46

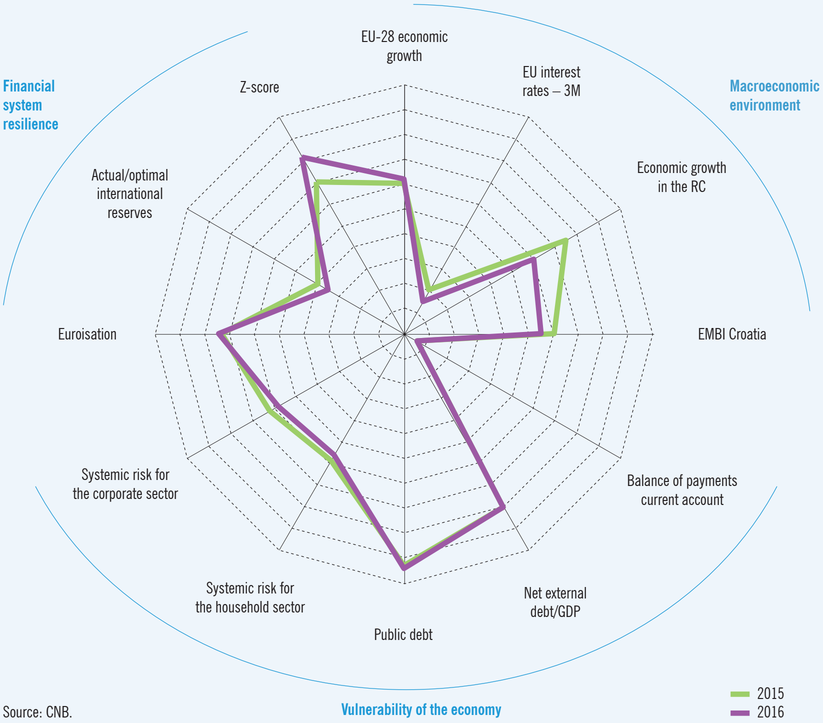
Box 4 The single passport and its impact on financial stability 54

Box 5 Introduction of the capital buffer for other systemically important credit institutions 57

Box 6 Stress testing of credit institutions 59

Overall assessment of the main risks and challenges to financial stability policy

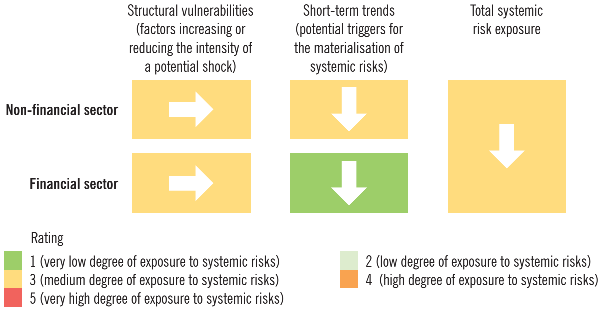
Financial stability map



Source: CNB.

The main financial stability indicators for Croatia are summarised in the financial stability map, which shows changes in key indicators of the possibility of the occurrence of risks related to the domestic and the international macroeconomic environment as well as the vulnerability of the domestic economy, in addition to changes in indicators of financial system resilience that can eliminate or reduce costs should such risks materialise. The map shows the most recent developments in or forecasts of selected indicators and their values in the reference period, i.e. the previous year. Increased distance from the centre of the map for each variable indicates a rise in risk or the vulnerability of the system, that is, of a diminution of its resilience, and accordingly a greater threat to stability. Any increase in the area of the map, then, indicates that the risks for the financial stability of the system are increasing, while a diminution of the area suggests they are decreasing.

Figure 1 Risk map


Structural vulnerabilities (factors increasing or reducing the intensity of a potential shock)
Short-term trends (potential triggers for the materialisation of systemic risks)
Total systemic risk exposure
Non-financial sector
Financial sector
Rating
1 (very low degree of exposure to systemic risks)
2 (low degree of exposure to systemic risks)
3 (medium degree of exposure to systemic risks)
4 (high degree of exposure to systemic risks)
5 (very high degree of exposure to systemic risks)

Note: The risk map summarises the level and dynamics of structural and cyclical vulnerabilities in the financial and non-financial sectors and it is based on the standardisation of indicators that reflect systemic risks in these sectors. For more detail on this topic see Box 1 Redesigning the systemic risk map, *Financial Stability,* No. 15, July 2015.
Source: CNB.

Structural vulnerabilities of the domestic economy, although still significant, have decreased mildly due to continued economic growth and the start of fiscal consolidation as well as to a small decrease in the external debt to GDP ratio and positive balance of payments performance. The stagnation and low liquidity in the residential real estate market has had an opposite effect.

Structural vulnerabilities of the financial sector have not changed significantly from the previous issue of Financial Stability, remaining heavily influenced by high levels of currency risk and currency-induced credit risk, the concentration of credit institution exposure on the government sector and groups of affiliated entities from the non-financial corporate sector and the high concentration of the banking system. The banking system has remained stable and highly capitalised, unaffected even by losses generated by the conversion of Swiss franc loans.

The short-term trends in the household vulnerability indicator most worth pointing out include decreases in debt and in interest payments, coupled with income growth, which have led to a decline in this indicator and, in turn, in the sector's overall systemic vulnerability. The vulnerability indicators of the non-financial corporate sector point to a reduction in this sector's overall risk level, primarily due to declines in liquidity risk and solvency risk stemming from good business performance continuing from 2015.

Relaxed financial conditions in domestic and international financial markets in the first half of 2016 were disrupted at the end of the observed period by strong volatility and uncertainty surrounding the admittedly unexpected results of the UK referendum on EU membership. The domestic component of financial stress remained low in the observed period as money market interest rates were kept low and stable due to a stable kuna exchange rate and high banking sector liquidity, as well as to resulting low money market interest rates, whereas the foreign component improved, mainly as a result of a decline in the country risk premium.

The trends described have also resulted in the mitigation of systemic risks at the system level. However, this could change very quickly should significant political instability occur.

The acceleration of economic activity after a six-year recession and a stronger than expected fiscal consolidation carried out in 2015 have reduced the risks to financial stability. Additionally, interest rates in financial markets have remained relatively low and financial conditions relaxed. However, financial market volatility in the first half of 2016 suggests that risks have remained due to a potential sharp and fast increase in financing costs in the international market, driven by risk aversion growth. During the mentioned period, this volatility had the greatest impact on the prices of riskier assets. Still, these price changes did not strongly affect trends in yields on Croatian bonds or the country risk premium, both of which narrowed in the observed period.

As anticipated, the risks that may threaten financial system stability have been mitigated by an accelerated economic growth from 1.6% in 2015 to an expected rate of 2.3% for 2016, spurred by rising personal consumption, coupled with the continuation of exports and current account surplus growth as well as with anticipated further fiscal adjustment. On the other hand, structural vulnerabilities, such as relatively high public and external debts, have continued to pose a serious threat to financial stability that could increase in the event of a rise in risk aversion or of interest rates in the international market.

As neither the European Central Bank nor the Fed has decided to raise benchmark interest rates or announced any intention to do so, risks related to a sharp increase in these rates in 2016 are currently very low. European financial markets have continued to experience abundant liquidity and low interest rates, while corporate financing costs are expected to decline to a greater extent under the expanded QE programme. Expected euro area growth rates have remained low, standing slightly below those at the end of the previous year. Despite the solid growth of the US economy, the Fed postponed raising interest rates in June in the face of concerns over a decline in new employment, relatively low corporate investments and low inflation.

In Croatia, the several-year household-sector deleveraging process has continued, accelerated due to the conversion of Swiss franc loans causing reductions in the loan principal. This sector's aggregate vulnerability has decreased not only because of the decline in debt but also because of increases in deposits and other liquid assets, as well as due to growth in disposable income. Although the debt stagnated at the beginning of the year, the deleveraging trend is expected to stop only when consumer optimism has increased permanently amid employment growth and steady economic recovery.

The vulnerability of the non-financial corporate sector has declined, primarily due to good business performance in 2015. The aggregate profits of enterprises were used to strengthen capitalisation and partly also to reduce some enterprises' indebtedness. Corporate lending, having held steady in the previous year, grew mildly early in this year, and banks recorded an increase in demand for investment loans.

The recovery of capitalisation (following a temporary decrease caused by the conversion of Swiss franc loans) and a rise in the coverage and sale of non-performing loans have positively affected the stability of the banking sector. In addition, the risks arising from cross-border financing have been increasingly reduced as a result of banks' gradual deleveraging against their parent banks and a growth in domestic financing sources in their balance sheets. However, despite the high banking system liquidity, liquidity risks have been growing due to an increase in the share of sight deposits induced by the interest rate fall. Another risk to the banking sector lies in the growth of exposure to the government, generated, among other things, by the deleveraging of the household sector and non-financial corporations.

Macroeconomic environment

As the global economic slowdown in the first half of 2016 was sharper than had been expected at the end of 2015 and financial markets were more volatile, the risks of the possible tightening of financial conditions have increased, while the risks to the country's financial stability have been mitigated by Croatia's continued economic recovery and consolidation of public finances.

Table 1 Economic growth, exports and industrial production in selected developed and emerging market countries

	Annual GDP growth rate			Quarterly GDP growth rate, $\Delta Q_t/Q_{t-1}$		Annual rate of change in exports		Annual rate of change in industrial production (seasonally adjusted)	
	2014	2015	2016[a]	Q3/2015	Q4/2015	Q3/2015	Q4/2015	Q4/2015	Q1/2016
USA	2.4	2.4	2.3	1.4	0.5	–8.1	–10.4	–1.6	–1.7
EU	1.4	2.0	1.8	0.4	0.4	–3.5	2.3	0.0	0.3
Germany	1.6	1.7	1.6	0.3	0.3	0.2	–0.6	–0.2	–0.4
Italy	–0.3	0.8	1.1	0.2	0.1	–6.5	6.0	0.3	0.2
Slovenia	3	2.9	1.7	0.4	0.6	–2.2	3.1	–0.1	–0.6
Slovak R.	2.5	3.6	3.2	n.a.	n.a.	–3.7	9.5	2.1	1.6
Czech R.	2	4.2	2.1	0.7	0.0	–3.5	5.6	–0.2	–0.4
Poland	3.3	3.6	3.7	1.0	1.5	–2.1	7.2	0.0	1.8
Hungary	3.7	2.9	2.5	0.6	1.0	–0.9	2.0	–0.6	1.4
Estonia	2.9	1.1	1.9	0.1	0.9	–2.9	2.4	–1.1	0.0
Latvia	2.4	2.7	2.8	0.9	–0.3	4.1	4.8	0.1	–2.1
Lithuania	3	1.6	2.8	0.5	0.5	–0.1	3.9	–4.4	1.1
Bulgaria	1.5	3.0	2.0	0.7	0.7	–0.3	n.a.	–0.6	1.0
Romania	3	3.8	4.2	1.5	1.1	2.2	–2.9	0.9	1.2
Croatia[b]	–0.4	1.6	2.3	1.4	–0.5	3.0	4.3	0.4	2.1

[a] Forecast. [b] The seasonal adjustment methodology of Croatia's GDP has been presented in the manuscript titled Description of the X-12 seasonal adjustment methodology, which is available at request.

Sources: Eurostat, CBS, Bloomberg, OECD, Bureau of Economic Analysis (quarterly data for the US) and CNB (for Croatia).

Table 2 Fiscal balance and current account balance in selected developed and emerging market countries

	Fiscal balance, as % of GDP (ESA 2010)			Current account balance, as % of GDP		
	2014	2015	2016[a]	2014	2015	2016[a]
USA	–4.9	–4.0	–4.4	–2.3	–3.3	–2.8
EU	–3.0	–2.4	–2.1	1.6	2.0	2.2
Germany	0.3	0.7	0.2	7.8	8.8	8.5
Italy	–3.0	–2.6	–2.4	1.8	2.2	2.4
Portugal	–7.2	–4.4	–2.7	0.0	–0.1	0.3
Ireland	–3.8	–2.3	–1.1	3.6	4.4	4.6
Greece	–3.6	–7.2	–3.1	–3.0	–0.2	0.6
Spain	–5.9	–5.1	–3.9	1.0	1.4	1.5
Slovenia	–5.0	–2.9	–2.4	6.5	7.0	7.0
Slovak R.	–2.7	–3.0	–2.4	0.8	0.8	–0.6
Czech R.	–1.9	–0.4	–0.7	–2.0	–2.0	–1.5
Poland	–3.3	–2.6	–2.6	–1.3	0.1	–0.3
Hungary	–2.3	–2.0	–2.0	2.2	4.9	5.0
Estonia	0.8	0.4	–0.1	1.1	2.0	0.9
Latvia	–1.6	–1.3	–1.0	–2.0	–1.2	–2.6
Lithuania	–0.7	–0.2	–1.1	3.9	–1.5	0.0
Bulgaria	–5.4	–2.1	–2.0	2.8	1.9	2.3
Romania	–0.9	–0.7	–2.8	3.0	3.8	4.2
Croatia	–5.5	–3.2	–2.3	2.1	5.1	2.7

[a] Forecast.
Sources: European Commission, *European Economic Forecast*, fall 2015 and CNB (for Croatia).

Global growth projections for 2016 were revised downwards in the first half of the year due to weakened global demand and recessions in some large emerging market countries. The recovery in the EU has continued in 2016 on the back of domestic demand, relaxed financing conditions, lower energy product and commodity prices and favourable effects of a depreciated euro exchange rate. Expected growth rates for developed EU countries for 2016 have headed slightly down and remained relatively low, while real GDP growth rates for Central and Eastern European countries are expected to average about 2.5% in 2016 (Table 1). Both macroeconomic and financial developments will partly depend on the fallout of the UK referendum on EU membership, which could additionally slow down economic recovery in EU member states.

Despite highly expansionary monetary policies pursued by leading central banks, financial market developments were in general more volatile in the first half of 2016 than in 2015 and especially in late June, after the UK 's referendum vote to leave the EU. However, rising uncertainties notwithstanding, financial conditions are unlikely to deteriorate significantly, thanks to leading central banks' commitment to preserving their stability.

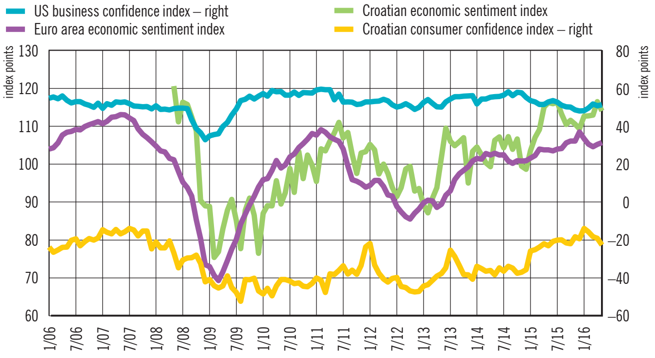
Table 3 Public and external debt in selected European emerging market countries
as % of GDP

	Public debt			External debt		
	2014	2015	2016[a]	2013	2014	2015
Italy	132.5	132.7	132.7	119.0	125.1	126.9
Portugal	130.2	129.0	126.0	228.0	235.3	222.3
Ireland	107.5	93.8	89.1	938.1	852.8	811.9
Greece	180.1	176.9	182.8	229.1	238.7	250.6
Spain	99.3	99.2	100.3	155.0	166.4	167.4
Slovenia	81.0	83.2	80.2	111.5	124.0	115.8
Slovak R.	53.9	52.9	53.4	81.3	89.6	85.8
Czech R.	42.7	41.1	41.3	63.5	68.6	70.5
Poland	50.5	51.3	52.0	70.1	71.0	70.3
Hungary	76.2	75.3	74.3	146.3	145.3	135.0
Estonia	10.4	9.7	9.6	93.7	94.6	93.3
Latvia	40.8	36.4	39.8	131.4	142.1	137.3
Lithuania	40.7	42.7	41.1	69.9	70.5	75.1
Bulgaria	27	26.7	28.1	91.8	93.6	78.7
Romania	39.8	38.4	38.7	68.1	63.0	56.0
Croatia	85.1	86.7	87.4	105.6	108.4	103.7

[a] Forecast.
Sources: European Commission, *European Economic Forecast*, fall 2015, World Bank, *Quarterly External Debt Statistics* and CNB (for Croatia).

The ECB eased monetary policy further in the first half of 2016 through implementing new measures to spur economic growth and increase the annual inflation rate for it to stand "below, but close to 2%". The ECB's key interest rate on the main refinancing operations fell by 5 b.p. in March and remained at 0%, the deposit facility rate was cut to –0.40% and the rate on the marginal lending facility to 0.25%, with all these rates standing at their lowest levels to date. In addition, monthly

Figure 2 Continuation of relatively high economic sentiment for Croatia and a slight decrease in consumer confidence in the first half of 2016



Sources: Bloomberg, EC and CNB.

bond purchases were increased from EUR 60bn to EUR 80bn, with such purchases intended to be run until the end of the first quarter of 2017, that is until a sustained adjustment in the path of euro area inflation has been achieved, while the issue share limits for bonds issued by international organisations and multilateral development banks were raised from 33% to 50% (Figure 3c). Bonds eligible for purchase now include investment-grade bonds issued by non-bank corporations established in the euro area, which should further reduce corporate financing costs. Under four new four-year refinancing operations, to be launched starting from June 2016, banks will be allowed to borrow an amount equivalent to up to 30% of their eligible loans at the repo rate.

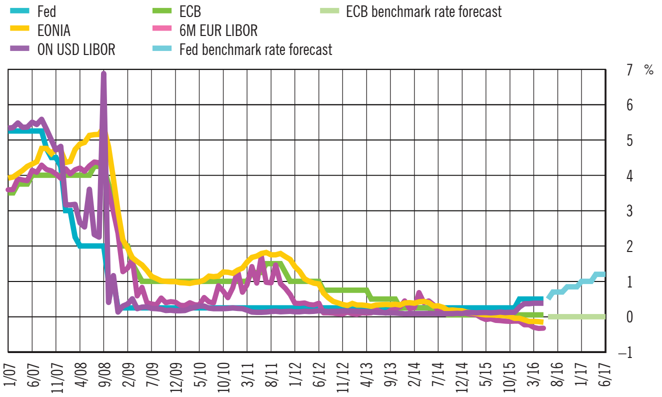
The easing of the ECB's monetary policy has boosted expectations that euro area interest rates will remain low in the forthcoming period. Recent ECB surveys on bank lending conditions and corporate access to finance show that ECB measures have further improved financing conditions and resulted in increases in corporate demand for loans and lending activity. Government bond yields have remained low, for some countries even negative, and EU countries' yield spreads have also narrowed (Figures 4, 5 and 6). However, low interest rates and the ECB's expansionary monetary policy, coupled with banks' non-performing loan burden, have also increased risks of low profitability of banks and insurance companies and somewhat negatively impacted the financial intermediation process.

The Fed has been raising its benchmark interest rate at slower pace than expected since the end of 2015, thus lowering the risks associated with divergent monetary policies pursued by leading central banks that could influence international capital flows and negatively affect some emerging markets (Figures 3a and 3b). The Fed's benchmark interest rate started to be increased gradually late in the previous year on the back of favourable US economic indicators, but was kept on hold in the first half of 2016 owing to diminished US growth expectations, the adverse effect of the strong US dollar on US exports, which, together with decreased import prices, additionally reduced the already low inflation rate, as well as to growing uncertainties surrounding global economic growth (Table 1, Figures 3a and 3b).

The weakened link between the prices of some asset types and macroeconomic indicators or business performance indicators has increased systemic vulnerabilities that could materialise should risk aversion surge and thus primarily affect securities of riskier issuers (Figure 8b). High global liquidity and low key benchmark interest rates have spurred the growth of financial asset prices in many developed countries. This has resulted in a fall in bond yields and increases in equity indices and price to earnings ratios (Figures 4, 5, 6, 7 and 8a), and there are also concerns over overoptimistic risk assessment in some market segments.

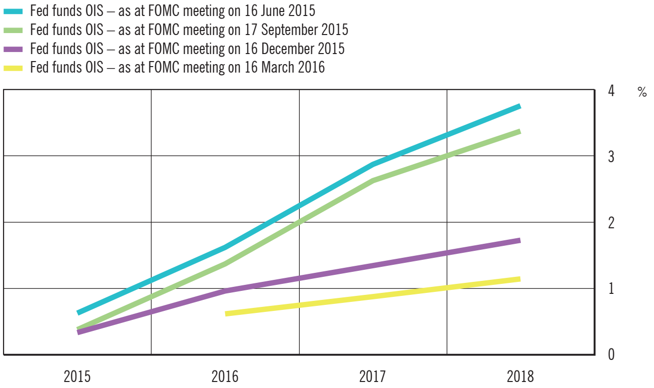
Potential threats to financial market stability and positive real trends are geopolitical developments as well as low commodity prices, affecting especially large exporters such as

Figure 3a Benchmark euro interest rates at historic lows



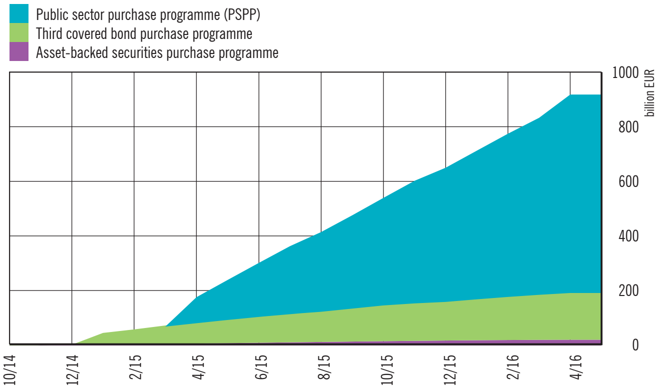
Sources: Fed, ECB and Bloomberg.

Figure 3b Fed's slower than expected pace of benchmark interest rate increases



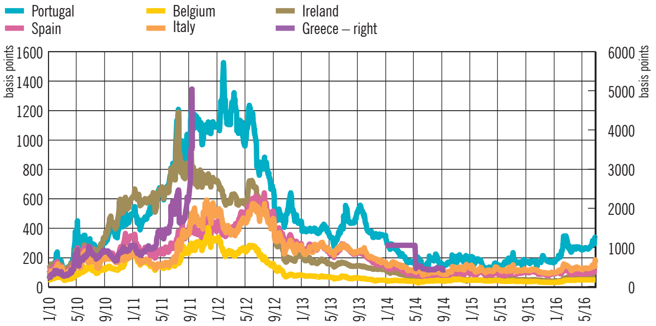
Source: Bloomberg.

Figure 3c ECB's bond purchase programmes have further eased financial conditions in the euro area



Source: Bloomberg.

Figure 4 Increase in perceived risk of vulnerable euro area member states

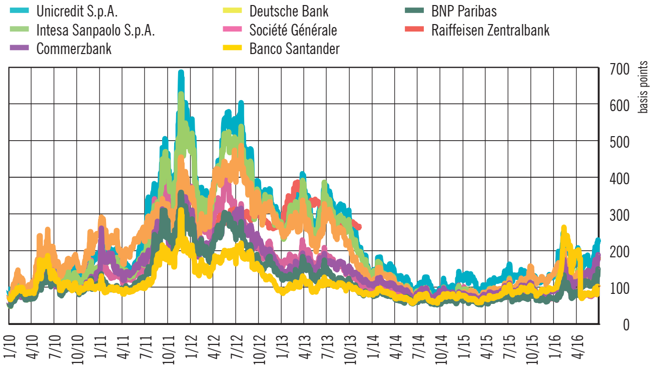


Note: The figure shows CDS spreads for 5-year bonds.

[a] A credit default swap (CDS) spread is an annual premium that a CDS buyer pays for protection against the credit risk associated with an issuer of an instrument.

Source: Bloomberg.

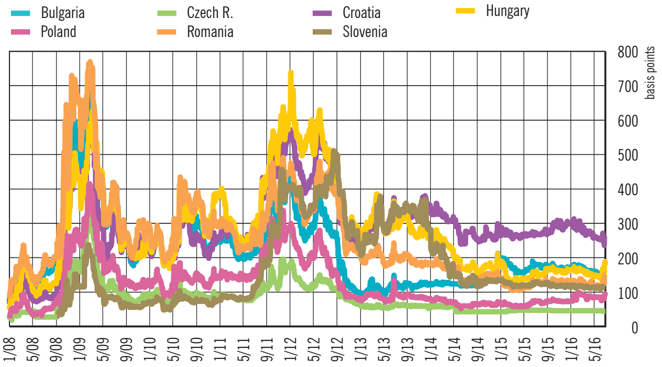
Figure 5 Perceived risk for large European banks is higher than in previous years



Note: The figure shows CDS spreads for 5-year bonds.

Source: Bloomberg.

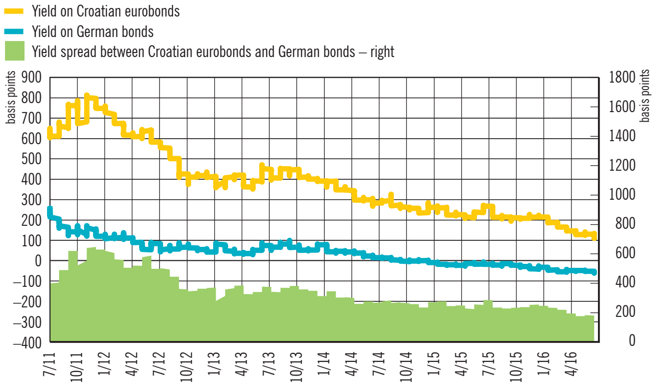
Figure 6 Perceived risk for Croatia, although still high, has declined compared with that for peer countries



Note: The figure shows CDS spreads for 5-year bonds.

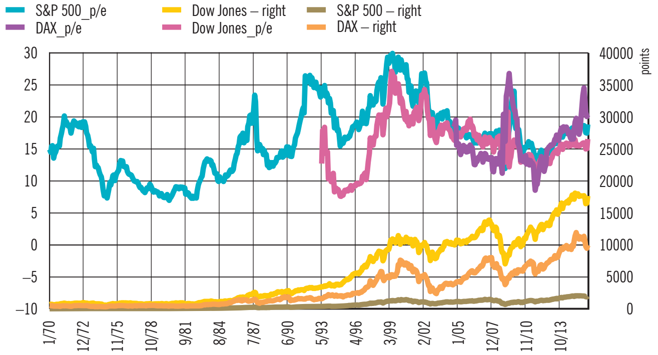
Source: Bloomberg.

Figure 7 Narrowed spread between yields on Croatian and benchmark German bonds maturing in 2018



Source: Bloomberg.

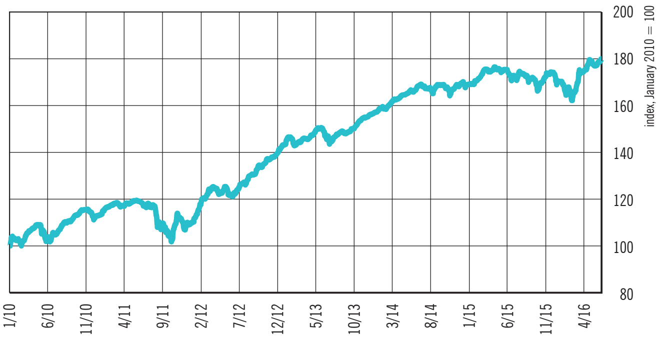
Figure 8a Relatively optimistic equity valuation points to potential risks



Note: P/E measures the share price relative to per-share earnings.

Source: Bloomberg.

Figure 8b Volatility of return on high-risk corporate bond issues increased in the first quarter



Source: Bloomberg.

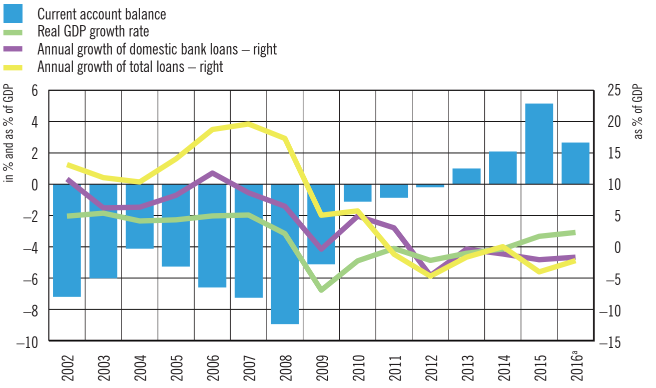
Brazil and Russia, a drop in demand from China and related uncertainties about the adjustment of the Chinese economy to slower growth rates, in addition to concerns over a possible US economic slowdown. Under such conditions, an increase in risk premiums could be triggered by disturbances in the Middle East and possible terrorist attacks, while the refugee crisis is much less likely to escalate after the agreement between the EU and Turkey. Financial market instability could also be caused by uncertainties connected with the unexpected results of the UK referendum on EU membership, while risks related to Greece could mount if additional fiscal consolidation proved necessary.

The materialisation of these risks and a potential surge in investor risk aversion would primarily affect countries with high financing needs such as Croatia.

Despite Croatia's continued economic recovery in 2016, debt to GDP ratios are likely to remain high for some time. The real GDP growth rate, standing at 1.6% in 2015, the year when Croatia came out of a long recession, could be about 2.3% in 2016. Positive contributions to economic activity are expected from foreign demand, stimulated by economic recovery in Croatia's main trading partners, the increasing competitiveness of the domestic economy and a positive tourism performance, as well as from personal consumption increasing more rapidly due to real disposable income growth, rising private and public investments and an improved use of EU funds (Figures 10a, 10c and 24).

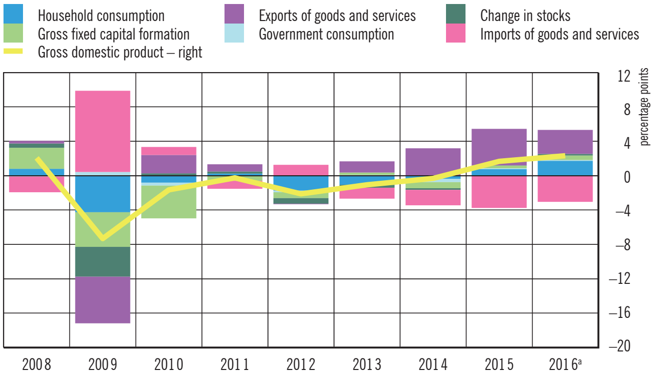
As anticipated, Croatia's external debt has inched down in absolute terms, but its share in GDP has remained very high, making the country highly vulnerable to possible changes in financing conditions. Standing at approximately 103.7% GDP at the end of 2015, external debt could drop to about 96.9% of GDP at the end of 2016 as a result of the expected nominal GDP growth and continued deleveraging of credit institutions

Figure 9 Economic recovery is not accompanied by a lending recovery



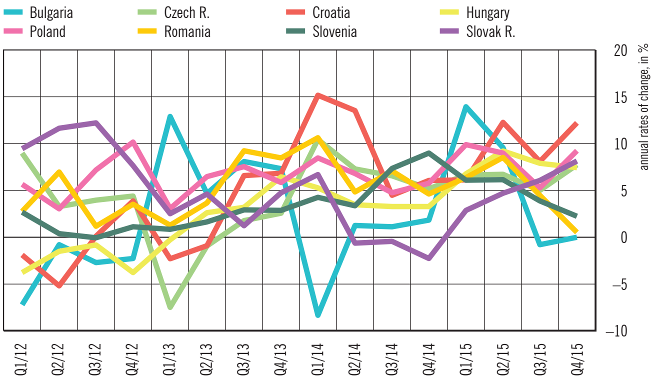
[a] Forecast.
Sources: CBS and CNB.

Figure 10a Largest contributions to growth in 2016 are expected to come from household consumption and exports



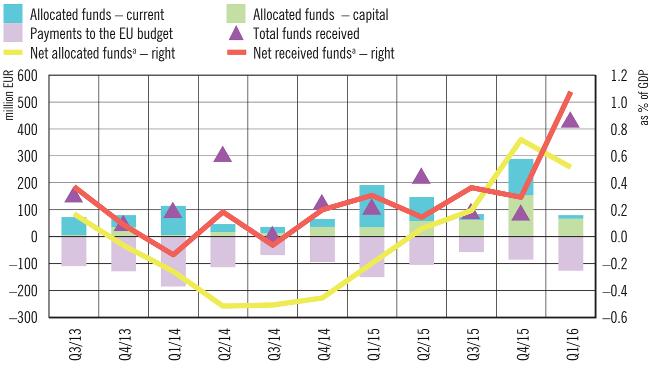
[a] Forecast.
Source: CBS.

Figure 10b Croatia's export growth rates the highest among Central and Eastern European countries



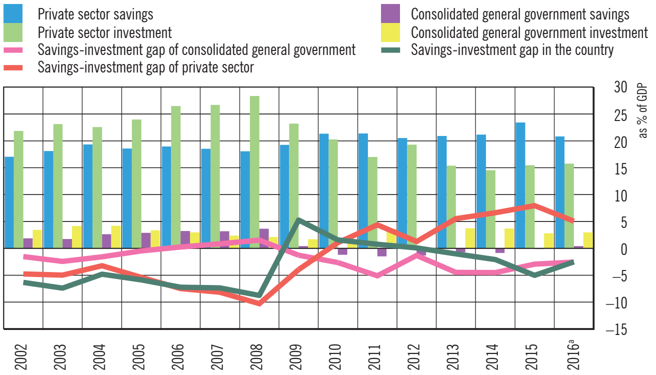
Sources: Eurostat and CNB calculations.

Figure 10c Withdrawal of EU funds intensified in late 2015



[a] Average for the last four available quarters.
Sources: IMF and CNB.

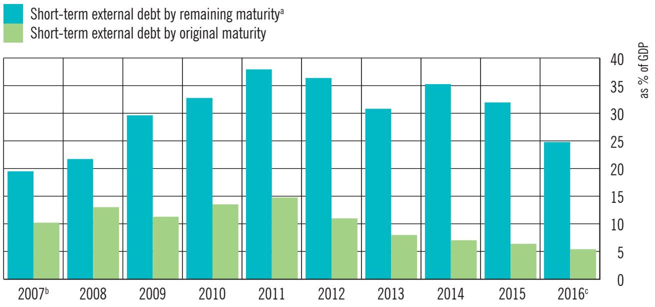
Figure 11 Private sector savings are expected to decline slightly in 2016



[a] Forecast.

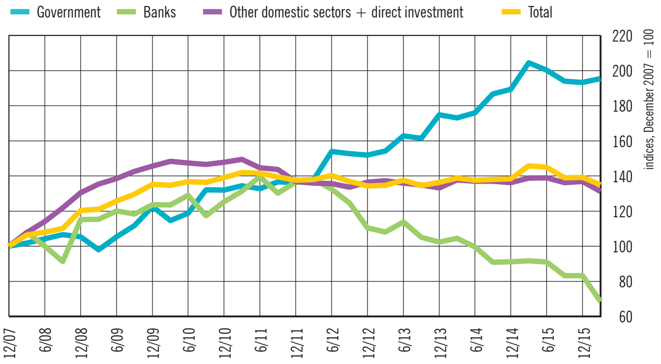
Sources: MoF and CNB (estimate).

Figure 14 External debt falling due in 2016 lower than in the previous years



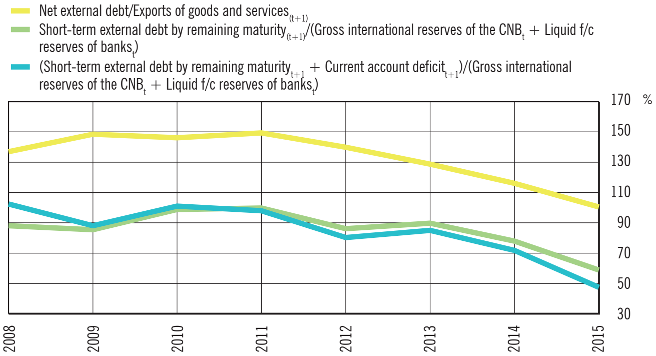
[a] Short-term external debt by remaining maturity is the amount of debt maturing in the reference year, representing the sum of the balance of short-term debt at the end of the previous year and long-term debt maturing in the reference year. [b] Since end-2007 external debt has been calculated according to the new methodology. [c] Forecast.
Note: From 2008 on, short-term debt by remaining maturity includes round-tripping transactions which represent an accounting item that has a neutral effect.
Source: CNB.

Figure 12 Continued rise in government external debt and further deleveraging by other sectors, primarily the banking sector



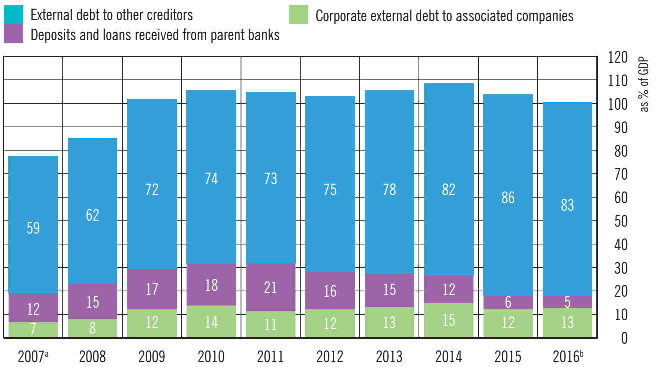
Source: CNB.

Figure 15 Continued improvement in selected external vulnerability indicators



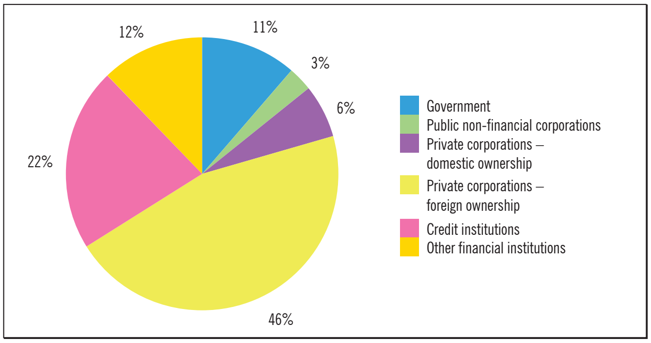
Note: Net external debt is calculated as gross external debt net of foreign debt claims.
Source: CNB.

Figure 13 Vulnerabilities connected with the high external debt level declining due to the creditor structure



[a] Since end-2007, external debt has been calculated according to the new methodology. [b] Forecast.
Source: CNB.

Figure 16 Private non-financial corporations in foreign ownership account for the largest share in external debt principal payments by sectors in the remaining part of 2016



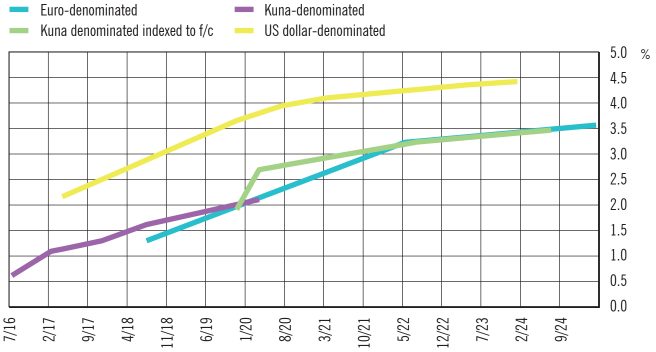
Note: According to data by the end of February 2016.
Source: CNB.

(Figure 12). Due to lower needs for the refinancing of debt falling due and the expected current account surplus in 2016, external vulnerability indicators have continued to improve (Figure 15). The risks related to external debt refinancing have also been mitigated by the creditor structure, that is, a high share in total debt accounted for by domestic banks' parent banks and associated companies (Figure 13), while a model estimate of the current international reserve level shows that it is sufficient to cushion any potential shock and preserve the stability of the kuna/euro exchange rate, which is a key precondition for the maintenance of total financial stability (Figures 18 and 22).

With stronger than expected fiscal consolidation in 2015, the risks to the domestic economy generated by fiscal policy have decreased to some extent. However, the risks associated with the high level of public debt, which could reach 87% of GDP in 2016, have remained high (Tables 2 and 3). Croatia's risk premium has remained considerably higher in 2016 than risk premiums for Central and Eastern European peer countries. It should be noted, however, that due to its narrowing in the first part of the year, the spread between CDS on five-year bonds for Croatia and comparable average CDS for CEE countries has decreased from 182 b.p. at the end of 2015 to 150 b.p. at the end of June 2016 (Figure 5). Developments in this spread and sovereign credit ratings assigned by leading rating agencies could in the forthcoming period depend not only on macroeconomic and financial indicators, but also on political stability in the country.

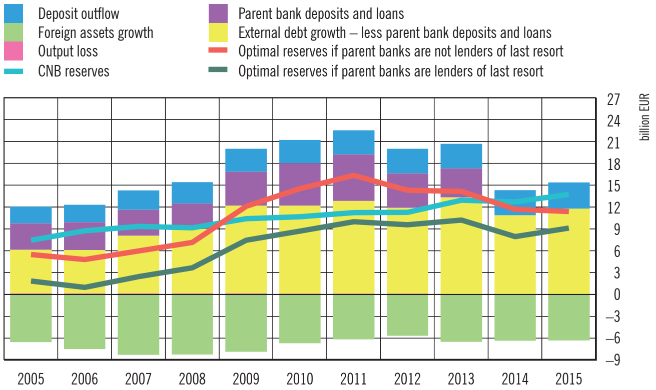
The main risks to the domestic economy are related to a potential decline in foreign demand caused by growth deceleration in Croatia's main trading partners, a relatively sluggish economic recovery as well as to the possible worsening of financial conditions in global markets and risk premium growth that could drive up financing costs for domestic sectors.

Figure 17 Croatian US dollar-denominated bond yields exceed euro-denominated bond yields



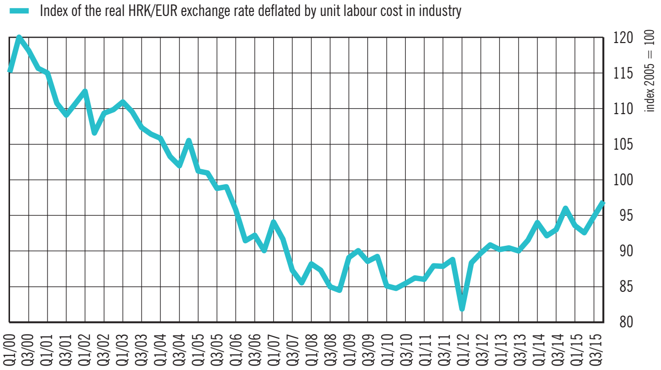
Note: Yield curves are the result of the interpolation of the data on bond yields by the currency of issue.
Source: Bloomberg.

Figure 18 International reserves exceed the model-estimated optimal reserve level



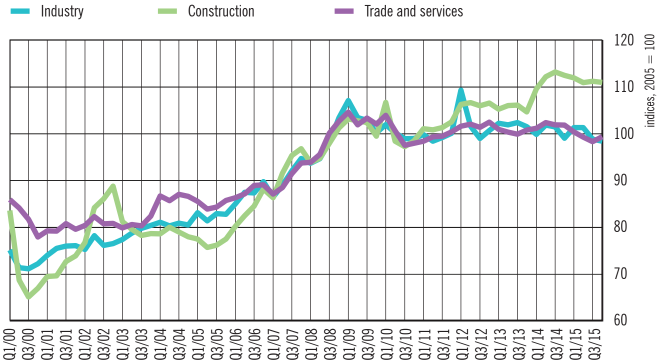
Source: CNB.

Figure 19 Continued slight depreciation of the real exchange rate of the kuna versus the euro



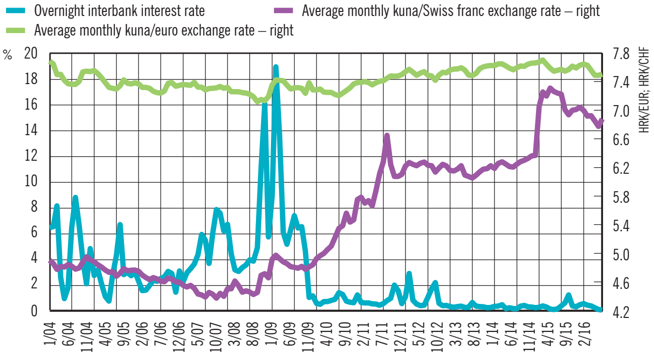
Note: A fall in the index indicates a real appreciation of the kuna against the euro.
Sources: CBS, CNB and CNB calculations.

Figure 20 Unit labour costs dipped in late 2015



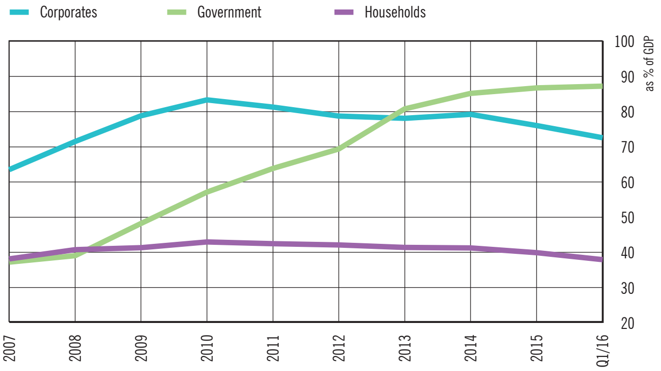
Sources: CBS and CNB calculations.

Figure 22 Appreciation of the kuna/euro exchange rate and continuation of very low overnight interest rates due to high banking sector liquidity



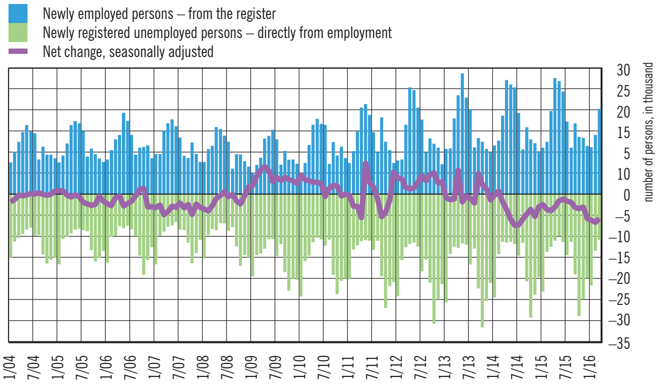
Source: CNB.

Figure 21 Slowdown in the growth of total government debt and continued corporate and household deleveraging



Source: CNB, financial accounts.

Figure 23 Changes in employment registered with the Croatian Employment Service (CES)



Sources: CES and CNB calculations.

Box 1 Credit default swap (CDS) market

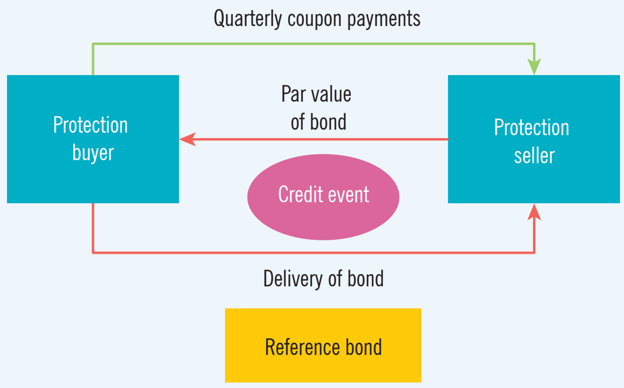
The CDS market complements other financial markets by providing market participants with an efficient instrument for managing credit risk and transferring it from their balance sheets. However, a high interdependence between CDS buyers and sellers, a high concentration of these instruments' exposures and relatively high asymmetric payments in the case of a credit event (default) exacerbated the global financial crisis of 2008. The CDS spread complements the risk premium calculated on the basis of the yield to maturity spread as a more precise measure of credit risk. However, the unhedged short position creating profit for the buyer when the value of a sovereign or corporate bond falls was at the peak of the financial crisis often considered a cause of unrealistically expensive sovereign borrowing and generator of instability.[1] Some of the mentioned risks have been reduced by regulatory changes in the US and EU. Still, not all the risks dissipated with the implementation of the new regulatory framework and some new dangers have arisen. The CDS market should be analysed because of its significance for countries with relatively high external and public debt, such as Croatia.

A detailed analysis of the CDS market is necessary from the point of view of financial stability as CDS price trends influence the price of reference entities' borrowing in international markets. A sharp increase in credit risk of a reference entity, a country or a systemically important financial institution, can result in the growth of systemic risk and might pose a threat to financial system stability.

Characteristics of CDS instruments

A CDS is a financial derivative that enables the buyer to transfer the credit risk of the reference entity to the seller. In practice, CDS are traded in over the counter (OTC) markets in such a way that the buyer and the seller of the instrument conclude a private bilateral contract under which the seller agrees to pay the buyer an agreed notional amount in the case of a credit event and the buyer agrees to make periodic coupon payments on the premium. The amount of the premium paid by the buyer to the seller as compensation for the assumed risk is shown as a percentage of the agreed notional amount and primarily depends on the probability of a credit event occurring and the possibility of collection in case it occurs[2]. CDS contracts are concluded for a fixed period, mostly from one to five years.

Figure 1 Structural presentation of CDS instrument



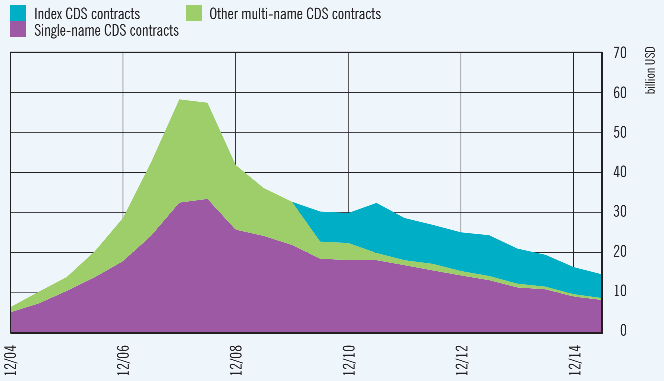
Source: CNB.

CDS market

CDS instruments first appeared in financial markets in the early nineties. Once large global banks had realised that these instruments enabled them to make a relatively fast transfer of credit risk from their balance sheets, thus reducing their regulatory capital requirements, the CDS market spread globally in a fairly short period and expanded rapidly until the outbreak of the 2008 financial crisis. The notional value of the CDS market was slightly below USD 60 trillion at the time, with single-name CDS contracts accounting for a bit more than 50% of the market (Figure 2). After having decreased sharply in 2008, when some contracts were liquidated due to the occurrence of credit events, the notional value of active CDS contracts has continued to drop steadily, which can partly be attributed to technical improvements in the standardised CDS settlement process.

A major characteristic of the CDS market is its high level of concentration, which cannot be precisely quantified due to lack of data, but there are many estimates. According to an estimate by David Mengle, a group of large dealers, known as the G14, intermediated in approximately 90% CDS transactions in 2010.[3] The reasons for this include the structure of CDS instruments, a highly asymmetrical structure of payments made in the case of a credit event and the fact that by concluding

Figure 2 Notional value of CDS contracts, by type of instrument



Source: BIS.

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[1] For more details see *Global Financial Stability Report*, IMF, April 2013, available at: https://www.imf.org/External/Pubs/FT/GFSR/2013/01/pdf/c2.pdf

[2] The annual premium payable by the CDS buyer is estimated as follows: $CDS\ spread = PD \cdot (1-RR) \cdot NV$, where PD is the probability of default, RR the expected rate of return in the case of default and NV the agreed notional value.

[3] Mengle, D. (2010): *Concentration of OTC Derivatives among Major Dealers*, Working Paper, International Swaps and Derivatives Association. The G14 dealers comprise Bank of America-Merrill Lynch, Barclays Capital, BNP Paribas, Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JPMorgan, Morgan Stanley, Nomura, Royal Bank of Scotland, Société Générale, UBS and Wells Fargo Bank.

CDS contracts buyers exchanged the reference entity's credit risk for the credit risk of the counterparty to the contract. Therefore they aimed to cooperate with large and well capitalised banks that in their opinion could meet potential commitments under CDS contracts.

Since it is an OTC market, the CDS market exhibits a high level of interconnectedness of participants as an open position in a CDS on a reference entity is much cheaper and faster to change by concluding a new CDS contract with the same or another counterparty than by renewing the existing contract. This results in a large number of open positions that are mutually offset.

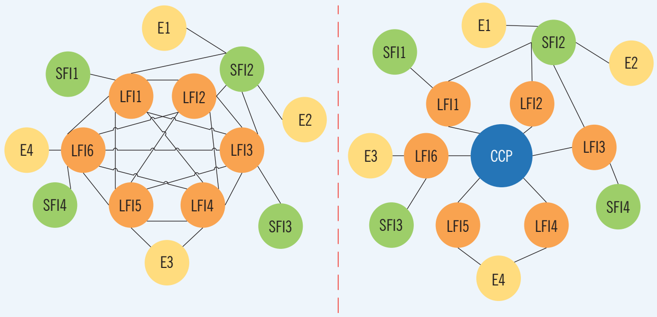
Due to the mentioned characteristics of CDS contracts, including asymmetric payments and the influence on the price of reference entity's borrowing along with the high concentration, interconnectedness of participants and a general non-transparency of information on market participants' open positions, the CDS market was the focal point of the financial crisis. US and EU regulatory authorities focused on market regulation and the reduction of systemic risk arising from a default by a large market participant. At the Pittsburgh meeting in 2009, G-20 leaders agreed that all standardized OTC derivative contracts should be cleared by a central counterparty (CCP), that information should be reported to trade repositories and that capital requirements for outstanding contracts should be increased. The European Parliament and the Council of the European Union went a step further and, aiming to strengthen the regulatory framework and prevent the spreading of systemic risk stemming from speculative purchases of a large number of naked CDS, in March 2012 adopted Regulation (EU) No 236/2012 on short selling and certain aspects of credit default swaps, which prohibits the use of naked sovereign CDS and the creation of speculative short positions by means of such contracts. In addition, at mid-2012, the European Parliament and the Council adopted Regulation (EU) No 648/2012, known as EMIR, introducing the obligation for OTC market participants to centrally clear certain classes of derivative contracts and defining guidelines for the operation of trade repositories.

Central counterparty – CCP

The materialisation of a counterparty credit risk and CDS defaults generate losses for the counterparty, which, if large, can lead to a domino effect and market contagion. A central counterparty (CCP) is a legal person that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and mitigating counterparty risk. CCPs are currently the first line of defence against the contagion of systemic risk through CDS contracts as they collect information on CDS contracts, assess market participants' open positions and manage counterparty risk by regularly calculating collateral requirements as well as initial and variable margins. They are also key in simplifying the market structure and hence enabling the monitoring of the interdependence of CDS market participants' positions and their total exposures (Figure 3).

CCPs do not assume market risk for they function under the "closed book" principle, where each position with a counterparty is closed with the counter position of another counterparty. However, CCPs are exposed to the risk default by the counterparty to the contract (Figure 4). In case of a clearing member's default, the CCP no longer has a covered position and requires sufficient funds to meet the obligations towards the counterparty clearing member. These funds can come from three different sources: the collateral posted, that is, initial and variable margins of a bankrupt member, own funds and default fund contributions.

Figure 3 CDS market structure with and without CCP intermediation



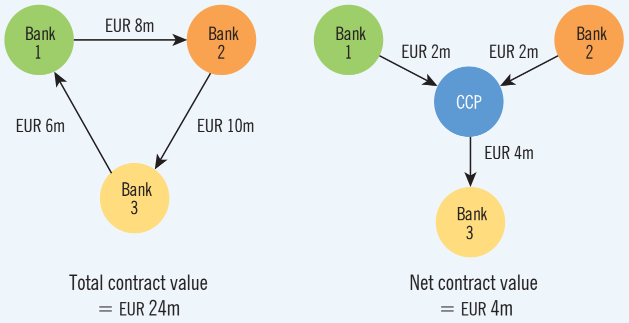
Note: LFI stands for large financial institutions, SFI for small financial institutions and E for end-users.
Source: CNB.

Market risk perception for the Republic of Croatia

As already mentioned, CDS market transparency and information accessibility are considerably lower than those of other OTC financial derivatives markets. According to data published by the Depository Trust & Clearing Corporation (DTCC)[4], the total average value of active contracts on bonds the Republic of Croatia as the reference entity in the end-2008 to end-2015 period was HRK 56.8bn. However, as the bulk of this amount comes from offsetting contracts, the average net value of these contracts, that is, the total long position of market participants in these contracts was HRK 4bn in the observed period or 7% of the total value of active CDS contracts.

Given that CDS contracts are most often used for protection from credit risk and that their speculative use has been forbidden since 2012,

Figure 4 Multilateral netting of CDS contracts intermediated by a CCP



Source: CNB.

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[4] Available at: http://www.dtcc.com/repository-otc-data.

when it comes to sovereign CDS contracts it is worth analysing the share of the public debt of the Republic of Croatia “insured” by CDS instruments. The share of the net value of CDS contracts in the public debt of the Republic of Croatia had a relatively constant average value of 1.9% in the observed period, thus ranking Croatia at the top among EU countries. However, the portion of total public debt accounted for is nonetheless very small, which may call into question the considerable impact these instruments have on the price of borrowing by the government and, in turn, by all residents of the Republic of Croatia (Figure 5).

The number of active contracts with the Republic of Croatia as the reference entity was increasing steadily from about 600 at the end of 2008 to about 1,300 at the end of 2012. Since most of these contracts were used for shorting long positions under existing CDS contracts, the ratio between their net and total value fell from 19% to a mere 4% at the end of 2012. As demand for shorting positions in CDS increased amid rising financial market uncertainty, CDS spreads widened and CDS prices rose as a result (Figure 6).

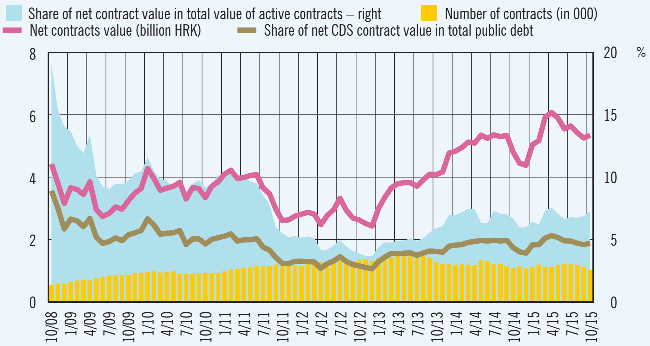
The indicator of market participants’ propensity to hold long CDS positions, shown as the share of the net value of CDS contracts in their total value, suggests that investors are less inclined to hold open positions in CDS contracts involving CEE countries as reference entities than in contracts involving other EU countries. Furthermore, the openness of positions is negatively related to the level of CDS spreads, indicating caution on the part of investors as regards the openness of CDS positions of the countries they consider riskier and their unwillingness to assume exposure to credit event risk despite these instruments’ potentially higher market premium. Consequently, the price of these instruments remains high because of their low supply in the market.

Conclusion

Considering CDS contracts’ positive and potentially negative impacts on the systemic stability of global financial systems and financial market developments, it comes as a bit of a surprise that there is a lack of both pre-transaction and post-transaction information on market quotations and trading volumes.

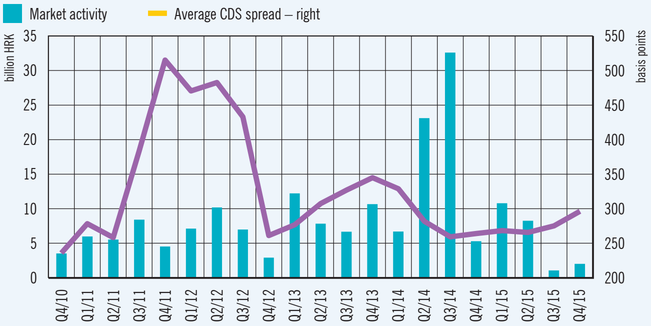
MiFIR and MiFID II, regulatory reforms coming into force as a package in early 2017, aim to enhance pre-transaction and post-transaction transparency and establish a new category of platforms for the exchange of financial derivatives as well as to strengthen their regulation by introducing advanced technical standards. This will provide for a better use of all advantages of CDS instruments and minimise negative systemic effects manifested in the latest episode of the financial crisis. Under the new regulation, the organisation of the CDS market will become more like that of the market in futures, which are standardised instruments that require participants’ active management of collateral and margins and are centrally cleared and traded in stock exchanges. The goal is to establish a sound market infrastructure for an accurate counterparty risk management, considerably increase the price transparency of CDS instruments and thus enable their more precise evaluation as well as to boost market efficiency by ensuring cheaper management of long and short positions for market participants. Finally, this should also increase CDS market liquidity and, in turn, improve the credibility and value of information provided by the prices of CDS instruments.

Figure 5 Market indicators of the value of active CDS contracts on Republic of Croatia bonds



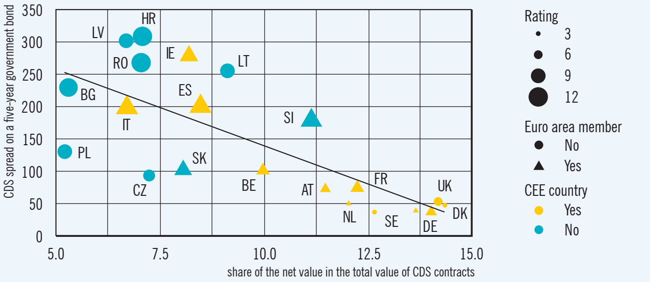
Note: The net value of CDS contracts is the net long position of all reported and settled CDS contracts on Republic of Croatia bonds.
Sources: DTCC and CNB.

Figure 6 Market trading in CDS contracts on Republic of Croatia bonds



Note: The market activity indicator shows the volume of trading in new transactions that influence market risk of market participants.
Sources: DTCC and Bloomberg.

Figure 7 Market participants' propensity to hold long positions in EU countries’ CDS contracts

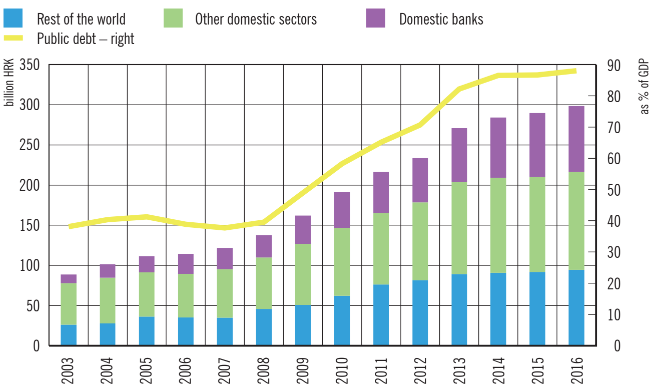


Note: The figure shows the average values of the indicator in the end-2008 to end-2015 period. The size of a figure marks the numerical equivalent of Fitch's rating scale published in early 2016, with a lower number designating a better credit rating.
Sources: DTCC and Bloomberg.

Government sector

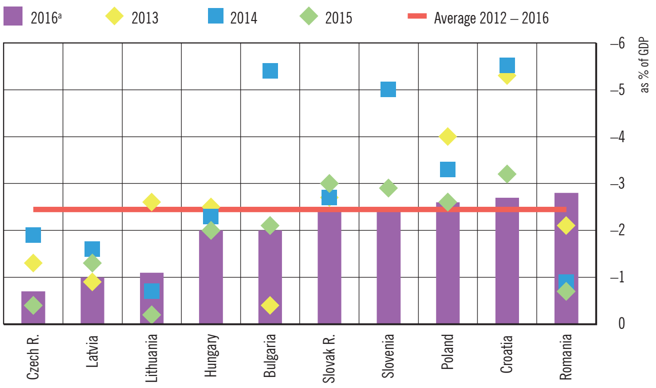
The risks to fiscal sustainability have been diminishing due to economic recovery continuing in 2016 as well as to the primary surplus recorded in the previous year and the resulting reduction in borrowing needs. The share of kuna-denominated securities in the total public debt is expected to increase in 2016 as a result of a change in the regulatory treatment of banks' exposure to government debt.

Figure 24 General government debt



Sources: CNB and EC (projection).

Figure 25 General government deficit



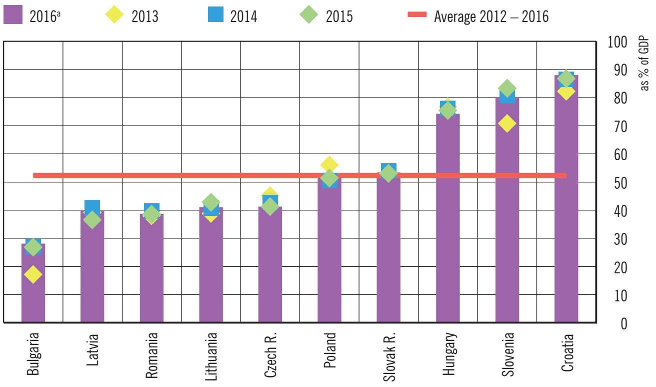
[a] Estimate.
Sources: EC and CNB.

The intensive consolidation of the government sector has continued from 2015 into 2016, generated by an increase in budget revenues and the reduction of investment expenditures. The 2015 year-end general government deficit stood at 3.2% of GDP, which is a significant decrease from 5.5% of GDP in 2014. The deficit decreased as a result of a 22% fall in public investments in 2015 and a rise in excise duties on refined petroleum and tobacco products early in the year. Due mostly to growth in indirect tax revenues, total revenues were up by 4.4%.

The budget deficit reduction was also aided by economic recovery. The decrease in the government deficit to GDP ratio was not caused only by improved fiscal indicators, but also by accelerated economic activity in the previous year, a trend that has continued this year, driving up budget revenues. Similar trends, such as a drop in the fiscal deficit or its stagnation, coupled with economic growth, were recorded in most peer countries in 2015 and have continued in 2016 (Figure 25).

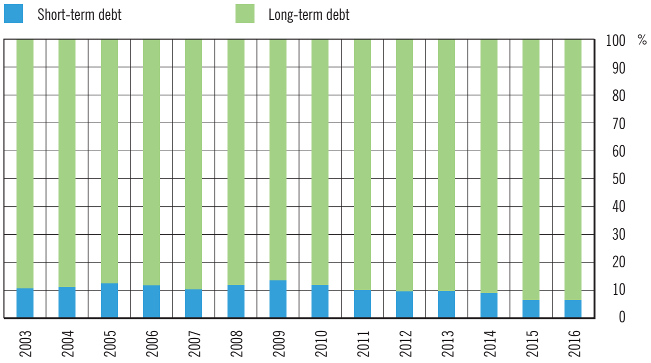
With fiscal consolidation continued in 2016, the budget deficit is expected to drop to 2.7% of GDP. Further budgetary consolidation will contribute to financial stability, reduce borrowing needs and, in turn, reduce pressures on the domestic financial market.

Figure 26 Public debt



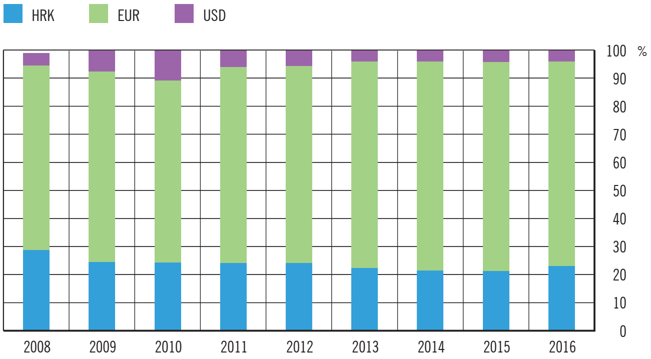
[a] Estimate.
Sources: EC and CNB.

Figure 27 Maturity breakdown of public debt



Source: CNB.

Figure 28 Currency breakdown of public debt



Source: CNB.

Table 4 Thresholds of the fiscal sustainability risk indicator[a]

Indicator	Direction to be safe	Threshold	Observation for Croatia	Change
r – g[b] (2016)	<	1.1%	3.9%	↓
General government public debt (as % of GDP) (2016)	<	42.8%	88.1%	↑
Cyclically adjusted primary balance (as % of potential GDP) (2016)	>	–0.5%	1.5%	↑
Gross financing needs (as % of GDP) (2016)	<	20.6%	16.3%	↓
Share of short-term debt as a ratio of total debt (2016)	<	44.0%	6.7%	↓
Debt denominated in foreign currencies (2016)	<	40.3%	77.0%	↓
Weighted average maturity of public debt (years) (2015)	>	230.0%	5.3	↑
Short-term external public debt (as % of international reserves) (2015)	<	61.8%	11.2%	↓

[a] Baldacci, E., I. Petrova, N. Belhocine, G. Dobrescu, and S. Mazraani: *Assessing Fiscal Stress*, IMF Working Paper, WP/11/100.
[b] Imputed interest rate on general government debt, deflated by the GDP deflator (5-year average), minus real GDP growth rate (5-year average).
Sources: IMF WP/11/100 and CNB.

Growing at a decelerated pace, public debt reached 86.7% of GDP in 2015. The slowdown in debt growth was due to the use of the government deposit accumulated in late 2104 and the reduction of the general government deficit. On the other hand, the public debt to GDP ratio was statistically increased in 2015 by the inclusion of a concession contract from the construction sector.

Croatia still has the highest public debt to GDP ratio in the group of peer countries, but the scope of public debt is very broad. Still, this ratio has stabilised at a level below 90% and it is projected by the European Commission to decrease as of 2017 as a result of GDP growth, revenues from the sales of financial assets and the deficit reduction.

Fiscal sustainability risk indicators have improved in several areas. As a result of the primary general government surplus of 0.3% of GDP in 2015 (Figure 30), the cyclically adjusted primary balance recorded a surplus of 1.1% of GDP. With the continued fiscal consolidation and reductions in the general government deficit in 2106, the primary surplus is expected to increase further to 0.9% of GDP and the cyclically adjusted primary surplus to 1.5% of GDP (Table 4). Positive developments in other indicators suggest that Croatia has entered a period of declining risks to fiscal sustainability.

Trends in the maturity and currency structures of public debt have also been positive. The maturity structure of Croatia's public debt is favourable, as long-term debt accounts for 93.3%

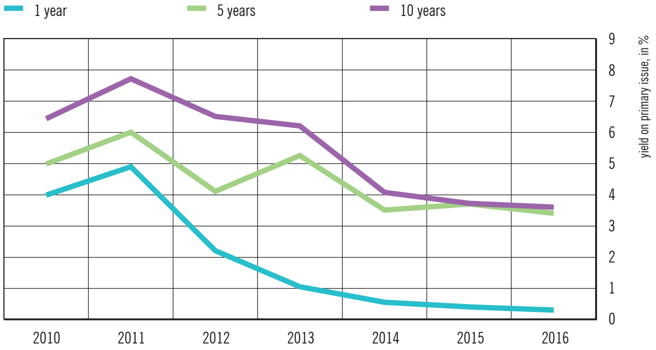
of the total debt, with the share slightly rising (Figure 27). The average remaining maturity of public debt grew from 5 to 5.3 years in 2015 as a result (Figure 34), after falling for three years in a row. Foreign currency or foreign currency-indexed debt has continued to account for the largest share (77%) in the public debt currency structure. The regulatory treatment of banks' exposure to government debt may increase the share of kuna-denominated securities. Specifically, the MoF ceased issuing foreign currency-indexed T-bills in early 2016 and continued to issue only kuna-denominated T-bills.

Borrowing needs are being increasingly reduced by the fiscal consolidation. Due to decreases in the general government deficit in 2015 and 2016, financing needs have decreased considerably, falling to 16.3% of GDP in 2016 from a record high of 20.8% percent in 2014. This has resulted in a decline in government borrowing from domestic banks, which has contained risks to financial stability and may stimulate banks to step up lending to the household and corporate sectors.

Yields on government securities have continued to decrease in 2016. However, they have remained higher than peer countries' yields due to the non-investment grade credit rating, the high public debt level and a negative perception of long-term potential growth.

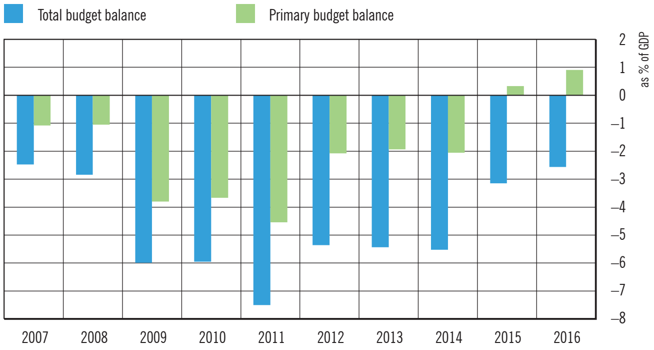
The public debt projection under a stress scenario is most sensitive to a one-off depreciation of the exchange rate. In a stress scenario involving a potential one-off 10% depreciation in the exchange rate in 2016, public debt would rise to 94.9% of GDP. Under a combined stress scenario involving a 3.1% drop in GDP and a one-time depreciation of 10%, public debt would increase to 98.8% of GDP. In a stress scenario assuming a 3.1% drop in GDP, public debt would grow to 92.6% relative to a baseline scenario predicting that public debt would grow to 87.4% of GDP in 2016.

Figure 29 Yield on primary issue of euro and euro-indexed securities



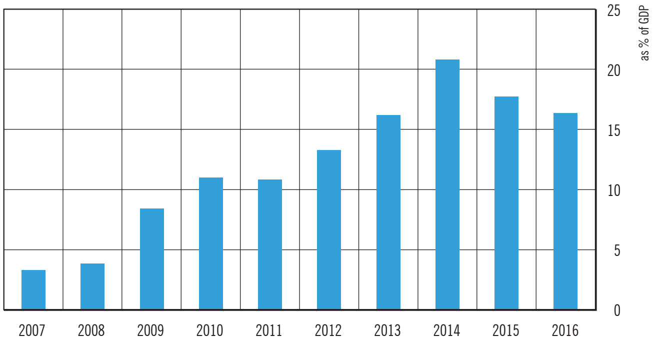
Source: Bloomberg.

Figure 30 General government deficit



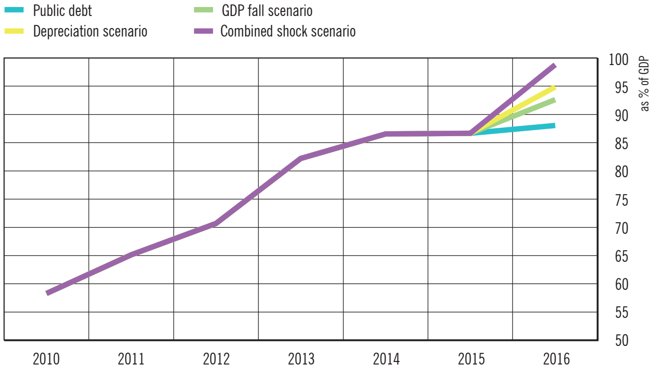
Sources: CNB and EC (projection).

Figure 31 Financing needs



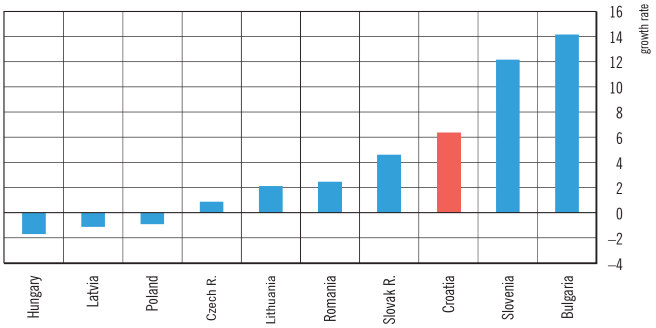
Note: Amounts are stated including T-bills.
Source: CNB.

Figure 32 Projection of public debt under various scenarios



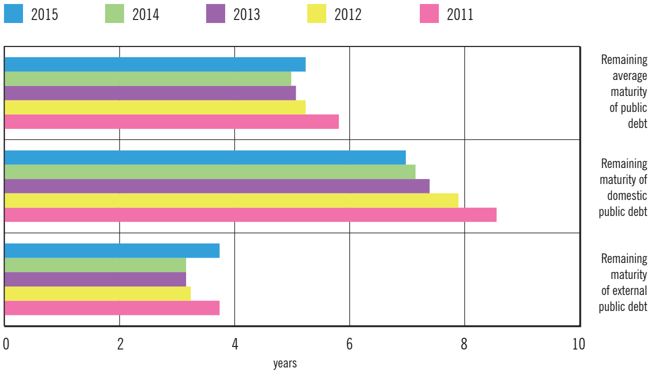
Source: CNB.

Figure 33 Public debt growth rate (2009 – 2015)



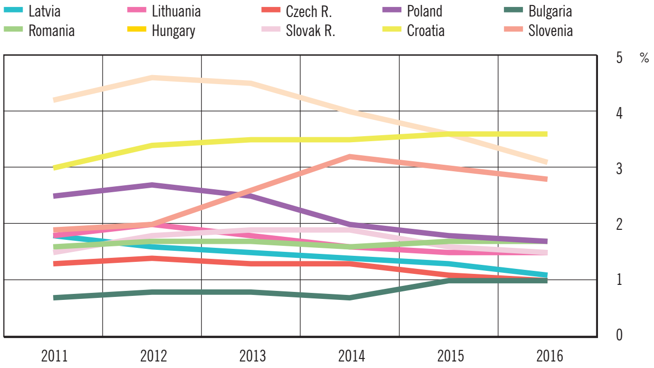
Source: EC.

Figure 34 Average remaining maturity of general government debt



Source: CNB.

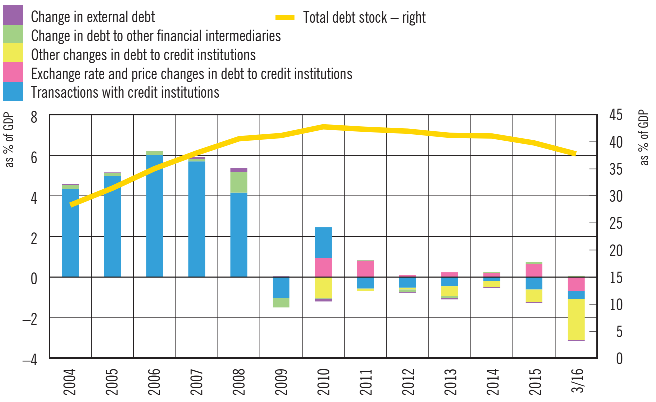
Figure 35 General government interest expenses



Source: EC.

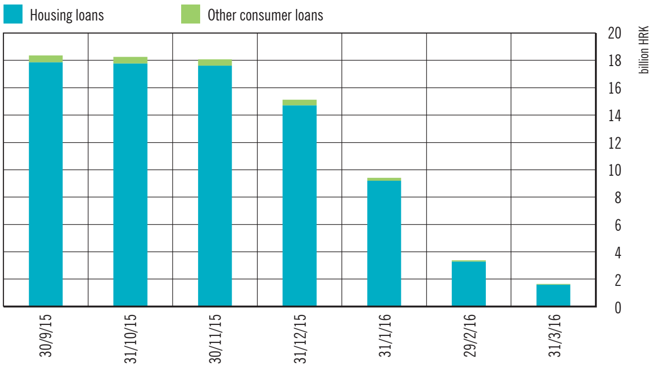
Household sector

Figure 36 Continued household deleveraging



Sources: HANFA and CNB.

Figure 37 Statutory conversion of Swiss franc loans has mostly been implemented
(outstanding principal amount of Swiss franc loans)



Source: CNB.

The reduction of debt and the foreign currency exposure of households has had a positive effect on the household sector's aggregate vulnerability, which is expected to continue decreasing in the upcoming period.

In late 2015 and early 2016, households continued to deleverage at an average effective annual rate of about –1%, which is in line with the dynamics of the effective decrease in household sector debt observed in the last several years. However, nominal debt, which includes exchange rate and price changes as well as other changes that do not constitute actual repayments of liabilities, decreased at a much higher rate in the same period, with the result that household indebtedness declined to the pre-crisis level[1] of 37.8% of GDP (Figure 36) by the end of March 2016, recoding an annual nominal rate of decrease in the total debt of –7.6% (Figure 45). Several factors contributed to such a great difference in the dynamics of the nominal and effective debt amount. The most important among these factors is a decrease in household debt owed to credit institutions arising from the statutory conversion of Swiss franc-indexed loans to euro-denominated loans started at the end of September 2015 (Figures 37 and 38). The cumulative statistical effect of the statutory conversion, reported together with the sale of household placements conducted by credit institutions to clear their balance sheets of non-performing loans, was almost 2% of GDP in the observed six months. The appreciation of the kuna exchange rate in the first quarter of 2016 also positively influenced the total debt amount. Household liabilities to foreign creditors also decreased slightly in the observed period, while debt owed to other domestic financial intermediaries remained mostly unchanged. The level of household indebtedness was favourably affected not only by a continuing decrease in liabilities to most creditors, but also by a small increase in aggregate income.

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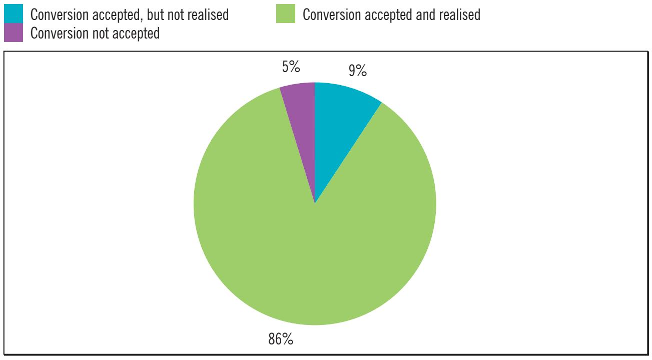
[1] The level attained in 2007 immediately before the outbreak of the large financial crisis.

Figure 38 Most conversion agreements have been accepted (loan stock as at end-March 2016)



Sources: MoF and CNB.

Total household financial assets did not change significantly in the observed period, standing at 117% of GDP at the end of March 2016 (Figure 39). The share of the foreign component of total financial assets declined as a result of a HRK 10bn effective decrease in the household sector's foreign assets in the observed period. This one-off decline was due to the restructuring of an equity investment, which at the same time pushed up the domestic component of this sector's financial assets by HRK 8bn. Accounting for almost a half of the household sector's total financial assets, deposit claims on credit institutions remained the dominant form of household savings (Figure 40).

However, part of savings and time deposit funds started to spill over to transaction accounts in early 2015. This trend was not only caused by relatively low and declining interest rates

Effect of the statutory conversion of Swiss franc-denominated loans on debt, indebtedness and household lending statistics

The conversion of Swiss franc-indexed loans to euro-denominated loans laid down by the Act on Amendments to the Consumer Credit Act of September 30, 2015 had a marked effect on the statistical treatment and recording of household loans. In order to avoid misleading conclusions on the dynamics of lending and indebtedness, this effect should be distinguished from effective changes in debt, total repayment burden and interest burden of this sector. Therefore, where possible, the graphic presentations of household debt in this chapter show separately the effect of the statutory conversion, the bulk of which was performed in January 2015 and in January and February 2016 (Figures 37 and 38).

There are three basic statistical effects of the conversion. The first is related to a reduction in the remaining principal of Swiss franc-indexed loans resulting from their conversion to euro-denominated loans at the exchange rate applicable at the loan payment date. The currency transformation of the loan principal reduced the total household debt by almost HRK 6bn in the period until the end of March 2016 and it was recorded in other changes in debt to credit institutions (Figure 36).

In addition to the change in the currency denomination of loans, the conversion involved replacing contracted interest rates on Swiss franc loans by corresponding interest rates on euro loans and changing the loan repayment schedule accordingly. Changes of such magnitude in lending conditions required that loan agreements between individual clients and banks be renegotiated (refinancing), which is statistically recorded as new lending business of credit institutions (amounts and interest rates) and is the second important effect of the conversion. As a result, the last quarter of 2015 and, in particular, the first quarter of 2016, saw a significant statistical increase in the amount of newly granted household loans (Figure 41), especially in housing loans (Figure 42), which should be analysed separately from trends in actual new household borrowing. In line with this, interest rates on newly-granted foreign currency indexed housing loans also increased (Figure 58 in the chapter Real estate) due to the fact that converted loans were granted at an interest rate that would have been charged on these loans had they been granted in euros, which matches the interest rate on the stock of corresponding euro-denominated housing loans. As interest rates on the stock of loans exceed interest rates on newly granted loans, interest rates on newly granted housing loans recorded a one-off increase in the same period.

While the mentioned effects have mostly made an impact on the household debt and household lending statistics, the third important effect of the conversion, the treatment of overpayments, will mainly materialise in the forthcoming period. Specifically, the amounts of repayments of Swiss franc-indexed loans are converted into euros at the exchange rate applicable at the payment date. If the total amount paid in prior to the conversion exceeds the total amount that should have been paid in under the new loan repayment schedule, the surplus is considered as overpayment and converted into kuna at the exchange rate in effect at the conversion date. The treatment of this amount will depend on its ratio to the remaining amount of loan repayments due, but the final effect will primarily be observed in decreases in interest paid and loan repayment burden in the future, which will favourably affect aggregate indicators of household sector indebtedness and vulnerability. Specifically, if the established overpayment amount is lower than 50% of the sum of the remaining repayments, then it is used for future repayments in such a manner that future annuities are reduced up to a maximum of 50% until the overpaid amount is spent. If the overpaid amount exceeds 50% of the sum of the remaining repayments, the use of this amount is agreed between the bank and the debtor. If it is established that the overpayment exceeds the total amount of the remaining repayments, the bank is obliged to repay the overpaid amount to the debtor within 60 days of the accepted conversion date. Finally, if it is established that there is no overpayment, that is, that the total amount paid in until the conversion date is lower than the total amount of the remaining repayments under the new loan repayment schedule, the debtor is obliged to compensate the bank for the shortfall pursuant to the mutual agreement.

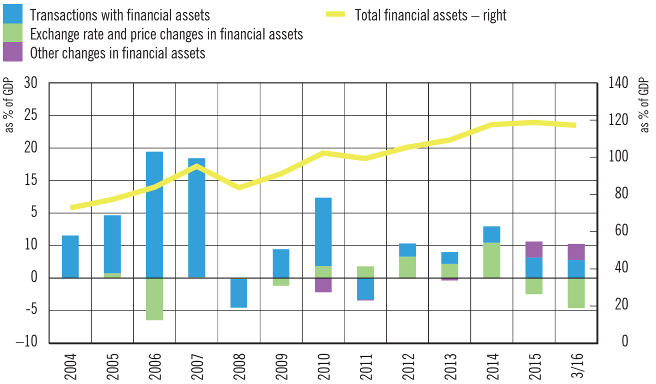


Figure 39 Household financial assets are stable

Sources: HANFA and CNB.

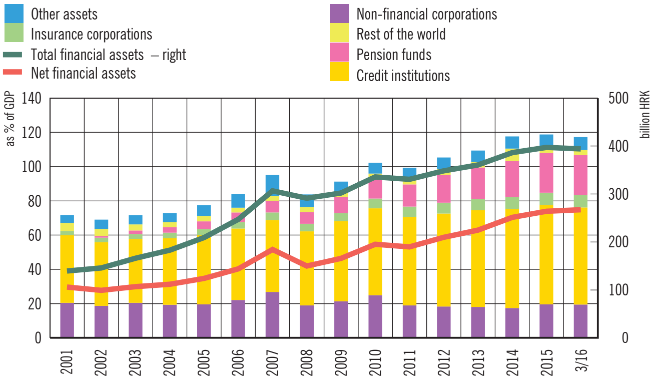


Figure 40 Deposits with credit institutions are the dominant form of household savings

Sources: HANFA and CNB.

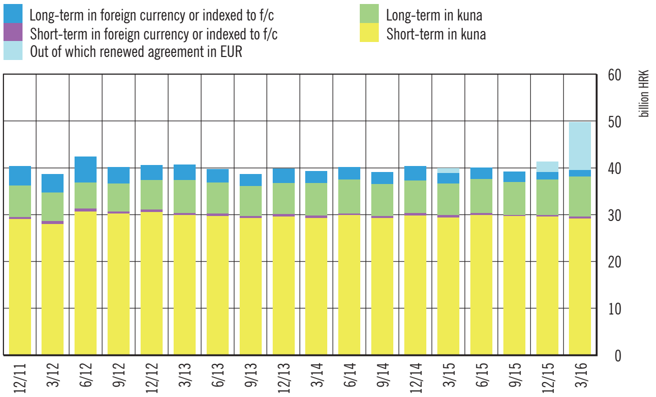


Figure 41 Slight upturn in lending activity

Source: CNB.

Household deposits

Since the beginning of 2015, natural-persons' income from capital has been taxed at an annual rate of 12%, including interest accrued on kuna and foreign currency savings deposits irrespective of their maturity (Act on Amendments to the Income Tax Act). Given that interest income on transaction accounts of up to 0.5% annually is tax exempt, the legal changes mentioned affected the household deposit structure in credit institutions.

Following the entry into force of the amendments, the period from January 2015 to March 2016 saw an outflow of HRK 6.2bn from household time deposits. Most of these funds were transferred to transaction accounts, improving their balance by HRK 5.4bn in the same period, while the rest were transferred to savings deposits, which rose by HRK 1.8bn (a rise in the interest rate differential between savings and transaction accounts in this period increased their relative profitability).

The structure of time deposits also changed as only time deposits with a maturity of up to one year (mostly six to twelve months) recorded an outflow in the previous year and this year, while deposits with a maturity longer than one year increased. This is because the average interest rate on deposits with a maturity of up to one year amounted to 1.9% and that on new deposits to 1.6%, while the average interest rate on deposits with a maturity longer than one year was 2.7% or 2.2%.

on time deposits[2], but probably also by the taxation of interest receipts pursuant to the Act on Amendments to the Income Tax Act (Official Gazette 143/2014). Pursuant to this Act, interest income on transaction accounts of up to 0.5% annually is tax exempt[3]. The remaining household financial assets are mainly allocated pursuant to legal requirements and invested in pension funds (20.3% of the total financial assets as at the end of March 2016).

The continued effective downward trend in household debt indicates that lending activity, although it has strengthened (Figures 41 and 42)**, is still not strong enough to compensate for the repayments of this sector's existing credit liabilities.** Following a decline in newly-granted household loans over the whole of 2015, new household borrowing intensified slightly in the first quarter of 2016. While the maturity structure remained relatively stable (Figure 41), with a share of 75% accounted for by the short-term financing required primarily for the regular

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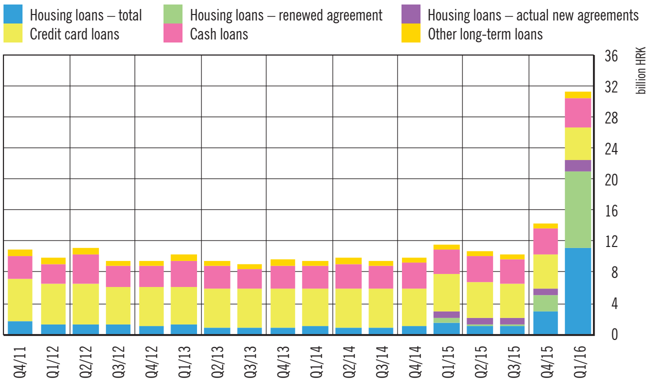
[2] The weighted average interest rate on household time deposits was 2.2% and on new time deposits 1.6% in the observed six-month period.

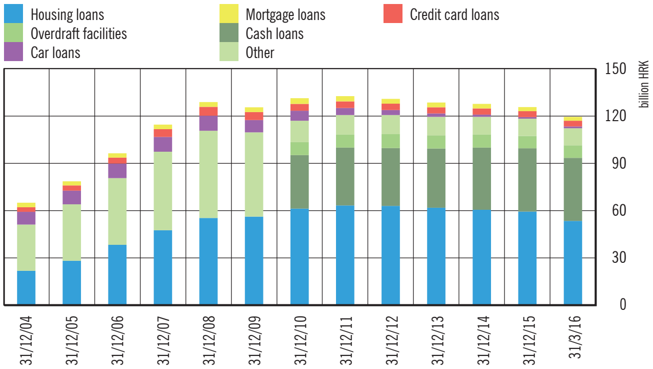
[3] In accordance with the Act on Amendments to the Income Tax Act, income from capital excludes the interest on positive balances in giro accounts, current accounts and foreign currency accounts received from banks, savings banks and other financial institutions, up to the amount paid by these institutions on sight deposits. The exemption applies if the interest on sight deposits is lower than the lowest interest on time deposits, that is, if it amounts to a maximum of 0.5% annually.

Figure 42 Mild recovery in new long-term borrowing in early 2016



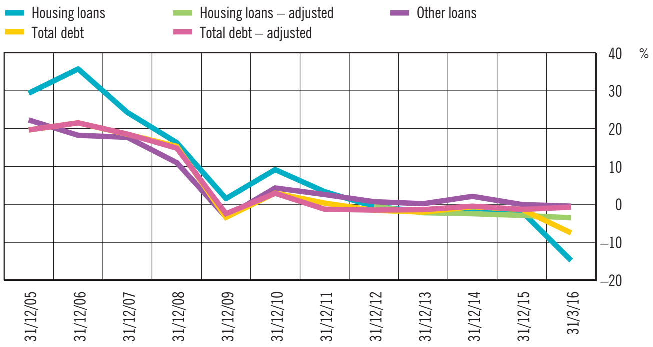
Source: CNB.

Figure 43 Continuing decrease in total loan amounts despite an increase in lending activity



Note: Cash loans and overdraft facilities have been excluded from the category other household loans since the end of 2010 due to the fact that they have become new categories.
Source: CNB.

Figure 44 Loan dynamics has reflected on changes in total household debt



Note: The growth rate of the total adjusted debt and adjusted housing loans indicates a change in the amounts, which excludes exchange rate changes, price changes and other changes.
Source: CNB.

rollover of current account overdrafts, long-term newly-granted loans rose by HRK 1bn in the first three months of this year,[4] with almost equal contributions coming from housing and cash loans (Figure 42). Nevertheless, the total amount of housing loans was down at an annual rate of –14.8%, that is, down 3.5% if the statistical effect of the conversion of Swiss franc-denominated loans is excluded (Figures 43 and 44). All other loans also decreased (Figure 43), with the exception of cash loans, the only loan type growing steadily since the outbreak of the financial crisis, albeit at increasingly lower annual rates (1.5% at the end of March). These developments reflect changes in the household consumption structure and investment propensity, which are caused, among other things, by the weakening demand for long term borrowing due to long-lasting adverse economic developments and uncertainties.

Eased lending standards and positive signals from the labour market (Figures 45 and 46) may boost lending activity. The majority of banks further relaxed their standards for the approval of housing and consumer loans[5], especially as regards loan approval fees and interest margin in the late 2015 and early 2016. Household loan demand gradually increased slightly (Figure 47) amid the relaxation of household lending standards, continuing since the end of 2014, and incentives from the labour market in the same period. However, it has remained relatively weak and insufficient to stimulate lending markedly and halt the several-year household deleveraging trend.

Consequently, notwithstanding the aggregate growth in wages and employment (Figure 45) and the positive effects of the several-year deleveraging trend and the conversion of Swiss franc loans on this sector's aggregate creditworthiness, a change in demand capable of stimulating a longer-term and stronger recovery of lending will be possible only when the overall economic recovery gains momentum and when new and more secure jobs are created and wages increased by productive contributions, which will eliminate the uncertainties preventing households from assuming new obligations.

The substitution of kuna loans for foreign currency-indexed loans, continuing since the end of 2012, intensified in the observed period. The share of kuna loans in total loans peaked at 35.1% (Figure 48) by the end of March 2016. The change of the currency structure of loans was accelerated due to the experience with Swiss franc-denominated loans that had raised awareness of the risks inherent in such loans and changed the household propensity for foreign currency borrowing. In addition, positive effects on kuna household loans were also made by the increased transparency in the definition and modification

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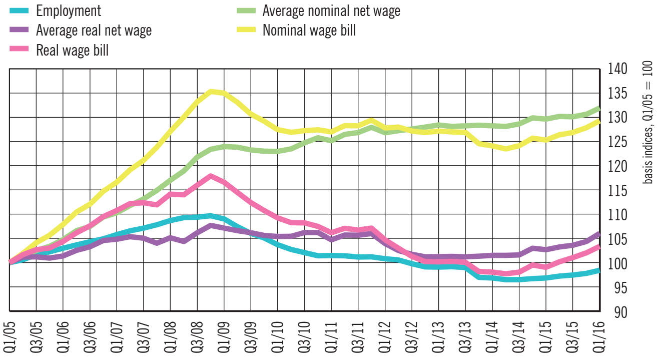
[4] This excludes the effect of Swiss franc-denominated loans on the amount of newly-granted long-term loans.

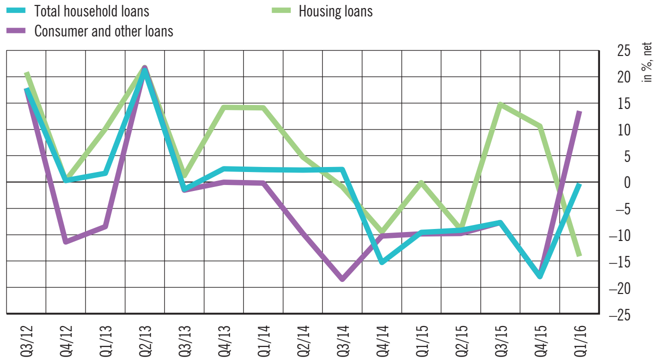
[5] Only one bank tightened lending standards for consumer and other household loans in the first quarter of 2016, while in most other institutions conditions remained unaltered or were mildly relaxed. However, as the bank in question plays a significant role in the household lending segment, this has significantly impacted the aggregate change in lending standards applied to this type of loans.

Figure 45 Positive signals from the labour market



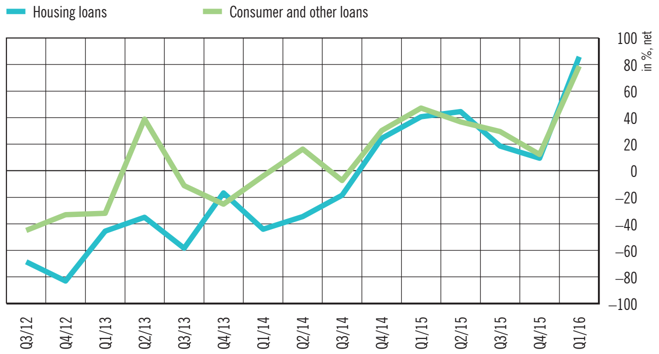
Note: As of 2015, net wage amounts have been reported in accordance with the JOPPD form, which makes it impossible to compare them directly with the amounts in the previous periods.
Source: CBS and CPII.

Figure 46 Relaxed household lending standards



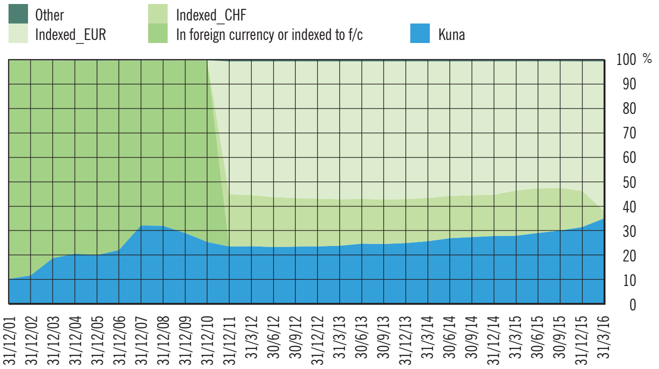
Note: A positive value indicates the tightening of lending standards and a negative value indicates their relaxation.
Source: CNB.

Figure 47 Banks expect household loan demand to strengthen



Note: A positive value indicates an increase and a negative value indicates a decrease in demand.
Source: CNB.

Figure 48 Share of kuna loans is on the increase



Note: Since the end of 2010, the category of foreign currency loans or foreign currency-indexed loans has been divided into two subcategories: euro-indexed and Swiss franc-indexed loans.
Source: CNB.

of interest rate conditions facilitated by consumer credit regulations in late 2013 (Figure 49) and by a rise in kuna deposits in transaction accounts.

CNB's efforts towards the "re-kunisation" of the domestic financial system by providing consumers with better information and protection and credit institutions with longer-term sources of kuna liquidity as well as by imposing an ongoing regulatory burden on foreign currency funding of banks have also contributed to these trends. Household foreign currency risk exposure is likely to continue to decline, with another positive stimulus to be made by the transposition of the Mortgage Credit Directive[6] into the national legislation (a proposal of the Consumer Home Loan Act[7] put forward by the Ministry of Finance), which will, among other things, enable consumers to opt for one-off conversions of foreign currency-indexed home loans to kuna loans, free of additional costs. This legal option reduces the possibility of the materialisation of currency-induced credit risk and partially transfers this risk to credit institutions. Considering that banks might incorporate the option for conversion into lending costs, this legal provision could change the price of financing in kuna. However, this, and the share of kuna loans, will heavily depend on the continued growth of kuna deposits.

Households were highly exposed to the risk of interest rate change late in the previous year and early this year due to the fact that almost 96% of all loans were granted with interest rates variable within one year (Figure 51). Despite the fact that the statistics on interest rate variability show no significant structural changes, the conversion of Swiss franc-denominated loans resulted in a one-off increase in the household sector exposure to interest rate risk as interest rates on these loans

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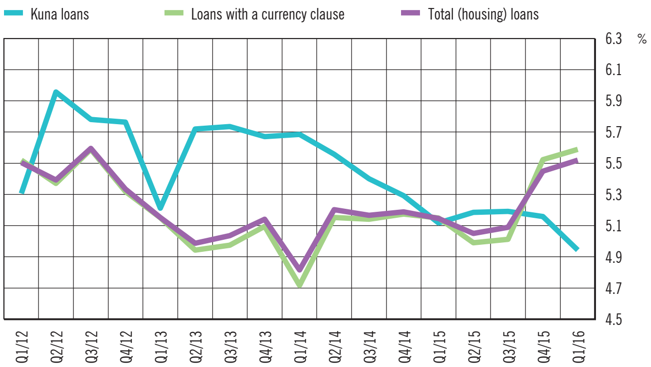
[6] Mortgage Credit Directive 2014/17/EU.

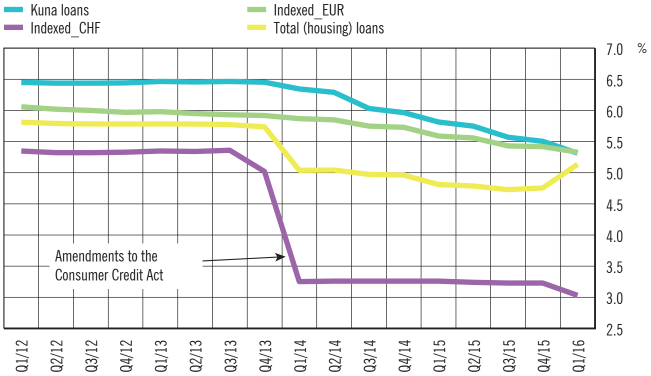
[7] The Act will not only strengthen consumer protection, but enable all consumers taking out a foreign currency home loan to convert such a loan to an alternative currency that is the currency of denomination of most of their income or assets, with no additional fees, at any time during the loan agreement period.

Figure 49 Continued general downward trend in interest rates on newly-granted (housing) loans



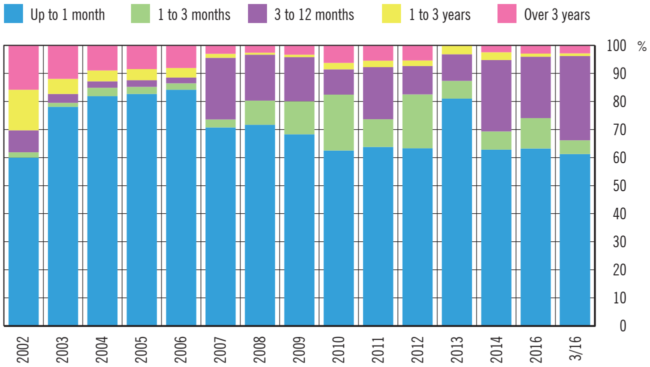
Source: CNB.

Figure 50 Interest rates on kuna-denominated and euro-denominated housing loans are on the same level



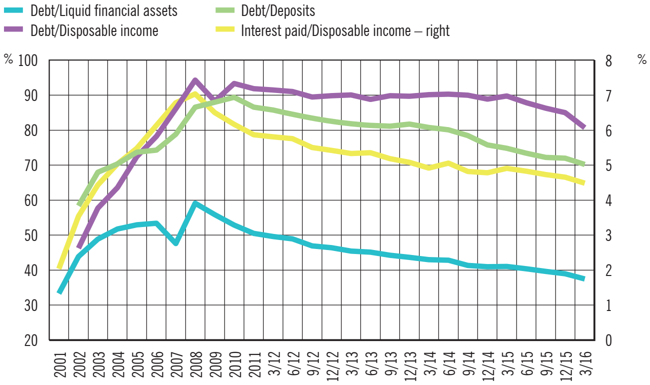
Source: CNB.

Figure 51 Continued high exposure of households to interest rate risk



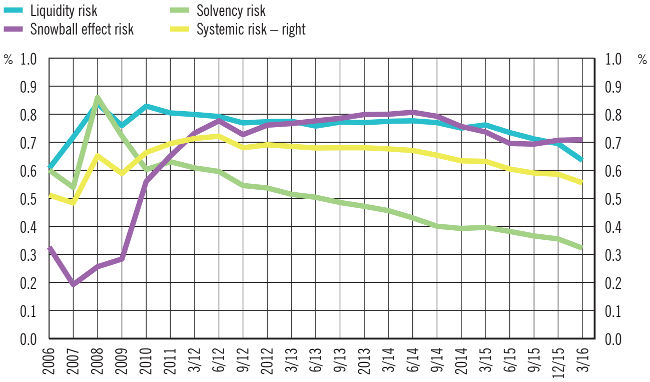
Source: CNB.

Figure 52 Decrease in household debt and interest burdens



Sources: HANFA and CNB.

Figure 53 Systemic vulnerability of households continues to decrease



Note: Household sector vulnerability is measured by the household systemic risk. i.e. by the average of liquidity risk (LR). solvency risk (SR) and "snowball effect" risk (SNR) which are defined as follows:

$$LR_t = 0.5 \cdot \frac{Debt_t}{Disposable\ income_t} + 0.5 \cdot \frac{Interest\ payments_t}{Disposable\ income_t}$$

$$SR_t = \frac{Debt_t}{Net\ financial\ assets_t}$$

$$SNR_t = \frac{Interest\ payments_t}{\frac{Debt_t + Debt_{t-1} + Debt_{t-2} + Debt_{t-3}}{4}} - \left(\frac{Disposable\ income_t}{Disposable\ income_{t-4}} - 1\right)$$

Sources: HANFA and CNB.

had been effectively fixed since 2014 pursuant to amendments to the Consumer Credit Act (Figure 50). When these loans were converted to euro-denominated loans, legally fixed interest rates were replaced by corresponding variable interest rates on euro-denominated loans. Although the overall exposure of households to interest rate risk has remained very high, amendments to the Consumer Credit Act have significantly increased transparency in the setting and modification of interest rates. This, and better information on the risk inherent in variable interest rates, depending on the parameter of their dynamics[8], should raise consumer awareness of the possible effects of risk materialisation and available protection. Furthermore, the Consumer Credit Act and a proposal of the Consumer Home Loan Act allow consumers to repay a loan prior to maturity, free of any fees, if they consider changes in interest rate conditions inconvenient.

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[8] http://www.hnb.hr/-/rizici-za-potrosaca-u-kreditnom-odnosu.

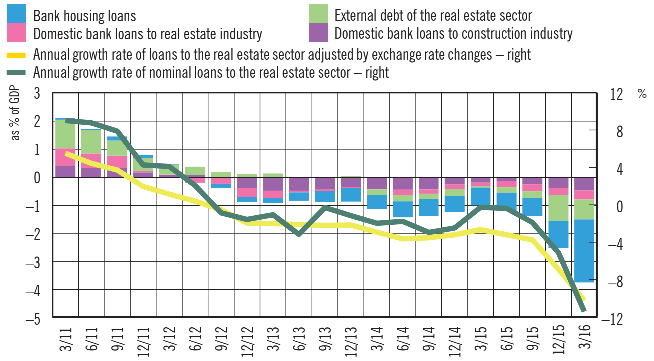
Household indebtedness and interest burden indicators continued to improve in the last quarter of 2015 and in the first quarter of 2016 (Figure 52). The aggregate household indebtedness burden considerably declined due to reductions in total debt and interest expense (both down at an average annual rate of 5% in the observed period), coupled with increases in liquid financial assets and deposits, with the latter accounting for the largest share in these assets. Disposable income grew in the same period as a result of employment and wage growth, with the result that the ratio of debt to all mentioned categories enabling its repayment fell to the level of more than a decade ago. Household interest burden also dropped, and the trend is likely to continue in the forthcoming period because of the decrease in the repayment amounts of loans initially granted in Swiss francs and converted into euros on the basis of overpayments.

Decreases in debt and interest payments, together with income growth, have led to a decline in vulnerability indicators and, in turn, the household sector's overall systemic vulnerability (Figure 53). Only the "snowball effect" risk increased in the observed period because the implicit interest rate on total debt grew faster than household income. This is because the decrease in interest payments was smaller than that in the total nominal debt (due to the conversion of Swiss franc-indexed loans) on which the interest is paid.

Numerous legal amendments and economic policymakers' initiatives have significantly contributed to the reduction of household aggregate credit liabilities and vulnerability to shocks over the past few years. Consumer awareness and consumer protection have been considerably improved, as has market transparency. However, as the strengthening of loan demand is conditioned upon a strong and steady overall economic recovery ensuring stable sources of income and thus alleviating uncertainty for households, especially young households, the several-year effective deleveraging could continue, although at a slightly slower pace.

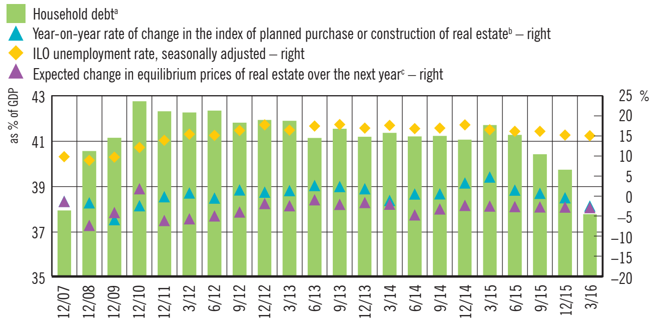
Real estate[9]

Figure 54 Deleveraging in the real estate sector intensified due to the statutory conversion of Swiss franc-denominated loans



Note: Changes in debt are adjusted by exchange rate changes. External debt includes the debt of real estate and construction industries.
Source: CNB calculations.

Figure 55 Despite positive labour market trends, households have continued to refrain from long-term investments



[a] Refers to the expected annual change in the same period of the next year (+12 months) and is estimated based on the equilibrium price model, taking into account CNB projections for the main determinants of demand for residential real estate.
[b] Index of planning the purchase or construction of real estate was calculated based on consumers' answers to the question on plans regarding the purchase or construction of real estate in the next 12 months from the CNB's consumer confidence survey.
Source: CNB.

Notwithstanding the improved financial availability of residential real estate, a significant recovery in demand for residential units and corporate activity associated with the real estate market will be possible only with a stable and strong economic recovery. This market is therefore expected to continue stagnating in the forthcoming period.

Deleveraging in the real estate sector continued at a more rapid pace in late 2015 and in early 2016, primarily due to the conversion of loans initially granted in Swiss francs, with a positive impact also resulting from the slight economic growth in the same period. This sector's years-long deleveraging with respect to domestic and foreign creditors accelerated, with the result that the total debt fell by 11.4% annually by the end of March 2016 or by 10.2% if the effect of the appreciation in the kuna exchange rate early in this year is excluded (Figure 54). The largest cumulative contribution to the debt decrease came from a drop in the housing loan amount (slightly above 2% of GDP), related primarily to the statutory conversion of Swiss franc-denominated loans. Domestic credit institutions' exposure to corporations in the construction and real estate activities decreased by about 0.6% of GDP in the same period, partly as a result of the "clearing" of balance sheets of non-performing placements and the sale of these placements. Liabilities to foreign creditors of corporations associated with the real estate sector also declined late in the previous year, by about 0.7% of GDP.

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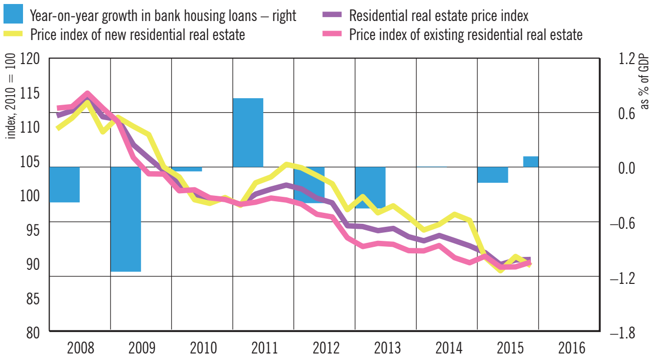
[9] In this chapter developments in the real estate market are analysed and operations of non-financial corporations in the construction and real estate activities are monitored.

The slight economic growth in 2015, reflected in positive labour market developments, has been insufficient to provide a strong impetus to real estate demand (Figure 55). Household investment activity concerning the planning of the purchase or construction of residential real estate[10] was on a steady decline in 2015. The decline has continued into 2016, against a background of weakened household borrowing capacity and the propensity to borrow, especially long-term. Accordingly, residential property prices were falling throughout 2015 (the end-year annual rate of decrease was 2.1%). The fall in these prices accelerated slightly from 2014, with the price adjustment still below the several-year average, including annual decreases of more than 6% (Figure 56). Newly-constructed residential property prices dropped at an especially sharp rate of almost 7% from the end of 2014, while the prices of old residential units held steady in the same period. Continued low liquidity in the real estate market, standing below the years-long average, has been creating downward pressures on prices.

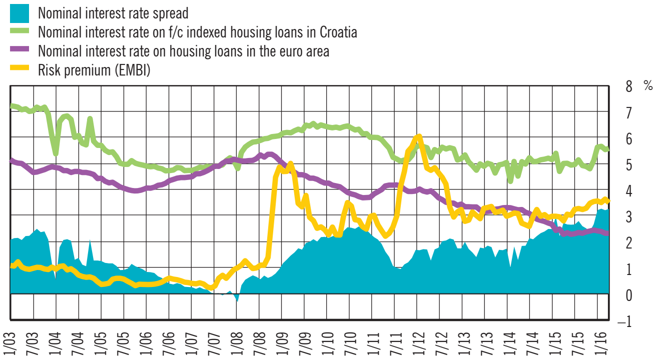
Due to the several-year decline in prices, residential property has become considerably more financially available to households than in the pre-crisis period (Figure 59). The aggregate financial availability improved in 2015 as a result of a price contraction and household income growth generated by the slight economic recovery and taxation changes. The statutory conversion of loans initially made in Swiss francs to euro-denominated loans had a dominant impact on the increase in nominal interest rates on foreign currency-indexed housing loans at the end of the previous year and early this year, additionally widening the already wide interest rate spread relative to comparable interest rates in the euro area (Figure 57). That is, pursuant to legal provisions, the currency conversion of these loans, statistically recorded as new lending business, involved setting a new interest rate that was to be equal to the interest rate that these loans would have had at the moment of conversion, had they been granted in euros (See: Effect of the statutory conversion

Figure 56 Continued decrease in real estate prices



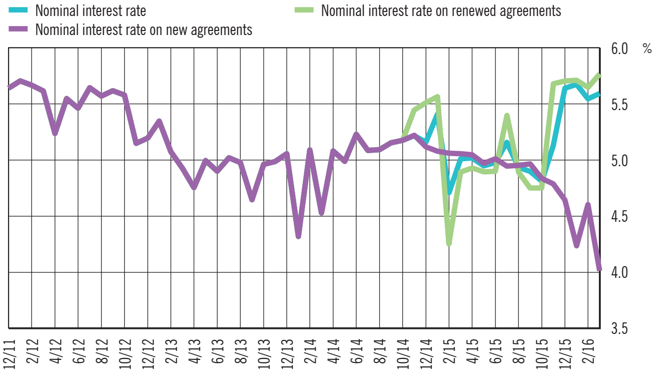
Note: The index takes into account qualitative characteristics of the real estate in standardising residential units. The amount of newly-granted housing loans excludes refinancing.
Sources: CBS and CNB.

Figure 57 Conversion of Swiss franc-denominated loans has widened the interest rate spread



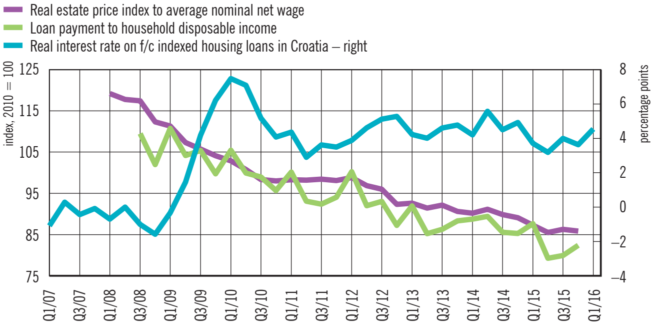
Note: Since December 2011, interest rates have been calculated according to the new methodology (for more details on the new interest rate statistics, see *CNB Bulletin*, No. 204, June 2014).
Sources: ECB and CNB.

Figure 58 Decrease in interest rates on genuinely new foreign currency-indexed housing loans



Source: CNB.

Figure 59 Residential property much more financially available than before



Note: The real interest rate on f/c indexed housing loans was deflated by the change in the average nominal net wage, excluding the effect of the crisis tax, and it is presented as the moving average of three successive time periods. Loan payment refers to an average housing loan for the purchase of residential property of 50 square meters at the price relevant in the reference period (measured by the real estate price index).
Sources: CBS and CNB calculations.

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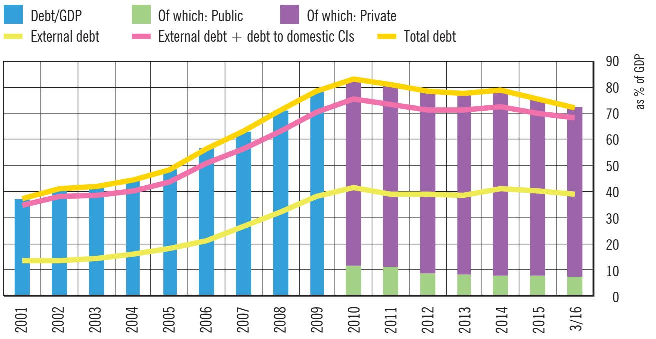
[10] Based on the responses to the questions from the Consumer Confidence Survey.

of Swiss franc-denominated loans on debt, indebtedness and household lending statistics in the chapter Household sector). It should be noted that the dynamics of interest rates on genuinely new housing loans favourably affected loan demand and the financial availability of residential property in the observed period (Figure 58).

Indicators of financial availability of residential property could continue to improve during this year, mainly as a result of the expected growth of employment and household income. However, residential property prices are unlikely to grow significantly given the still relatively weak demand for new residential property, which will be boosted only by a robust economic recovery. The legal regulation of real estate valuation, including the establishment of a database with sale and purchase prices and publicly accessible “price blocks” for the whole country, will increase this market’s transparency and could intensify the real estate market activity in the next medium-term period. Also very important for the recovery of the real estate market is a transparent and clear announcement of the legal initiative for levying a real estate tax and its implementation so as to remove the surrounding uncertainty.

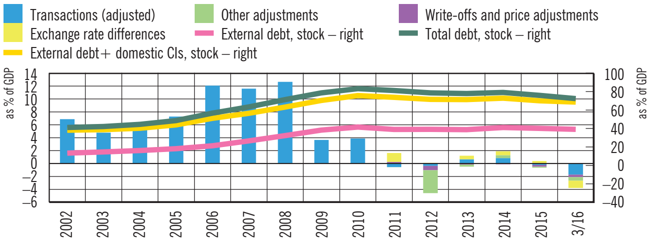
Non-financial corporate sector

Figure 60 More intensive deleveraging in foreign and domestic markets has reduced total indebtedness



Note: Indebtedness of the non-financial corporate sector as the debt-to-GDP ratio. The difference between external debt and debt to domestic credit institutions, and total debt (other debt) is the debt to domestic leasing companies, insurance companies and other financial institutions.
Sources: CNB and HANFA.

Figure 61 Reduction in non-financial corporate indebtedness is mostly due to debt repayment

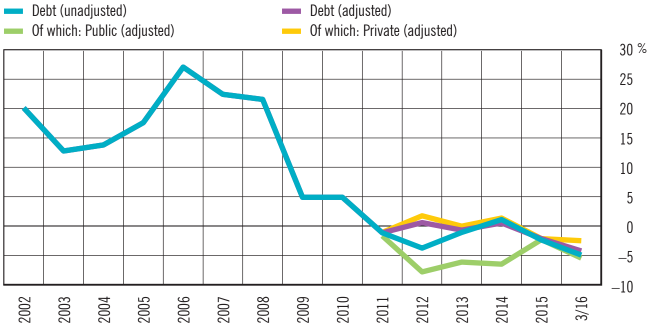


Notes: The presentations are based on audited data from the consolidated balance of the financial accounts and aligned with changes in the sector classification under the ESA 2010 methodology. Total indebtedness has been adjusted for the debt of BINA-Istra, which is treated in financial accounts as general government debt because of the public-private partnership. Therefore, the total indebtedness of the non-financial corporate sector was reduced by around 1.3% of GDP (e.g. from around 80.4% to around 79.1% of GDP in 2014).
Decomposition of changes in non-financial corporate indebtedness as the ratio of the change in debt to GDP. Other adjustments refer to a portion of shipyard debt assumed by the government in June 2012, the sale of non-performing claims, the winding-up of a domestic bank and the methodological changes in the recording of fees in 2013.
Sources: CNB and HANFA.

The years-long downward trend in the total indebtedness of the non-financial corporate sector on a yearly basis (except in 2014) continued in the first quarter of 2016 as a consequence of more vigorous deleveraging of non-financial corporations vis-a-vis foreign sources. Favourable business results in 2015 (increase in profit) also contributed to the recent reduction in the sector's indebtedness as some corporations used a part of profits to reduce the financial leverage. Nevertheless, lending activity picked up pace in the first quarter of 2016. The vulnerability of the non-financial corporate sector has declined primarily due to improved business performance.

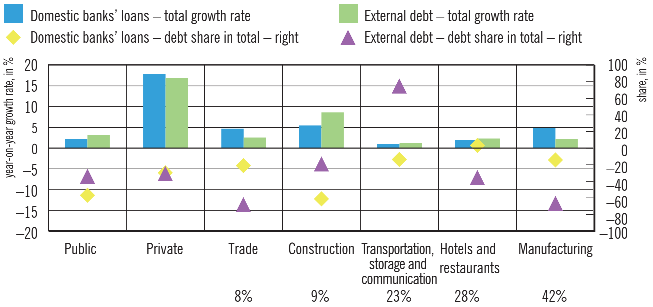
The total indebtedness of the non-financial corporate sector continued to decline year-on-year in the first quarter of 2016. It dropped to 72.4% of GDP at the end of the first quarter of 2016, down from 75.8% of GDP at the end of 2015 (Figure 60). Transactions (net debt repayments) had a negligible effect on the reduction of indebtedness in 2015, while, including the effect of the external debt-to-equity swap in 2015, net transactions were slightly positive (amounting to some 0.6% of GDP). The reduction of indebtedness in 2015 was also offset by the strengthening of the euro over the year. The year-on-year debt reduction resulting from transactions (debt repayments) stood at around 1.7% of GDP in the first quarter, while around 46% of net transactions (around 0.8% of GDP) can be accounted for by external debt for equity transactions. A significant impact on the total decrease of indebtedness in the first quarter was also made by exchange rate changes, which reduced the

Figure 62 Non-financial corporations, particularly those in the public sector, have reduced their debt



Notes: Annual rates of change in non-financial corporate debt. Annual rates of change in the debt of non-financial institutions exclude the impact of exchange rate differences, the sale of non-performing claims, a portion of shipyard debt assumed by the government in June 2012, the winding up of a domestic bank and the methodological changes in the recording of fees in 2013.
Sources: HANFA and CNB.

Figure 63 Most activities have reduced their domestic and external debt



Notes: The annual rates of change in external debt and domestic bank loans by activity from 31 March 2015 to 31 March 2016. The structure of the change in debt by activity is presented only for the sector of private non-financial corporations, while percentages on the horizontal axis indicate the share of export revenues in total revenues of the activity in 2015. The right hand side shows the share of domestic and external debt in total domestic and external debt. Growth rates are not adjusted for external debt-to-equity swaps.
Sources: FINA and CNB.

indebtedness by an additional 1.1% of GDP, and also by GDP growth (Figure 61).

The very good business performance that continued into 2015[11] provided the possibility of financing from own funds and a gradual restructuring of corporate balance sheets that involved a reduction in financial leverage. Such movements may have had the dominant influence on the decrease in external indebtedness of non-financial corporations in the first quarter of 2016: external indebtedness went down by around 1 percentage point from the end of 2015 and by around 3 percentage points from the first quarter of 2015, contributing largely to the reduction in total sector indebtedness (excluding the mentioned debt-to-equity swap transactions, the annual decrease stood at around 1.6 percentage point). The indebtedness of the non-financial corporate sector to domestic credit institutions also decreased from the first quarter of 2015 to the first quarter of 2016. While the annual decrease in the indebtedness to domestic credit institutions neared 2 percentage points, the first quarter of 2016 was characterised by an increase in lending activity and debt of non-financial corporations to domestic credit institutions.

Private non-financial corporations recorded negative annual rates of change in total debt in the first quarter of 2016 (Figures 62 and 63). The largest annual rate of decrease in domestic bank loans was recorded in the construction activity, while external debt of most other activities was reduced. The exception was in the transportation, storage and communication activities, whose external debt increased and domestic loans decreased. The high growth rates of external debt observed in these activities were the consequence of new borrowings by airports and seaports, and mobile operators. External debt was mostly reduced by corporations in the trade and manufacturing sectors (retail chains, pharmaceutical industry and shipyards).

The highest annual rate of decrease in total debt in the first quarter was seen in public non-financial corporations (Figure 62), which reduced equally their debt to domestic and foreign sources (Figure 63), in contrast with 2015, when this debt held steady. Nevertheless, due to the larger share of private non-financial corporate debt in total debt, private enterprises had a predominant influence on the rate of change in total debt of the non-financial corporate sector. The most significant decline in the external debt of public enterprises was observed in the oil production industry (refinancing from domestic sources) and transportation, storage and communication activities in the public sector. While the strongest impact on the change in the debt of public enterprises was made by deleveraging corporations, some public enterprises in the transportation, storage and communication sector were also dominant in new borrowing from external sources, while domestic credit institutions mostly lent to public enterprises in the oil production industry (the mentioned refinancing of external debt) and public enterprises in accommodation and manufacturing industries.

The results of the bank lending survey in the fourth quarter of 2015 and the first quarter of 2016 point to the ongoing increase in loan demand by enterprises and a relaxation of lending terms, which pertains to all corporate segments and loan categories (Figure 64). However, in the first three months of 2016, the trends in loan demand lost some momentum and lending standards tightened from the end of 2015. Among factors that affected the relaxation of standards particularly noteworthy in the observed period were positive expectations regarding general economic trends, enhanced competition among banks and the high level of bank liquidity. In addition, corporate credit demand also recorded positive developments (in the last quarter of 2015, they were the most favourable since the Survey was first conducted), with a particular jump being observed in demand from small and medium sized enterprises. Over one third of the banking sector reported gross fixed capital formation as a contributing factor to demand growth, a major reversal from the earlier part of 2015 and previous years when this factor was one of the main causes for the fall in corporate loan demand. Demand driven by corporate debt restructuring, which was observed in the earlier periods, became even stronger. Furthermore, one should note that the movements in the last two quarters were largely generated by assessments of significant[12] banks in the market.

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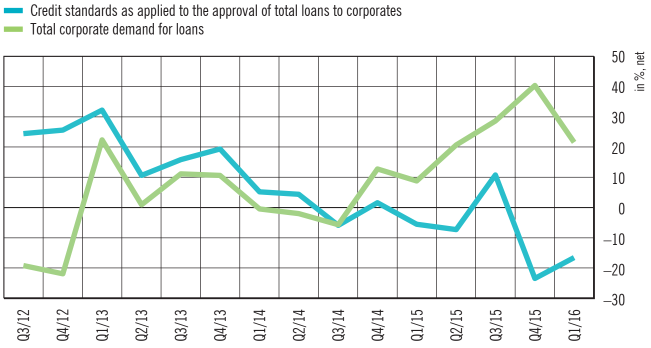
[11] According to the cumulative business results of entrepreneurs in 2015; source: www.fina.hr.

Stagnation in lending to non-financial corporations in the last four quarters paired with their steady deleveraging, which was significantly influenced by write-offs, sale of claims and exchange rate differences, led to a further decline in their debt to domestic banks (Figures 62, 63 and 65). From the end of 2015 to the first quarter of 2016, short-term financing (both kuna and foreign currency) edged up while longer-term financing decreased. On an annual basis, the currency and maturity structure of newly-granted loans slightly changed in favour of short-term loans from March 2015 to March 2016 (Figure 66).

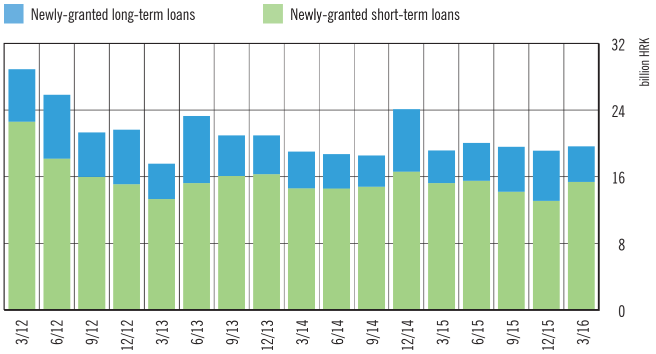
Because of corporate deleveraging with respect to domestic (mostly in a foreign currency) and foreign creditors, the financing and refinancing of debts denominated in the domestic currency, the overall exposure of the non-financial corporate sector to currency risk decreased slightly but remained high. The mild reduction in corporate exposure to currency risk was also due to the fall in the share of foreign currency-indexed loans in newly-granted short-term loans (Figures 66 and 67), which was slightly more prominent in private sector enterprises. In the last six months, the share of newly-granted short-term kuna loans went up by around 3 percentage points (from 53.0% to 56.1%) from the same period in 2015, while the share of newly-granted short-term foreign currency loans decreased (from 13.0% to 10.3%). In addition, in contrast to public enterprises, private enterprises in the period from March 2015 to March 2016 met their foreign currency liabilities to both foreign and domestic creditors to a somewhat greater extent and thus at the same time reduced their currency risk. Broken

Figure 64 Demand steadily increased and credit standards for corporate loans continued to ease in the last two quarters



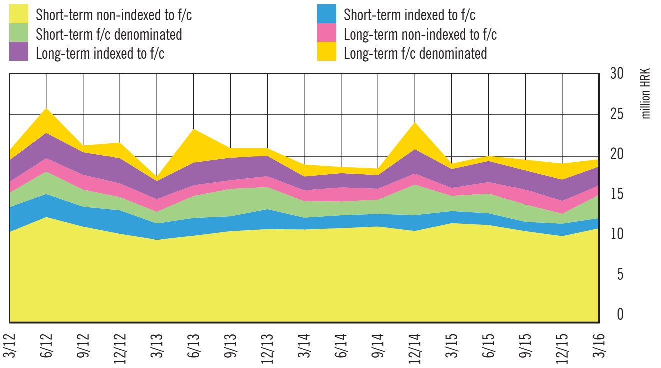
Note: Positive values show the increase in demand, i.e. the tightening of credit standards, whereas negative values show the decrease in demand, i.e. the easing of standards.
Source: CNB.

Figure 65 Lending to non-financial corporations stagnant in the last six months



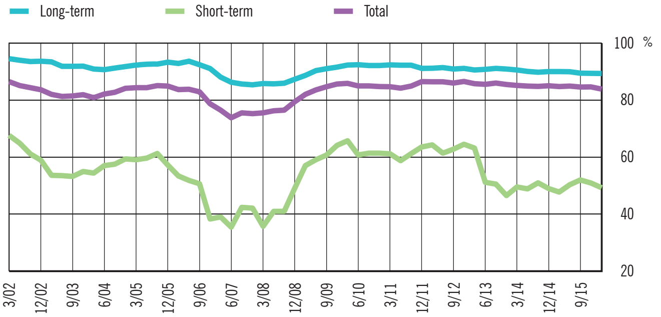
Note: The figure shows newly-granted domestic bank loans to non-financial corporations.
Source: CNB.

Figure 66 A slight increase in short-term corporate financing in kuna (on an annual basis)



Notes: The figure shows the breakdown of newly-granted loans to non-financial corporations by maturity and currency. Short-term loans comprise personal overdrafts, which are statistically recorded as newly-granted loans in each month.
Source: CNB.

Figure 67 Share of corporate non-kuna debt[a] remained mostly unchanged



[a] It is assumed that total external debt is denominated in foreign currencies. Debt indexed to foreign currencies (a foreign currency clause) is also included.
Note: Presented is the share in total corporate debt (by maturity).
Source: CNB.

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12 In terms of the share in total corporate loans.

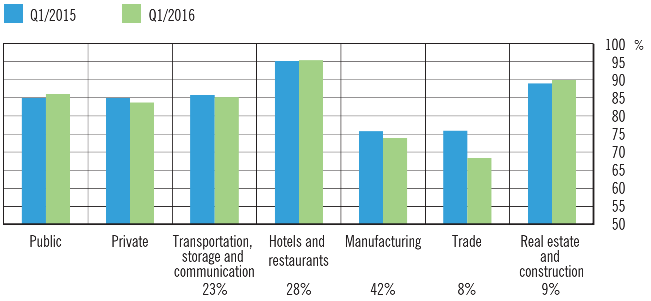
down by activity, the greatest contribution to the mild decrease in the currency exposure of the sector came from enterprises engaged in trade (which usually generate low foreign currency revenues) and manufacturing. The decrease in currency risk exposure mostly related to the mentioned reduction of debt to foreign creditors as well as the increase in short-term kuna financing from domestic banks. Currency risk exposure of enterprises engaged in other activities remained mostly unchanged (Figure 68).

Corporate exposure to interest rate risk increased slightly in the first quarter of 2016 from the end of 2015, additionally underlying the risks associated with potential interest rate growth. In particular, the structure of loans by interest rate variability shows an increase in the share of loans with an interest rate variable within 3 months. The share of these loans stood at a high 86% at the end of March 2016 (it was 79% at end-2015), while the share of loans with interest rates variable within longer periods decreased (Figure 69). One of the reasons for such movements is the said increase in short-term financing relative to long-term corporate financing in the first three months of the year and the resulting shorter period of interest-rate fixing for newly-granted loans in that period.

Long-term interest rates of domestic banks held steady from September 2015 to March 2016, remaining within the range of their usual volatility. Prices of short- and long-term corporate financing drifted lower, averaging 4% and 5% respectively. However, in the first three months of 2016, short-term interest rates on corporate loans in Croatia dropped slightly more, owing mostly to the decreased price of kuna financing, which is structurally significant. Notwithstanding abundant bank liquidity and stronger competition among banks, the relatively high country risk premium (which trended up from early 2015 and dropped marginally towards the end of the period under review) was probably one of the factors limiting the scope for any further significant reduction in the price of corporate financing. Parallel with such movements of interest rates in Croatia, their downward trend in the euro area continued in relation to long-term corporate financing (to 1.95% in late March 2016), while short-term interest rates held at the levels attained in mid-2015 (averaging 1.80%). In such conditions, the spread between interest rates on corporate loans in Croatia and the euro area narrowed with regard to short-term loans and widened slightly for long-term loans, reflecting the persistent, relatively high country risk premium (Figures 70 and 71).

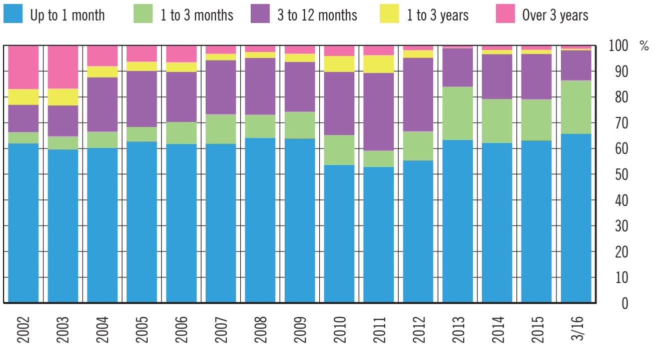
Vulnerability indicators of the non-financial corporate sector show a decline in the overall risk level of the sector, which was mostly due to the fall in solvency and liquidity risks, influenced favourably by persistently good business results in 2015. The downsizing of the non-financial corporate sector debt and increase in earnings before interest, taxes, depreciation and amortisation (EBITDA) contributed to the reduction in liquidity risk, while the parallel fall in solvency risk was under the positive influence of the increase in capital and reserves from total operating profit in 2015. The snowball effect risk also decreased somewhat in 2015 due to the expected continued in-

Figure 68 Trade and manufacturing have decreased their currency risk exposure



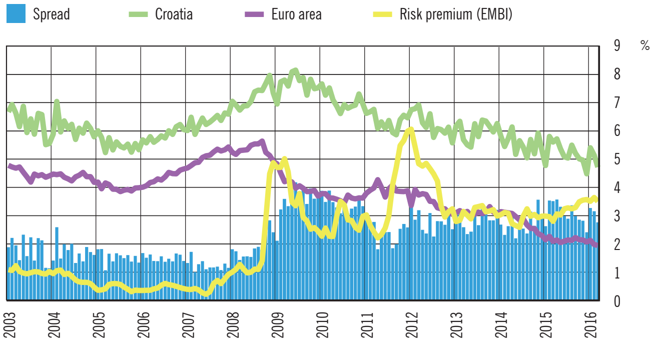
Notes: The figure shows the share of corporate non-kuna debt in total loans (by sub-sector and activity). Percentages on the horizontal axis indicate the share of export revenues in total revenues of the activity in 2015. It is assumed that total external debt is denominated in foreign currencies. Debt indexed to foreign currencies (a foreign currency clause) is also included.
Sources: FINA and CNB.

Figure 69 Risks associated with potential growth in interest rates on corporate loans grew slightly



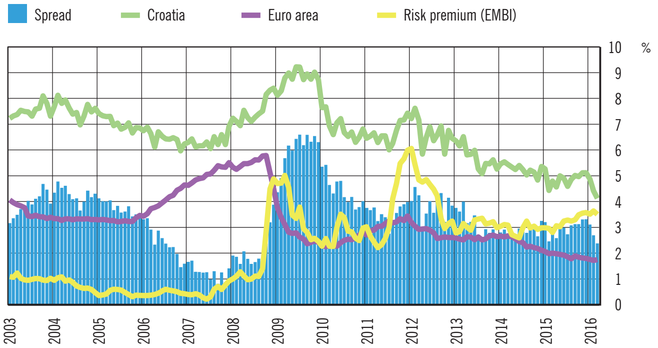
Note: The figure presents a breakdown of bank loans to non-financial corporations by interest rate variability.
Source: CNB.

Figure 70 In contrast with the euro area, interest rates on long-term loans in Croatia have held steady



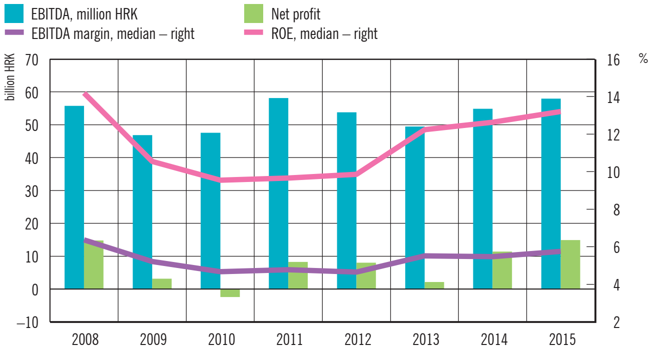
Note: Among other things, the figure shows interest rates on newly-granted long-term corporate loans in Croatia and the euro area.
Sources: ECB, Bloomberg and CNB.

Figure 71 Interest rates on short-term loans to non-financial corporations have drifted down



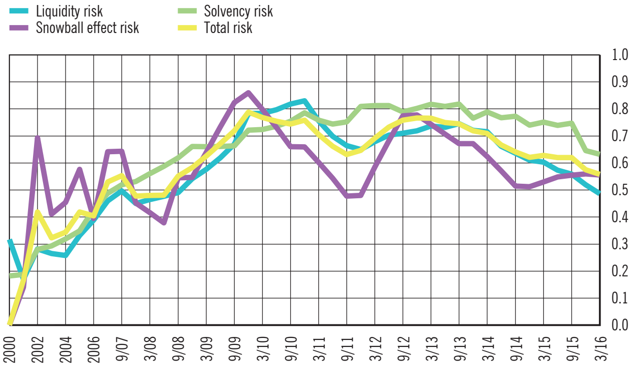
Note: Among other things, the figure shows interest rates on newly-granted short-term corporate loans in Croatia and the euro area.
Sources: ECB, Bloomberg and CNB.

Figure 73 Aggregate business results of non-financial corporations recovered in 2015, almost to the pre-crisis level in 2008



Sources: CNB and FINA .

Figure 72 Good business results and debt reduction helped to decrease corporate sector risk



Note: Vulnerability indicators of the non-financial corporate sector. The vulnerability of the non-financial corporate sector was estimated by three indicators. The liquidity risk indicator was calculated as the ratio of the sum of the total debt amount and interest payments of the sector to gross operating profit, i.e. EBITDA:

$$LR_t = 0.5 \cdot \frac{Debt_t}{\text{EBITDA}_t} + 0.5 \cdot \frac{Interest\ payments_t}{\text{EBITDA}_t}$$

The solvency indicator was calculated as the debt-to-equity ratio:

$$SR_t = \frac{Debt_t}{Equity_t}$$

The snowball effect risk was calculated as the ratio of interest payments to the average debt adjusted by the growth in gross operating profit, i.e. EBITDA:

$$SNR_t = \frac{Interest\ payments_t}{\frac{Debt_t + Debt_{t-1} + Debt_{t-2} + Debt_{t-3}}{4}} - \left(\frac{\text{EBITDA}_t}{\text{EBITDA}_{t-4}} - 1\right)$$

These indicators were normalised to the value range 0 – 1 and the total risk was calculated as the average of the three mentioned normalised indicators:

$$TR_t = \frac{LR'_t + SR'_t + SNR'_t}{3}$$

Expected profit (EBITDA) of corporations was estimated in line with GDP growth projections for 2016.

Sources: FINA and CNB.

crease in corporate earnings (EBITDA) in 2016 (Figure 72). In view of the fact that the 2014 increase in EBITDA exceeded the implicit interest rates paid on the average corporate debt, the snowball effect risk indicator remained in the zone of very low risk. According to the first released cumulative business results of entrepreneurs for 2015, which include non-financial and financial corporations, as well as tradesman, individuals and associations in the dual bookkeeping system, profit for the period grew by more than 100%, while capital and reserves increased by almost 9%. EBITDA of non-financial corporations went up around 6% in 2015, while net profit surged by around 30% (Figure 73). Cumulative annual financial statements of entrepreneurs for 2015 show that export sale revenues and imports grew by around 10% and 6% respectively. Investments in long-term assets increased by around 14%, which explains the significant rise in demand for investment loans evident in the bank lending survey results. In 2015, a noticeable decrease was recorded in long-term liabilities to affiliated enterprises (of 23%) and long-term liabilities arising from securities (of 39%).

Described movements suggest that a portion of profits of non-financial corporations continued to be transferred to capital and reserves (reserves increased in 2015 by around 40%), while the remaining portion was used to decrease the liabilities to funding sources, above all long-term liabilities to affiliated enterprises and long-term liabilities arising from securities.

The upward trend in aggregate capitalisation of enterprises, primarily from generated profits, is expected to continue in the forthcoming period. Recent developments also suggest that demand for investment loans may continue to grow, which is also due to historically low interest rates on long- and short-term corporate loans. Should such trends continue, the risks to financial stability coming from this sector should decrease steadily, above all due to stronger profitability and capitalisation of the non-financial corporate sector.

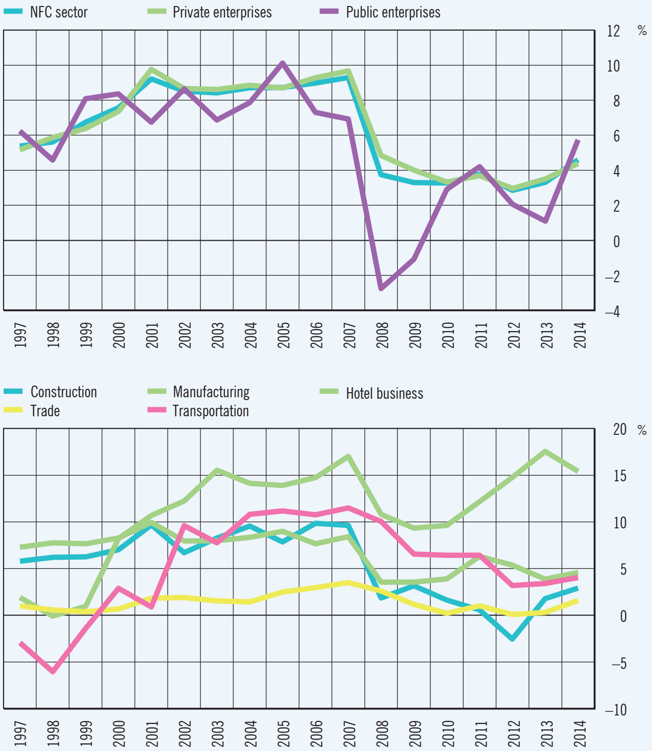
Box 2 Decomposition of changes in profitability of non-financial corporations in Croatia by means of the Jeon-Miller decomposition

In economic practice, aggregate profitability indicators are often interpreted as changes arising from movements in the profitability of individual enterprises, while in reality it is possible that no enterprise actually recorded profitability growth. For example, it is possible that an increase in sector profitability is caused by the exit of less profitable enterprises from the market or an increase in the market shares of more profitable ones. Jeon and Miller developed a decomposition method that breaks down market profitability into several components. This provides useful information on movements in profitability in the market under review, without the need to observe individual data on market participants.

General movement in profitability and the methodological approach

Gross profit margin (GPM), defined as the ratio of gross operating profit[1] to total operating income, was used as a measure of sector and activity profitability. In the period from 1997 to 2014, the GPM of the non-financial corporate sector and the sub-sector of private non-financial corporations averaged 6.3%. In the pre-recession period, it averaged 8.7%, while during the crisis, i.e. after 2008, it was almost three times lower (averaging 3.5%). In the same period, the GPM of public sector enterprises exhibited similar dynamics, though at lower levels[2]. Broken down by activity, the hotel business recorded above-average profitability in the period after 2002, and even during the crisis its profitability exceeded 10% (over 18% in 2013), while, as expected, below average profitability in the crisis period was seen in trade and construction (Figure 1).

Figure 1 Movements in gross profit margin by segments and activities



Sources: FINA, CNB and CNB calculations.

The methodological calculation of the Jeon-Miller decomposition is simple. As mentioned earlier, changes in profitability are decomposed into four components[3]. The first component is the change within, which represents the effect of changes in performance of individual enterprises. For example, profitability growth in a particular industry is interpreted as profitability growth of enterprises engaged in that activity. The other component is the change between, which represents the change of market shares of enterprises operating in the observed market. The market share of a particular enterprise is defined as the share of total operating revenues generated by that enterprise in total operating revenues of the activity under review. For example, an increase in the market share of an enterprise with higher profitability or a decrease in the market share of less profitable enterprises leads to growth in sector profitability. Finally, the third and fourth components are the effects of entries and exits of enterprises, which illustrate the contribution of new participants in the market and the contribution of their elimination from the market (or merger/acquisition). For example, the entry of more profitable or the exit of less profitable enterprises will stimulate profitability growth, while the entry of less profitable or the exit of more profitable enterprises will stimulate a decline in profitability.

Technically speaking, the analysis covered performance data of non-financial corporations[4] (FINA database) in the period from 1996 to 2014. Time of entry to the market is defined as the first year in which

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[1] Gross operating profit is defined as the difference between operating revenues and operating expenses (material costs + staff costs).

[2] Particularly noteworthy were 2008 and 2009, when the GPM of public enterprises was negative, averaging –1.9%. This was the result of revenues decreasing twice as much as expenses (16% vs 8%) from 2007 to 2009. Within operating expenses, material costs were reduced the most.

[3] In formal terms, a change in sector (activity) profitability is defined as follows:

$$\Delta R_t = \sum_{i=1}^{n_t^{stay}} r_{i,\Delta t} \cdot \bar{\theta}_i \,(within) + \sum_{i=1}^{n_t^{stay}} (r_i - \bar{R}) \cdot \theta_{i,\Delta t}\,(between) + \sum_{i=1}^{n_t^{enter}} (r_{i,t} - \bar{R}) \cdot \theta_{i,t}\,(entry) \;-$$

$$- \sum_{i=1}^{n_{t-1}^{exit}} (r_{i,t-1} - \bar{R}) \cdot \theta_{i,t-1}\,(exit),$$

R_t and $r_{i,t}$ are the GPM of the sector and individual enterprise in year t, while θ_i and $\theta_{i,t}$ are corresponding market shares,

$$r_{i,\Delta t} = r_{i,t} - r_{i,t-1},$$

$$\theta_{i,\Delta t} = \theta_{i,t} - \theta_{i,t-1},$$

$$\bar{\theta}_i = \frac{\theta_{i,t} - \theta_{i,t-1}}{2},$$

$$r_i = \frac{r_{i,t} + r_{i,t-1}}{2},$$

$$\bar{R} = \frac{R_{i,t} + R_{i,t-1}}{2}.$$

[4] a) Tradesmen are not included in the analysis; b) In line with the methodology of the European System of National and Regional Accounts (ESA 2010), in order to ensure the comparability of data before and after 2014, the analysis does not include the following: CR Infrastructure, Croatian Radiotelevision, CM, Croatian Roads and Rijeka – Zagreb Motorway, which have been included in the central government sector as of 2014.

an enterprise files a financial statement[5], while the first year after the last submission of the financial statement is considered the year of exit. In addition, it is considered that enterprises with total operating revenues below HRK 5000 actually do not exist in the market, so that the years in which total operating revenues are for the first time lower or higher than that amount are considered adjusted exits and entries respectively. Therefore, it is considered that all other enterprises remained in the market in the current and preceding year. A specific situation is the absence of a financial statement for an enterprise that submitted it in the preceding and following year. Such enterprises with interruptions[6] (almost always of one year) are included in the aggregate by injection of the arithmetic mean of financial variable values in the preceding and following year into the missing year. Furthermore, enterprises whose profitability is within the 1st percentile[7] of the GPM distribution for enterprises are also excluded from consideration (on an annual level).

Analysis results

Changes in profitability and market shares of individual enterprises stand out as key factors that trigger movements in profitability of the sector as a whole. While periods of growth in sector profitability were mostly spurred by the increase in market shares of more profitable enterprises and the decrease in market shares of less profitable enterprises, the periods of downturns in profitability were mostly due to lower profitability on an individual level (Table 1).

Furthermore, in the pre-crisis period, the "within" effect, i.e. the effect of changes in profitability of enterprises on an individual level, had (on average) a mildly negative impact on the increase in sector profitability, which became increasingly smaller over time (from 2002 to 2007).

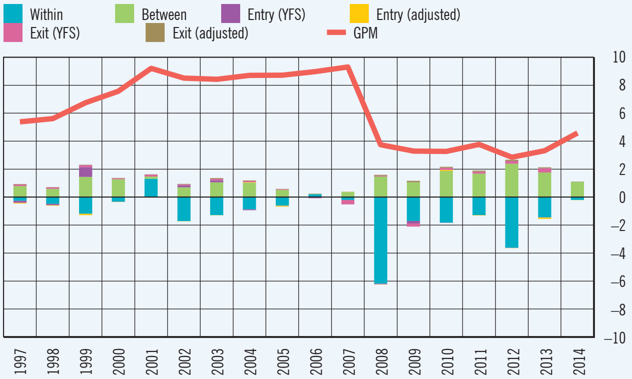
Table 1 Contributions of particular effects to changes in sector GPM in the period from 1997 to 2014

	Contribution to net change	Contribution to growth	Contribution to fall
Within effect	–21.68	–7.17	–14.51
Between effect	19.23	12.56	6.67
Entry effect (YFS)	0.34	0.28	0.06
Entry effect (adjusted)	–0.31	–0.26	–0.04
Exit effect (YFS)	1.18	0.98	0.20
Exit effect (adjusted)	0.82	0.47	0.35

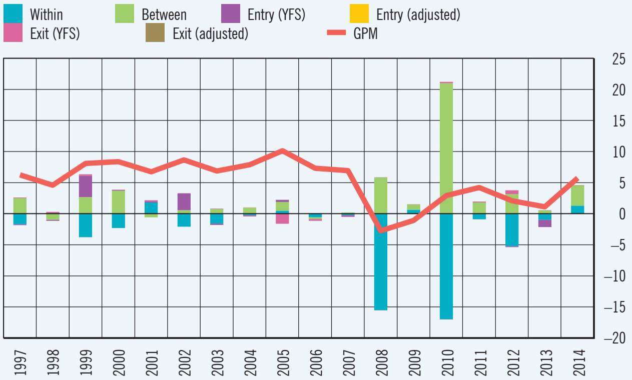
Note: The effects are reported in such a way that in the sum they correspond to the change in GPM expressed in percentage points in the period from 1997 to 2014.
Source: CNB calculations.

This suggests that, in addition to the rise in profitability of individual enterprises, market shares of less profitable enterprises decreased in the period under review (as a result of an upsurge in total operating revenues of the sector – of 10% to 20% a year). The decrease in market shares of less profitable enterprises is also reflected in the positive impact of the "between" effect. Also, notwithstanding favourable economic conditions in that period and the rise in total sector profitability, the decrease in the level of these two effects over time suggests that there

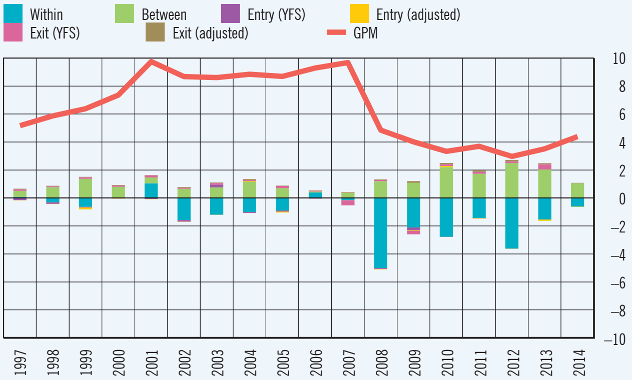
Figure 2 Jeon-Miller decomposition of the sector and sub-sectors of public and private non-financial corporations



Public enterprises



Private enterprises



Note: 1. The "exit" effect was presented with the opposite sign so that the sum of effects represents a change in GPM. 2. See the methodological approach for an explanation of adjusted entries and exits.
Sources: FINA, CNB and CNB calculations.

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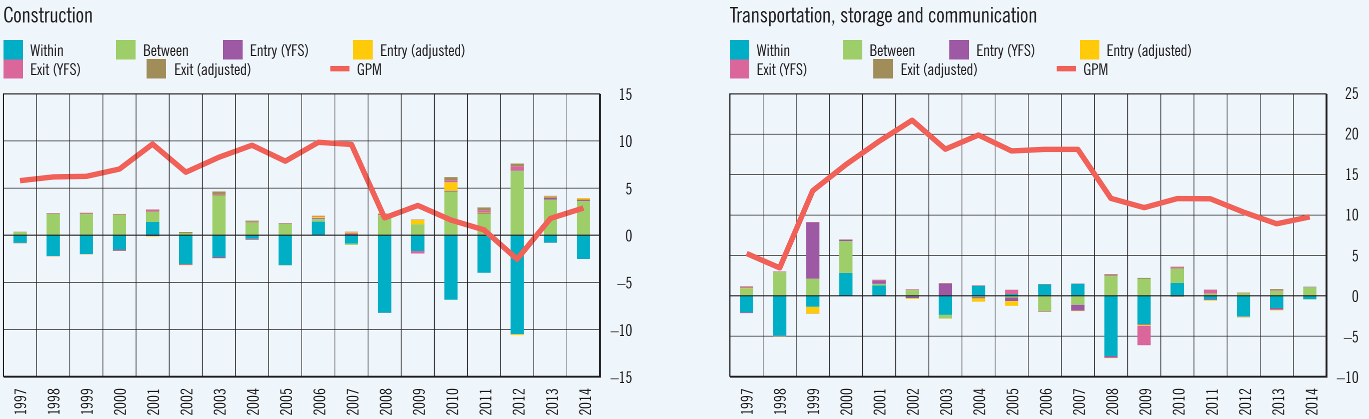
[5] All enterprises that operated at the end of 1996, the first year for which data were available, were considered as existing enterprises, i.e. not established in 1996.

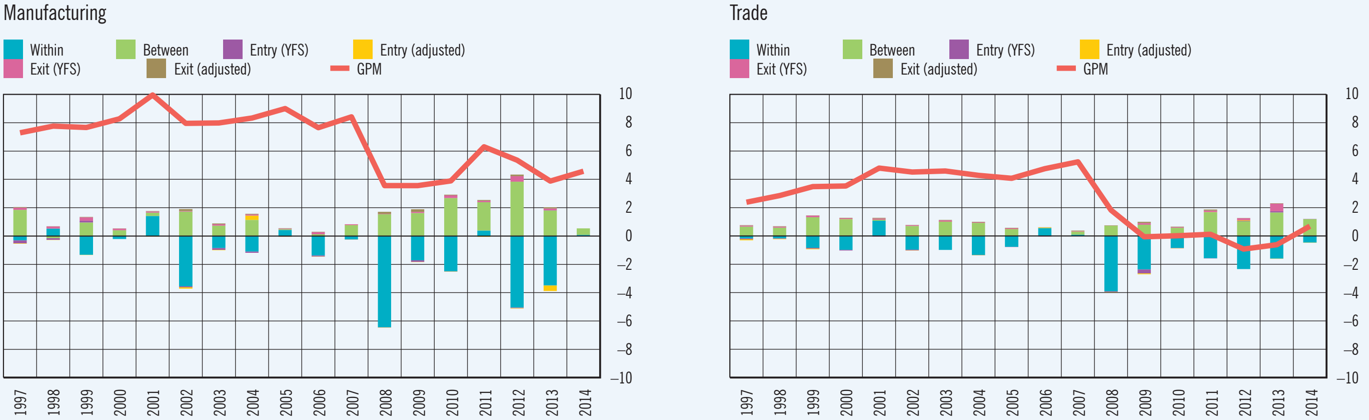
[6] A company has to submit its annual financial statement (GFI-POD) to FINA even if it no longer operates, but was in operation in previous periods and has assets and liabilities recorded in its business books. Only companies that have not operated since establishment need not submit their GFI-POD.

[7] Enterprises with extremely large operating losses and a relatively (compared to generated losses) low level of total operating revenues have a marginal impact on the calculation of the GPM of the sector (activity), while in decomposition their impact on the "within" and "between" effects is significant.

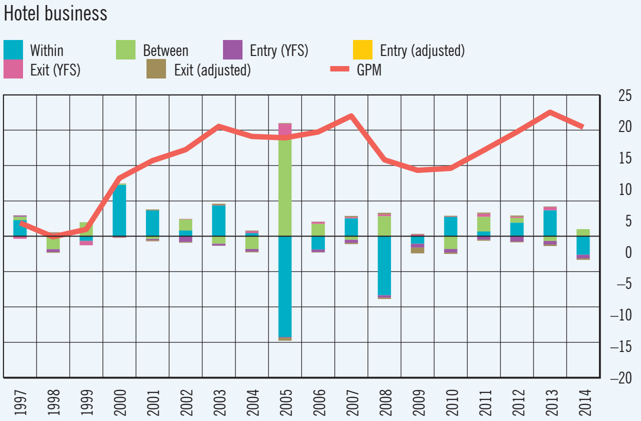
Figure 3 Jeon-Miller decomposition of non-financial corporations (by activity)


Construction

Transportation, storage and communication


Manufacturing

Trade


Hotel business

Note: The "exit" effect was presented with the opposite sign so that the sum of effects represents a change in GPM. See the methodological approach for an explanation of adjusted entries and exits.
Sources: FINA. CNB and CNB calculations.

is a relatively large number of enterprises (almost 50% on average) that operated less profitably and efficiently.

While the growth in market shares of more profitable enterprises and the parallel decrease in market shares of less profitable ones had a positive influence on total sector profitability after 2008, it was insufficient to offset the opposite influence of the lower profitability of many enterprises in that period. As a result, profitability of the whole sector was, on average, lower than in the pre-crisis period (Figure 2).

Observed by sub-sectors of public and private enterprises, profitability in the non-financial corporate sector was predominantly influenced by developments and decomposition of private enterprises. With regard to the profitability of public enterprises, one may notice the larger volatility of the “entry” and “exit” effects, which is due to the relatively small number of public enterprises compared with private ones, and the characteristic higher concentration. During both the pre-crisis and the crisis period, there was no significant change in the profitability of public enterprises on an individual level, with the exception of 2008 and 2010. The strong impact of changes in profitability in 2010 was largely the result of the business problems of a manufacturing company significant for the market (negligible revenues and extremely high expenses). In addition, in 2013, the market entry of a low-profit company (resulting from division) had a major hand in the lower profitability of public enterprises in that year.

Movements in profitability in most activities were similar to movements at the sector level. The exception was the hotel business, where most enterprises continued to record profitability increases in the crisis period, while the growth in the market share of more profitable hotel enterprises produced an additional favourable influence. The atypical year of 2005 was the consequence of extremely large losses of two enterprises with significant market shares as well as their merger in that year. In addition, the transportation, storage and communication activities, with above-average profitability, have been reporting a mild downward trend in profitability ever since 2002. In the pre-crisis period, this was predominantly due to the entry of new enterprises (which operated at a loss in the beginning), with a parallel decrease in the market share and operating revenues of more profitable enterprises. In contrast, in the crisis period, noteworthy was the decrease in profitability on an individual level (Figure 3). The decreases in operating revenues in the pre-crisis period and reduction in profitability on individual levels in the crisis period mostly refer to telecommunication companies.

The least profitable activities, particularly after 2008, were trade and construction. This was mostly due to the fall in profitability of individual enterprises, with the opposite (positive) effect being made by the exit of unprofitable enterprises from the market and the increase in the market shares of profitable ones. Nevertheless, the positive effects were insufficient to offset the fall in profitability of individual enterprises in these activities. It should be mentioned that the exit of enterprises in the construction activity largely refers to the exit of special purpose vehicles from the market (Figure 3). This was mainly the outcome of the sharp decrease in operating revenues of enterprises, which in turn resulted from the illiquidity of the real estate market.

Conclusion

The presented results of the decomposition of changes in profitability of Croatian non-financial corporations (by sector and activity) indicate that, in addition to changes in corporate sector efficiency, developments in total profitability are to a large extent influenced by competition effects, which exert pressure on enterprises and force them to restructure and improve efficiency. Nevertheless, the impact of these effects is somewhat stronger in private enterprises than in public enterprises, both in the pre-crisis and crisis periods. Effects of market entry and exit of enterprises had a relatively small influence on overall profitability trends throughout the observed period[8]. Finally, additional benefits of the Jeon-Miller decomposition of changes in profitability presented will no doubt be provided by analyses planned in future research, primarily in the direction of econometric analysis of determinants of particular effects (by sector and in selected activities).

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[8] The relatively small importance of these effects is mostly due to low total operating revenues of enterprises that generate them, in line with the methodology applied in this analysis. In *de jure* terms, observing the number of non-financial corporations that entered and exited the market, Croatia, with shares of entries and exits averaging 8.0% and 6.5% respectively in the recession period, was below the CEE level, while net entries indicate that Croatia remained at average levels. The data source can be found at the following link: http://ec.europa.eu/economy_finance/events/2015/20151124-workshop/documents/world_bank_section_i_nov24_en.pdf.

Box 3 Comparative analysis of debt of the EU non-financial corporate sector by activity

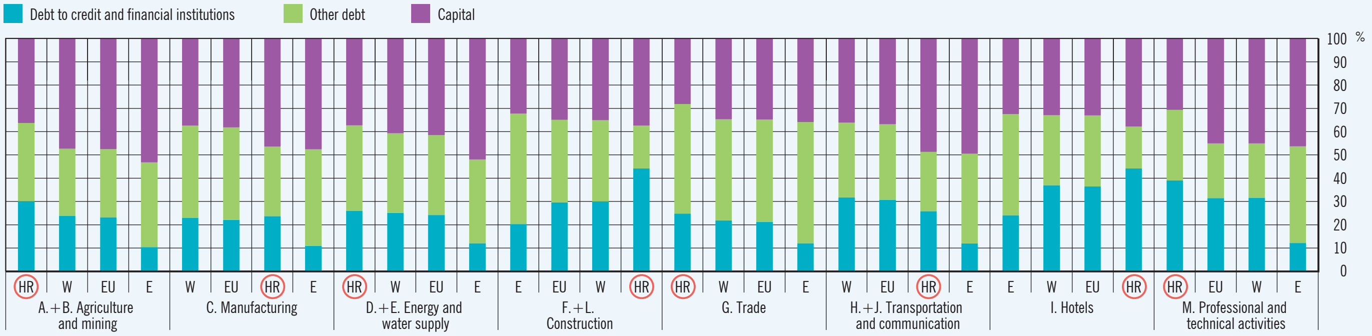
The analysis published in Financial Stability No 16 showed that there are differences in financial leverage and debt indicators of non-financial corporations in Croatia and EU countries. The purpose of this analysis of the non-financial sector debt by industrial activities is to identify the structural levels of debt in EU countries and compare them with Croatian enterprises so as to obtain a comparative overview of debt and profitability by individual activity in comparison with other member states.

This provides an indirect view of credit and concentration risks of enterprises engaged in these activities in Croatia and the contribution of individual activities to the overall risk of the non-financial corporate sector. The analysis includes debt and profitability indicators by industrial activity and the balance sheet structure (total liabilities) for the entire EU in 2014. The analysis is limited to those activities of non-financial corporations that contribute the most to total debt. The data used in the analysis are from the Amadeus database of the Bureau van Dijk and samples are considered to be representative for each member state.

Within the structure of their liabilities, Croatian enterprises in most activities, particularly more heavily indebted activities like construction, manufacturing, hotel business and transportation, storage and communication, have a relatively large share of capital when compared with the EU average. At the same time, enterprises in these activities use other funding sources to a smaller extent, while credit arrangements with financial and credit institutions predominate among others' funding sources (Figure 1).

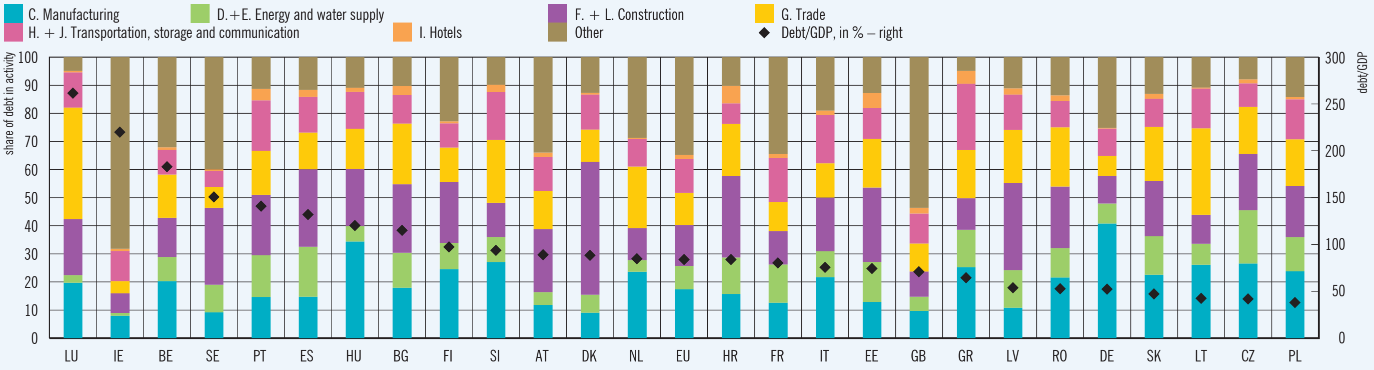
In Croatia, the lowest financial leverage (total assets/capital), i.e. the largest share of capital in the balance sheet, is recorded by transportation, storage and communication companies, while construction and manufacturing enterprises are also relatively well capitalised when compared with the EU average for the activity. Companies engaged in agriculture and mining have, on average, the lowest financial leverage in EU countries. In most activities, Croatian non-financial corporations are

Figure 1 Structure of liabilities according to financing sources by activity in groups of EU countries



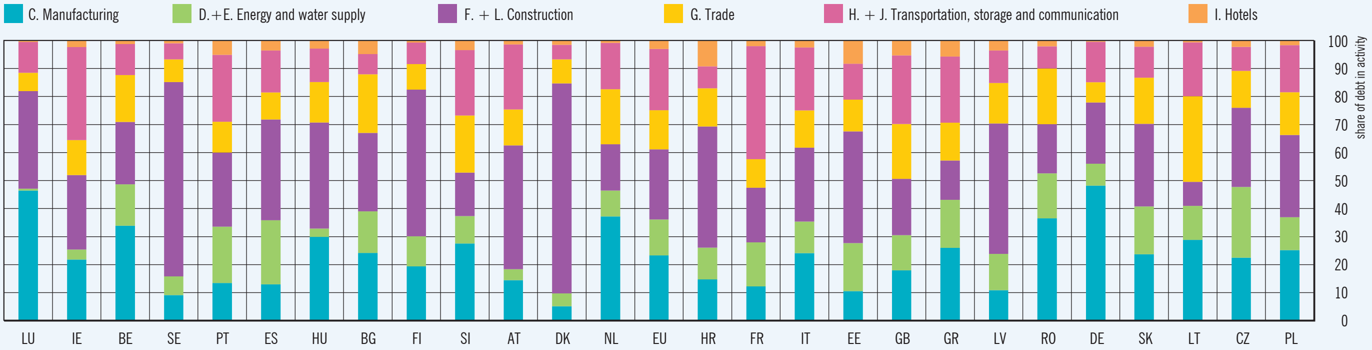
Note: "W" stands for "old Europe" countries: AT, BE, CY, DK, FI, FR, DE, GR, IE, IT, LU, MT, NL, PT, ES, SE, GB; "E" stands for "new Europe" countries: BG, CZ, EE, HU, LV, LT, PL, RO, SK, SI; "EU" includes the average of all 28 EU member states. Within each activity, the groups of countries are presented in descending order by the share of total debt, and in ascending order by the share of capital in liabilities.
Source: BvD Amadeus.

Figure 2 Structure of total non-financial corporate sector debt by activity in EU countries and sector debt



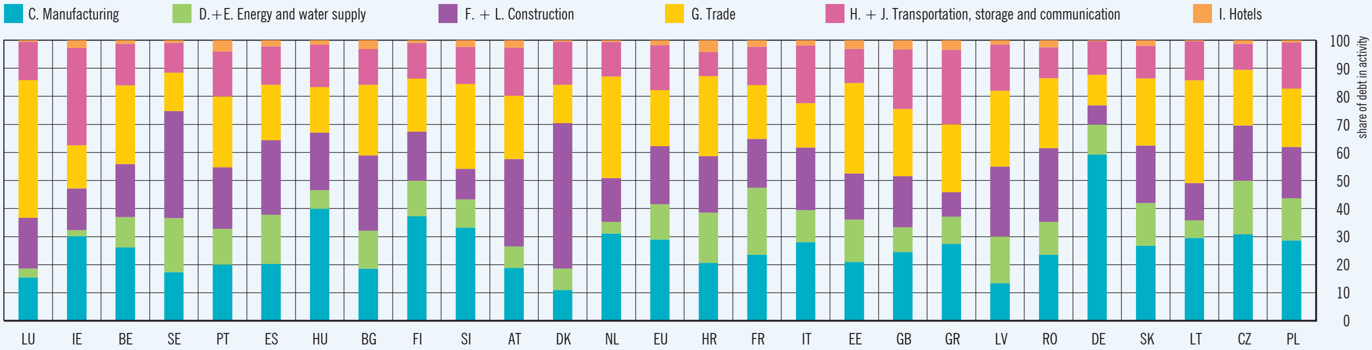
Source: BvD Amadeus.

Figure 3 Structure of non-financial corporate sector debt to credit and financial institutions by activity in EU countries and sector debt



Source: BvD Amadeus.

Figure 4 Structure of other non-financial corporate sector debt by activity in EU countries and sector debt



Source: BvD Amadeus.

relatively more indebted than those from new EU member states, and in some activities they are more indebted than corporations from the "old" EU member states. Compared with the new EU member states, Croatian corporations in all observed activities have a larger share of debt to financial and credit institutions in their total liabilities.

In agriculture and mining, construction and professional and technical activities (where most debt is accounted for by holding companies), with regard to the structure of financing sources, a much larger share of funding of Croatian enterprises is based on debt to financial and credit institutions, even when compared with enterprises from "old" EU member states. The debt to financial and credit institutions of Croatian enterprises engaged in transportation, storage and communication, and hotel business is lower than the EU average and the average for "old" EU member states, but exceeds the average for "new" Europe.

Total debt, in addition to indebtedness, i.e. the financial leverage of individual enterprises, is also determined by the structure of the economy. Due to the Croatian economy's orientation towards tourism, companies in the hotel business, and construction as an auxiliary activity, have a large share of assets and debt in the branch structure of assets and debt of the non-financial corporate sector (Figure 2). Predominant within the structure of total debt of the non-financial corporate sector by activity in Ireland and the United Kingdom, as well as Sweden, Belgium and France (Figure 2), is the debt of companies engaged in other activities, mostly companies engaged in management activities. This mostly refers to parent companies of large multinational corporations and groups that manage subsidiaries consolidated in their balance sheets. In Croatia, the share of these companies is among the lowest in the EU, amounting to around 8% of total assets of Croatian non-financial corporations.

While having a much larger share of debt to financial and credit institutions than their EU counterparts (Figure 3), construction and hotel business enterprises in Croatia also have the smallest share of funding from other sources and the lowest financial leverage in Europe (the largest share of capital in assets, which indicates the management impact of the unit of capital on company assets, hence the name of the indicator (Figures 1 and 4).

Croatian enterprises use other sources of finance less than the EU average, with the exception of trade and energy and water supply activities, where the share of other debt in total debt is at the level of that in "old" Europe countries (Figures 1 and 4). Therefore, construction and hotel business activities in Croatia have the lowest share of other debt in total debt as they are more oriented towards financing from own sources or from financial and credit institutions. Funding sources such as postponed payments of liabilities to suppliers, advance payments, intragroup financing and issuance of debt securities are less used by Croatian enterprises than by those in "old" Europe countries, where such financing forms are more developed and have been in use for centuries. The bulk of other debt of Croatian enterprises consists of liabilities to suppliers (mostly used by companies in trade), liabilities to affiliated enterprises, loans and deposits and tax liabilities, while liabilities arising from securities and advances are almost negligible in other debt (both account for around only 2% of other debt of Croatian corporations).

It is difficult to establish whether such balance sheet structures lead to increased risks without a detailed quantitative analysis of risk factors, but a relative assessment can be made, i.e. a rating based on a comparison of branch indicators among EU countries. Indicators with good predictive properties for assessing the probability of default (PD) will be used for the purpose. One of the univariately most predictive measures of risk in the domain of profitability indicators is profitability expressed as the ratio of earnings before interest, taxes, depreciation and amortisation (EBITDA) and total liabilities (EBITDA / total liabilities). Among debt indicators, the own funding coefficient (capital / total assets * 100%) exhibits a high univariate predictability, the inverse value of which is also interpreted as financial leverage. A high level of the own funding coefficient coupled with high profitability correlates with the low level of risk in such an activity, as high profitability can also ensure the ability to service in good time all types of liabilities: to financial institutions and other liabilities.

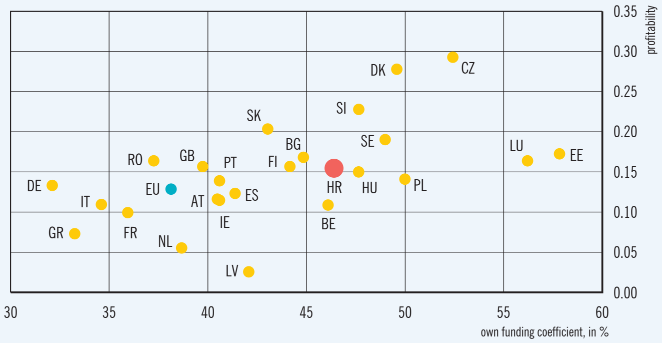
The figures below show the profitability indicator in relation to the own funding coefficient by EU countries and main activities.

With regard to the profitability indicator and the own funding coefficient, the manufacturing industry (C., Figure 5) in Croatia is slightly above the average for the manufacturing industry in the EU. According to indicators defined in this way, Croatian manufacturing companies are somewhat better rated that their counterparts from Greece, Italy, France, Latvia, the Netherlands, Germany, Belgium and Portugal, and worse rated than companies from most "new" Europe countries (Poland, the Czech Republic, Slovakia, Estonia, Hungary, Slovenia,...). The higher EBITDA profitability than in "old" Europe is the consequence of larger amortisation and depreciation of tangible assets, as discussed in Financial Stability No 16, which influences a higher relative profitability than in other EU countries with somewhat different business practices regarding the management of company's tangible assets.

The construction activity (F. and L., Figure 6) in Croatia has a somewhat better own funding indicator than the EU average, while it is almost equal to the branch average in the EU with regard to the profitability indicator. The impact of the large share of total construction debt in sector debt results in a higher risk of that activity for Danish companies, while the high profitability of Swedish and Finnish construction companies compensates for their low own funding coefficient.

Figure 5 Profitability and own funding coefficient of manufacturing activity in EU countries

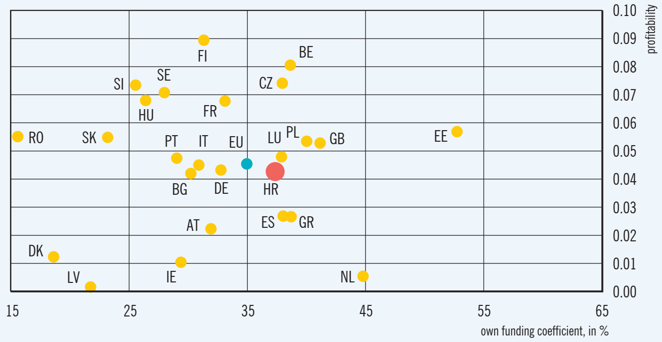
C. Manufacturing



Source: BvD Amadeus.

Figure 6 Profitability and own funding coefficient of construction activity in EU countries

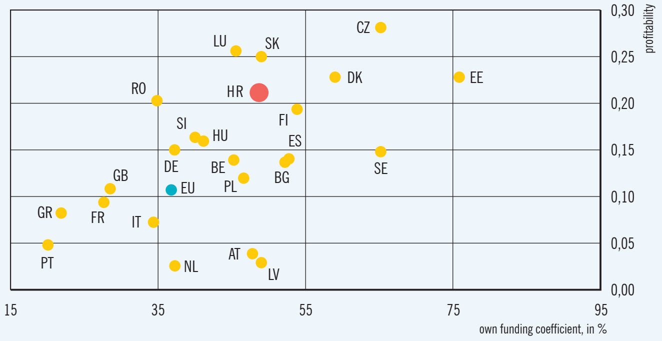
F. + L. Construction



Source: BvD Amadeus.

Figure 7 Profitability and own funding coefficient of transportation, storage and communication activities in EU countries

H. + J. Transportation, storage and communication



Source: BvD Amadeus.

According to the observed indicators, transportation, storage and communication activities (H. and J., Figure 7) are the best rated activities in Croatia and they put Croatian companies among the most profitable and below-average indebted companies in EU countries.

The analysis shows that Croatian companies in the most heavily indebted activities – construction and manufacturing – use different sources of finance: while construction companies borrow more from financial and credit institutions, manufacturing companies (and trade companies) rely more on the financing options provided by their suppliers, such as postponed payment for delivered goods and services and other funding sources. The manufacturing industry uses its own funding sources (capital) more than construction so that, with a higher EBITDA profitability, manufacturing companies are better rated than construction companies. Croatian manufacturing companies are better rated than the EU average and, as a result of deleveraging with respect to financial and credit institutions, they are continuing to raise the own funding coefficient, thereby improving further their performance indicators. Croatian construction companies are within the limits of the average EU values. Croatian companies in transportation, storage and communication activities stand out for their high profitability and own funding coefficient, which puts them among the better rated companies in the same activity from EU countries, while the growth in their debt indicates further development of this activity in Croatia. Finally, it should be noted that this analysis was conducted on data aggregated by activity, so that the conclusions for the calculated aggregate cannot be directly applied to all companies engaged in that activity.

Banking sector

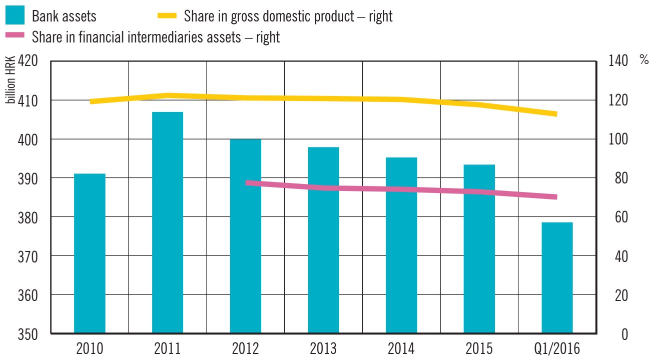
Stable operating income and the intensified sale of non-performing placements have a positive effect on banking sector stability. In contrast, vulnerability may grow should the recent trend of increased payments of retained earnings continue.

Balance sheet vulnerabilities

The decline in bank assets on an annual level (Figure 74) was the consequence of the steady decrease in the credit portfolio of the private sector (Figure 75), which was stepped up by the principal write-off related to the conversion of Swiss franc-indexed loans, intensified sale and write-offs of non-performing claims, as well as the appreciation of the kuna against the euro. The asset decrease was particularly strong in the last quarter of 2015 and the first quarter of 2016 when banks deleveraged abroad, i.e. with respect to majority foreign owners, by withdrawing seasonally accumulated deposits with foreign banks. This continued the several-year downward trend in banking system assets, which at the end of the first quarter 2016 dropped to the end-2009 level. As a result, the share of banks in total assets of financial intermediaries fell to around 70%, but banks remained the most represented financial intermediaries in Croatia.

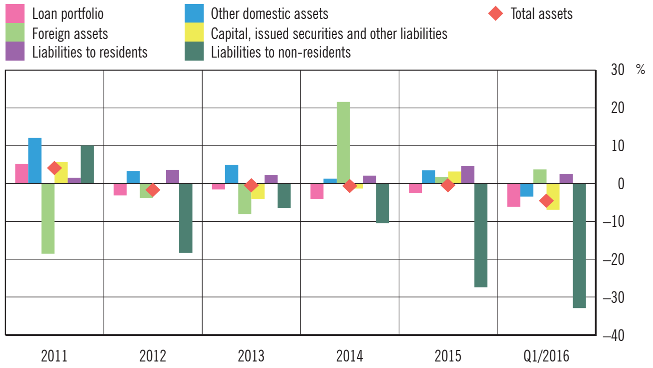
Amid the falling domestic assets, high liquidity and low interest rates on stable domestic sources of finance, banks repaid foreign funding and reduced their dependence on cross-border financing. The decrease in total liabilities of the banking system, of HRK 16.5bn at end-March 2016, was entirely due to deleveraging of banks with respect to foreign owners by reducing received loans and deposits. These funding sources decreased by 60% from the end of March 2015. The shares of other sources went up, including the share of resident deposits, which accounted for 78% of total bank liabilities at end-March 2016 (Figure 76).

Figure 74 Total bank assets dropped to the end-2009 level



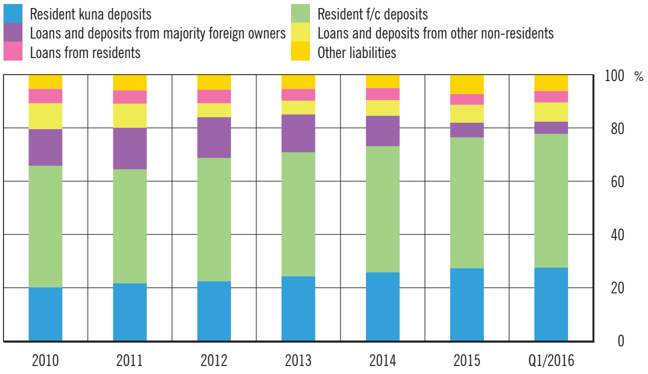
Note: Selected developments in the banking sector; the figures indicate the annual rate of change in total net assets of the banking sector.
Source: CNB.

Figure 75 Reduction of the credit portfolio and deleveraging with respect to foreign owners set the trends in bank balance sheets



Note: The year-on-year rates of change in major banking sector balance sheet items.
Source: CNB.

Figure 76 Reduced reliance of banks on cross-border funding sources



Note: Structure of banking sector liabilities.
Source: CNB.

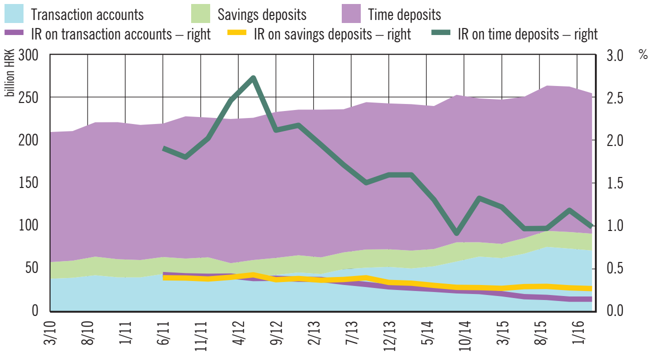
This reduced bank dependence on parent banks. It should be noted that resident deposits are a more diversified funding source and are mostly covered by the deposit insurance scheme. Nevertheless, the increase in resident deposits was entirely the result of the rise in balances in transaction accounts, which are, because of their smaller reallocation costs for clients, a more unstable source than time deposits. For banks, this increases the risk of liquidity outflows as well as reinvestment, particularly in an environment characterised by stress conditions.

While time deposits decreased, funds in transaction accounts grew steadily, at least partly owing to the fall in interest rates and introduction of taxes on (kuna and foreign currency) savings, which further intensified the trend (Figure 77)[13].

The credit portfolio decreased continuously, whereas the share of the government in banks' balance sheets increased, strengthening the link between the sovereign risk and banks' solvency. The fall in loans granted, of HRK 15.7bn, was also due to the write-off of the principal of Swiss franc-indexed loans that were converted to euro-indexed loans[14]. Placements to the government recorded a 1.9% annual decrease at the end of March 2016. However, as households and enterprises deleveraged at a faster pace[15], the share of placements to the government continued to grow, to 19.1% of assets at the end of March 2016 (Figure 78). While such a banking business model is generally perceived as less risky, the latest iteration of stress testing[16] indicated its vulnerability to a sudden change in the subdued global risk premium. Such a change would probably cause liquidity turmoil in secondary markets, particularly because the bulk of government securities is held in portfolios traded at market values.

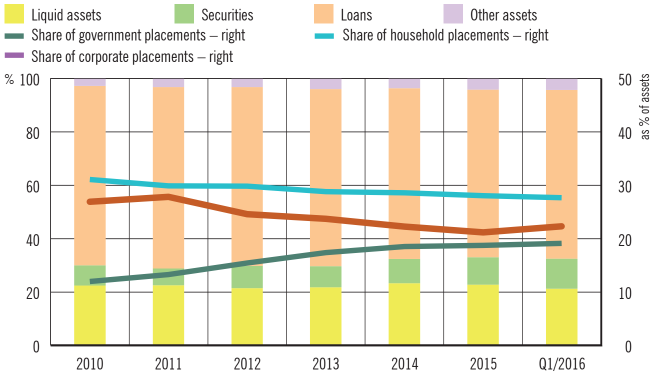
Along with the fall in loans, banks recorded an 8.3% annual decrease in liquid assets (Figure 78), which was triggered by the downturn in deposits with the CNB after the decision on the compulsory purchase of CNB bills had ceased to have effect. To ensure sufficient liquidity in the kuna money market, which had been reduced by the conversion of Swiss franc-indexed loans, the CNB abolished the compulsory purchase of these bills. In particular, the write-off of some loans indexed to the Swiss franc led to bank deleveraging, in particular with respect to foreign owners. In efforts to obtain the foreign currency funds needed for deleveraging, banks reduced their kuna liquidity,

Figure 77 Steady fall in interest rates on time deposits spurred an increase in funds in resident transaction accounts



Note: Structure of resident deposits and interest rates on new deposits.
Source: CNB.

Figure 78 Bank exposure to government units continued to increase



Note: Structure of banking sector assets.
Source: CNB.

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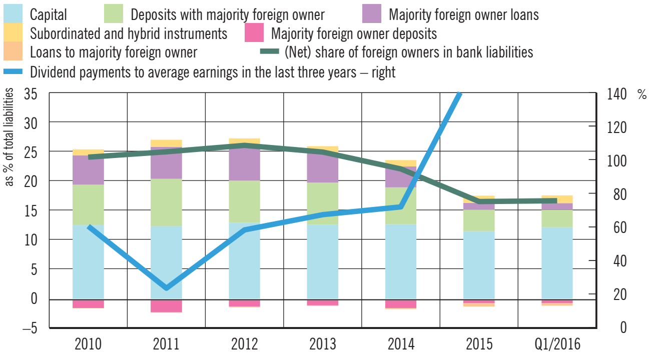
[13] Under the Act on Amendments to the Income Tax Act (OG 143/2014), a 12% tax on interest on kuna and foreign currency savings (sight, time and annuity) was introduced as of 1 January 2015. Interest receipts on funds in current and giro accounts are not taxed if the interest rate is below 0.5% per annum. See the section Household deposits in the chapter Household sector.

[14] The Act on Amendments to the Consumer Credit Act (OG 102/2015).

[15] The rates of the annual change in placements to households and enterprises stood at –8.8% and –4.9% respectively.

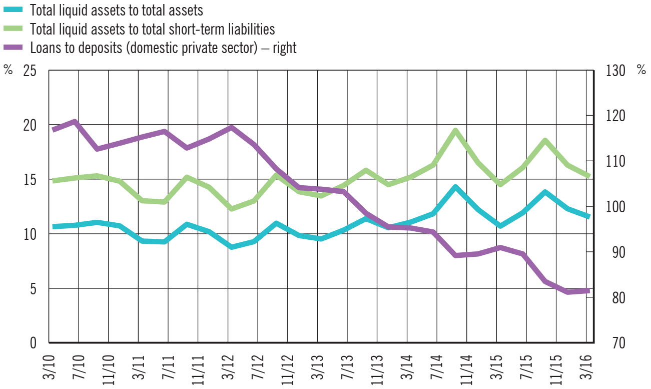
[16] See the chapter Stress testing of credit institutions, *Financial Stability*, No. 16, February 2016.

Figure 79 Significant decrease in the net financial position with respect to foreign owners partly due to record high dividend payments



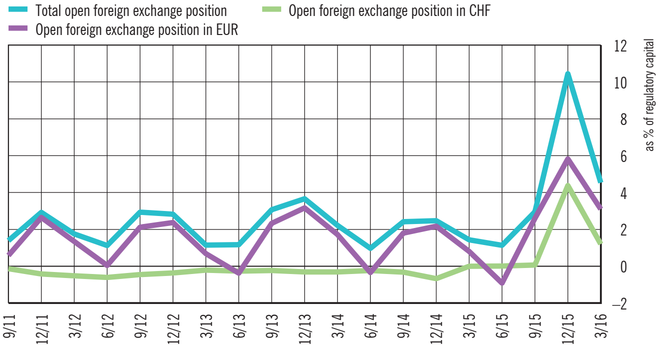
Note: Net financial position of banks with respect to foreign owners.
Source: CNB.

Figure 80 High liquidity indicators remained on a several-year upward trend



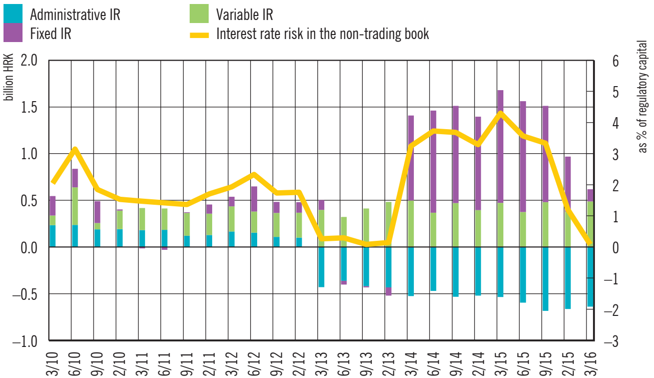
Source: CNB.

Figure 81 Temporary large mismatch of the net foreign exchange position returned to average levels after the conversion of CHF loans



Note: The figure shows average daily values of indicators in the quarter observed.
Source: CNB.

Figure 82 Exposure to interest rate risk in the non-trading book and change in the economic value according to the type of interest rate



Source: CNB.

though it increased again after the abolition of the decision on the compulsory purchase of CNB bills.

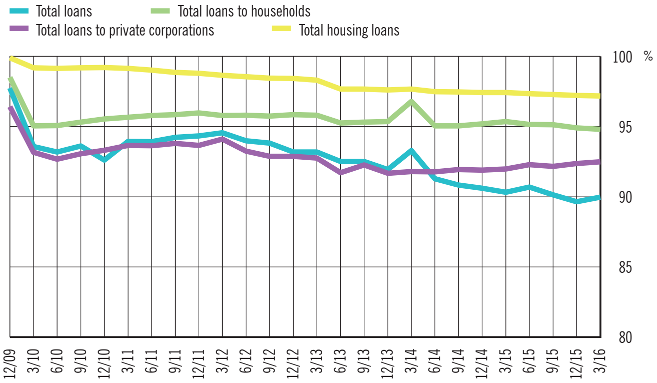
As the amount of loans and deposits received from foreign owners dropped, the share of foreign owners in bank liabilities fell to 16.6 percentage points (Figure 79). Dividend payments in 2015 exceeded by a large margin the average bank profits earned in the last three years (Figure 79), making up another channel of deleveraging with respect to foreign owners while, bearing in mind the losses generated in 2015, they created additional pressures on bank capital.

Exposure to direct and indirect risks

Notwithstanding the decrease in bank liquid assets, thanks to the simultaneous and even more pronounced fall in loans granted, the years-long upward trend in liquidity indicators of the Croatian banking sector continued (Figure 80). At the same time, the loan-to-deposit ratio dropped to its lowest level since 2004. Therefore, while Croatian banks finance loans from sources of financing perceived to be stable, such movements also indicate the absence of nominal credit growth notwithstanding the mild economic recovery over the last year.

In managing direct currency risk, i.e. the net open foreign exchange position, banks do not show a strong propensity to take risks. With some seasonal fluctuations triggered by seasonal foreign currency inflows during the tourist season, the net open foreign exchange position was relatively matched and was up to 4% of own funds. The matching of the banks' net foreign exchange position decreased temporarily towards the end of the year (Figure 81), which was related to the process of conversion of Swiss franc-indexed loans. The mismatch was largely due to the bookkeeping treatment of embedded derivatives in the course of conversion of Swiss franc-indexed loans to euro-indexed loans and the treatment of loan loss provisions for Swiss franc-indexed loans as kuna provisions.

Figure 83 The share of unhedged loans in total loans exposed to CICR has remained relatively high



Source: CNB.

The measured interest rate risk in the non-trading book was reduced by the conversion of Swiss franc-indexed loans to euro-indexed loans because interest rates on the former loans had been fixed as of January 2014 by amendments to the Consumer Credit Act[17]. Therefore, this risk was around 0.1% of own funds at the end of March 2016 (Figure 82).

With reduced direct interest rate risk, in an environment of historically low interest rates and relatively low global risk aversion, banks continue to be exposed to potential interest rate-induced credit risk, which has increased due to the larger share of loans with variable interest rates (because of the conversion of Swiss franc-indexed loans to euro-indexed loans). Nevertheless, limits on the nominal and effective interest rate on consumer credits[18] at least partly limit potential interest rate-induced credit risk (for more details see Box 2 Interest rate risk in the Republic of Croatia, *Financial Stability*, No. 15). Nevertheless, these limitations at the same time raise interest rate risk in the non-trading book above the reported level due to the limited possibility to increase lending rates any faster.

Banks are also significantly exposed to indirect currency risk as around 90% of loans exposed to that type of risk are not hedged against currency-induced credit risk (Figure 83). However, the provisions of the draft Consumer Home Loan Act, which, among other things, enable a one-off conversion of a home loan denominated in (or indexed to) a foreign currency to a kuna loan, thereby partly limiting currency exposure of consumers and indirectly bank exposure to CICR, can be expected to diminish this risk, while bank exposure to direct currency risk is expected to grow[19]. Nevertheless, accumulation of systemic risks will, in addition to other characteristics, depend on movements in the spread between interest rates on foreign currency loans and kuna loans. It should be noted that these risks are not expected to accumulate soon as the legal provisions will apply only to new housing loans.

Strategic risks

Bank performance indicators in 2015 were mostly influenced by the conversion of Swiss franc loans and costs arising from that process, estimated by the banks at HRK 7.3bn, or approximately the same as the sum of bank operating profits before taxes in 2012, 2013 and 2014 (Figure 84). Bank earnings over the past four years were primarily determined by movements in charges for value adjustments and provisions. Their impact on bank earnings in 2015 became even more pronounced when, partly as a result of provisions for losses incurred in the conversion of Swiss franc loans (HRK 6.8bn[20]), they hit a historic high of HRK 12bn, or 3% of total bank assets (Figure 85).

If the one-off conversion costs were excluded, the ROAA and ROAE of banks improved over the last year, so under that scenario the average return on equity would stand at 5.1 percentage points on an annual level at the end of March 2016 (Figure 86). Therefore, with the exception of costs arising from the conversion of Swiss franc-indexed loans, the upward trend in profitability indicators that began in 2014 has continued into 2016. However, caution is warranted with regard to its continuance in the future as it is partly the outcome of historically low interest rates in international financial markets (see Figure 3.a, chapter Macroeconomic environment), which resulted in the lowest ever interest rates at which banks obtain funds and whose potential for further decrease is limited. In addition to the downward trend in deposit interest rates, interest rates on loans also decreased, so that interest margins mostly remained stable. At the same time, the regulations on maximum interest rates also put pressure on lending rates. For example, the Consumer Credit Act, together with legislative amendments to default interest for consumers[21], was reflected in the decrease in interest rates on short-term loans (Figure 87). However, the opposite effect is observed in loans converted from Swiss franc loans because, even with higher interest expenses on euro sources compared with Swiss franc sources, the positive impact for banks arises from higher interest rates on euro loans than on Swiss franc loans, i.e. a higher expected interest margin.

Without counting converted loans, which were classified as newly-granted loans (see the chapter Household sector), newly-granted household loans slightly edged up in the first quarter of 2016, but some of them were the outcome of the termination of loans following the conversion of Swiss franc loans to euro

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[17] The Act on Amendments to the Consumer Credit Act (OG 143/2013).

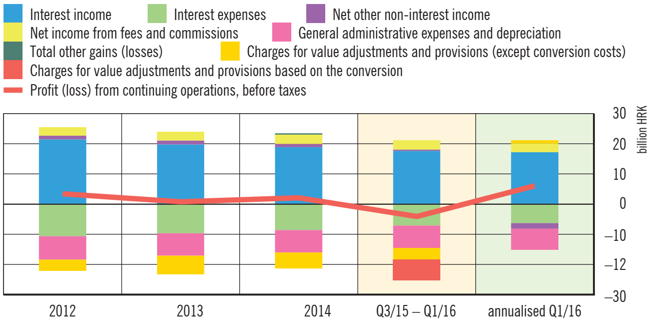
[18] Under the provisions of the Consumer Credit Act.

[19] It should be noted that, in case of a sudden exchange rate change that is unfavourable for consumers, the conversion may result in larger repayment costs than would be the case without the conversion.

[20] This is the banks' estimate, while actual costs are a result of final calculations.

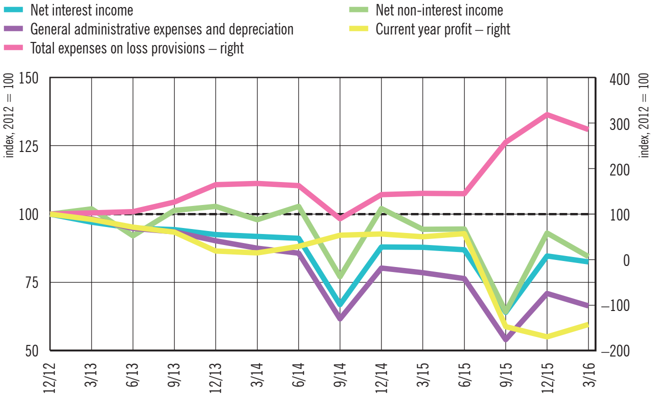
[21] As of 1 August 2015, the default interest rate for consumers was lowered from 12% to 8.14%. Therefore, the effective interest rate on housing loans is limited to 8.14% and to 10.14% for other consumer loans.

Figure 84 Bank performance indicators show progress in the first quarter of 2016



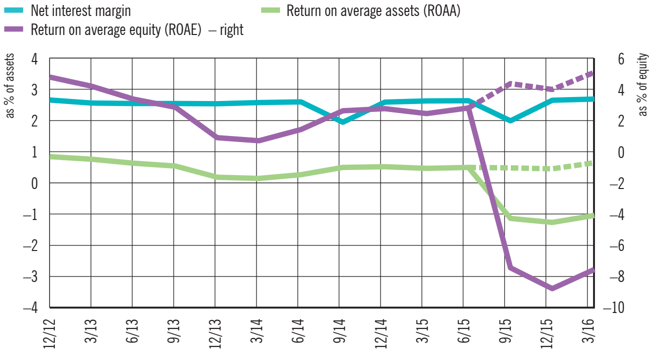
Note: Decomposition of income statement by key items.
Orange shaded are banks' income statement items for the period from the end of March 2015 to the end of March 2016. Green shaded are item values for the first quarter of 2016 annualised based on the assumption of equal performance in the remaining three quarters.
Source: CNB.

Figure 85 Business performance under the influence of historically high value adjustment costs



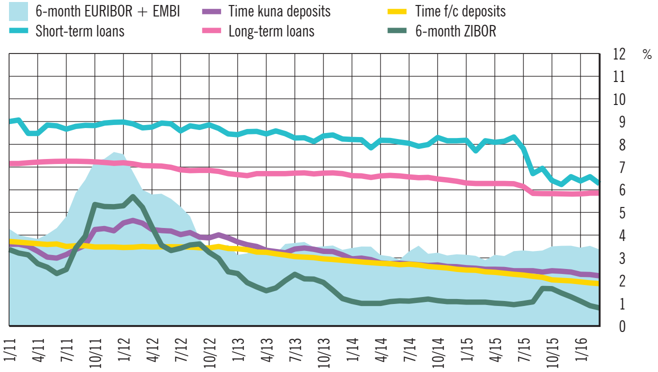
Source: CNB.

Figure 86 Bank profitability has been improving, excluding the cost effect of the Swiss franc loans conversion



Note: Broken lines represent indicator values without the effect of the conversion of Swiss franc loans.
Source: CNB.

Figure 87 Lending and deposit interest rates continued to decrease



Note: The interest rates on loans and deposits refer to the stock of observed items.
Source: CNB.

loans and the subsequent taking of new loans in the other or same bank under new conditions.

Strategic options for particular banks in the process of raising deposits and extending loans have been steadily shrinking, which is evident in increasing system concentration in the period after 2007 (Figure 89). Concentration of loans to the non-financial sector is higher than asset concentration and exhibits a more pronounced upward trend. In contrast, concentration of time deposits has been falling ever since 2009, which may be attributed to low levels of deposit interest rates that induced some clients to search for higher yields.

In addition, while the forthcoming Consumer Home Loan Act[22] should reduce the asymmetry of information between credit institutions and consumers and enhance competition among banks in the process of granting consumer home loans[23], it could also enable the transfer of currency, interest rate and other risks as well from the household sector to the banking sector, which could limit the room for further decline or trigger an increase in interest rates on such loans. Finally, the entry into force of this Act could prolong the period in which banks have a diminished appetite to take credit risk and extend the period in which there is no growth of credit to the private sector.

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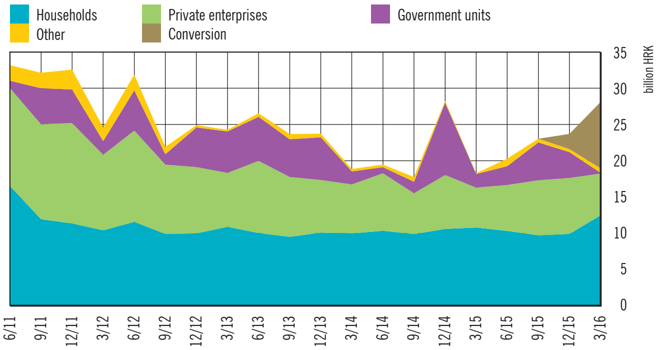
[22] This Act transposes into the legal system of the Republic of Croatia Directive 2014/17/EU of the European Parliament and of the Council of 4 February 2014 on credit agreements for consumers relating to residential immovable property and amending Directives 2008/48/EC and 2013/36/EU and Regulation (EU) No 1093/2010 (OJ L 60, 28.2.2014).

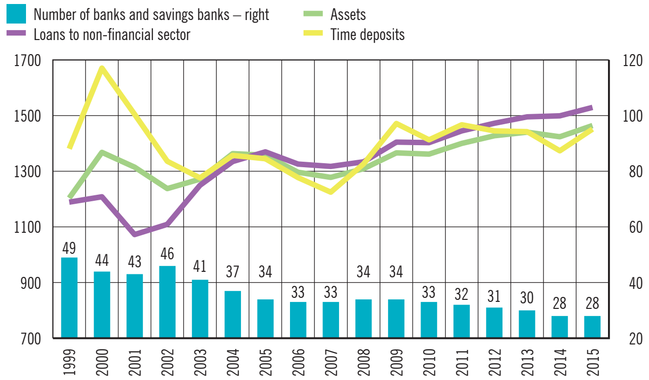
[23] The draft Act, among other things, introduces the following: (i) the possibility to provide in a contract for the transfer of ownership of the collateral for a consumer home loan to a credit institution to be considered complete fulfilment of all obligations under the consumer home loan; (ii) the possibility of a one-off conversion of a consumer home loan denominated in a foreign currency (including loans indexed to a foreign currency) to a kuna loan (or another alternative currency); (iii) the possibility of early repayment at any time, while credit institutions are entitled to fair and objectively justified compensation for potential costs; (iv) the possibility of early discharge of the obligation without compensation if the consumer does not agree to changes in interest rates, etc.

Figure 88 Lending to households and private companies has remained subdued



Note: The conversion denotes the amount of converted loans in the observed quarter that are treated in the books as newly-granted loans, although they are not essentially new.
Source: CNB.

Figure 89 Steady growth in banking system concentration

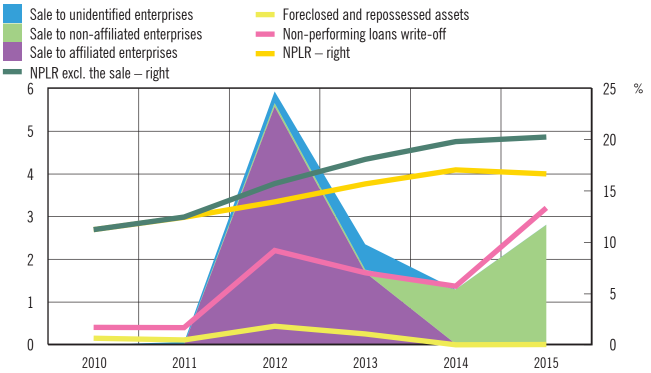


Note: Concentration of items observed is presented by means of the Herfindahl-Hirschman index of concentration.
Source: CNB.

Credit risk

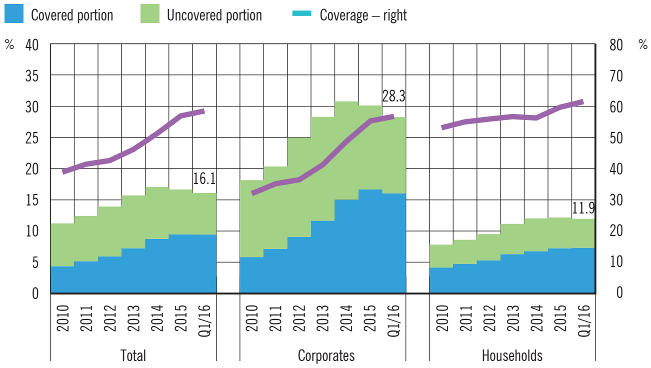
While credit growth was absent in 2015, the banks' credit portfolio improved slightly thanks to the intensified process of cleaning banks' balance sheets, i.e. the sale of non-performing placements, as well as partly due to economic growth associated with the recovery of some non-performing placements. Induced by the progressive character of requirements for value adjustments for non-performing placements under the CNB decision[24], banks sold HRK 2.8bn worth of non-performing placements in 2015, which is 6% of their total amount at end-2014, with more than 80% of placements being sold to enterprises specialising in collecting and managing claims (Figure 90). Most of the claims sold relate to placements to corporates, as evident from the indicator of the ratio of non-performing loans to total loans to this

Figure 90 Intensification of the process of resolving the issue of non-performing loans by the sale of placements



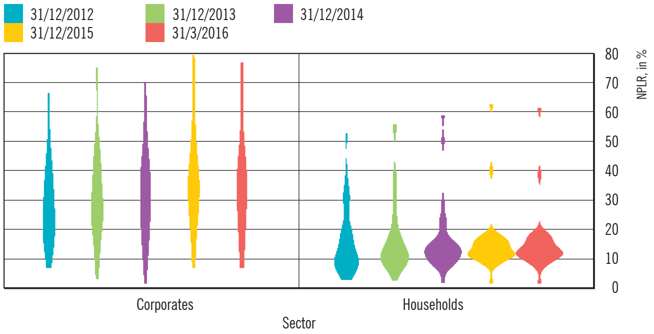
Source: CNB.

Figure 91 NPLR growth has come to an end



Source: CNB.

Figure 92 Distribution of NPLR by banks is much more dispersed in the corporate sector than in the household sector



Note: The violin plot figure shows the estimated density function of the ratio of non-performing loans to total loans, where the density function is estimated by the kernel estimator.
Source: CNB.

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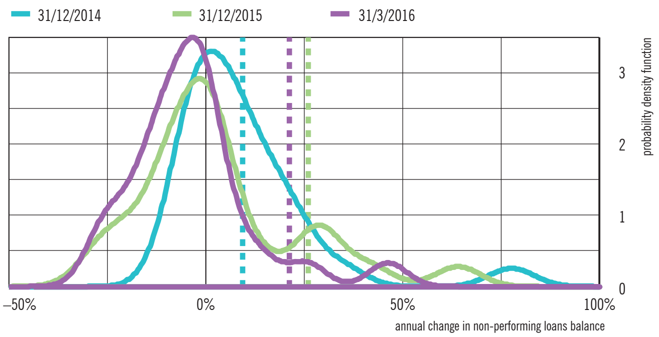
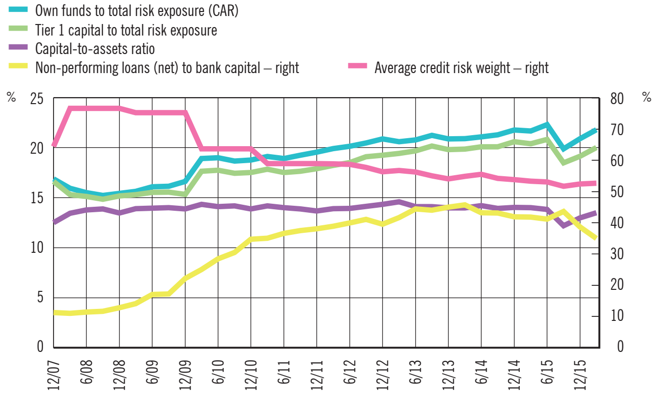
[24] Decision on the classification of placements and off-balance sheet liabilities of credit institutions (OG 41A/2014).

Figure 93 Most banks show positive steps with regard to the volume of non-performing loans



Note: The presented density functions are approximated by the kernel estimator. Broken lines represent the average value of change in the balance of non-performing loans in the year under review.
Source: CNB.

Figure 94 Recovery of capital adequacy ratios following a temporary deterioration in the second half of 2015



Source: CNB.

sector, which decreased by 2.3 percentage points at an annual level. In the same period, the ratio of non-performing loans to the total credit portfolio of banks fell by 1 percentage point, to 16.1% at the end of March 2016 (Figure 91).

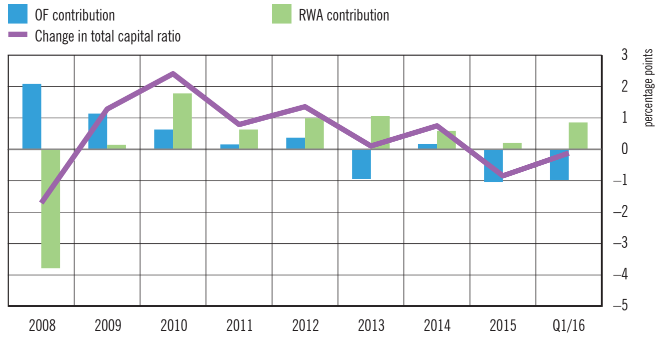
With regard to the distribution of the credit portfolio quality by bank, it is evident that dispersion is much larger in the corporate sector than in the household sector (Figure 92). Nevertheless, a slight positive change in the overall distribution has been seen in the corporate sector as the non-performing loans ratio decreased in the last year, while the credit portfolio quality of the household sector continued to deteriorate. Observing the change in the balance of non-performing loans and its distribution by banks, a decrease may be seen in most banks (Figure 93), although the average value of change suggests an increase in the stock of non-performing loans, primarily due to several banks that recorded sharp increases.

Bank capitalisation

Capital adequacy indicators of banks deteriorated temporarily in the third quarter of 2015, largely due to the bookkeeping treatment of the conversion of Swiss franc-indexed loans. In late March 2016, when most of the converted loans had already been booked, capital adequacy ratios almost returned to the level of June 2015, so that the banking system in Croatia remained highly capitalised (Figure 94). The total capital ratio, which represents the ratio of own funds to the total risk exposure amount, was 21.8% at the banking system level at the end of March 2016.

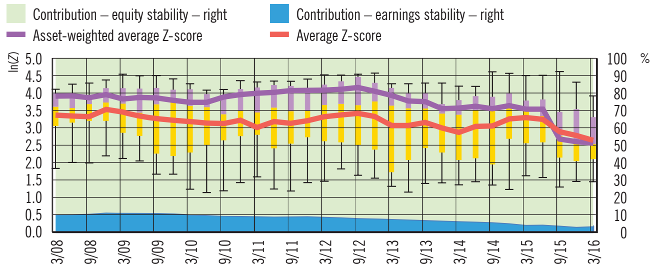
The total capital ratio in 2015 recorded a significant downturn at an annual level due to the decrease in own funds caused by operating losses and increased dividend payments (Figure 95). However, the ratio rebounded in the first quarter of 2016, due to the decrease in the risk exposure amount, which in turn

Figure 95 Total capital ratio fell marginally due to the parallel decline in own funds and amount of risk exposure



Note: The growth of the total capital ratio may be the result of the growth in own funds or the fall in the amount of risk exposure.
Source: CNB.

Figure 96 Insolvency risk increased due to higher volatility of bank earnings and reported losses



Note: The Z-score is a widely accepted indicator of the individual stability of banks and is calculated as:

$$Z = \frac{k+\mu}{\delta},$$

in which k is the equity and assets ratio, μ is the average indicator of ROA (in the last two years) and δ is the volatility of earnings (standard deviation of profitability of assets for the last two years). A higher score denotes a higher stability of the bank, i.e. a lower risk of bank failure. Also, the score can be divided into two components: earnings stability index and equity stability index.
Source: CNB.

resulted from the write-off of converted Swiss franc-indexed loans and increased sale of non-performing placements.

The risk of any institution in the banking system becoming insolvent, in terms of the Z-score, increased due to the fall in return indicators for assets and increased volatility of earnings (Figure 96). The stability of larger banks, which incurred larger losses due to the conversion of Swiss franc loans, was undermined more, so that the asset-weighted Z-score at end-March 2016 was somewhat lower than the average Z-score. Nevertheless, as the Z-score for the Croatian banking sector decreased mostly on account of the one-off effect of the conversion of Swiss franc loans on bank earnings and not because of reduced bank capitalisation, this indicator is expected to improve in the forthcoming period.

Box 4 The single passport and its impact on financial stability

In line with the fundamental freedom of movement of services[1] in the single EU market, the passporting system, i.e. the principle of single authorisation (single passport)[2], enables a credit institution of a member state to provide services for which it has been authorised by the competent authorities of its home member state through a branch or even directly in other member states. While the single passport generally contributes to more favourable conditions of financing and its availability in the single market, in some member states it also creates new risks and/or transfers and changes the forms of existing risks to financial stability. At the same time, within the territory of a host member state, it may reduce the scope of supervision over a part of the financial system by the competent authority of that member state.

Direct provision of services within the territory of the Republic of Croatia

Under the conditions specified in the Credit Institutions Act (OG 159/2013, 19/2015 and 102/2015), a credit institution of a member state may directly provide services within the territory of the Republic of Croatia ("RC") only on a temporary basis or where it does not provide services regularly, frequently or on an ongoing basis[3]. This temporary character of the direct provision of services should prevent them attaining any significant volume and thus, indirectly, any significant impact on financial stability. However, for this type of cross-border provision of services – in part probably due to a more simple customisation and calibration of the credit risk models for cross-border markets in the segment of large corporations, which is necessary to determine a risk-based price – one may notice that credit institutions from other member states favour bigger clients involving lower risks at a more favourable price than in the Croatian market, which supports the trend for non-financial corporate sector to deleverage with respect to domestic banks (Figures 61 and 71). Indirectly, with regard to credit institutions with head offices in the RC, this leads to an increase in the risk of specific portfolios, a slow reduction of the share of non-performing loans and orientation of strategies of credit institutions with head offices in the RC toward the financing of government, perceived as less risky.

Provision of services through a branch in the RC

In addition to the direct provision of services within the territory of the RC, credit institutions of other member states may provide services for which they have obtained authorisation in their home member state through a branch established in the RC. Guided by supervisory practices, when deciding on the application for the establishment of a branch within the territory of the RC, the home competent authorities will probably assess:

(i) whether the credit institution has the appropriate organisational, technical and personnel structure or the adequate financial position to provide the planned scale of services in the RC through a branch;

(ii) whether the credit institution is in this way attempting to evade the stricter rules and regulations in force in its home member state; or

(iii) whether this could jeopardise the safety and stability of the credit institution's operation.

However, the assessment of the possible impact on financial stability in the RC or whether the credit institution is attempting to evade the stricter rules and regulations in force in the RC is left to the discretion of the competent authority of the home member state, which alone decides on the application to establish a branch in the RC[4].

The Single Rulebook in the member states should ensure that equivalent prudential requirements are applied to a credit institution of another member state that establishes a branch in the RC and to credit institutions with head offices in the RC. However, prudential requirements are applied to branches so established on a consolidated basis, which is in contrast with branches of third-country credit institutions[5]. In addition, for completely equivalent prudential requirements it is necessary to ensure in other member states the reciprocal acceptance of macroprudential measures on a voluntary basis[6] on a larger scale than before[7], so that, among other things, adequate capital buffers and capital conservation measures would also apply to exposures of branches of credit institutions from other member states. Generally speaking, the uneven application of prudential requirements, apart from jeopardising the safety and stability of the branch, indirectly affects the financial stability of the system as a whole. This is particularly true in the case of the provision of services by significant[8] branches when potential problems of credit institutions of other member states could spread much more rapidly to the banking system of the RC than if they were operating through a subsidiary. In other words, operating through branches, particularly significant ones, raises the risk of contagion from financial systems of other member states.

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[1] The right of establishment and freedom to provide services.

[2] In accordance with Article 13, paragraph (1) of the Credit Institutions Act (OG 159/2013, 19/2015 and 102/2015), "member state" means a member state of the European Union and a contracting party to the Agreement on the European Economic Area (OJ, L 1, 3.1.1994).

[3] Article 83, paragraph (2) and Article 12, paragraph (2) of the Credit Institutions Act (OG 159/2013, 19/2015 and 102/2015).

[4] In accordance with Article 85, paragraph (1), item (1) of the Credit Institutions Act (OG 159/2013, 19/2015 and 102/2015), the CNB may issue the notification to a credit institution of another member state of the conditions which, in the interests of the general good, must be met when providing services through a branch in the RC.

[5] Under Article 92, paragraphs (1) and (2) of the Credit Institutions Act (OG 159/2013, 19/2015 and 102/2015), the provisions of that Act and Regulation (EU) No 575/2013 and regulations adopted thereunder shall apply *mutatis mutandis* to branches of third-country credit institutions, which among other things, includes requirements regarding capital adequacy, capital buffers and capital conservation measures. On the other hand, branches of credit institutions of the member states are subject to prudential requirements on a consolidated basis so that, in accordance with technical standards regarding the information reported when exercising the right of establishment and freedom to provide services, information is exchanged between the competent authorities of the home and host member states.

[6] Regulation (EU) No 575/2013 prescribes mandatory reciprocity in the application of risk weights and criteria (Article 124, paragraph (5)) and the higher minimum LGD values (Article 164, paragraph (7)) that have been determined by the competent authorities of another member state to exposures secured by (commercial and residential) property. Mandatory reciprocity is also applied to a countercyclical capital buffer (CCB) of less than 2.5%. The need for reciprocal application of other macroprudential measures is determined by the competent authority when introducing a specific macroprudential measure.

[7] In accordance with the ESRB report of June 2015 (*A review of macro-prudential policy in the EU one year after the introduction of the CRD/CRR)*, voluntary reciprocity has been rarely used. Therefore, in late 2015 the ESRB issued the Recommendation of the European Systemic Risk Board of 15 December 2015 on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures (ESRB/2015/2).

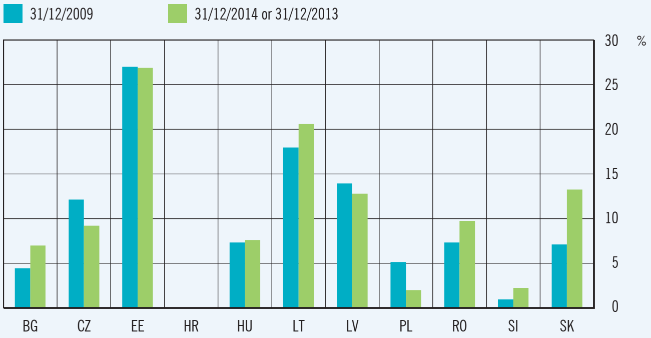
The most recent financial crisis would probably have had much more unfavourable effects on the financial stability in the RC if the operation of credit institutions from member states through branches had been more significant for the banking system of the RC. In the pre-crisis period, the CNB had already used a number of administrative and other measures to prevent excessive credit growth and debt and strengthened the capital adequacy of banks in the RC by building up buffers for losses incurred during the crisis. A more significant share of branches of institutions from other states, to which such measures would not have been applied, could at that time increase the vulnerability of the banking system in the RC, in particular contagion risk from financial systems of other countries that did not apply similar measures at the time.

Nevertheless, one should note that technical standards on the exchange of information between the competent authorities of the home and host member states incorporate the principle of proportionality under which a larger range of information is exchanged for branches that are considered significant, which should provide a higher level of supervision by the competent authorities for such branches.

Possible transformation of existing subsidiaries into branches

Potentially smaller costs, easier allocation of capital, a higher level of protection against political risk and potentially lower prudential requirements applied to branches of credit institutions from other states may provide incentives to transform subsidiaries into branches. The merger of a subsidiary with a head office in the RC with a credit institution of another member state or the transfer of its total assets and liabilities are subject to authorisation by the CNB[9]; when the authorisation is being decided on, the impact of the merger or transfer on the stability of the financial system as a whole is assessed, among other things. The merger or transfer of total assets and liabilities is possible exclusively if the attendant risks and/or vulnerabilities do not threaten the financial stability in the RC.

Figure 1 Ratio of assets of branches of institutions from other member states and assets of credit institutions with head offices in a member state



Note: In the calculation of the ratio used were the latest available data of a member state's supervisory disclosure (31 December 2013 for CZ, HU, PL and SI and 31 December 2014 for the others).
Sources: EBA and competent authorities of the member states.

Branches in member states from Central and Eastern Europe

Member states from Central and Eastern Europe (CEE) are characterised by a large share of foreign ownership in their banking systems. While an increase in the market share of branches has in recent years been observed in most CEE member states, the ratio of total assets of branches of institutions from other member states to total assets of credit institutions with head offices in the member state concerned (Figure 1) does not yet indicate their systemic importance. With the exception of the Baltic member states and Slovakia, which recorded the sharpest increase in the period under review, this ratio was below 10% at the end of 2014.

Determinants of the business organisation model

Papers in the field of the analysis of statistical relations of the business models used by credit institutions of member states for operations in other member states and their determinants are rather rare and there is still no sufficient evidence on their stability in conditions of the single market, i.e. the member states where the single passport system applies. Cerutti et al.[10] considered the determinants of organisational forms of internationally active banks in Latin America and Eastern Europe and established that the determinants considered below are significant when deciding on whether to operate through a branch or a subsidiary in a particular country, concluding that the most significant indication in that selection is the expansion strategy preferred by the home institution. By using more recent data on 50 subsidiaries and 34 branches from 6 CEE member states[11], Fáykiss et al.[12] confirmed the results of Cerutti et al., though the significance of individual determinants has weakened.

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[8] Particular reasons for considering a branch to be significant are the following: (i) the market share of the branch in terms of deposits as defined in the law governing deposit insurance exceeds 2% in the RC; (ii) suspension or closure of the operations of the branch would have an impact on systemic market liquidity and the payment, clearing and settlement systems in the RC; and (iii) the size and the importance of the branch in terms of the number of clients within the context of the banking or financial system of the RC.

[9] Article 63, paragraphs (2) and (3) of the Credit Institutions Act (OG 159/2013, 19/2015 and 102/2015).

[10] Cerutti, E., G. Dell'Ariccia, and M. Soledad Martínez Pería (2007): *How banks go abroad: Branches or subsidiaries?*, Journal of Banking & Finance, vol. 31, pp. 1669 – 1692.

[11] Bulgaria, Czech Republic, Poland, Slovakia, Romania and Hungary.

[12] Fáykiss, P., G. Grosz, and G. Szigel (2013): *Transforming subsidiaries into branches – Should we be worrying about it?*, MNB Occasional Papers 106.

Under the recognised determinants of the reviewed business organisation models (branches or subsidiaries) in the mentioned papers the probability of a branch of an institution from another member state being established or of its existing subsidiaries being transformed into branches within the territory of the RC may be considered moderate:

(i) the expansion strategy of the parent institution; the preferred business strategy of the parent institution is a significant determinant when selecting a business model in another member state. The usual business model of parent institutions of subsidiaries operating in the RC, in terms of the ratio of the number of branches established and the number of subsidiaries established in other member states[13], is the operation through a subsidiary in another member state, which indicates that it is unlikely that existing subsidiaries in the RC would be transformed into branches;

(ii) the (planned) size of a subsidiary or branch; size measured in terms of assets is inversely proportional to the probability of operation as a branch. The larger (planned) volume of activity is generally associated with operation as a subsidiary (Fáykiss et al.), which may be associated with the credit institution’s unlimited liability for the obligations of its branches;

(iii) the business strategy; branches are less likely to focus on retail clients. Subsidiaries with head offices in the RC of parent institutions from other member states are primarily oriented towards retail clients or else such clients account for a significant part of their operations, which indicates a low probability of their transformation into branches;

(iv) the level of economic development of the host country; Fáykiss et al. established that parent institutions prefer to establish branches in more developed countries, which they attributed to protection against losses that parent institutions may incur through their unlimited liability for the obligations of the branch; and

(v) greenfield investment; greenfield investment increases the probability of operation as a branch; however, as it is increasingly easier to transform subsidiaries into branches in the territory of member states, the significance of this determinant has weakened considerably (Fáykiss et al.).

Instead of a conclusion

Along with the benefits of the freedom of movement of services in the single market, the application of the single passport may have adverse effects on the financial stability in member states. This is why there are increasingly more proponents of the view that the provision of cross-border services should be limited exclusively to the model of operating through a branch that is not significant.

Also, apart from there being unlimited liability for the obligations of the branch, which is perceived as a disadvantage of operating in another member state through a branch, some regulators resort to measures to reduce the asymmetry of information between clients and the credit institution about a possible change in the business model, enabling clients (depositors in particular) to terminate contracts without incurring a penalty fee if there are significant changes to the contract terms.

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[13] The ratio of the number of branches and the number of subsidiaries was considered according to the available data of the Bankscope database.

Box 5 Introduction of the capital buffer for other systemically important credit institutions

In line with the European[1] and domestic[2] regulations governing the area of prudential requirements for credit institutions, as of the beginning of 2016 the CNB imposed the capital buffer requirement for nine credit institutions identified as systemically important. The capital buffer for other systemically important institutions (hereinafter: O-SII buffer and O-SIIs) must be allocated in terms of Common Equity Tier 1 capital in the amount of 0.2%, or 2% of the total risk exposure amount, depending on the estimated systemic importance. This buffer serves to protect the financial system and the entire economy from systemic risks that may arise from the malfunction or failure of individual institutions. The application of such capital buffers increases the resilience of O-SIIs to disturbances, which should also mitigate the potential impact on the financial system and economy as a whole.

Methodology for identifying O-SIIs

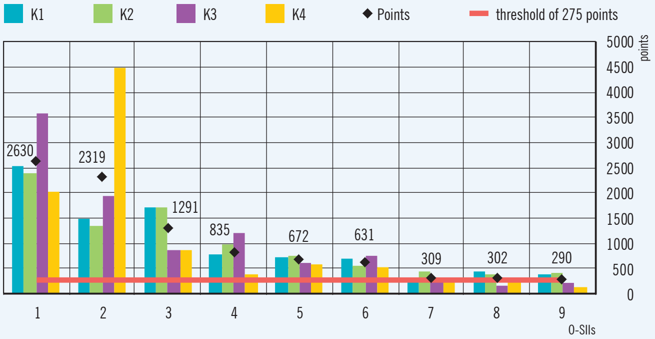
The methodology for identifying institutions that are systemically important for the domestic financial system is aligned with the European Banking Authority Guidelines (EBA/GL/2014/10) on the criteria to determine the conditions of application of Article 131(3) of Directive 2013/36/EU in relation to the assessment of other systemically important institutions. In line with this methodology, the CNB once a year estimates on an individual, sub-consolidated or consolidated basis the systemic importance of credit institutions authorised in the RC by taking account of the following four basic and equally important categories: size of the credit institution, its importance for the economy of the RC, complexity of the credit institution, and interconnectedness with the financial system. Each component of systemic importance is monitored through several relevant indicators (Table 1).

Table 1 Systemic importance indicators

Criterion	Indicator
K1	Total assets (balance sheet amount)
K2	Total value of payment transactions in the Croatian Large Value Payment System by credit institutions – credit transfers (outgoing payments)
K2	Deposits and loans (including electronic money) received from depositors from private (non-government and non-financial) sectors in the EU
K2	Deposits and loans given to receivers from private (non-government and non-financial) sectors in the EU
K3	Notional value of all non-standard derivative financial instruments (all except futures)
K3	Cross-border payables (payables to creditors outside Croatia)
K3	Cross-border receivables (receivables from debtors outside Croatia)
K4	Liabilities in the financial system
K4	Assets in the financial system
K4	Stock of issued debt securities

Note: K1 – size of the credit institution, K2 – importance of the credit institution for the economy of the RC, K3 – complexity of the credit institution, K4 – interconnectedness of the credit institution with the financial system.
Source: CNB.

Figure 1 Scoring O-SIIs



Note: K1 – size of the credit institution, K2 – importance of the credit institution for the economy of the RC, K3 – complexity of the credit institution, K4 – interconnectedness of the credit institution with the financial system.
Source: CNB.

In accordance with the scoring methodology[3], each credit institution is assigned a number of scores representing an assessment of its systemic importance. The threshold of 275 basis points has been set as the threshold above which credit institutions are identified as O-SIIs (Figure 1). The quantitative assessment of an institution's systemic importance is finally complemented by a qualitative supervisory expert opinion, taking into account the relevant available qualitative and quantitative information.

Determination of the O-SII buffer

The amount of capital needed to cover the risks associated with potential malfunction of O-SIIs is based on the assigned systemic importance score. The calibration of the O-SII buffer is determined primarily by the legislative ceiling on this buffer, which is set at 2% of the total risk exposure amount[4], where the optimum rate is determined in line with the systemic importance assessment by the equal expected impact approach[5]. In this approach, the capital buffer is calculated for each O-SII that would equalise the effects on the system in the event of distress of the institution to the effects on the system of a failure of an institution without the O-SII status.

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[1] Regulation (EU) No 575/2013 of the European Parliament and of the Council on prudential requirements for credit institutions and investment firms.

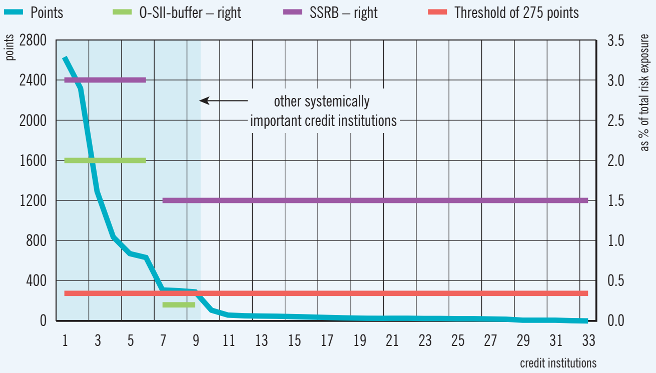
[2] Credit Institutions Act (OG 159/2013, 19/2015 and 102/2015).

[3] For more details on the scoring methodology, see https://www.hnb.hr/documents/20182/121030/tf-s-sjo-spo-pdf-e-postupak_osv.pdf/41d3a956-c41b-426b-aab4-24413d35ff93.

[4] Directive 2013/36/EU.

[5] Skořepa, M., and J. Seidler (2014): *Capital Buffers Based on Banks' Domestic Systemic Importance: Selected Issues*, Research and Policy Notes 1/2014, Czech National Bank.

Figure 2 Relationship between the O-SII buffer and the SSRB



Source: CNB.

As the buffer for other systemically important institutions became available to regulators as late as the beginning of 2016, in the period from 2014 to 2016, the CNB covered the existing systemic risk arising from O-SIIs operations by means of the structural systemic risk buffer (hereinafter: SSRB) as of mid-2014, which was in line with the recommendations of the European Systemic Risk Board[6] and practices in some EU countries[7]. The essential overlapping of these two buffers and their legally determined interaction arising from the provision that only the higher of these two buffers is applicable[8] makes it necessary to review the SSRB rates at the time of introducing or recalibrating the O-SII buffer to ensure the optimum coverage of identified systemic risks arising from the system structure. Therefore, at the time of introduction of the O-SII buffer, the CNB revised and kept the SSRB unchanged to ensure that the level of buffers is commensurate to established risks. Therefore, O-SIIs are currently required to maintain only the SSRB as the structural systemic risk buffer rates are currently higher than the O-SII buffer rates (Figure 2).

The introduction of the O-SII buffer completed the process of defining and implementing a set of macroprudential instruments related to capital buffers that had begun in 2014. The additional capital requirement for the coverage of systemic risks to which the financial system is exposed, and which credit institutions are required to maintain in the form of the highest quality capital, currently comprises the following: (i) the capital conservation buffer (2.5%); (ii) the countercyclical capital buffer (0%); (iii) the structural systemic risk buffer (1.5% or 3%); and (iv) the capital buffer for other systemically important institutions (0.2% or 2%). The total amount of the additional, combined capital requirement that an individual credit institution is required to set aside currently stands at 4% or 5.5% of the total risk exposure amount depending on the criteria for application of specific buffer rates and their legally defined relations.

It should be noted that identification of a particular credit institution as systemically important does not imply that in the event of any distress that would seriously threaten the continuity of its operations, it would be automatically bailed out by taxpayers' money. The issue of too-big-to fail institutions the operations of which the market implicitly assumes would be saved by government intervention, even in the event of serious distress, which raises the problem of moral hazard, is one of the indirect objectives of the entire macroprudential policy. Therefore, this issue should be resolved by strengthening the entire regulatory, supervisory and, in particular, resolution mechanism, which would enable the maintenance of the key functions and continuity of operation of all credit institutions in distress in such a way as to minimise the adverse effects on the system as a whole.

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[6] ESRB: The ESRB Handbook on Operationalising Macro-prudential Policy in the Banking Sector, p. 87.

[7] https://www.esrb.europa.eu/national_policy/systemically/html/index.en.html.

[8] Article 139, paragraphs (1) and (3) of the Credit Institutions Act.

Box 6 Stress testing of credit institutions

With the redesign of the regulatory framework for credit institutions, which was vigorously addressed after the outbreak of the great crisis, and establishment of macroprudential policy at a global level, the stress testing tool has been given much more prominence and significance. The methodological frameworks for stress testing of institutions to various macroeconomic and financial shocks, sometimes under complete internally consistent macroeconomic scenarios, have become one of the most important instruments for the preservation of the stability of credit institutions as well as of entire financial systems.

With regard to their final, operational purpose, there are several types of stress testing exercises which can be roughly divided into three main categories:

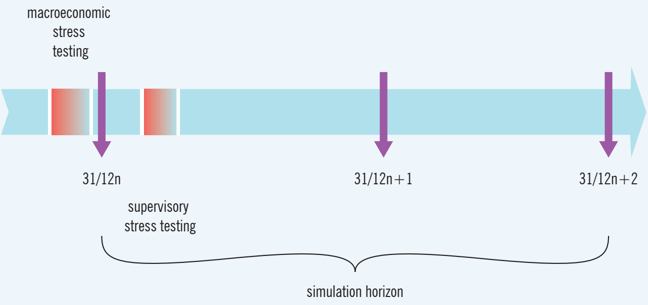
1. stress testing within internal risk management policies and procedures of an individual credit institution or group (*internal tests*);

2. stress testing which is part of the supervisory and regulatory function of the competent authorities with a view to maintaining the stability and continuity of operation of each individual credit institution (*supervisory tests*); and

3. stress testing which provides an insight into vulnerabilities of the financial system, taking into account its complexity (interconnectedness of individual institutions and markets) with a view to maintaining the stability of the financial system as a whole (*macroeconomic tests*).

Apart from conceptual differences, individual types of tests differ in terms of methodology. One of the main differences arises from the approach to testing as supervisory and internal tests are usually conducted bearing in mind the specific risk profile of an individual institution while relying on internally developed risk assessment models of the credit institution itself in estimating the effects of shocks on specific operational aspects (bottom-up approach). On the other hand, macroeconomic tests are based on the use of internally consistent macroeconomic scenarios that are, by means of macroeconomic models[1], reflected in individual institutions and the entire financial system (top-down approach). Each category of tests provides an additional set of information that should be observed comprehensively to identify and correct deficiencies of individual approaches to testing and to get as realistic as possible picture of risk exposure of parts or the whole system. Where necessary, such risks are mitigated by subsequent corrective action, mainly by increasing the institution's resistance to their materialisation.

Figure 1 Stress-testing dynamics



Source: CNB.

As of 2015, the CNB has broadened the "usual" macroeconomic stress testing of the financial system, which has been regularly improved in terms of methodology[2], by supervisory stress testing. Coordinated by the CNB, supervisory stress testing is conducted by credit institutions themselves, using their own models and assumptions[3]. The primary purpose of this testing is to identify and assess risks in the course of supervision, particularly when assessing key elements of the supervisory review and evaluation process (SREP), which includes the use of quantitative results of supervisory stress testing for the purpose of assessing capital adequacy. In addition, this also complements the information obtained from macroeconomic testing for the purposes of monitoring financial stability and calibrating macroprudential measures to hedge against systemic risks.

To align the simulation horizons of macroeconomic and supervisory tests, starting from 2016, macroeconomic stress testing will be conducted at the end of each year with a simulation horizon of the following two years. For the same simulation horizon, supervisory testing will be conducted in the first half of the first year of simulation (Figure 1).

In addition to greater comparability of results of individual iterations of macroeconomic tests, this will enable analytical integration of macroeconomic and supervisory stress tests, which will broaden the set of information on capital and liquidity buffers in the system. Also, from the methodological aspect these results ensure a higher degree of compatibility with European stress tests, while retaining the character of the specific national features in the calibration of shocks and scenario designs.

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[1] For the purpose of macroeconomic stress testing, the CNB uses a structural macroeconomic model called PACMAN (Policy Analysis Croatian Macroeconomic Model) developed for the purpose of simulating the effects of economic shocks and economic policy measures on the domestic economy. The model is written in the form of a system of simultaneous equations consisting of 27 behavioural equations and 75 identities and 102 endogenous and 45 exogenous variables. In addition, a number of satellite models and methodological concepts have been developed to enable the exercise.

[2] For more on this issue see Box 5 New methodological approach to stress testing, *Financial Stability*, No. 14.

[3] When coordinating the whole exercise the CNB may, when necessary, in a conservative manner, limit the use of some assumptions or, to ensure comparability of effects in credit institutions, define certain assumptions and conditions of the scenario.

The presented redesign of stress testing procedures by synchronisation of macroeconomic and supervisory testing provides a wider set of information on the resilience of credit institutions, which are the most important part of the financial system, to highly unlikely but plausible shocks. Furthermore, it ensures a higher degree of comparability of results of individual stress test types, as well as of their individual iterations. Finally, the new approach should provide more comprehensive information on the risks and vulnerabilities of the system for the purpose of monitoring financial stability and the (re)calibration of macroprudential measures to hedge against systemic risks.

List of figures and tables

Financial stability map 5
Figure 1 Risk map 6
Table 1 Economic growth, exports and industrial production in selected developed and emerging market countries 8
Table 2 Fiscal balance and current account balance in selected developed and emerging market countries 9
Table 3 Public and external debt in selected European emerging market countries 9
Figure 2 Continuation of relatively high economic sentiment for Croatia and a slight decrease in consumer confidence in the first half of 2016 9
Figure 3a Benchmark euro interest rates at historic lows 10
Figure 3b Fed’s slower than expected pace of benchmark interest rate increases 10
Figure 3c ECB’s bond purchase programmes have further eased financial conditions in the euro area 10
Figure 4 Increase in perceived risk of vulnerable euro area member states 11
Figure 5 Perceived risk for large European banks is higher than in previous years 11
Figure 6 Perceived risk for Croatia, although still high, has declined compared with that for peer countries 11
Figure 7 Narrowed spread between yields on Croatian and benchmark German bonds maturing in 2018 11
Figure 8a Relatively optimistic equity valuation points to potential risks 11
Figure 8b Volatility of return on high-risk corporate bond issues increased in the first quarter 11
Figure 9 Economic recovery is not accompanied by a lending recovery 12
Figure 10a Largest contributions to growth in 2016 are expected to come from household consumption and exports 12
Figure 10b Croatia’s export growth rates the highest among Central and Eastern European countries 12
Figure 10c Withdrawal of EU funds intensified in late 2015 12
Figure 11 Private sector savings are expected to decline slightly in 2016 13
Figure 12 Continued rise in government external debt and further deleveraging by other sectors, primarily the banking sector 13
Figure 13 Vulnerabilities connected with the high external debt level declining due to the creditor structure 13
Figure 14 External debt falling due in 2016 lower than in the previous years 13
Figure 15 Continued improvement in selected external vulnerability indicators 13
Figure 16 Private non-financial corporations in foreign ownership account for the largest share in external debt principal payments by sectors in the remaining part of 2016 13
Figure 17 Croatian US dollar-denominated bond yields exceed euro-denominated bond yields 14
Figure 18 International reserves exceed the model-estimated optimal reserve level 14
Figure 19 Continued slight depreciation of the real exchange rate of the kuna versus the euro 14
Figure 20 Unit labour costs dipped in late 2015 15
Figure 21 Slowdown in the growth of total government debt and 25continued corporate and household deleveraging 15
Figure 22 Appreciation of the kuna/euro exchange rate and continuation of very low overnight interest rates due to high banking sector liquidity 15
Figure 23 Changes in employment registered with the Croatian Employment Service (CES) 15
Box 1 16
Figure 1 Structural presentation of CDS instrument 16
Figure 2 Notional value of CDS contracts, by type of instrument 16
Figure 3 CDS market structure with and without CCP intermediation 17
Figure 4 Multilateral netting of CDS contracts intermediated by a CCP 17
Figure 5 Market indicators of the value of active CDS contracts on Republic of Croatia bonds 18
Figure 6 Market trading in CDS contracts on Republic of Croatia bonds 18
Figure 7 Market participants' propensity to hold long positions in EU countries’ CDS contracts 18
Figure 24 General government debt 19
Figure 25 General government deficit 19
Figure 26 Public debt 20
Figure 27 Maturity breakdown of public debt 20
Figure 28 Currency breakdown of public debt 20
Table 4 Thresholds of the fiscal sustainability risk indicator 20
Figure 29 Yield on primary issue of euro and euro-indexed securities 21
Figure 30 General government deficit 21
Figure 31 Financing needs 21
Figure 32 Projection of public debt under various scenarios 22

Figure 33 Public debt growth rate (2009 – 2015) 22
Figure 34 Average remaining maturity of general government debt 22
Figure 35 General government interest expenses 22
Figure 36 Continued household deleveraging 23
Figure 37 Statutory conversion of Swiss franc loans has mostly been implemented 23
Figure 38 Most conversion agreements have been accepted 24
Figure 39 Household financial assets are stable 25
Figure 40 Deposits with credit institutions are the dominant form of household savings 25
Figure 41 Slight upturn in lending activity 25
Figure 42 Mild recovery in new long-term borrowing in early 2016 26
Figure 43 Continuing decrease in total loan amounts despite an increase in lending activity 26
Figure 44 Loan dynamics has reflected on changes in total household debt 26
Figure 45 Positive signals from the labour market 27
Figure 46 Relaxed household lending standards 27
Figure 47 Banks expect household loan demand to strengthen 27
Figure 48 Share of kuna loans is on the increase 27
Figure 49 Continued general downward trend in interest rates on newly-granted (housing) loans 28
Figure 50 Interest rates on kuna-denominated and euro-denominated housing loans are on the same level 28
Figure 51 Continued high exposure of households to interest rate risk 28
Figure 52 Decrease in household debt and interest burdens 28
Figure 53 Systemic vulnerability of households continues to decrease 28
Figure 54 Deleveraging in the real estate sector intensified due to the statutory conversion of Swiss franc-denominated loans 30
Figure 55 Despite positive labour market trends, households have continued to refrain from long-term investments 30
Figure 56 Continued decrease in real estate prices 31
Figure 57 Conversion of Swiss franc-denominated loans has widened the interest rate spread 31
Figure 58 Decrease in interest rates on genuinely new foreign currency-indexed housing loans 31
Figure 59 Residential property much more financially available than before 31
Figure 60 More intensive deleveraging in foreign and domestic markets has reduced total indebtedness 33
Figure 61 Reduction in non-financial corporate indebtedness is mostly due to debt repayment 33
Figure 62 Non-financial corporations, particularly those in the public sector, have reduced their debt 34
Figure 63 Most activities have reduced their domestic and external debt 34
Figure 64 Demand steadily increased and credit standards for corporate loans continued to ease in the last two quarters 35
Figure 65 Lending to non-financial corporations stagnant in the last six months 35
Figure 66 A slight increase in short-term corporate financing in kuna (on an annual basis) 35
Figure 67 Share of corporate non-kuna debt remained mostly unchanged 35
Figure 68 Trade and manufacturing have decreased their currency risk exposure 36
Figure 69 Risks associated with potential growth in interest rates on corporate loans grew slightly 36
Figure 70 In contrast with the euro area, interest rates on long-term loans in Croatia have held steady 36
Figure 71 Interest rates on short-term loans to non-financial corporations have drifted down 37
Figure 72 Good business results and debt reduction helped to decrease corporate sector risk 37
Figure 73 Aggregate business results of non-financial corporations recovered in 2015, almost to the pre-crisis level in 2008 37
Box 2 38
Figure 1 Movements in gross profit margin by segments and activities 38
Table 1 Contributions of particular effects to changes in sector GPM in the period from 1997 to 2014 39
Figure 2 Jeon-Miller decomposition of the sector and sub-sectors of public and private non-financial corporations 39
Figure 3 Jeon-Miller decomposition of non-financial corporations (by activity) 40
Box 3 42
Figure 1 Structure of liabilities according to financing sources by activity in groups of EU countries 42
Figure 2 Structure of total non-financial corporate sector debt by activity in EU countries and sector debt 42
Figure 3 Structure of non-financial corporate sector debt to credit and financial institutions by activity in EU countries and sector debt 43
Figure 4 Structure of other non-financial corporate sector debt by activity in EU countries and sector debt 43
Figure 5 Profitability and own funding coefficient of manufacturing activity in EU countries 44
Figure 6 Profitability and own funding coefficient of construction activity in EU countries 44
Figure 7 Profitability and own funding coefficient of transportation, storage and communication activities in EU countries 44
Figure 74 Total bank assets dropped to the end-2009 level 46

Figure 75 Reduction of the credit portfolio and deleveraging with respect to foreign owners set the trends in bank balance sheets 46

Figure 76 Reduced reliance of banks on cross-border funding sources 47

Figure 77 Steady fall in interest rates on time deposits spurred an increase in funds in resident transaction accounts 47

Figure 78 Bank exposure to government units continued to increase 47

Figure 79 Significant decrease in the net financial position with respect to foreign owners partly due to record high dividend payments 48

Figure 80 High liquidity indicators remained on a several-year upward trend 48

Figure 81 Temporary large mismatch of the net foreign exchange position returned to average levels after the conversion of CHF loans 48

Figure 82 Exposure to interest rate risk in the non-trading book and change in the economic value according to the type of interest rate 48

Figure 83 The share of unhedged loans in total loans exposed to CICR has remained relatively high 49

Figure 84 Bank performance indicators show progress in the first quarter of 2016 50

Figure 85 Business performance under the influence of historically high value adjustment costs 50

Figure 86 Bank profitability has been improving, excluding the cost effect of the Swiss franc loans conversion 50

Figure 87 Lending and deposit interest rates continued to decrease 50

Figure 88 Lending to households and private companies has remained subdued 51

Figure 89 Steady growth in banking system concentration 51

Figure 90 Intensification of the process of resolving the issue of non-performing loans by the sale of placements 51

Figure 91 NPLR growth has come to an end 51

Figure 92 Distribution of NPLR by banks is much more dispersed in the corporate sector than in the household sector 51

Figure 93 Most banks show positive steps with regard to the volume of non-performing loans 52

Figure 94 Recovery of capital adequacy ratios following a temporary deterioration in the second half of 2015 52

Figure 95 Total capital ratio fell marginally due to the parallel decline in own funds and amount of risk exposure 52

Figure 96 Insolvency risk increased due to higher volatility of bank earnings and reported losses 52

Box 4 54

Figure 1 Ratio of assets of branches of institutions from other member states and assets of credit institutions with head offices in a member state 54

Box 5 57

Table 1 Systemic importance indicators 57

Figure 1 Scoring O-SIIs 57

Figure 2 Relationship between the O-SII buffer and the SSRB 58

Box 6 59

Figure 1 Stress-testing dynamics 59

Abbreviations and symbols

Abbreviations

bn – billion
CAR – capital adequacy ratio
CBS – Central Bureau of Statistics
CCE – Croatian Chamber of Economy
CDCC – Central Depository & Clearing Company
CDS – credit default swap
CEE – Central and Eastern European
CES – Croatian Employment Service
CICR – currency-induced credit risk
CIHI – Croatian Institute for Health Insurance
CIs – credit institutions
CM – Croatian Motorways
CNB – Croatian National Bank
CPII – Croatian Pension Insurance Institute
DAB – State Agency for Deposit Insurance and Bank Resolution
EAD – exposure at default
EBA – European Banking Authority
EBITDA – earnings before interest, taxes, depreciation and amortisation
EC – European Commission
ECB – European Central Bank
EFSF – European Financial Stability Facility
EIZG – Institute of Economics, Zagreb
EMBI – Emerging Market Bond Index
EMU – Economic and Monetary Union
EONIA – Euro Overnight Index Average
ERM – Exchange Rate Mechanism
ESM – European Stability Mechanism
EU – European Union
EULIBOR – Euro London Interbank Offered Rate
EUR – euro
EURIBOR – Euro Interbank Offered Rate
f/c – foreign currency
FDI – foreign direct investment
Fed – Federal Reserve System
FINA – Financial Agency
FRA – Fiscal Responsibility Act
FSI – financial soundness indicators
GDP – gross domestic product
GFS – Government Finance Statistics
HANFA – Croatian Financial Services Supervisory Agency
HBS – Household Budget Survey
HH – households
HREPI – hedonic real estate price index
HRK – Croatian kuna
IBIR – interbank interest rates
ILO – International Labour Organization
IMF – International Monetary Fund
IR – interest rate
LTIR – long-term interest rates
m – million
MoF – Ministry of Finance
MRR – marginal reserve requirements
NFC – non-financial corporations
NPLR – ratio of non-performing loans to total loans
OECD – Organisation for Economic Co-operation and Development
OF – own funds
ON USLIBOR – overnight US dollar London Interbank Offered Rate
pp – percentage points
RC – Republic of Croatia
ROAA – return on average assets
ROAE – return on average equity
RR – reserve requirements
RWA – risk-weighted assets
SDR – special drawing rights
yoy – year-on-year
ZIBOR – Zagreb Interbank Offered Rate
ZSE – Zagreb Stock Exchange

Two-letter country codes

BA – Bosnia and Herzegovina
BG – Bulgaria
CZ – Czech Republic
EE – Estonia
HR – Croatia
HU – Hungary
LT – Lithuania
LV – Latvia
MK – The former Yugoslav Republic of Macedonia
PL – Poland
RO – Romania
SI – Slovenia
SK – Slovak Republic

Symbols

– – no entry
.... – data not available
0 – value is less than 0.5 of the unit of measure being used
Ø – average
a, b, c,... – indicates a note beneath the table and figure
* – corrected data
( ) – incomplete or insufficiently verified data

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