No.
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Year 5
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FINANCIAL STABILITY

CROATIAN NATIONAL BANK

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No. 8, Zagreb, January 2012

PUBLISHER
Croatian National Bank
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www.hnb.hr

Printed in 400 copies

ISSN 1846-9264 (print)
ISSN 1847-0017 (online)

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Introductory remarks

Finance plays a key role in the allocation of resources, i.e. the process of transforming savings into investments, and therefore into economic growth and an increase in the overall level of social welfare. At the same time, because financial stability is based on the confidence of financial market participants, it largely depends in turn on their perceptions and behaviour, which are subject to cyclical swings. As financial crises create considerable economic and social costs, the maintenance of financial stability has the character of a public good and is thus an important economic policy objective.

Financial stability is characterised by the smooth functioning of all financial system segments (institutions, markets, and infrastructure) in the resource allocation process, in risk assessment and management, payments execution, as well as in the resilience of the system to sudden shocks. This is why the Act on the Croatian National Bank, in addition to the main objective of the central bank – maintenance of price stability and monetary and foreign exchange stability – also lists among the main central bank tasks the regulation and supervision of banks with a view to maintaining the stability of the banking system, which dominates the financial system, as well as ensuring the stable functioning of the payment system. Monetary and financial stability are closely related, for monetary stability, which the CNB attains by the operational implementation of monetary policy, performing the role of the bank of all banks and ensuring the smooth functioning of the payment system, lowers risks to financial stability. At the same time, financial stability contributes to the maintenance of monetary and macroeconomic stability by facilitating efficient monetary policy implementation.

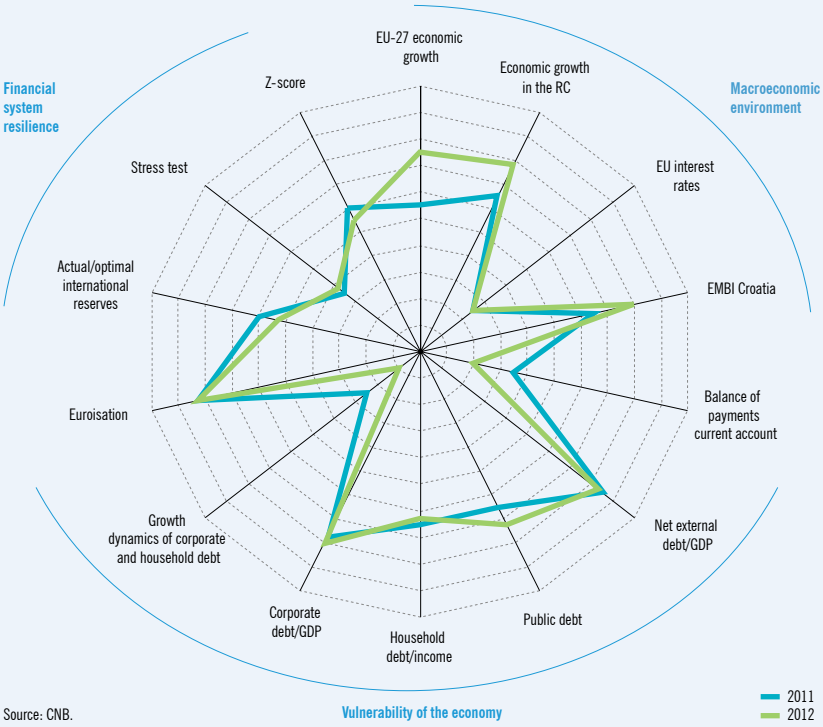
The CNB shares the responsibility for overall financial system stability with the Ministry of Finance and the Croatian Financial Services Supervisory Agency (HANFA), which are responsible for the regulation and supervision of non-banking financial institutions. Furthermore, owing to the high degree to which the banking system is internationalised, as reflected in the foreign ownership of the largest banks, the CNB also cooperates with the home regulatory authorities and central banks of parent financial institutions.

The publication Financial Stability analyses the main risks to banking system stability stemming from the macroeconomic environment of credit institutions and the situation in the main borrowing sectors, as well as credit institutions' ability to absorb potential losses should these risks materialise. Also discussed are CNB measures to preserve financial system stability. The analysis focuses on the banking sector, due to its predominant role in financing the economy.

The purpose of this publication is systematically to inform financial market participants, other institutions and the general public about the vulnerabilities and risks threatening financial system stability in order to facilitate their identification and understanding as well as to prompt all participants to take adequate safeguards should these risks actually occur. It also aims at enhancing the transparency of CNB actions to address the main vulnerabilities and risks and strengthen financial system resilience to potential shocks that could have significant negative impacts on the economy. This publication should encourage and facilitate a broader professional discussion on financial stability issues. All this together should help maintain confidence in the financial system and thus its stability.

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

Figure 1 Financial stability map



Source: CNB.

The exacerbation of the debt crisis and the deterioration of the economic outlook for the eurozone in interaction with the weak fiscal position have increased capital costs and may bring a new wave of recession in the country, with adverse consequences for financial stability in 2012. Resilience of the Croatian banking sector to external shocks has improved to some extent, but the real challenges to the preservation of financial stability are still the implementation of credible fiscal adjustment and improvement of the medium-term growth outlook by structural reforms.

The main financial stability indicators for Croatia are summarised in Figure 1. The financial stability map shows changes in key indicators of the possibility of occurrence of risks related to the domestic and international macroeconomic environment and vulnerability of the domestic economy, as well as indicators of financial system resilience that can eliminate or reduce the costs should such risks materialise. The map shows the most recent market developments or projections of selected indicators and their values in the comparable period, i.e. the previous year. For each variable, an increase in the distance from the map centre indicates greater risks or system vulnerability and lesser resilience, as well as a greater threat to stability. Hence, an increase in the map area suggests an increase in risks to financial stability, while a decrease in the area suggests their reduction.

The intensification of the debt crisis and the deterioration of the economic outlook for the eurozone will adversely affect financial stability in Croatia in 2012. The expected slowdown of the EU economy and recession in some of the major Croatian trading partners will dampen foreign demand. In addition, the high degree of uncertainty and the aversion of international investors to assuming additional risks will hamper new borrowing and refinancing of the debt maturing in 2012. Due to a combination of weak export demand and impeded access to foreign financial markets, the Croatian economy could enter a mild recession. All this together will add to the uncertainties. Therefore, a possible deterioration of the eurozone crisis in interaction with relatively weak domestic fundamentals (rapid growth in the public debt to GDP ratio) could bring about a much more adverse macroeconomic scenario and increase the risks to financial stability.

Against the background of the renewed recession, the poor government finance situation will be one of the major risks to financial stability in 2012. The postponement of the fiscal adjustment process put Croatia among the few countries whose budget balance deteriorated in 2011. Combined with a higher risk premium, which was pushed up by increased risk aversion due to the crisis deepening in the eurozone, this has become a threat to the country's solvency. The expansive fiscal policy has threatened Croatia's credit rating, made debt refinancing more difficult and more expensive for all sectors, with negative implications for financial stability. All this has reduced the room for fiscal policy as it will be forced into procyclical restrictions in view of the renewed recessionary trends expected in 2012.

As weak economic performance also adversely affects the public finance situation, it is important to revive economic growth in the medium term. A medium-term economic stagnation impairs the sustainability of all debts and is another possible channel that could activate an unfavourable spiral of growing market scepticism, more expensive refinancing, and upsurge in private and public sector debt.

In such conditions, the risk of credit risk materialisation faced by the banking sector will be somewhat stronger in 2012 than in 2011. Should the crisis escalate, the refinancing risk associated with foreign liabilities and the risk of capital flight from Croatia would intensify, generating downward pressures on the exchange rate and raising interest rates. This would further increase credit risk relative to the baseline scenario, hamper financing and add to the risk of a contraction in bank loans. Although the banking sector as a whole has relatively large buffers to protect its solvency even in the case of major shocks, differentiation within the sector has been increasing. A possible need to set aside additional value adjustments for existing non-performing loans or incorrectly classified loans may further weaken the capital of some small banks that are already less capitalised.

In early 2012, the Croatian economy and financial system are somewhat better prepared for a new onslaught of the financial crisis than at the time the previous edition of this publication was prepared. The continuation of private sector adjustment to poor economic prospects eliminated the current account deficit in 2011, which stabilised net external debt and reduced foreign funding needs in 2012. International reserves also increased slightly in 2011, while maturing external debt will be lower in 2012 than in 2011. No significant amount of external government debt falls due in 2012. The banking sector mostly relies on domestic savings, while for foreign funding it primarily turns to owners, which have proved to be a stable source of financing during the crisis. However, the risks parent banks face due to the turbulence in the eurozone could build up pressures on the financial system's foreign currency liquidity.

The banking sector also faces up to the risks emerging from the new recession more strongly. After increased payments in 2010, banks mostly retained their earnings in 2011, and their capital growth followed asset growth. Also, their business performance improved slightly in 2011, which further strengthened buffers against adverse shocks. Finally, banks used the slower growth in non-performing loans in 2011 to increase the coverage of these loans by value adjustments. This reduced potential new costs for value adjustments for existing non-performing loans.

Unfavourable macroeconomic and financial developments and the increased risk of materialisation of adverse scenarios impose a difficult task upon all agents important for the maintenance of financial stability. Closely following foreign banks, domestic banks started to change the relative credit supply by sector, reducing in their portfolios the share of loans to corporates dealing in construction and real estate management. These corporates have been recording a steady fall in activity and a weaker loan servicing capacity. Such a policy on the part of the banks mitigates risks to financial stability in the medium run. However, the banking sector should maintain the current level of capital adequacy, while some banks should raise it even further to continue to channel financial surpluses efficiently under the harsh circumstances expected in 2012. In concert with capital injections to less-capitalised banks, the ongoing process of mergers and consolidation in the banking sector is another option to stabilise weaker banks.

Against this background, the government needs to begin fiscal adjustment processes and structural reforms so as to put public finances on a sustainable path. Urgent implementation of a credible fiscal adjustment plan should, in the short run, provide access to international financial markets for the government, domestic corporates and banks at acceptable financial terms. However, without improvement in the medium-term growth outlook, fiscal adjustment efforts will lead to a prolonged economic stagnation, which may also worsen foreign funding conditions.

The cumulative drop in Croatian GDP since the onset of the financial crisis has not departed significantly from the average for the countries in the region, though the decline lasted somewhat longer. Changes in the sectoral allocation of loans, which began in 2010 and continued in 2011, have somewhat

improved the growth outlook. Still, the postponement or absence of reforms to facilitate reallocation of capital to profitable sectors with better growth perspectives will make Croatia economically stunted in the medium run. A radical improvement of the business and investment climate, particularly the stronger protection of ownership rights, coupled with reforms of the social security systems, the labour market and public administration should become economic policy priorities.

As before, the central bank will intervene should there be any major disruptions in the domestic or foreign financial markets, to alleviate their impact on monetary and credit developments and exchange rate stability. However, no monetary or macroprudential policy measure can improve the medium-term growth outlook and eliminate risks to financial stability emerging from prolonged economic stagnation, which can be dealt with only by structural policies.

Macroeconomic environment

The growing risks of a deterioration in financial stability and eurozone recession impose the need for a sizable shift in domestic economic policy so as to improve the country's risk perception.

The international macroeconomic environment is highly likely to deteriorate in 2012. The crisis in the eurozone sovereign debt market is a threat to banking sector stability and adversely affects consumer confidence and business expectations. Growth forecasts for the eurozone have been slashed, and even the possibility of another economic slump is not excluded. This would actually be a new bottom of the recession that began with the global financial crisis of 2008 (Tables 1, 2 and 3).

Multiple efforts of eurozone member states to stabilise the sovereign debt market have not yielded any significant results (Tables 2 and 3 and Figure 4). Although there is larger funding from eurozone funds, the Greek debt solution adopted involves private investors participating more in the costs of reducing the debt to a sustainable level. However, efforts to increase the EFSF's funding capacity and thus prevent a spillover of the crisis to other eurozone countries failed to restore investor confidence. In mid-2011, the crisis spread to the Italian and Spanish sovereign debt markets, raising the yields on government bonds to levels unsustainable in the long run (Figure 4).

In the eurozone, there is no lender of last resort for sovereign debt. The main problem in the short run is the market belief that the EFSF has insufficient funding capacity to assume the role of lender of last resort , i.e. secure unlimited liquidity on the government bond market. However, there is also the main structural problem of the eurozone being a monetary union without fiscal competences, i.e. without fiscal union elements capable of guaranteeing the long-term public finance sustainability of all eurozone members. As this solution would imply unlimited

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

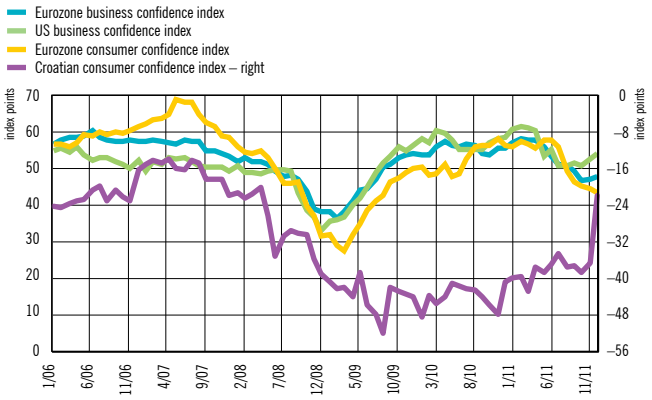
	Annual GDP growth rate			Quarterly GDP growth rate, $\Delta Q_t/Q_{t-1}$		Annual rate of change in exports of goods		Annual rate of change in industrial production (seasonally adjusted)	
	2010	2011[a]	2012[b]	Q2/2011	Q3/2011	Q2/2011	Q3/2011	Q2/2011	Q3/2011
USA	3.0	1.6	1.5	0.3	0.5	17.9	26.8	3.8	3.7
EU	2	1.6	0.6	0.2	0.2	11.7	9.6	3.9	3.6
Germany	3.7	2.9	0.8	0.3	0.5	12.7	11.0	8.2	8.3
Italy	1.5	0.5	0.1	0.3	0.2	13.2	9.6	1.8	0.2
Slovenia	1.4	1.1	1.0	0.0	–0.2	13.8	10.8	4.0	0.8
Slovak R.	4.2	2.9	1.1	0.8	0.8	18.0	11.1	7.7	5.8
Czech R.	2.7	1.8	0.7	0.2	–0.1	18.6	12.2	8.8	4.5
Poland	3.9	4.0	2.5	1.2	1.0	12.3	7.9	7.2	5.7
Hungary	1.3	1.4	0.5	0.2	0.5	13.1	9.0	4.1	1.7
Estonia	2.3	8.0	3.2	1.7	1.2	48.2	36.9	26.2	17.4
Latvia	–0.3	4.5	2.5	2.0	1.3	30.3	19.0	12.9	8.1
Lithuania	1.4	6.1	3.4	1.8	1.4	33.0	26.1	9.2	5.8
Bulgaria	0.2	2.2	2.3	0.3	0.3	27.7	20.4	6.8	3.3
Romania	–1.9	1.7	2.1	0.9	1.8	18.8	18.0	5.8	6.1
Croatia	–1.2	0.4	–0.2	0.7	0.8	7.5	4.9	1.2	–2.0

[a] Estimate. [b] Forecast.
Sources: Eurostat, CBS, Bloomberg, OECD and CNB (for Croatia).

transfers among eurozone members, it actually points to the irreconcilability of the principle of unlimited political sovereignty of the member states and the efficient functioning of the monetary union in the globalised financial market.

In other words, there is no political support in eurozone countries with strong finances for automatic transfers to countries with fiscal deficits, and there is no political support for necessary adjustments in the latter countries. Under the current institutional arrangements, there is no guarantee against sovereign default risk. Hence, politicians are facing the difficult task of finding solutions capable of ensuring both voter and financial market confidence.

Figure 2 Business and consumer confidence indices



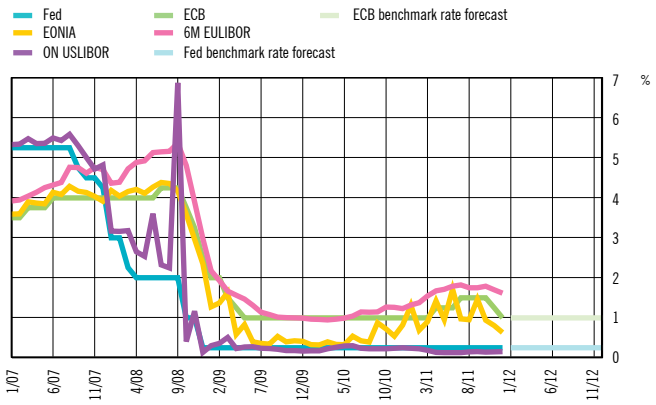
Sources: Bloomberg and CNB.

Under the current arrangements, the ECB's role is limited to interventions in the secondary bond market to secure the smooth functioning of monetary policy transmission. Therefore, the market perception that there is no effective lender of last resort for member states weakens investor confidence and strengthens pressures to sell bonds, thereby turning the liquidity crisis into a solvency crisis of vulnerable countries.

The negative feedback between the sovereign bond market and eurozone banks has also played an important role in the spread of the crisis (Figures 4 and 5). Large exposure of banks to vulnerable eurozone countries generates significant losses in banks' balance sheets. Together with a perception of limited government capacity to support under-capitalised banks, this has led to a crash in the market for long-term bank financing and a sharp drop in interbank market transactions. Combined with potential deposit outflows, which have already begun in most risky countries, this stifles the ability of banks to finance the economy and may prompt a resurgence of the financial crisis. In view of the interconnectedness of the global financial system, the crisis could easily turn into a new global crisis.

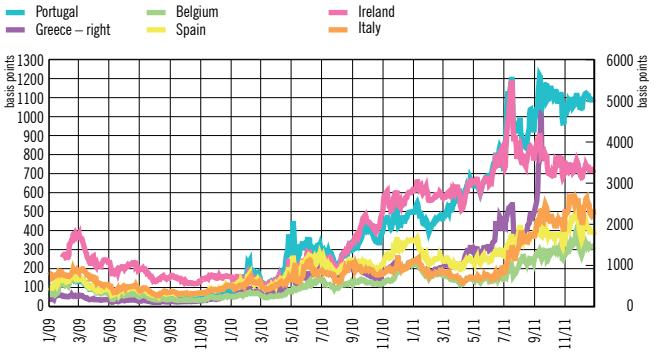
In such conditions, banks reduced their exposure to peripheral eurozone sovereign debt in 2011 and compensated for the lack

Figure 3 Key interest rates of the main central banks and leading market interest rates



Sources: Fed, ECB and Bloomberg.

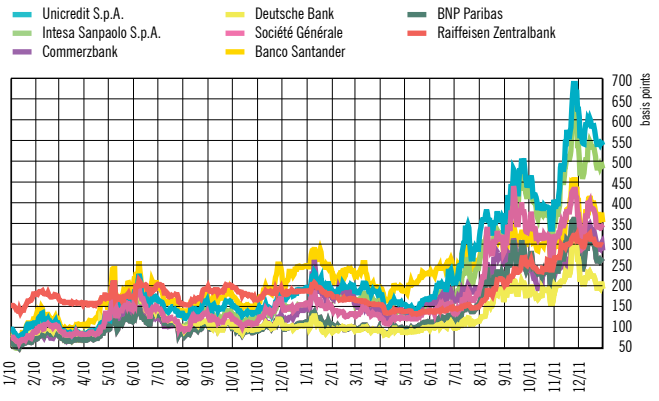
Figure 4 CDS[a] spreads for 5-year bonds of selected eurozone countries



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

Source: Bloomberg.

Figure 5 CDS spreads for 5-year bonds of selected banks



Source: Bloomberg.

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

	Fiscal balance, as % of GDP (ESA 95)			Current account balance, as % of GDP		
	2010	2011[a]	2012[b]	2010	2011[a]	2012[b]
USA	–10.6	–10.0	–8.5	–3.3	–3.3	–3.1
EU	–6.6	–4.7	–3.9	–0.9	–0.8	–0.4
Germany	–4.3	–1.3	–1.0	5.1	5.1	4.4
Italy	–4.6	–4.0	–2.3	–4.2	–3.6	–3.0
Portugal	–9.8	–5.8	–4.5	–9.8	–7.6	–5.0
Ireland	–31.3	–10.3	–8.6	–0.7	0.7	1.5
Greece	–10.6	–8.9	–7.0	–11.8	–9.9	–7.9
Spain	–9.3	–6.6	–5.9	–4.5	–3.4	–3.0
Slovenia	–5.8	–5.7	–5.3	–1.1	0.1	0.3
Slovak R.	–7.7	–5.8	–4.9	–2.9	–0.7	–1.2
Czech R.	–4.8	–4.1	–3.8	–2.3	–3.6	–3.2
Poland	–7.8	–5.6	–4.0	–3.1	–5.0	–4.3
Hungary	–4.2	3.6	–2.8	1.7	1.7	3.2
Estonia	0.2	0.8	–1.8	2.8	3.1	1.5
Latvia	–8.3	–4.2	–3.3	3.6	–0.4	–1.1
Lithuania	–7.0	–5.0	–3.0	1.8	–1.7	–1.9
Bulgaria	–3.1	–2.5	–1.7	–1.5	1.6	1.4
Romania	–6.9	–4.9	–3.7	–4.2	–4.1	–5.0
Croatia	–4.9	–5.5	–4.3	–1.2	0.4	0.5

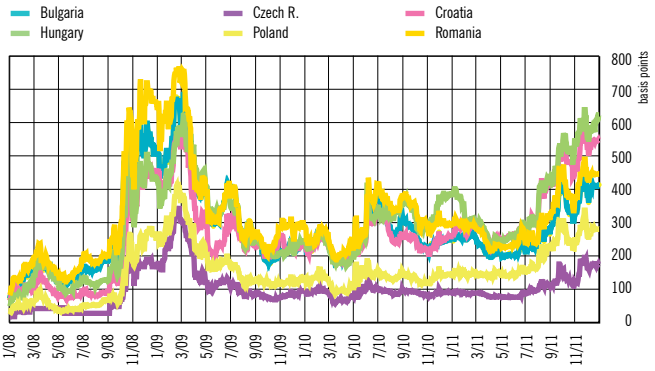
[a] Estimate. [b] Forecast.
Sources: European Commission, *European Economic Forecast,* autumn 2011 and CNB (for Croatia).

of funding in the market by increasingly relying on ECB liquidity facilities.

A fiscal agreement is therefore a step in the right direction on the long journey to permanent stabilisation. The EU summit in December 2011 mapped some steps towards solutions that should calm the market for eurozone sovereign debt and stabilise the financial sector. The endeavour to strengthen the institutional framework, ensuring long-term fiscal and financial stability in the eurozone, includes decisions to strengthen fiscal discipline among member countries through the fiscal compact, as it is called, involving a constitutional cap on budget deficit and public debt, with automatic penalties, and stronger supervision of fiscal and economic policies in both eurozone member states and other EU members willing to join the compact.

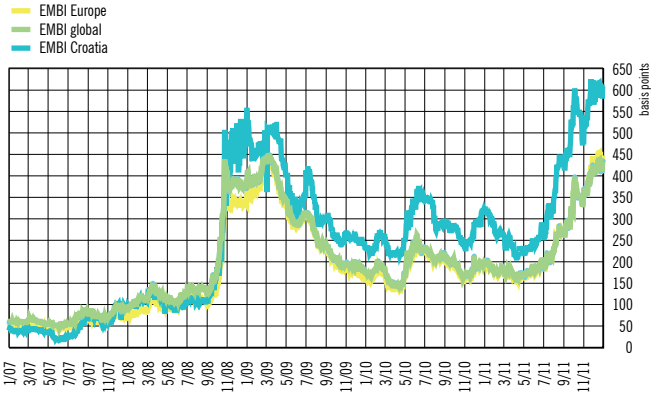
At the same time, efforts are made to strengthen the liquidity support system for solvent countries. The expeditious realisation of the plan to increase the EFSF's funding capacity and activation of the European Stability Mechanism (ESM) should as early as mid-2012, combined with additional funding to the IMF, significantly enhance the capacity to provide support

Figure 6 CDS spreads for 5-year bonds of selected emerging market countries



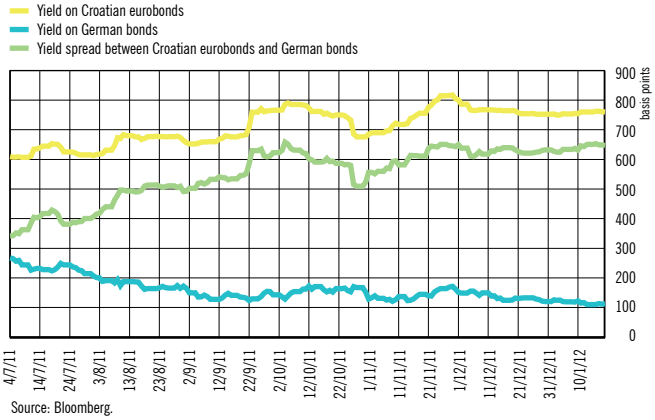
Source: Bloomberg.

Figure 7 EMBI spreads



Source: J. P. Morgan.

Figure 8 Yields on Croatian and benchmark German bonds maturing in 2018 and their spread



Source: Bloomberg.

Table 3 Public and external debt in selected European emerging market countries

as % of GDP

	Public debt		External debt	
	2011[a]	2012[b]	2010	6/2010
Slovenia	45.5	50.1	115.8	119.0
Slovak R.	44.5	47.5	76.0	78.2
Portugal	101.6	111.0	230.6	220.7
Italy	120.5	120.5	118.5	119.2
Ireland	108.1	117.5	1.113.3	1.055.1
Greece	162.8	198.3	181.3	184.0
Spain	69.6	73.8	166.1	167.9
Czech R.	39.3	41.9	49.6	48.9
Poland	56.7	57.1	56.3	68.8
Hungary	75.9	76.5	160.1	159.8
Estonia	5.8	6.0	116.1	110.7
Latvia	44.8	45.1	165.2	155.8
Lithuania	37.7	38.5	87.2	86.0
Bulgaria	17.5	18.3	105.5	98.3
Romania	34.0	35.8	77.5	79.2
Croatia	45.1	51.8	98.9	97.1

[a] Estimate. [b] Forecast.
Sources: Eurostat, World Bank, *Quarterly External Debt Statistics* and CNB (for Croatia).

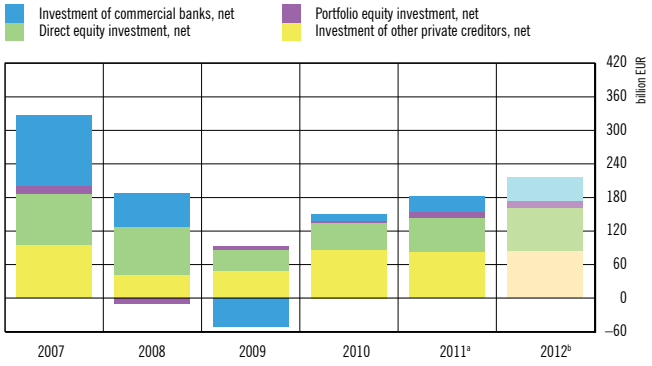
to countries facing liquidity problems and under-capitalised banks. According to the most recent estimates of the European Banking Authority (EBA), the latter have a capital shortage of around EUR 115bn.

In parallel to this, the ECB cut its interest rate twice in autumn 2011 (Figure 3), and decided to introduce three-year liquidity loans and expand the list of eligible collateral. It thereby enabled a strong improvement in bank liquidity and, indirectly, the liquidity in the sovereign debt market.

Markets have not yet become stable due to uncertainties surrounding the measures adopted (Figures 4, 5, 6 and 7). A further deterioration in financial market conditions should, at least in the short run, be prevented by the implementation of measures to strengthen financial support mechanisms for eurozone countries and banks, and by relinquishment of demands that private investors participate in the costs of a sovereign default. More permanent stabilisation of markets hinges on the implementation of the fiscal compact, which should be finalised in March 2012. As this is related to a number of legal and political issues, market uncertainties have continued.

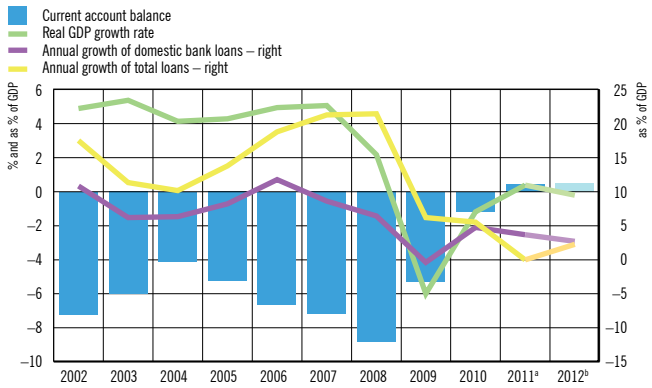
A final long-term solution in the form of a fiscal union, which would involve the issue of eurobonds, the levying of taxes at the EU level, and supranational supervision of the financial sector,

Figure 9 Capital inflows to European emerging market countries



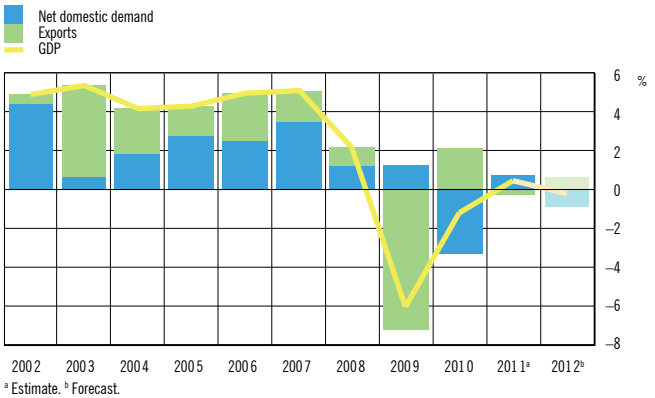
a Estimate. b Forecast.
Source: International Institute of Finance, *Capital Flows to Emerging Market Economies*, September 2011.

Figure 10 Foreign capital inflows and GDP growth in Croatia



a Estimate. b Forecast.
Sources: CNB and CBS.

Figure 11 GDP growth pattern (contribution to growth)



a Estimate. b Forecast.
Sources: CNB and CBS.

has not yet appeared on the horizon, though the fiscal compact is the first step in that direction.

To achieve long-term financial sustainability of the eurozone, it is crucial to secure the economic recovery of countries that have serious problems of low competitiveness (Table 1). Combined with fiscal consolidation and the reduction of capital costs to an acceptable level for countries with fiscal deficits, this may be achieved only in the context of rebalanced growth patterns in the eurozone (Tables 2 and 3). In addition to structural reforms, this implies stronger consumption as well as export demand in countries with surpluses, which would enable the countries with deficits to recover thanks to export growth. No decisive steps in this direction have been observed so far.

Banks have reduced their debts, which threatens credit growth and economic recovery. The harsher financing terms in the market and regulatory pressures to raise the capital adequacy ratio to 9% of risk weighted assets by mid-2012, induced banks to reduce their capital needs by selling assets; the banks are reluctant to raise additional capital in the market in view of the low market value of their shares. Bank efforts at divestment have a negative impact on loans to the economy and, in the negative spiral, on fiscal performances of the governments and their ability to support banks.

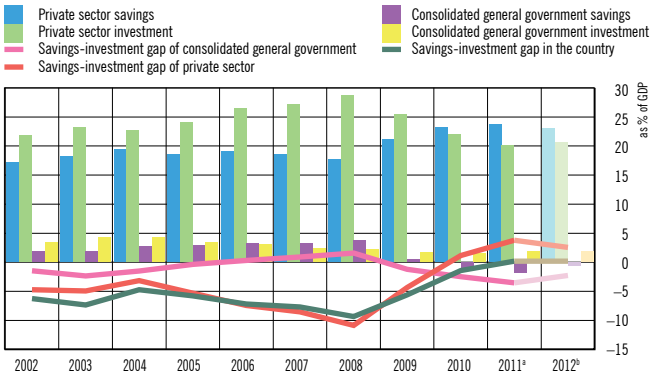
In such conditions, large European banks, which are important fund providers in international markets, have been reducing their exposures to all main regions worldwide. This has become a significant channel for the spread of financial stress at a global level.

Placements of banks that dominate in Southeast European markets levelled off in the first half of 2011. Partly in response to the fall in demand due to the sluggish economic activity in the autumn, these banks reduced their placements in the region and announced further limitations of activities in 2012 as well as tighter financing terms.

During the financial market crisis, volatile prices of financial assets is affecting countries' economic fundamentals, which reverses the causality direction that holds under normal circumstances. Lower capital inflows create pressures on foreign exchange rates, which reduces room for monetary stimulus to the economy. At the same time, increased risk aversion resulting from the eurozone crisis leads to an upsurge in risk premiums for countries in the region (Figures 6 and 7). All this together is contribution to a deterioration in funding conditions for economic entities in the domestic and foreign markets and impeding economic recovery.

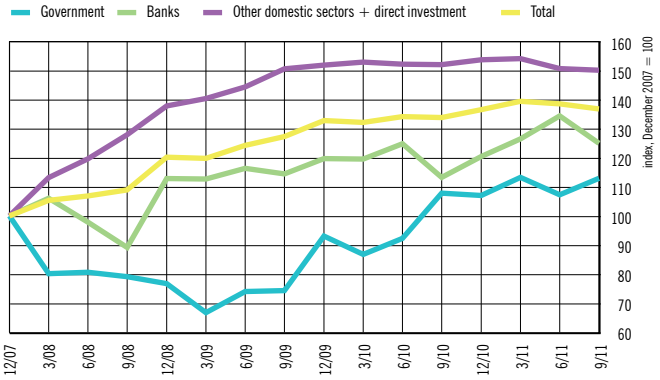
This is particularly true for the group of countries in the region, including Croatia, which at the same time have to implement fiscal restrictions in view of relatively high debt levels (Tables 1, 2 and 3). Croatia's vulnerability to external financial shocks will be somewhat lower in 2012 due to the smaller amount of the external debt falling due and the solid level of foreign currency liquidity reserves of the monetary system (Figures 14, 15,

Figure 12 Savings and investment – total and by sector



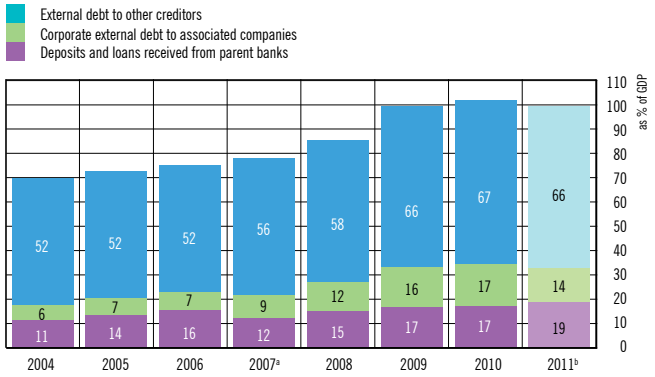
[a] Estimate. [b] Forecast.
Sources: MoF and CNB (estimate).

Figure 13 External debt by domestic institutional sector



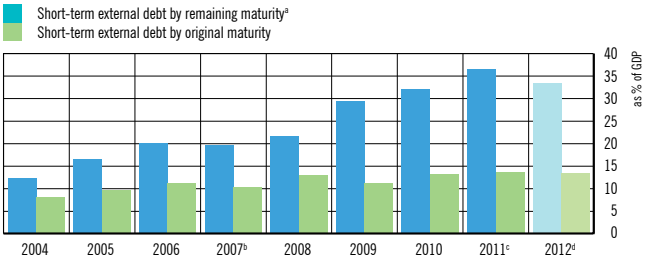
Source: CNB.

Figure 14 Total external debt by creditor



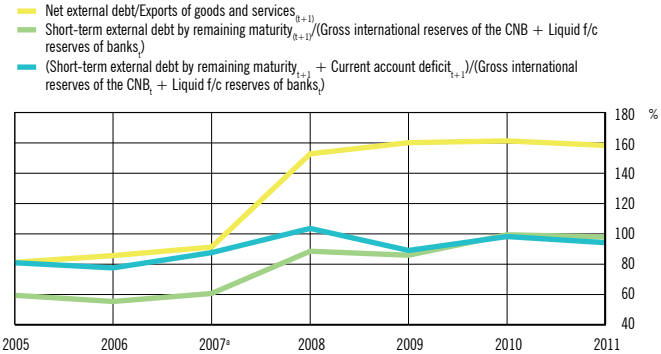
[a] Since end-2007, external debt has been calculated according to the new methodology. [b] Estimate.
Source: CNB.

Figure 15 Short-term external debt



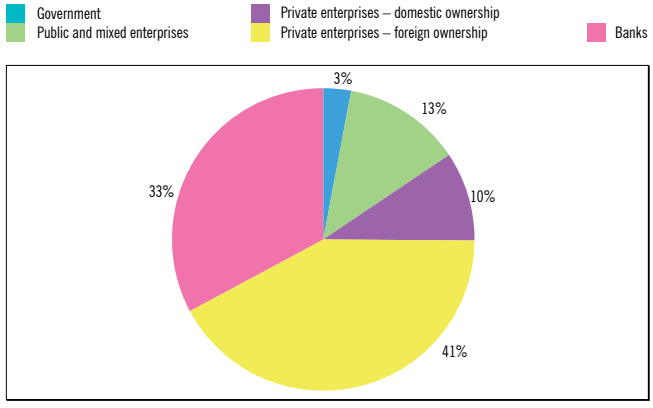
[a] Short-term external debt by remaining maturity is the amount of debt maturing in the reference year, representing the sum of the balance of short-term debt at the end of the previous year and long-term debt maturing in the reference year.
[b] Since end-2007, external debt has been calculated according to the new methodology.
[c] Estimate. [d] 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. This item excluded, the debt maturing in 2011 would decrease by about 2 percentage points of GDP. For more details on round tripping, see CNB Bulletin, No. 154, Box 4 Round tripping and its impact on Croatian statistical data.
Source: CNB.

Figure 16 Selected indicators of external vulnerability



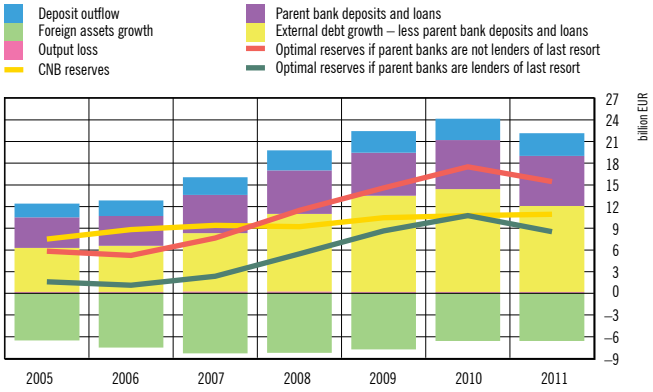
Note: Net external debt is calculated as a difference between gross external debt and gross international reserves and bank foreign assets.
[a] Since end-2007, external debt has been calculated according to the new methodology.
Source: CNB.

Figure 17 Projection of external debt principal payments in 2012 by sectors



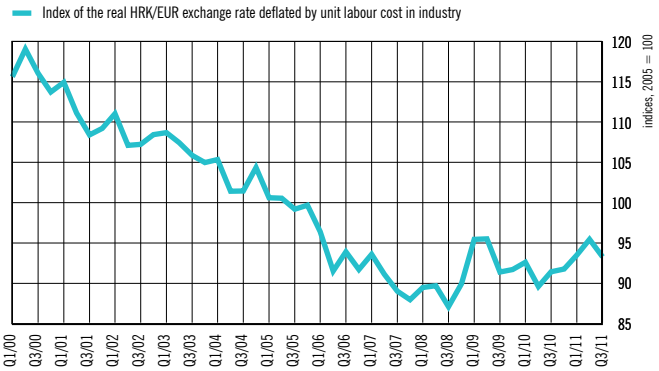
Source: CNB.

Figure 18 Optimal international reserves – contribution of individual components



Source: CNB.

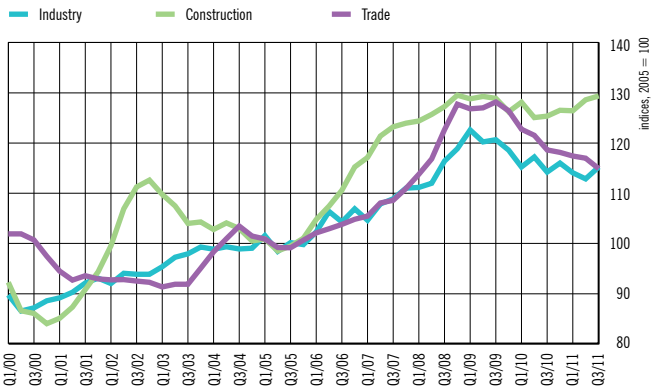
Figure 19 Real kuna/euro exchange rate



Note: A fall in the index indicates a real appreciation of the kuna against the euro.

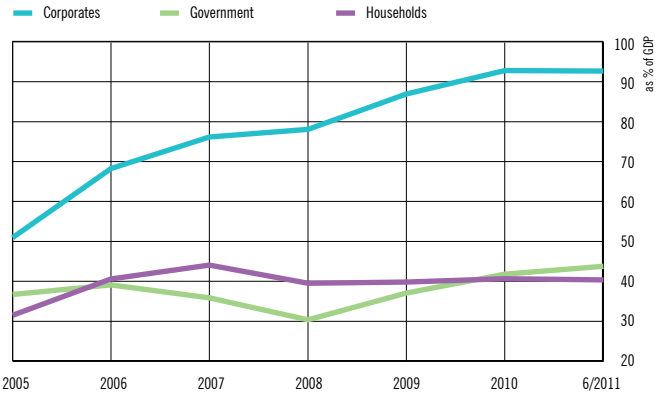
Sources: CBS, CNB and CNB calculations.

Figure 20 Unit labour cost



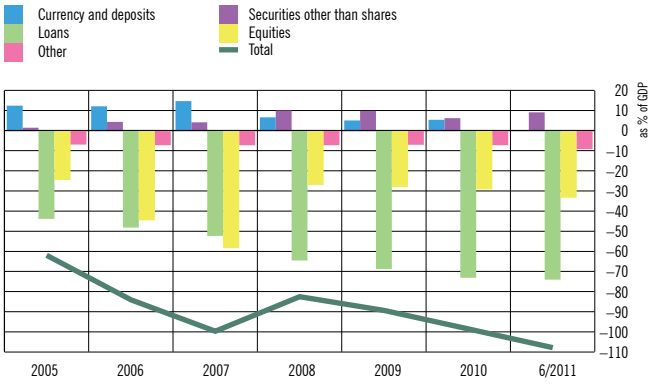
Sources: CBS, CNB and CNB calculations.

Figure 21 Total debt by sector



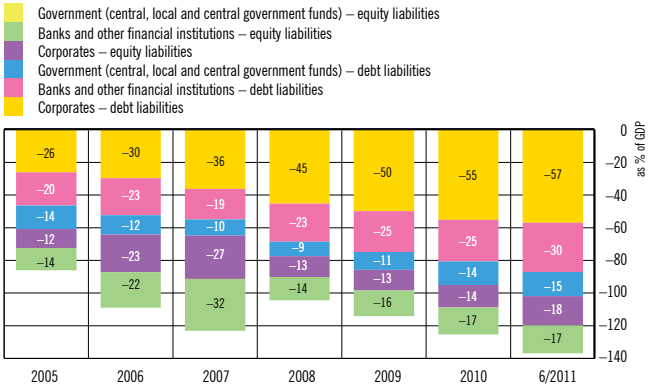
Source: CNB – financial accounts.

Figure 22 Net position of domestic sectors with respect to the rest of the world by instrument



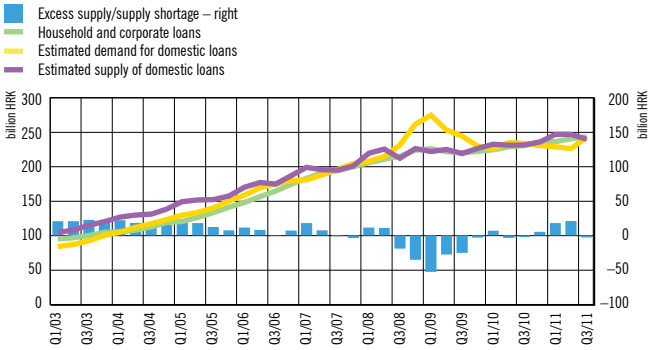
Source: CNB – financial accounts.

Figure 23 Net financial position of selected domestic sectors with respect to the rest of the world by equity and debt instrument



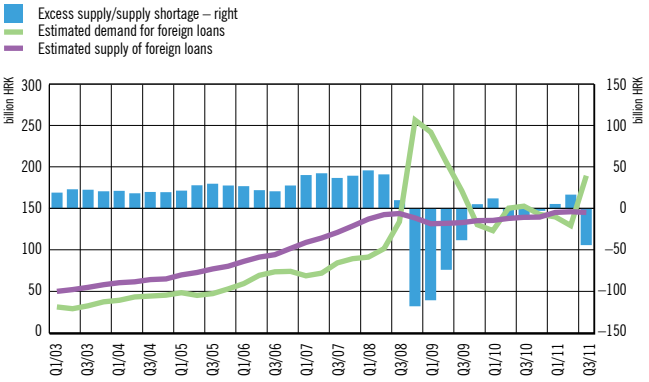
Source: CNB – financial accounts.

Figure 24 Estimated credit demand and supply in the domestic market[a]



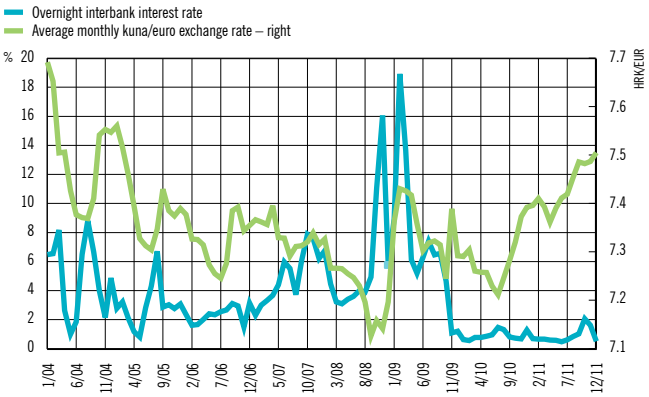
[a] Based on the results of the model used to estimate the impact of demand and supply on the Croatian credit market from Box 2 Credit market disequilibrium, *Financial Stability*, No. 5, July 2010.
Source: CNB calculations.

Figure 25 Estimated demand for and supply of foreign loans[a]



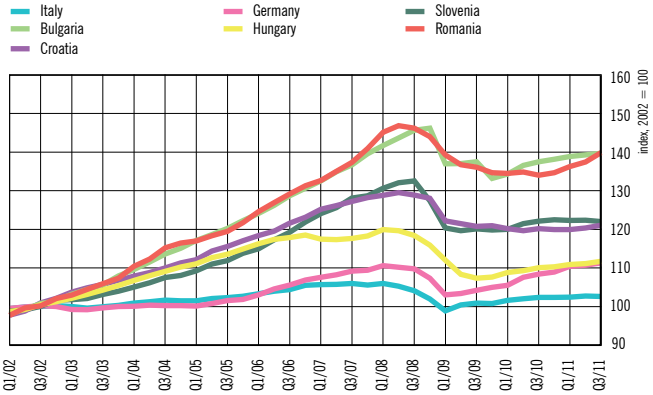
[a] See note under Figure 24.
Source: CNB calculations.

Figure 26 Kuna/euro exchange rate and overnight interest rates



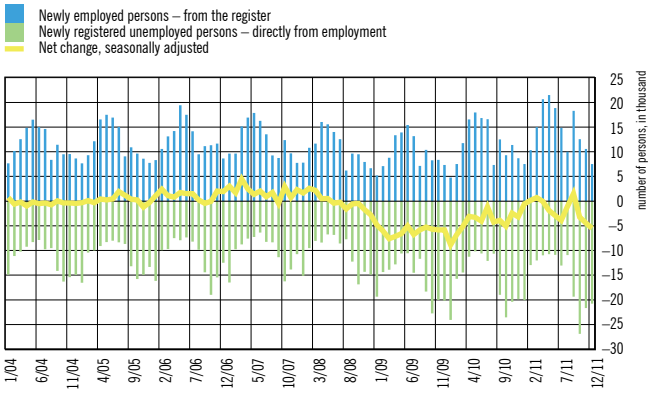
Source: CNB.

Figure 27 Gross domestic product, seasonally adjusted data in constant prices



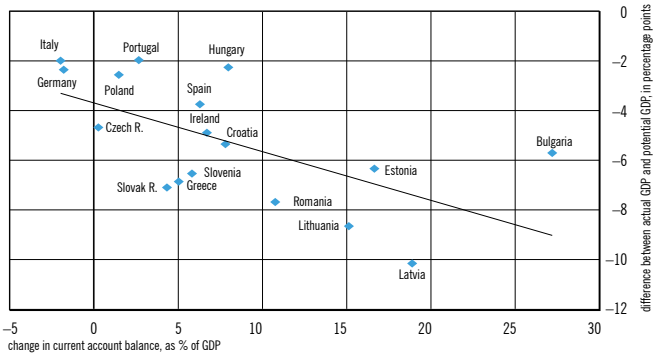
Sources: Eurostat, CBS and CNB.

Figure 28 Changes in employment registered with the Croatian Employment Service (CES)



Sources: CES and CNB calculations.

Figure 29 Changes in GDP and current account balances from end-2008 to end-2011 (annual data)



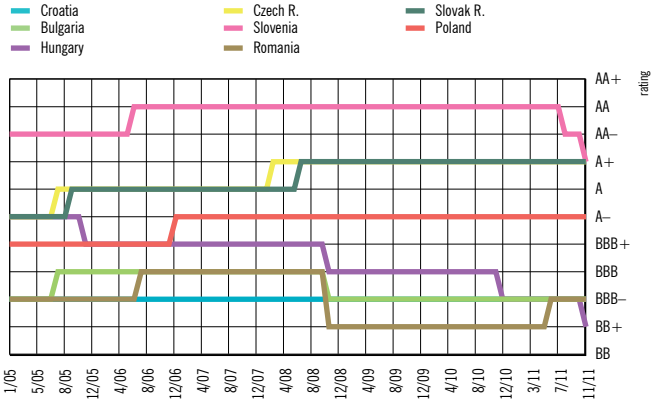
Sources: Eurostat, CNB and CNB calculations.

Table 4 Financial accounts for Croatia

Liabilities		Claims												Total liabilities	
		Domestic sectors										Rest of the world			
		Corporates		Financial sector		General government		Households		Total					
		2010	6/2011	2010	6/2011	2010	6/2011	2010	6/2011	2010	6/2011	2010	6/2011	2010	6/2011
Corporates	Monetary gold and SDRs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Currency and deposits	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Securities other than shares	0	0	2	2	0	0	0	0	2	2	1	2	3	3
	Loans	0	0	43	43	0	0	0	0	43	43	47	46	90	89
	Shares and equity	39	39	4	4	28	28	22	22	94	94	27	28	111	122
	Insurance technical provisions	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Other claims and liabilities	32	32	1	1	6	6	2	2	42	41	12	12	48	53
	Total	68	72	49	50	32	34	20	25	169	180	83	88	252	268
Financial sector	Monetary gold and SDRs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Currency and deposits	15	13	19	20	3	3	53	54	89	90	14	16	104	106
	Securities other than shares	0	0	0	0	0	0	0	0	0	0	3	2	3	2
	Loans	0	0	7	6	0	0	0	0	7	6	23	23	30	29
	Shares and equity	1	2	2	3	9	9	4	4	17	18	17	20	36	37
	Insurance technical provisions	1	1	1	1	0	0	16	18	18	19	0	0	18	20
	Other claims and liabilities	1	1	0	0	0	0	1	1	3	3	1	1	4	4
	Total	18	17	29	31	13	13	75	77	135	137	59	62	194	198
General government	Monetary gold and SDRs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Currency and deposits	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Securities other than shares	0	0	20	20	0	0	0	0	20	20	11	10	30	30
	Loans	0	0	8	9	0	0	0	0	8	9	4	5	11	14
	Shares and equity	0	0	0	0	26	26	0	0	26	26	0	0	30	26
	Insurance technical provisions	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Other claims and liabilities	3	3	0	0	0	0	0	0	3	3	0	0	4	3
	Total	4	3	27	29	30	26	0	0	61	59	14	15	75	73
Households	Monetary gold and SDRs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Currency and deposits	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Securities other than shares	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Loans	0	0	40	40	0	0	0	0	40	40	0	1	41	40
	Shares and equity	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Insurance technical provisions	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Other claims and liabilities	0	0	1	1	0	0	0	0	1	1	0	0	1	1
	Total	0	0	41	41	0	0	0	0	41	41	0	1	42	41
Rest of the world	Monetary gold and SDRs	0	0	1	1	0	0	0	0	1	1	0	0	1	1
	Currency and deposits	0	0	16	13	0	0	3	3	19	16	0	0	19	16
	Securities other than shares	0	0	20	22	0	0	0	0	20	22	0	0	20	22
	Loans	0	0	1	1	0	0	0	0	1	1	0	0	1	1
	Shares and equity	11	11	3	4	0	0	0	0	15	15	0	0	14	15
	Insurance technical provisions	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Other claims and liabilities	3	3	0	0	0	0	0	0	3	3	0	0	4	3
	Total	14	14	42	41	0	0	3	3	59	58	0	0	59	58
Total	Monetary gold and SDRs	0	0	1	1	0	0	0	0	1	1	0	0	1	1
	Currency and deposits	15	13	35	33	3	3	56	56	108	106	14	16	123	122
	Securities other than shares	0	0	42	45	0	0	0	0	42	45	14	14	57	58
	Loans	0	0	98	99	0	0	0	0	98	99	74	74	172	174
	Shares and equity	51	52	9	11	65	63	21	27	147	152	43	48	190	200
	Insurance technical provisions	1	1	1	1	0	0	16	18	18	20	0	0	18	20
	Other claims and liabilities	37	39	3	3	6	6	4	3	49	52	11	12	60	64
	Total	104	105	188	192	74	72	98	104	464	474	157	165	622	639

Source: CNB.

Figure 30 Changes in long-term sovereign credit ratings



Source: Fitch.

17 and 18). Neither should the banking sector have significant problems in meeting relatively weak credit demand as it mostly relies on domestic deposits and as parent banks, which are the predominant foreign funding source, have a relatively long-term horizon (Figures 10 and 14).

In conditions of tight funding terms that limit domestic demand growth, the expected slowdown in eurozone economic growth and export demand presents a large obstacle to Croatia's economic recovery (Figures 10 and 11). Stagnation and the drop in employment and household disposable income are expected to continue throughout 2012, while a gradual economic recovery is postponed to 2013, parallel to financial market stabilisation and EU and regional economic recovery. Although the risk of loss in the banking sector is expected to grow in such conditions, its stability should not be threatened thanks to the high capital adequacy ratio (estimated at around 20%).

The strong external adjustment of the Croatian economy, which was triggered by the fall in foreign capital inflows in the period after the outbreak of the global financial crisis, reversed the upward trend in external debt in 2011 (Figures 10, 13 and 14). Most of the adjustment was achieved through a sharp decline in domestic consumption and investment, which strongly reduced imports, while exports recovered gradually (Figure 11). With significant growth in net savings of the private sector, the increase in the general government deficit, mostly due to the fall in tax revenues, had a counter-cyclical effect and mitigated the fall in aggregate economic activity (Figure 12). However, this also generated a very sharp increase in public debt, which exceeded 45% of GDP in 2011 (Table 3).

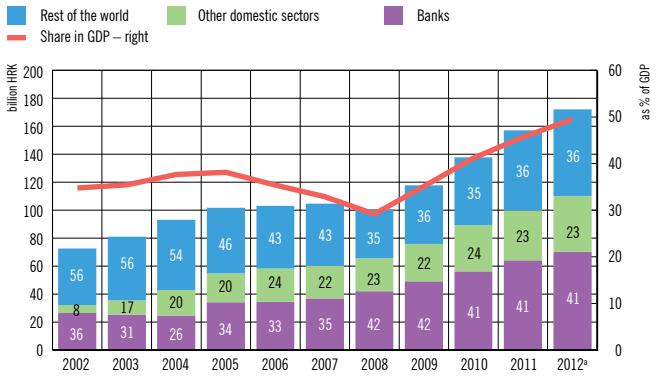
Economic policy must improve the risk perception of the country by credible reforms. With the rise in risk aversion triggered by the escalation of the eurozone crisis, borrowing costs in the international capital market have reached levels unsustainable in the long run. This poses a challenge for economic policy makers to improve the country's risk perception by decisive measures and secure access to foreign capital at a price that could stimulate economic recovery (Figures 6, 7 and 8).

In the medium run, it is necessary to implement credible fiscal adjustment that ensures public finance sustainability. This requires additional strengthening of the institutional framework to implement fiscal rules under the Fiscal Responsibility Act, primarily through a stronger role of an independent fiscal board. The intensity and timetable of the adjustment should be brought in line with financial market developments, while taking account of the stage of the economic cycle so as to avoid excessive pro-cyclical effects and maintain social and political stability.

Credible structural reforms are urgently needed to spur growth based on more dynamic exports and investments (particularly those oriented towards exports). For that purpose, it is necessary to support the continued strengthening of competitiveness in tradable sectors, which has been evident in the last few years, particularly by increasing productivity and reducing unit labour costs (Figure 20), and considerably improve the business climate so as to improve business expectations and stimulate investment. In this context, major steps should be made to strengthen the legal protection of ownership and security of claim collection, reduce administrative barriers to businesses and investors, step up further privatisation of state assets and labour market liberalisation, and provide strong incentives to corporate research and development activities.

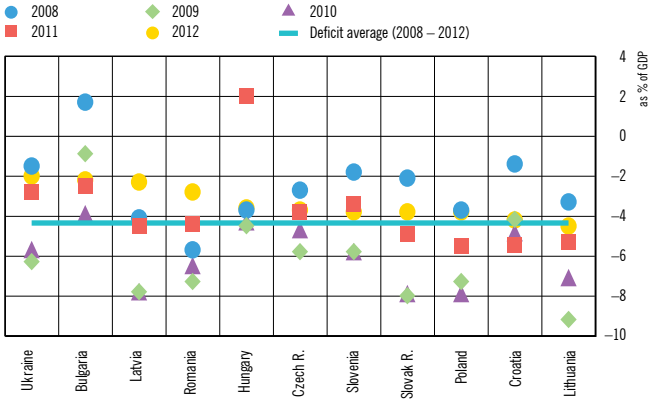
Government sector

Figure 31 General government debt



[a] CNB projections.
Sources: MoF and CNB.

Figure 32 General government deficit



Source: IMF, *Regional Economic Outlook 2011*.

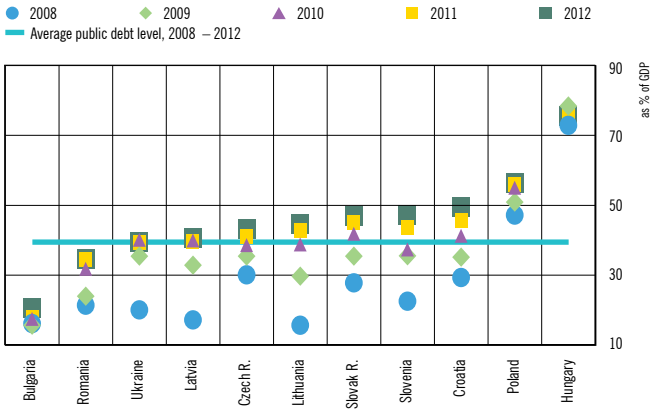
The trend for fiscal indicators to deteriorate, which is largely due to the global financial crisis, calls for the implementation of a credible fiscal consolidation programme to secure public debt sustainability and avoid a cut in the credit rating.

Over the last three years public debt has grown by 56%, burdening the government budget with 70% higher interest payments. The pace of public debt growth was in line with expectations in 2011. The exception was the debt arising from shipyard guarantees included in public debt and amounting to around HRK 11bn or 3% of GDP, which was transferred to 2012. With the general government deficit of around 5.4% of GDP, public debt (excluding Croatian Motorways, CM) will be around 45% of GDP in late 2011 (Figure 31), up 14% on the end of 2010 and 56% more than in the pre-crisis 2008. The steep price of the crisis that is being paid from the budget is also reflected in interest expenses; they are currently 70% higher than in 2008 and are still trending up.

Croatia has relatively high budget deficit and public debt levels. In the group of European emerging market countries, Croatia was among those with the largest deficits in 2011 (Figure 32). Exposure of the financial sector (banks) to the general government sector went up 22% in 2011. In comparison with the same group of countries, Croatia has nearly the highest public debt (Figure 33), which further confirms the need for a careful planning of the 2012 budget, particularly since economic stagnation in Croatia will most likely continue.

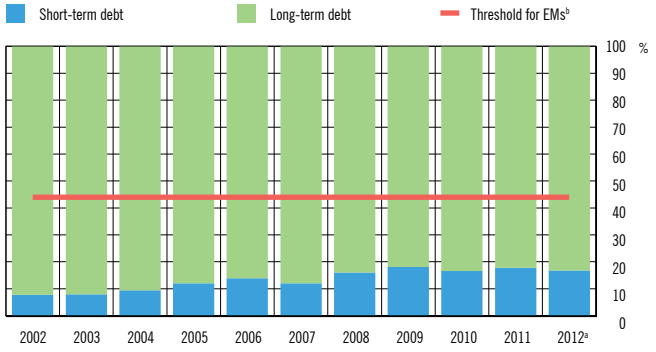
Rapid growth in public debt is the main source of risks. Putting an end to the strong public debt growth, which characterised the recessionary period that began in 2009, is the key fiscal policy challenge for 2012. Croatian public debt is still below 60% of GDP, but its fast increase needs to be stopped and re-

Figure 33 Public debt



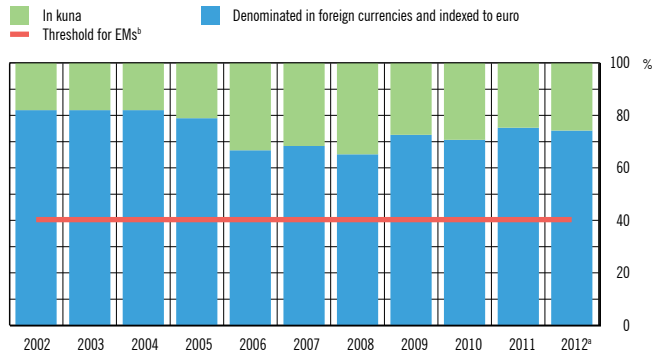
Source: IMF, *Regional Economic Outlook 2011*.

Figure 34 Breakdown of public debt by remaining maturity



[a] CNB projections.
[b] One of the indicators used for estimating the fiscal sustainability risk in emerging market countries (EMs).
Sources: MoF and CNB.

Figure 35 Currency breakdown of public debt



[a] CNB projections.
[b] One of the indicators used for estimating the fiscal sustainability risk in emerging market countries (EMs).
Sources: MoF and CNB.

Table 5 Thresholds of the fiscal sustainability risk indicator in 2011[a]

Indicator	Direction to be safe	Threshold	Observation for Croatia
r – g[b]	<	1.1%	1.6%
General government public debt (as % of GDP)	<	42.8%	45.7%
Cyclically adjusted primary balance (as % of potential GDP)	>	–0.5%	–2.9%
Gross financing needs (as % of GDP)	<	20.6%	10.5%
Share of short-term debt as a ratio of total debt	<	44.0%	17.8%
Debt denominated in foreign currencies	<	40.3%	75.3%
Weighted average maturity of public debt (years)	>	2.3	5.7
Short-term external public debt (as % of international reserves)	<	61.8%	9.6%

[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.

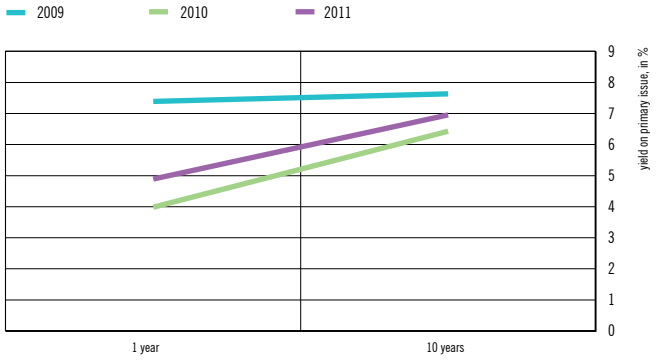
duced to one-digit annual growth rates. The best indicators of the high risk of public debt are the growing spread and yields on Croatian bonds; they increased substantially after problems mounted in large eurozone countries (primarily Italy).

The yield spread between Croatian bonds and benchmark German bonds maturing in 2015 was 243bp in early April 2011, rising to 629bp in early December 2011. The borrowing price for Croatia in late 2011 was much higher than the price achieved at the most recent bond issue in July 2011. In late 2011, yields on bonds maturing in 2018 were 7.8%, which implies that the yield on a ten-year bond would exceed 8%. The yield on one-year T-bills in the primary market went up from 2.68% in late May to 4.98% in late December.

Increased sovereign risk has spilled over to the banking and corporate sectors so that the yield on the only Croatian corporate eurobond maturing in less than five years reached 11.9%. The implementation of credible fiscal adjustment is thus crucial both for the reduction of funding costs and for financial stability. In addition to necessary structural reforms to achieve faster economic growth, this is a key prerequisite for the maintenance of the current credit rating.

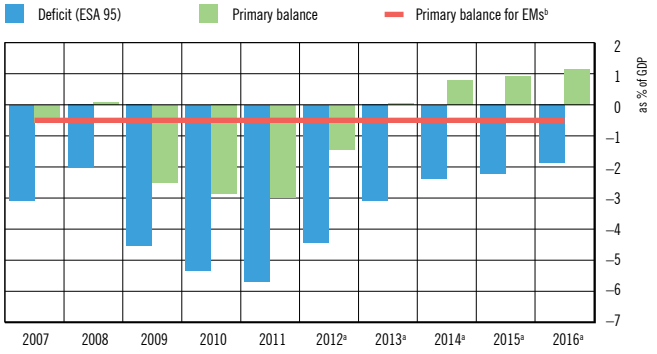
It remains to be seen which fiscal consolidation scenario for 2012 would be sufficient to preserve the credit rating. A cut in expenditures by 1% of GDP is a minimum under the provisions of the Fiscal Responsibility Act. However, under the alternative scenario, general government expenditures should be cut by 1.5% of GDP relative to those in 2011 to increase the probability of preserving the current credit rating. This would eliminate the primary deficit as soon as 2013, while the consolidated general government deficit, including Croatian Mo-

Figure 36 Yield on primary issue of euro securities



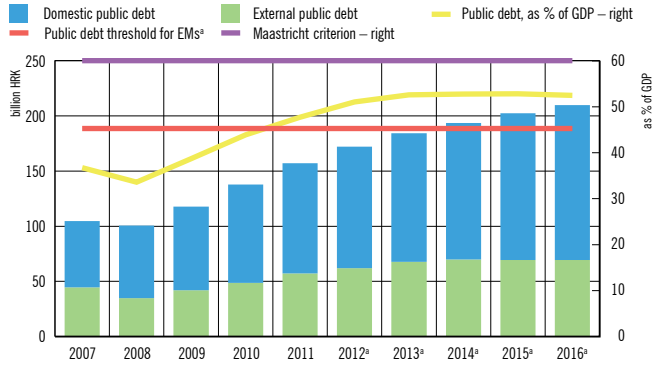
Source: MoF.

Figure 37 Projection of general government deficit



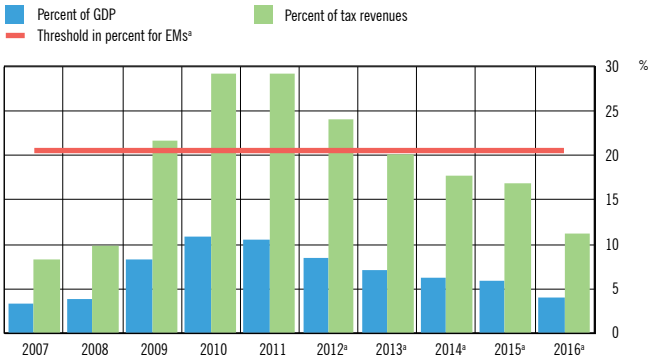
[a] CNB projections.
[b] One of the indicators used for estimating the fiscal sustainability risk in emerging market countries (EMs).
Sources: MoF and CNB.

Figure 38 Projection of general government debt



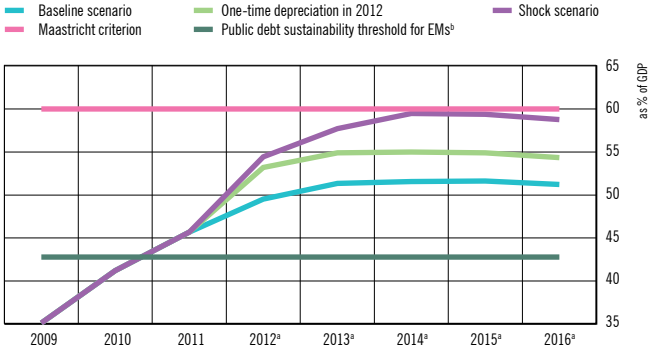
[a] CNB projections.
[b] One of the indicators used for estimating the fiscal sustainability risk in emerging market countries (EMs).
Sources: MoF and CNB.

Figure 39 Gross financing needs



[a] CNB projections.
[b] One of the indicators used for estimating the fiscal sustainability risk in emerging market countries (EMs).
Sources: MoF and CNB.

Figure 40 Projection of public debt under various scenarios



[a] CNB projections.
[b] One of the indicators used for estimating the fiscal sustainability risk in emerging market countries (EMs).
Source: CNB.

torways, would fall to below 3% of GDP in 2014. To that end, it is most important that the new government should offer a credible medium-term fiscal adjustment strategy to change the expenditure side by reducing the deficit and stabilise public debt at sustainable levels.

Refinancing needs are lower in 2012 than in the previous years, but there is still the risk on the side of foreign borrowing. In 2012, external and domestic payments stand at HRK 2.2bn and HRK 14.6bn respectively, 30% less than the total of HRK 22bn paid in 2011 (Figure 39). Foreign and long-term borrowings have become key risks in 2012. The move towards shorter maturity is already evident in the T-bill market, where banks have begun to subscribe currency-indexed T-bills maturing in three months instead of those maturing in a year. In the last quarter of 2011, over 50% of newly-subscribed currency-indexed T-bills were those maturing in three months. To maintain a significant share of foreign financing in 2012, it is important to give

a clear signal to foreign markets that a credible fiscal policy will be implemented.

Croatian public debt has a favourable maturity structure, but its average remaining maturity has been shortened. The average maturity of Croatian public debt is 5.7 years (Table 5), so high interest rates on public debt could be endured in the short run. The new debt, which is used to repay maturing debt, will certainly not substantially increase interest expenses on public debt in the short run. However, without measures to contain the increase in public debt, i.e. the basis on which interest is accrued, and without a fall in interest rates, interest expenses could again grow strongly. In comparison with the previous edition of Financial Stability, the overall average remaining maturity of public debt was shortened from 5.9 years to 5.7 years. The threshold for the share of short-term debt in total public debt is around 44% for emerging market economies. With its 16% share, Croatia is still far below that level (Figure 34). However, to maintain a favourable maturity structure strong fiscal consolidation has to begin in 2012.

Although stress tests show that public debt remains below 60% of GDP, this level would soon be breached without fiscal consolidation. The baseline scenario assumes stronger fiscal adjustment than that envisaged under the Fiscal Responsibility Act, a gradual economic recovery and stable exchange rate. By contrast, the shock scenario, which could be materialised should the eurozone crisis become deeper, assumes a combined impact of a 2% GDP fall and a one-off 10% depreciation. Under the latter scenario, public debt would come close to the Maastricht criterion of 60% in 2014 and to 66.4% of GDP if Croatian Motorways debt is included. Croatian Motorways currently meet criteria for not being included in public debt. However, as Eurostat has been imposing more stringent criteria in recent years, CM could again be included in public debt.

Box 1 Financial conditions and real economic activity

The tightening of financing conditions and an economic slowdown in most eurozone countries due to the escalating debt crisis on are certain to have a negative effect on the Croatian economy. Numerous research papers have suggested that there is a strong interdependence between financing conditions and real economic activity, which in a small and open economy such as Croatia heavily depend on global economic and financial conditions.[1] These research papers have mainly focused on the connection between these movements in normal circumstances. This research, however, aims to examine in more detail the interrelation between domestic and external financial conditions and economic activity against a background of an imminent severe tightening of financial conditions, and use the quantifications obtained for systemic risk projections. The Financial Conditions Index (FCI), designed for this purpose, was used to estimate a standard VAR model, which is usually employed to quantify the interrelation between financing conditions and economic activity. As the projections based on this VAR model show the trajectory of the economy under the most likely scenario, quantile regressions were used in the second step to make projections that would be valid in the event of highly unlikely outcomes (the at-risk model), in order to establish and project systemic risk trends.

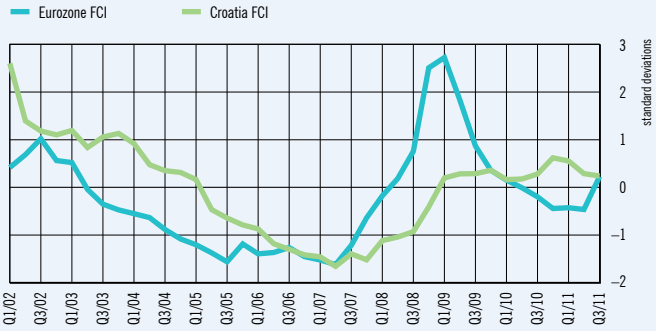
Financial conditions are determined by the interaction of various economic and financial variables that are often summarized by the Financial Conditions Index (FCI). The FCI is usually calculated using the best indicators for financing availability, such as financial market conditions, the price of capital, collateral requirements and other lending conditions, depending on country-specific factors and data availability. The principal component analysis method, standardly used in the literature to obtain a single indicator of general financing conditions from a large number of variables, transforms data by saving as much information as possible from the initial variable set in a small number of constructed series. This approach assumes the existence of a standardised indicator of financial conditions, that is, of a common component defined by the covariance between each indicator and other data.

The variables for the construction of the FCI for Croatia were selected taking into account the specific domestic monetary policy transmission mechanism, which is dominated by the exchange rate channel. In addition, due to the shallowness and relatively low level of development of domestic financial markets, some indicators that are commonly used to calculate the FCI for developed countries were unavailable. They were replaced by other variables that are especially relevant for small and open economies, such as capital inflows, global interest rate trends or risk premiums on government eurobonds.

The FCI for Croatia was calculated by the described method using the quarterly data for the period from the beginning of 2000 to the end of the third quarter of 2011 (Table 1). The largest weight in the FCI for Croatia is assigned to domestic variables whose growth has a negative impact on financing conditions, such as interest rates on various categories of loans and the ratio of non-performing placements to total placements. Financial conditions also deteriorate because of the weakening of the kuna exchange rate against the euro and a currency basket based on the shares of individual currencies in bank assets and due to interest rate increases on government foreign and short-term kuna borrowing, while they improve with an increase in foreign direct investments.

The dynamics of FCI in Croatia and in the eurozone[2] were relatively well harmonised during the period of abundant global liquidity and low interest rates preceding the global financial crisis, although the absolute levels of the indices cannot be compared due to differences in the calculation methods. After the onset of the crisis, financial conditions in the eurozone deteriorated significantly, were at their worst in early 2009 and then began to ease gradually. They continued to ease until the end of 2010, tightening again in mid-2011. Financial conditions in Croatia started to deteriorate in the same period as those in the eurozone, but failed to ease significantly in the last two and a half years, and the index remained at an elevated level (Figure 1).

Figure 1 FCI for Croatia and the eurozone



Note: Due to the difference in periods and variables included in the calculation of the FCI for Croatia and the eurozone, the absolute values for these two indices are not comparable.
Sources: IMF, *World Economic Outlook*, October 2011 and CNB.

The VAR model, used to establish the interconnection between financial conditions and real activity in Croatia and in the eurozone, contains four variables: the quarterly growth rates of real GDP in Croatia and in the eurozone, and the FCI for Croatia and the eurozone. These variables were divided into two blocks: domestic and foreign. This division takes into account the fact that Croatia is a small and open economy in which domestic variables do not influence foreign variables, but foreign do influence domestic variables. Structural shocks in the five-lag model were identified using the Cholesky decomposition under the assumption that the FCI has an instant effect on GDP growth rates. The obtained results point to a

1 See for example Krznar, I., and Kunovac, D.: *Impact of External Shocks on Domestic Inflation and GDP*, CNB Working Papers, W-26, December 2010.

2 The eurozone FCI was obtained from the IMF's *World Economic Outlook* for October 2011.

strong spillover of financial shocks from the eurozone to Croatia. For example, the tightening of financial conditions in the eurozone results in a deterioration of financing conditions and real economic slowdown in Croatia (Table 2). In contrast, real activity in the eurozone only affects domestic real activity, while a connection with domestic financial conditions was not established. A one percentage point increase in the eurozone GDP growth rate results in a 0.8 percentage point increase in Croatia's GDP growth rate at the moment of shock and in a 2 percentage point increase a year later. Domestic FCI and GDP shocks do not influence each other, which means that there is no significant interdependence between domestic financial conditions and real economic activity. However, it would require additional research to be able to adopt a firm stance with respect to this issue.

The dominating influence of the conditions in the eurozone on domestic economic developments was further confirmed by the variance decomposition of domestic variables (Table 3). After one year, as much as 69% of the domestic FCI volatility and 58% of the volatility in GDP growth rates can be ascribed to the foreign FCI. When the effect of changes in the eurozone's GDP is added, the share of the total variance of domestic variables explained by the foreign block reaches approximately three fourths.

The described VAR model was also estimated by quantile regressions in order to project systemic risk.[3] Negative tail events were established and projected using the 5th percentile of the rates of change in GDP and the 95th percentile of the FCI. Systemic risk projections derived from this model reflect the intensity of the adverse scenario, with a five percent

Table 1 FCI variables for Croatia and their impact on total index movement

Variables	Contributions
GDP	0.04
EMBI Croatia	0.11
EMBI + EURIBOR	0.13
1-year EURIBOR	0.05
EUR/HRK	0.25
EUR/CHF	–0.06
Weighted exchange rate in accordance with the structure of bank assets	0.28
VIX	0.07
LIBOR OIS	–0.11
Total external debt	0.08
Foreign direct investment	–0.14
Hedonic real estate price index	–0.04
Loan supply surplus/deficit in the domestic market	0.00
Share of non-performing loans in total placements (corporates)	0.31
Share of non-performing loans in total placements (households)	0.24
Loans to households and corporates	–0.01
Loans to government	0.05
Loans to state-owned enterprises	0.07
Interest rate on total kuna loans non-indexed to foreign currency	0.18
Interest rate on total kuna loans indexed to foreign currency	0.32
Interest rate on long-term kuna corporate loans indexed to foreign currency	0.28
Interest rate on short-term kuna corporate loans non-indexed to foreign currency	0.05
Interest rate on long-term kuna household loans indexed to foreign currency	0.32
Interest rate on kuna household loans non-indexed to foreign currency	0.31
Spread between interest rates on kuna loans indexed to foreign currency and foreign currency deposits	0.33
Spread between interest rates on total loans and total deposits	0.21
Spread between interest rates on kuna loans non-indexed to foreign currency and kuna deposits	0.07
Overnight interest rate (Zagreb Money Market)	0.05
Interest rate on 3-month T-bills	0.22
CROBEX	–0.01

Note: Larger absolute amount of contributions denotes larger significance in the index construction, with signs showing the correlation to the index. Positive index values assume financial conditions tighter than average and vice versa.
Source: CNB calculations.

Table 2 Accumulated response of the FCI and GDP growth rates to one-unit shocks to the foreign and domestic FCI and GDP growth rates, in percentage points

	Horizon (quarters)	Eurozone FCI	Eurozone GDP	Croatia FCI	Croatia GDP
Croatia FCI	0	0.17(*)	0.00	1.00(*)	0.00
	1	0.34(*)	–0.03	1.40(*)	0.03
	4	1.45(*)	0.00	2.00(*)	–0.22
Croatia GDP	0	–0.28(*)	0.82(*)	–0.40	1.00(*)
	1	–1.96(*)	1.49(*)	–1.10	0.92(*)
	4	–3.64(*)	2.02(*)	–0.60	1.83(*)

Note: (*) denotes 95% significance.
Source: CNB calculations.

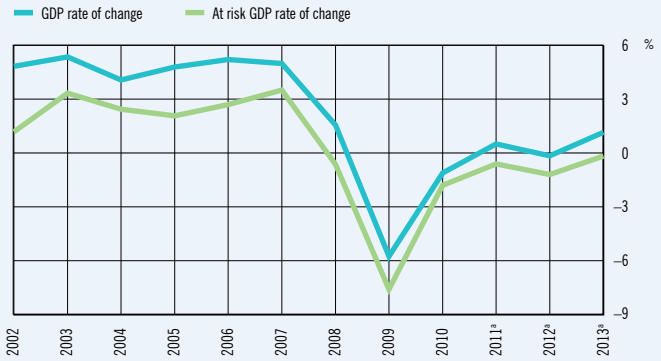
Table 3 Variance decomposition of the domestic FCI and GDP growth rates

	Horizon (quarters)	Eurozone FCI	Eurozone GDP	Croatia FCI	Croatia GDP
Croatia FCI	1	31%	0%	69%	0%
	4	69%	5%	23%	4%
Croatia GDP	1	4%	37%	1%	58%
	4	58%	20%	1%	21%

Source: CNB calculations

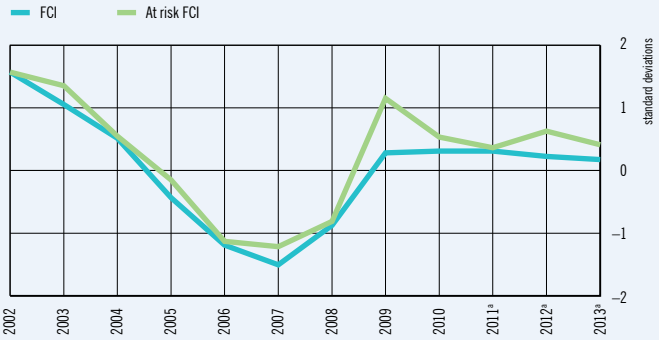
3 The methodology for the VAR model estimation by means of quantile regressions was obtained from Cecchetti, S. G., and Li, H.: *Measuring the Impact of Asset Price Booms Using Quantile Vector Autoregressions*, Working Paper, Brandeis University, 2008.

Figure 2 Comparison of the annual GDP growth rates in Croatia



a Forecast.
Source: CNB calculations.

Figure 3 Comparison of the FCI for Croatia



a Forecast.
Note: FCI is shown as the annual average.
Source: CNB calculations.

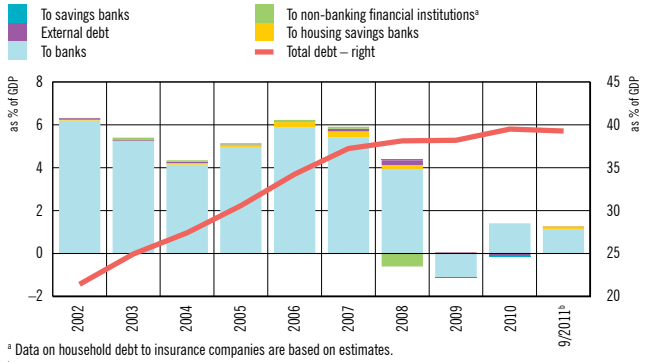
probability of materialisation. Real systemic risk was measured by at-risk rates of change in GDP, whereas financial systemic risk is reflected in the at-risk FCI.

FCI and GDP at-risk projections were made assuming that the CNB's baseline macroeconomic scenario and the European Commission's projection are the most likely outcomes for GDP for Croatia and the eurozone, while the FCI was projected by means of the basic VAR model. At-risk projections point to a highly unlikely shock scenario that could affect the domestic economy should the debt crisis in the eurozone escalate. This would lead to a recession coupled with a deterioration of financial conditions in the eurozone, which would further aggravate domestic financial conditions and deepen the recession in Croatia. However, systemic risk has strengthened only slightly and is expected to diminish in 2013 (Figures 2 and 3).

Financial conditions in the eurozone have a crucial impact on domestic financing conditions and real economic activity. In this context, the recent tightening of financial conditions and economic slowdown in the eurozone have increased the risk of a deterioration of domestic economic activity and the intensity of a highly unlikely adverse scenario, should it materialise.

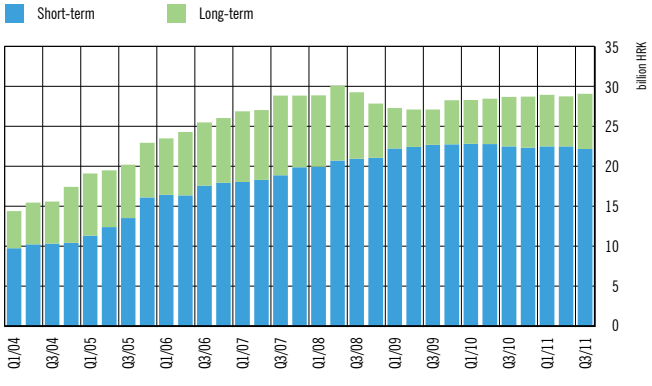
Household sector

Figure 41 Change in and stock of household debt



[a] Data on household debt to insurance companies are based on estimates.
[b] Year-on-year increase in debt as at end-September 2011.
Note: Data on total household debt exclude debt to leasing companies in order to avoid a break in the data series caused by the change in the methodology for reporting the value of leasing contracts from 1 January 2011 onwards.
Sources: HANFA and CNB.

Figure 42 Maturity breakdown of newly-granted household loans, adjusted by seasonal fluctuations



Source: CNB.

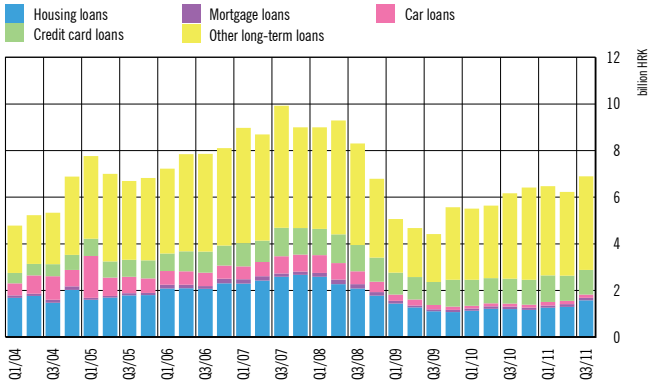
The stagnation of household debt observed in 2011 could continue into 2012. Nevertheless, exposure of households to macroeconomic and financial risks could further increase.

The household sector debt levelled off in 2011 (Figure 41). Although there was a mild nominal growth in household debt, this was predominantly due to the weakening of the kuna against the Swiss franc and the euro. Household indebtedness, adjusted for exchange rate changes, remained the same as in the year before (Figure 44). New loans slightly increased (Figure 42), particularly newly-granted long-term loans, while the amount of new short-term loans continued to decline. The rise in the share of long-term loans in total newly-granted loans was triggered by the fall in interest rates on these loans in 2011 and the gradual easing of negative trends in the labour market (Figure 45). The expected further deterioration of the economic outlook in 2012 could adversely affect household borrowing.

Other long-term loans (e.g. cash and any purpose loans) remained the primary form of new household loans in the first half of 2011 (Figure 43), which also accelerated the annual growth in the total amount of these loans (Figure 44). However, the rise in new housing loans gained momentum in the third quarter of 2011. The nominal amount of housing loans recorded a year-on-year growth rate of around 6% in late September. Still, this was mostly due to the strengthening of the Swiss franc and, to a lesser extent, of the euro in mid-2011.

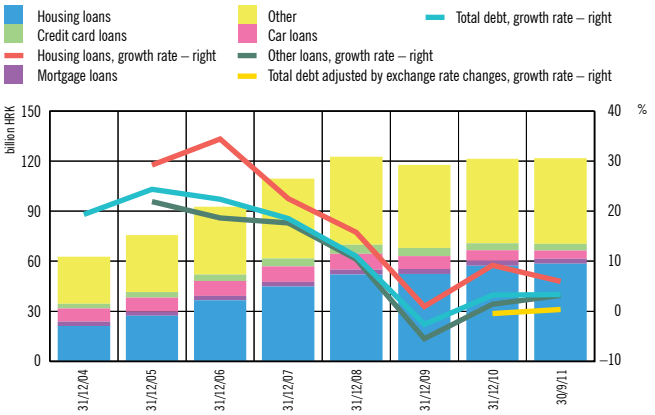
Household debt stagnation in the first three quarters of 2011 is also evident in the relatively stable ratio of household debt to disposable income, while other household debt indicators slightly improved (Figure 46). Due to the steady increase in household bank savings, the household debt-to-deposit ratio remained on the downward trend that had begun in late 2008. The increase in bank deposits exceeded the fall in household assets held in investment funds, so that the ratio of household

Figure 43 Newly-granted long-term household loans by purpose, adjusted by seasonal fluctuations



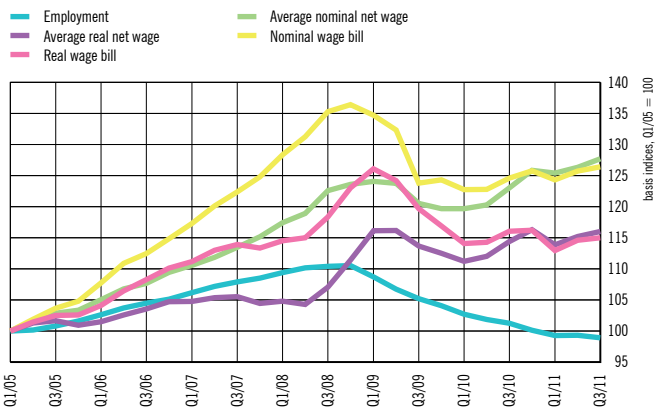
Source: CNB.

Figure 44 Household loans by purpose



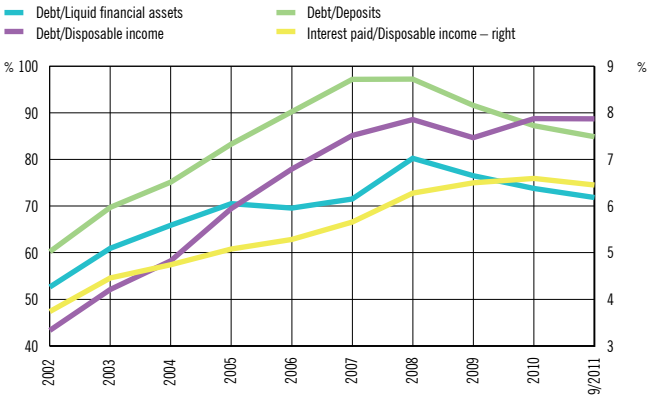
Source: CNB.

Figure 45 Employment and wages (seasonally adjusted)



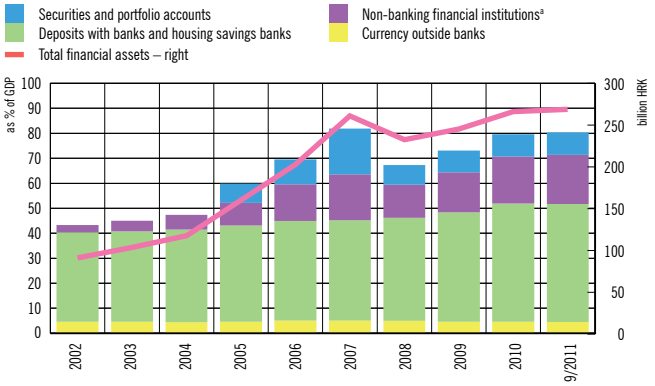
Source: CBS.

Figure 46 Household debt and debt burden



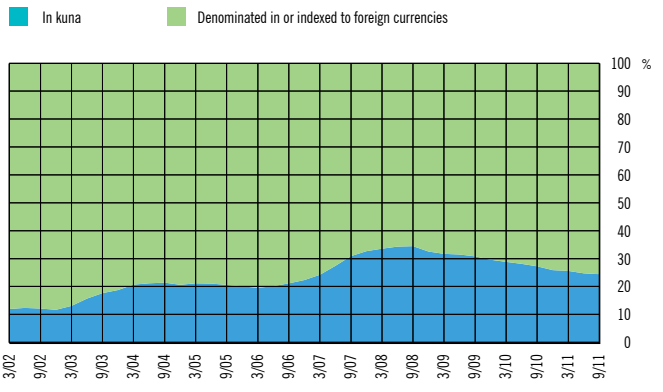
Sources: HANFA, CDCC and CNB.

Figure 47 Household financial assets



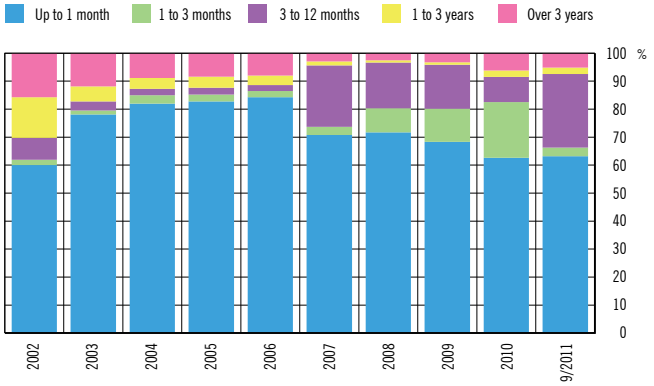
[a] Data on household claims against open-end and closed-end investment funds and data on claims against insurance companies are based on estimates.
Sources: HANFA, CDCC and CNB.

Figure 48 Currency breakdown of household loans



Source: CNB.

Figure 49 Household loans by interest rate variability



Source: CNB.

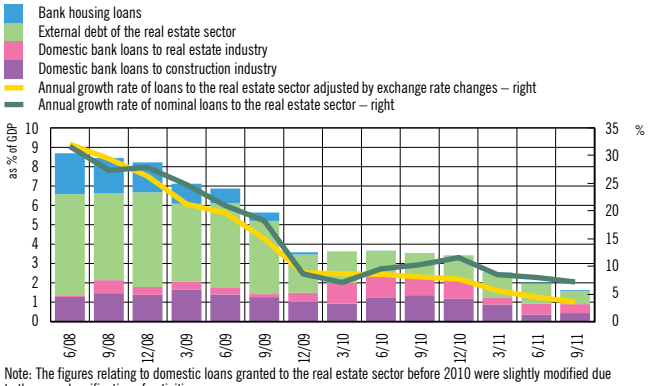
debt to total liquid financial assets continued to improve in the first three quarters of 2011. Although the ratio of household debt to liquid financial assets improved much less than the debt-to-deposit ratio, by September 2011 it had come close to the level before the eruption of the financial crisis (Figure 47). Thanks to the fall in bank interest rates and stagnant household debt, the long-lasting trend towards deterioration in the ratio of interest payments to household disposable income was reversed in 2011.

Exposure of households to exchange and interest rate risks remained high in the first three quarters of 2011 and trended up slightly. Developments in exchange rate risk reflect above all the move towards longer maturity of new loans as most long-term loans are indexed to foreign currency. The share of exchange rate-indexed loans in total loans stood at almost 76% in late September, returning to the level in early 2007 (Figure 48). At the same time, growth was recorded in household exposure to the risk of increased debt burden due to interest rate movements. In late September 2011, nearly 93% of all household loans were made with interest rates variable within a year (Figure 49).

The economic stagnation expected in 2012 will prolong unfavourable trends in the labour market. Coupled with the continued uncertainty about interest and exchange rate movements, this will dampen household demand for new loans. Most indicators of household debt could continue to improve in such conditions. However, the expected decrease in household disposable income due to the effect of necessary structural reforms and fiscal adjustment is likely further to increase the debt service risk in 2012.

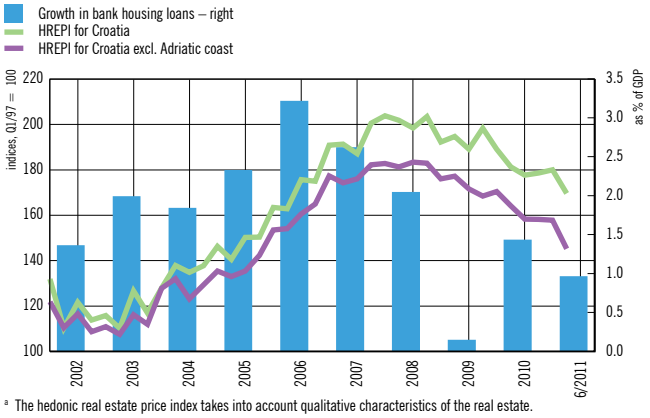
Real estate sector

Figure 50 Annual growth of domestic loans and external debt of the real estate sector, adjusted by exchange rate changes



Note: The figures relating to domestic loans granted to the real estate sector before 2010 were slightly modified due to the new classification of activities.
Source: CNB calculations.

Figure 51 Housing loans and HREPI[a] on a quarterly basis



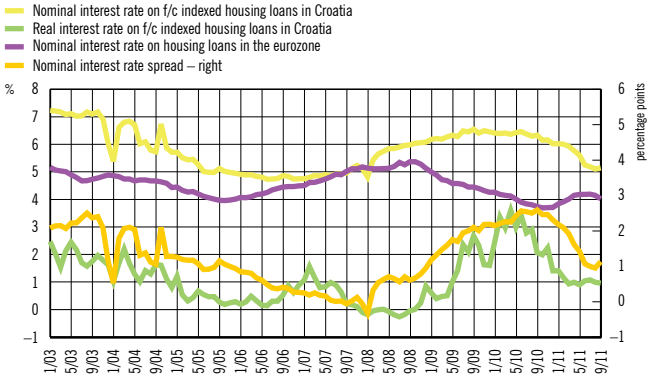
[a] The hedonic real estate price index takes into account qualitative characteristics of the real estate.
Source: CNB calculations.

Borrowing by the real estate sector continued to slow down in 2011, with stagnation in housing loans being accompanied by the sharpest ever decline in residential real estate prices. Unfavourable economic trends and uncertainty in the labour market will curb real estate demand in 2012 as well, so that no recovery in residential property prices is to be expected.

Borrowing by the real estate sector slackened noticeably in the first three quarters of 2011. The year-on-year rate of growth in total nominal debt was cut by half from end-2010 to end-September 2011, and stood at 7.2%. Adjusted by exchange rate changes, it dropped to 3.5% (Figure 50). The real estate sector borrowed less both from abroad and from domestic banks. A slight increase was evident only in domestic borrowing by corporates dealing in real estate activities. Domestic borrowing, on which the real estate sector relied heavily in 2010, decelerated more. As a result, the relative contributions of domestic and foreign sources to the rise in real estate sector debt became almost equal. Notwithstanding the increase in newly-granted housing loans in the third quarter of 2011, their amount, adjusted by exchange rate effects, has held steady for nearly two years.

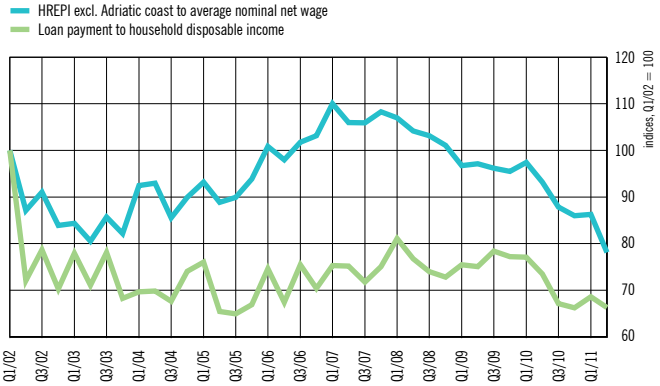
In a situation in which there are large unsold housing inventories and heightened uncertainty in the labour market, the downward trend in residential property prices continued in the first half of 2011 (Figure 51), despite the drop in real interest rates on housing loans (Figure 52) and the continued mild increase in real disposable income of households. Residential property prices in Croatia declined again, on average by 5.7% in the first half of 2011; at end-June they were at their lowest level in the last five years. Excluding the real property prices on the Adriatic

Figure 52 Comparison of interest rates on newly-granted housing loans in Croatia and the eurozone



Sources: ECB and CNB.

Figure 53 Financial availability of residential property



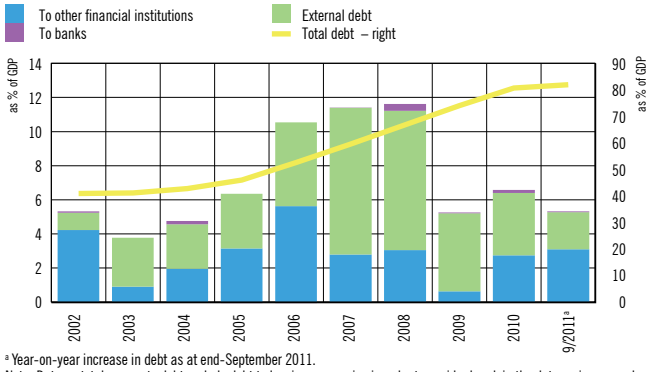
Sources: CBS and CNB calculations.

coast, which are more resilient to unfavourable domestic trends because of foreign demand, the annual decline in residential prices accelerated to the average –9.5% in the same period. This was the sharpest decrease ever recorded in residential property prices during a half year period.

The faster decline in prices of residential property in the first half of 2011 combined with a slight increase in nominal wages and household disposable income improved the financial availability of residential property (Figure 53). Similar trends probably continued in the remainder of 2011. The expected continued fall in employment and a slight decrease in real household disposable income could be reflected in a further decline in residential property prices in 2012, which could improve financial availability indicators.

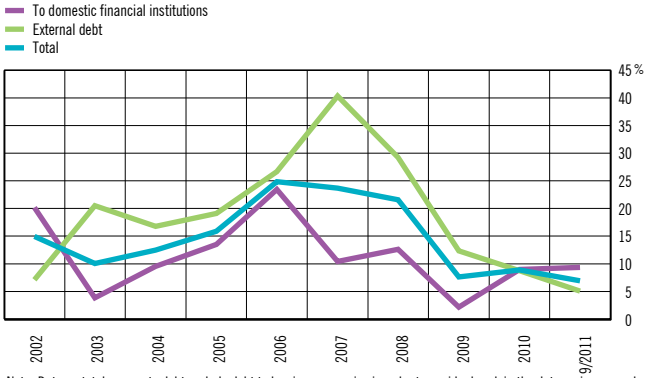
Non-financial corporate sector

Figure 54 Change in and stock of non-financial corporate debt



a Year-on-year increase in debt as at end-September 2011.
Note: Data on total corporate debt exclude debt to leasing companies in order to avoid a break in the data series caused by the change in the methodology for reporting the value of leasing contracts from 1 January 2011 onwards.
Sources: HANFA and CNB.

Figure 55 Annual growth rate of non-financial corporate debt



Note: Data on total corporate debt exclude debt to leasing companies in order to avoid a break in the data series caused by the change in the methodology for reporting the value of leasing contracts from 1 January 2011 onwards.
Sources: HANFA and CNB.

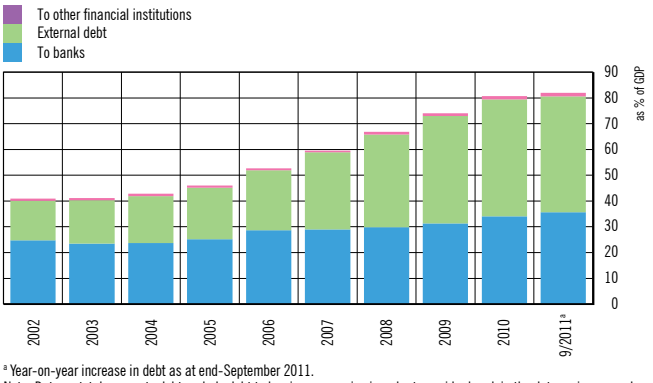
The non-financial corporate debt continued to grow in 2011, albeit at a slower pace than in 2010. The largest portion of the debt increase was financed by domestic banks, while foreign borrowing decelerated considerably. With regard to domestic financing, the sectoral reallocation of loans towards corporations from the tradable sector started with a time lag. Although it decreased slightly, corporate exposure to currency and interest rate risks remained relatively high.

Borrowing by non-financial corporations was slightly slower in the first three quarters of 2011 than in 2010. Against the background of the slight recovery in GDP growth, this put an end to the rise in corporate debt (Figure 54). The year-on-year growth rate of corporate debt[1] stood at 7% at end-September 2011, down from 8.7% at end-2010. Debt to domestic financial institutions continued to grow at almost the same pace (9.5%) as in 2010 so that, for the first time after a number of years, it outpaced the rise in external debt (5.1%) (Figure 55). The relatively solid dynamics of domestic borrowing is also evident in inflows of newly-granted domestic bank loans to non-financial corporations, which were slightly larger in 2011 than in 2010, with a marginally higher share of long-term loans (Figure 57).

To a large extent, these developments can be attributed to limited corporate demand for loans, which was the result of low investment demand against the backdrop of pessimistic expec-

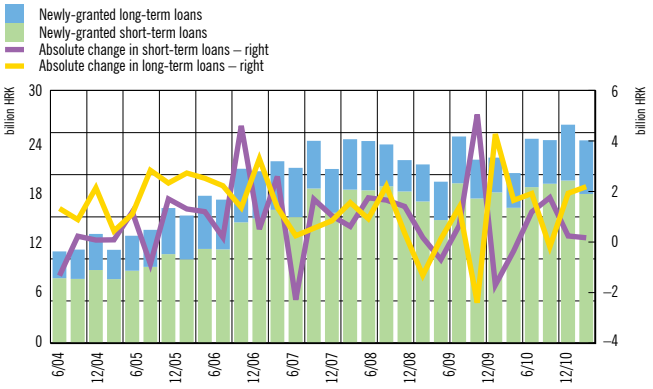
1 Total corporate debt does not include debt to leasing companies so as to avoid a break in the series caused by methodological changes in the presentation of leasing contracts, which were introduced as of 1 January 2011.

Figure 56 Non-financial corporate debt



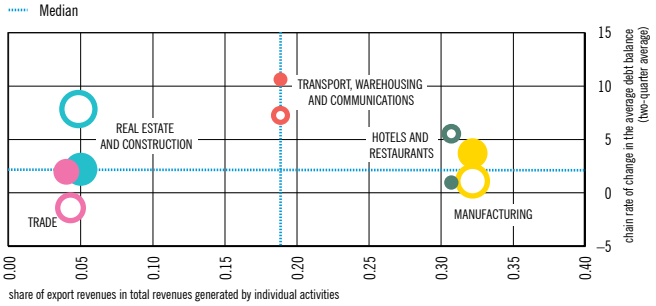
[a] Year-on-year increase in debt as at end-September 2011.
Note: Data on total corporate debt exclude debt to leasing companies in order to avoid a break in the data series caused by the change in the methodology for reporting the value of leasing contracts from 1 January 2011 onwards.
Sources: HANFA and CNB.

Figure 57 Newly-granted bank loans and absolute change in the stock of gross loans



Source: CNB.

Figure 58 Allocation of domestic bank loans by sectors from March to September 2011



Note: A full circle denotes the debt dynamics in the last two quarters observed (the average debt balance at end-September and end-June 2011 relative to the average debt balance at end-March 2011 and end-December 2010). An empty circle denotes the same change in the debt balance in the previous period (the average debt balance at end-March 2011 and end-December 2010 relative to the average debt balance at end-September and end-June 2010). The size of the circle denotes the significance of a particular activity's share in total debt of non-financial corporations to domestic banks. Activities accounting for a relatively minor share in total debt are not presented.
Sources: FINA (export and total revenues) and CNB (loans by activity).

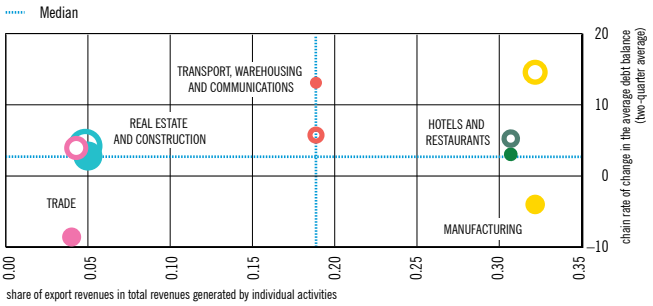
tations about future growth in revenues and less available foreign funding. Slower foreign borrowing of the corporate sector was due not only to low demand but also to the fact that foreign creditors are holding back on lending under the impact of uncertainty in global financial markets, pessimistic expectations about economic growth and stability in the eurozone, as well as the increased risk perception regarding Croatia.

Slower borrowing by non-financial corporations only slightly raised the ratio of their total debt to GDP, from 80.7% at end-2010 to 82.0% in September 2011. More than half of total corporate debt relates to foreign funding sources (Figure 56). Under the assumption of a steady slow growth in corporate debt and the expected stagnation of GDP, the debt-to-GDP ratio will probably stay almost the same in 2012.

Stronger borrowing from domestic banks was recorded mostly in the manufacturing industry, due to the recovery in foreign demand, and companies in the trading sector, which reduced their debt to domestic banks in the previous period. By contrast, the inflow of loans to corporates dealing in real estate and construction slowed down significantly (Figure 58). Thus, domestic bank funds were partly reallocated to activities with better growth prospects. However, the real estate and construction sector continued to account for the largest share of total loans by domestic banks.

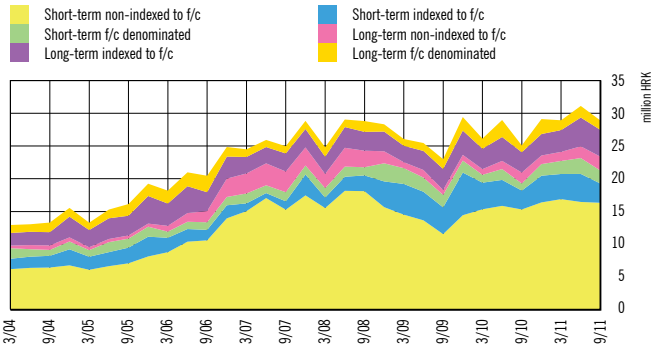
The slowdown in foreign borrowing was evident in almost all sectors and was particularly noticeable in the trade and manufacturing sectors, which reported negative growth rates of external debt (Figure 59). The slower growth in external debt was not so much evident in companies from the real estate and construction sector, which account for a major share in total external debt of the corporate sector but do not generate significant export revenues. This makes them more exposed to currency risk.

Figure 59 External debt allocation by sectors from March to September 2011



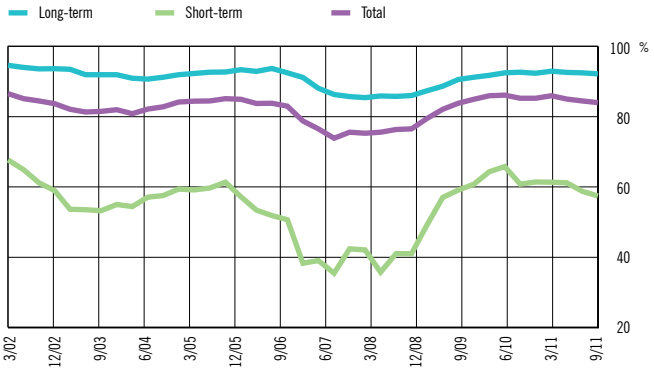
Note: A full circle denotes the debt dynamics in the last two quarters observed (the average debt balance at end-September and end-June 2011 relative to the average debt balance at end-March 2011 and end-December 2010). An empty circle denotes the same change in the debt balance in the previous period (the average debt balance at end-March 2011 and end-December 2010 relative to the average debt balance at end-September and end-June 2010). The size of the circle denotes the significance of a particular activity's share in total external debt of non-financial corporations. Activities accounting for a relatively minor share in total debt are not presented.
Sources: FINA (export and total revenues) and CNB (external debt).

Figure 60 Breakdown of newly-granted loans to non-financial corporations by maturity and currency



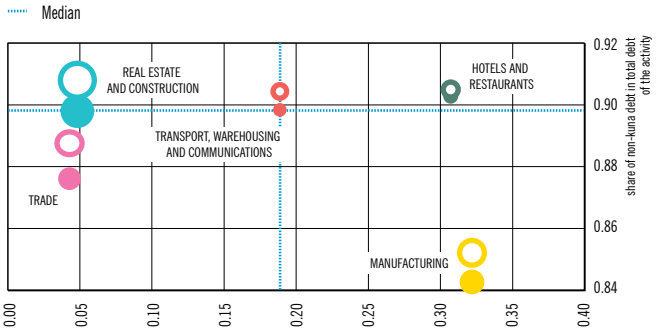
Note: Short-term loans comprise personal overdrafts, which are statistically recorded as newly-granted loans in each month.
Source: CNB.

Figure 61 Share of corporate non-kuna debt[a] in total loans



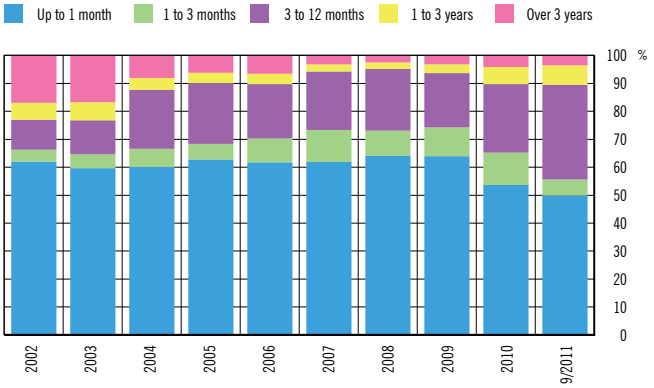
[a] It is assumed that total external debt is denominated in foreign currencies.
Source: CNB.

Figure 62 Currency exposure in September 2011



Note: A full (empty) circle denotes the share of non-kuna debt in September 2011 (March 2011). The size of the circle denotes a particular activity's share in total debt of non-financial corporations. Activities accounting for a relatively minor share in total debt are not presented.
Sources: FINA (export and total revenues) and CNB (loans by activity).

Figure 63 Breakdown of bank loans to non-financial corporations by interest rate variability



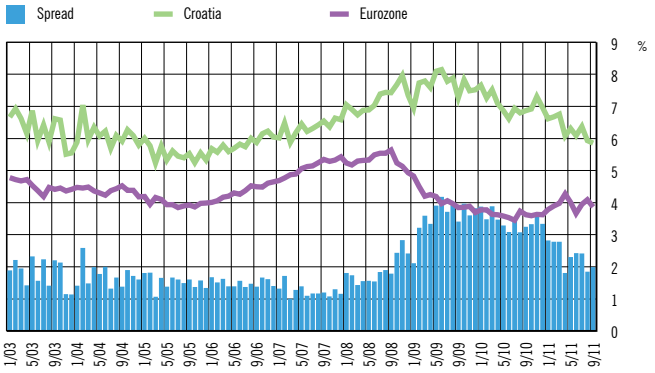
Source: CNB.

External debt developments had a predominant impact on the rise in total corporate debt, which was slower in almost all economic sectors in the second and third quarters of 2011 than in the previous period. The exception was the sector of transport, warehousing and communications, in which the increase in debt accelerated due to the higher growth in both external and domestic debt.

The slight recovery in corporate kuna financing, which had begun in 2010, continued into 2011. A change in the currency structure of newly-granted loans was noticeable in both short- and long-term corporate loans (Figure 60). However, this change had only a marginal impact on the currency structure of the total debt of non-financial corporations, around 84% of which related to foreign currency loans. No significant changes are expected in 2012 (Figure 61).

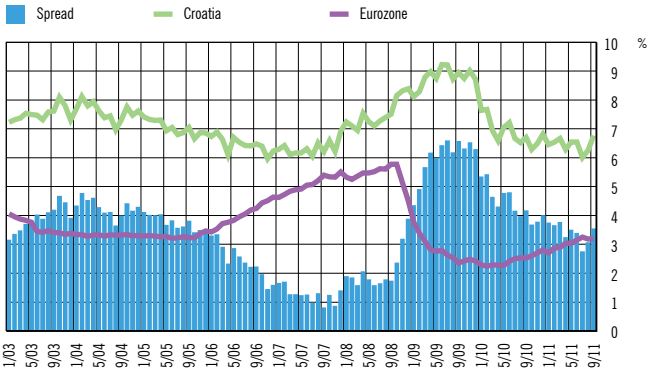
Due to slower foreign borrowing, exposure of non-financial corporations to currency risk was slightly reduced in late third

Figure 64 Interest rates on long-term loans to non-financial corporations in Croatia and the eurozone



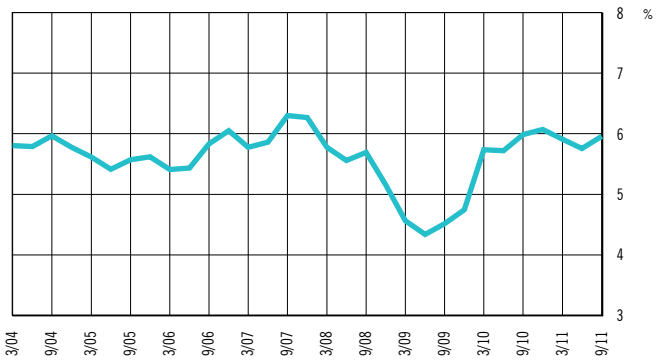
Sources: ECB and CNB.

Figure 65 Interest rates on short-term loans to non-financial corporations in Croatia and the eurozone



Sources: ECB and CNB.

Figure 66 Ratio of transaction account deposits of non-financial corporations to gross value added



Source: CNB.

quarter of 2011, but nevertheless stayed rather high. However, a parallel decrease was recorded in the share of foreign currency denominated debt of activities that do not generate significant export revenues, which is positive from the financial stability perspective (Figure 62).

Exposure of non-financial corporations to interest rate risk also remained high at the end of the third quarter of 2011. Loans with interest rates variable within a year continued to account for around 90% of total corporate loans. However, the maturity structure of these loans also continued to change. The average period in which interest rates are variable within a year lengthened due to the rise in the share of loans with interest rates variable after three months (Figure 63). Since non-financial corporations continue to be very vulnerable to any strong fluctuations in interest rates, a possible further lengthening of the maturity structure of newly-granted loans would not significantly reduce their exposure to interest rate risk in 2012.

The downward trend in bank interest rates on long-term corporate loans continued in the second and third quarters of 2011, so that in September 2011 these rates came close to their historical lows from the pre-crisis period. Interest rates on short-term kuna loans continued to hold steady at levels that were also close to those in the pre-crisis period. In the same period, interest rates on long- and short-term loans in the eurozone edged up, so that the spread between interest rates on corporate loans in Croatia and the eurozone narrowed further (Figures 64 and 65).

The rise in foreign interest rates and risk perception, which was triggered by weak demand under the impact of pessimistic growth expectations by the corporate sector, have not yet affected domestic interest rates. The liquidity of non-financial corporations, measured as the ratio of their transaction account deposits to gross value added, recovered due to improved profitability of the corporate sector and was in mid-2011 approximately the same as in the pre-crisis period (Figure 66).

The stagnation in interest rates at relatively low levels was able to continue into 2012 under the impact of the factors described. However, the risk of the rise in domestic interest rates will increase if financing terms in the eurozone continue to tighten in response to the escalation of the debt crisis.

Box 2 Supply and demand in Croatia's corporate credit market

The pro-cyclicality of banks' credit policies is considered to be a key mechanism intensifying business cycles. The mitigation of fluctuations in banks' credit policies has therefore been identified as a priority in the global financial architecture reform initiated to reduce the risk of future financial crises. Governments and central banks worldwide have made strong efforts during the recent financial crisis to improve the liquidity and solvency of their banking sectors and prevent or at least limit the scale of credit crunches.

According to the hypothesis of the pro-cyclicality of banks' credit policies, in good times lenders tend to underestimate individual borrower risk, which leads to an excessive accumulation of credit risk, while considerable tightening of credit policies after a crisis breakout slows down economic recovery. On the other hand, clients' propensity to borrow increases in good times, while their demand for financing declines in recession due to pessimistic expectations about future income growth.[1] In addition, a deterioration in the borrower's financial position directly reduces the borrowing capacity; in the literature this is known as the balance sheet effect or financial accelerator. The efficiency of the measures to mitigate the pro-cyclicality of banks' credit policies depends on the extent to which each of these components affects credit growth. This analysis will therefore use data on changes in debt and financial indicators of individual enterprises in Croatia in order to separate the effects that changes in supply and demand have on corporate debt.[2]

The concept of the so-called "credit limits" is the starting point for the separation of the effects that supply, demand and borrowers' characteristics produce on changes in total corporate debt.[3] These limits represent the maximum amount of new loans that lenders are willing to grant to enterprises of specific characteristics in a given year, that is, loan supply. The credit limits are determined using two analytical approaches: the quantile regression and the stochastic frontier analysis (SFA). The choice of the highest quantile (0.75), which in the quantile regression marked loan supply, was verified by an alternative approach to setting credit limits: the stochastic frontier analysis. On the other hand, the use of the estimated credit limits, that is, the actual new borrowing of enterprises relative to their characteristics is an indication of trends in loan demand. Specifically, when an enterprise's borrowing approaches the limits it is an indication that the bulk of its assumed allocation has been used, which suggests an increase in loan demand.

Each enterprise's credit limit was determined according to its characteristics, while the coefficients on these characteristics, estimated at a high percentile of the conditional distribution of the amounts of changes in debt, approximate banks' credit policies in a given year. Corporate debt represents the sum of corporate long-term and short-term liabilities to domestic and foreign financial institutions (the structure and dynamics of specific corporate debt components are explained in more detail in the chapter Non-financial corporations). Debt changes are normalised by corporate average assets in the observed year. The data on enterprises used[4] cover the period from 2003 to 2010, which enables the monitoring of shifts in loan supply and demand, while eliminating the effects of changes in balance sheet indicators in the period after the outbreak of the economic crisis. Financial characteristics of enterprises used to estimate expected new corporate debt were obtained from the Altman Z-score model of corporate credit risk[5] and include liquidity measures (the working capital to total assets ratio), the retained earnings to total assets ratio, the profits to total assets ratio and the ratio of sales to total assets. Also taken into account were the enterprise's size (measured by total assets and the number of employees), two tax shield measures[6] (measured by profit tax paid against total profit before taxes and, alternatively, by the ratio of depreciation to total assets), the enterprise's county of operation and its activity.

The results of the estimated model show that expected new debt is lower in enterprises with sufficient internal financial reserves, that is, in larger, more liquid and profitable enterprises. In addition, the expected new borrowing of enterprises with higher tax shields on interest paid is lower, which probably reflects the amount of debt generating the tax shield.

Figure 1 shows credit limits estimated using the described model on a sample of 1000 enterprises, randomly selected in any given year in order to keep their characteristics constant and eliminate the effect of changes in balance sheet indicators on credit limits. Credit limits were relativised by corporate average assets, with the enterprises in Figure 1 classified according to their limits in 2007. After having been relatively stable during the years of economic expansion and strong foreign capital inflows, the supply of corporate loans tightened considerably in the 2008 to 2010 period. Enterprises whose borrowing capacity was the highest in the previous years (in the 2004 to 2007 period) were the hardest hit by restrictive credit market conditions. Figure 2 shows a decrease in the supply of loans to a median enterprise; such a decrease was evident in all the sectors after the onset of the recession, with the exception of agriculture, hunting, forestry and fishing, where the supply had previously been somewhat lower. The pace of the loan supply contraction was relatively even for most of the activities: having edged down in 2008, loan supply to all the sectors decreased sharply in 2009 and started to stabilise, i.e. recover gradually, in 2010. The exceptions were the construction and real estate sectors, wherein loan supply continued to drop in 2010, although at a lower pace than in 2009.

1 Becker, B., and Ivashina, V.: *Cyclicality of Credit Supply: Firm Level Evidence*, NBER Working Paper, No. 17392, September 2011.

2 For a similar approach to household debt analysis see: Box 3 The role of supply and demand in cyclical fluctuations of household debt, Financial Stability, No. 7, and Herceg, I., and Šošić, V.: *The Anatomy of Household Debt Build Up in Croatia: Enlisting More Creditworthy Households or Relaxing Lending Standards?*, Comparative Economic Studies, No. 53, June 2011.

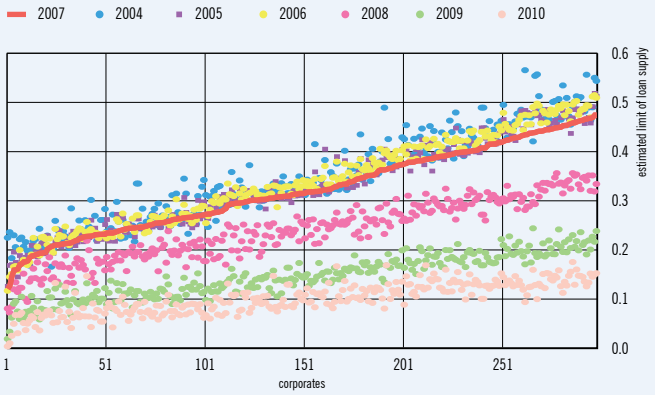
3 Herrala, R.: *Credit crunch? An empirical test of cyclical credit policy*, Bank of Finland Research Discussion Papers, 10/2009.

4 The data used in this analysis include data from FINA annual financial statements of entrepreneurs and CNB's data on enterprise goods exports in the 2004 to 2010 period.

5 Altman, E. I.: *Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy*, Journal of Finance, pp. 189-209, September 1968.

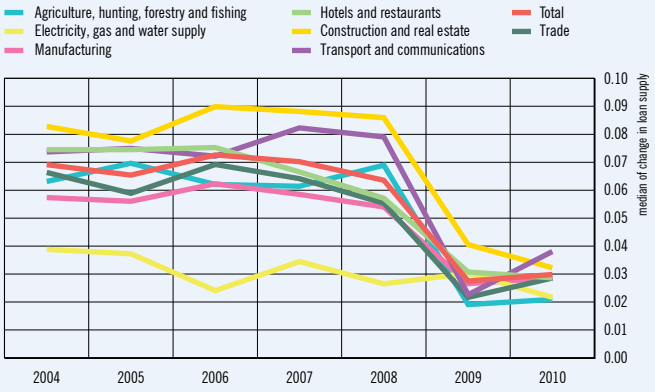
6 The tax shield is the reduction in profit tax resulting from deductions from the tax base. The deductions include, for example, interest paid and depreciation.

Figure 1 Supply of new corporate loans from 2004 to 2010



Source: CNB.

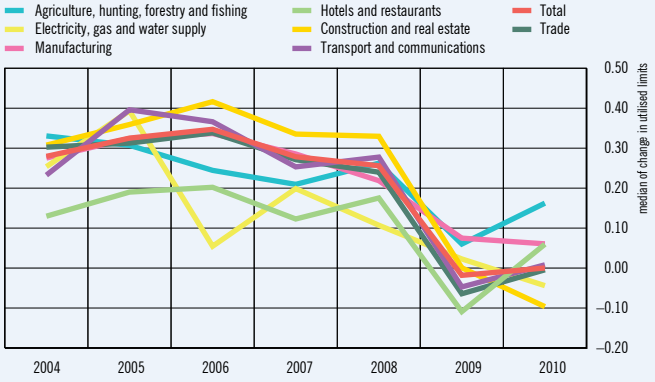
Figure 2 Supply of corporate loans according to activity, median



Source: CNB.

The drop in loan demand mainly further enhanced the effect that the decrease in loan supply had on the lending slowdown in the 2008 to 2010 period. As shown by the median use of credit limits by activities (Figure 3), in most of the sectors loan demand began to fall as early as in 2007, slightly earlier than loan supply, with the result that this decrease was somewhat more pronounced than that in loan supply. In addition, the deleveraging of enterprises recorded in 2009 halted, and in some activities reversed, in 2010, with no recovery in loan supply (based on trends in the median enterprise). These demand trends can also be related to movements in interest rates on corporate loans, which, having edged up since 2006, started to decline gradually from the high levels attained no sooner than in 2010.

Figure 3 Loan demand – utilisation of corporate loan limits according to activity, median



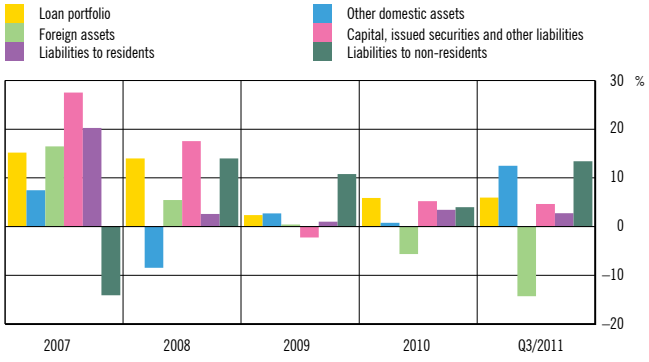
Source: CNB.

The analysis performed shows relatively uniform patterns of loan supply and demand by activities in the years preceding the escalation of the crisis, and a sectoral reallocation of loans, started in 2009 due to changes in final demand patterns. Loan demand by enterprises from tradable sectors, such as manufacturing and hotels and restaurants, increased in 2010 due to improved conditions in their export markets. Loan supply to the construction sector, far exceeding loan supply to other sectors in the pre-crisis period, decreased sharply in both absolute and relative terms. However, this decrease in supply was accompanied by an even larger decrease in demand, with the result that this sector's deleveraging continued in 2010. In contrast, loan demand by export enterprises decreased less than that by other enterprises in 2009 and increased significantly in 2010. This result also leads to the conclusion that the reallocation of loans to tradable sector enterprises was primarily due to changes in loan demand and to a lesser extent to changes in loan supply.

The results of the analysis show that a decrease in the corporate sector's loan demand is the main cause of the lending slowdown, although a drop in loan supply can also be observed. Furthermore, the relatively uniform trends in 2008 and 2009 were in 2010 followed by an increase in the reallocation of total loans to activities with higher growth potential, that is, to export enterprises. These developments were mainly due to the differentiation of loan demand between activities, and to some extent to minor relative changes in banks' loan supply. These trends are positive from the point of view of financial stability as they improve growth perspective and limit credit risk for banks. However, the reallocation's positive effects on the stability of domestic financial institutions are somewhat reduced by the fact that changes in the sectoral structure of loans in the initial phases of the recession were mainly related to foreign lending (Figures 49, 57 and 58).

Banking sector

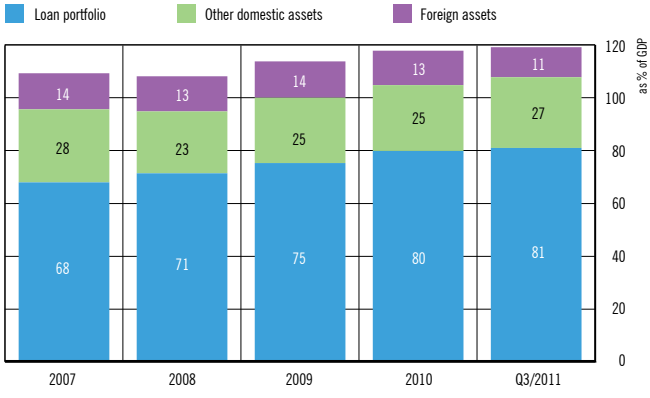
Figure 67 Major banking sector balance sheet items,[a] year-on-year rates of change



[a] An increase in balance-sheet items at end-September 2011 was calculated relative to September 2010.

Source: CNB.

Figure 68 Banking sector assets



Source: CNB.

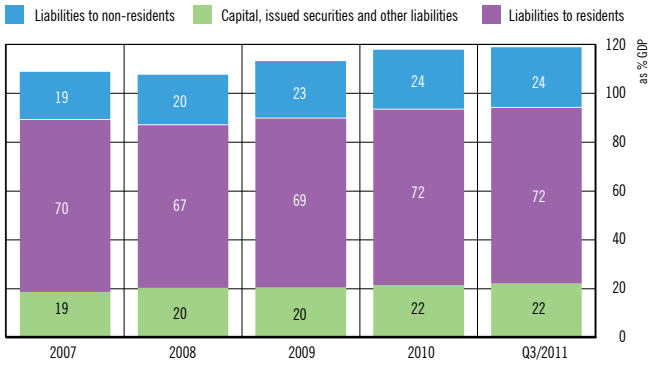
Moderate growth in banking sector assets continued and was accompanied by somewhat faster credit growth on the back of a gradual economic recovery in the first three quarters of 2011. Owners continued to predominate in foreign funding, which may pose a risk should there be any turbulence in international financial markets as parent banks would need additional capital. In the same period, profit of domestic banks improved slightly. Coupled with strong capitalisation, this provides an adequate buffer for the entire sector in case of highly unlikely adverse shocks. However, some banks could become slightly under-capitalised.

Balance-sheet vulnerabilities

Banking sector assets continued to grow at a relatively slow pace in the first nine months of 2011 due to the subdued demand for loans. The annual growth rate of bank assets stood at 5.1% in September 2011, slightly more than at end-2010. However, the slight weakening of the kuna continued to inflate the nominal growth of banks' balance sheets.[2] The ratio

2 The loan amount presented in bank statistical reports as at 30 September 2011 includes loans and, in some banks, debt securities held in the portfolio of loans and receivables. The value of loans and deposits is expressed in kuna, which means that exchange rate changes may decrease or increase non-kuna items. The annual depreciation of the kuna against the Swiss franc and the euro, of 11.8% and 2.7% respectively, stimulated the nominal increase in bank assets. In addition, in bank reports, the value of loans is presented on the net principle, i.e. the value of granted loans is reduced by the amount of loan loss provisions on these loans, so that the rise in loan loss provisions reduces net bank loans.

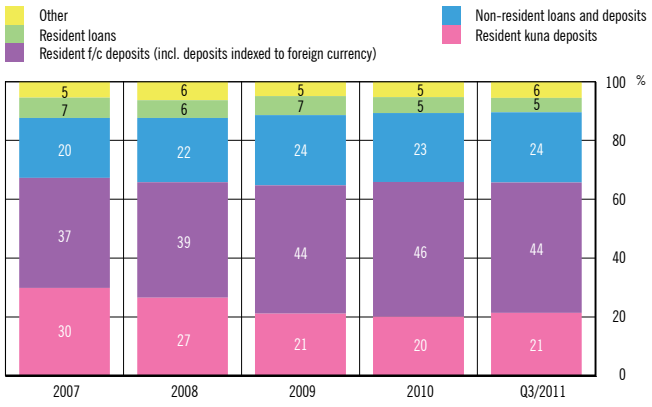
Figure 69 Banking sector liabilities[a]



[a] Collectively assessed impairment provisions represent the difference between banking sector assets and banking sector liabilities and capital.

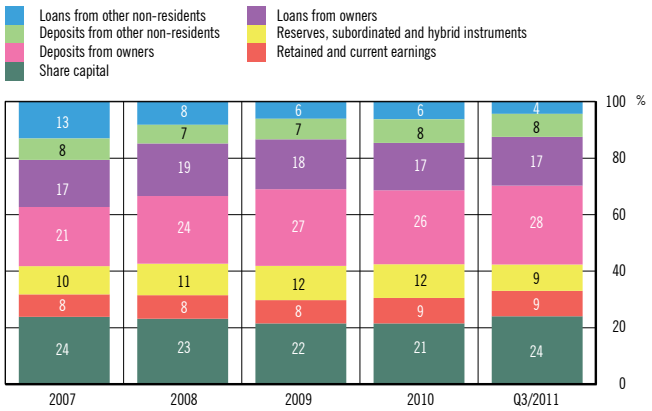
Source: CNB.

Figure 70 Structure of liabilities



Source: CNB.

Figure 71 Structure of foreign-source funds



Source: CNB.

of bank assets to GDP, which went up from 114% to 118% in 2010, grew at a much slower pace in 2011 due to the gradual economic recovery; by September 2011, this ratio increased by only one percentage point (Figure 68).

However, lending to domestic sectors accelerated to some degree in the first nine months of 2011 compared with 2010 (the annual growth rate of loans was 7.3% in nominal terms and 4.3% at constant exchange rate in September 2011, slightly more than in 2010). The stagnation in household borrowing continued to affect adversely the growth in bank placements, so that demand from the government and corporate sectors was again the main generator of credit growth in the context of the gradual economic recovery. Loans thus continued to grow faster than total assets, which increased their predominance in banks' portfolios. To a great extent, banks used the relaxation of the regulatory framework[3] early in the year to liquidate some foreign securities and invest in domestic securities (Figures 67 and 68). The increasing dominance of loans in the asset structure shows that banks raised credit and liquidity risks to generate additional income.

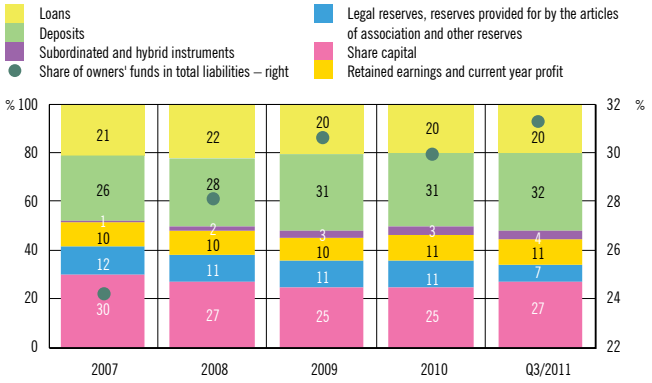
The year-on-year changes in balance sheet items at end-September 2011 show that liabilities to non-residents grew faster than domestic sources (Figure 67). The structure of total funding sources was relatively stable in the first three quarters, but the dominance of foreign owners in foreign funding (including capital) increased to almost 90% (Figures 69, 70, 71 and 72).

Foreign owners have been a stable funding source for their Croatian subsidiaries ever since the onset of the crisis. As foreign owners of domestic banks are mostly large international groups with a long-term operating strategy for the markets in the region, their operations in the Central and Eastern European region were less susceptible to short-term fluctuations resulting from market sentiments. Still, in view of the difficulties that foreign owners currently face in domicile markets and actions of some regulators to limit the exposure of banks to Central and Eastern Europe, foreign capital inflows will be constrained in the forthcoming period. For this reason, should the crisis hit again, Croatian banks that are subsidiaries of foreign banks would have to turn more to domestic sources to finance their credit growth and to their own liquidity reserves. Nevertheless, continuously solid business results, which Croatian subsidiaries recorded from the beginning of the financial crisis, and the dominant reliance on domestic funding, have put them in a relatively better position than their regional peers.

Though bank capital grew only slightly in the period under review, the banking sector stayed well capitalised. The share of the safest components of shareholders' equity increased, which improved the quality of capital (Figures 71 and 72).

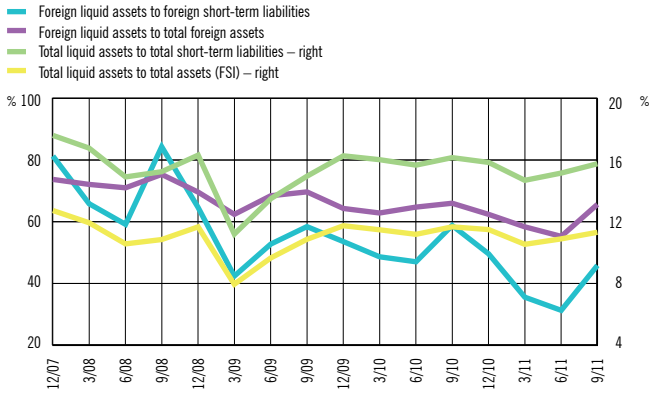
3 In March 2011, the rate of the minimum required foreign currency claims was reduced from 20% to 17%, which freed more than HRK 6bn to banks.

Figure 72 Breakdown of bank owners' funds by instrument



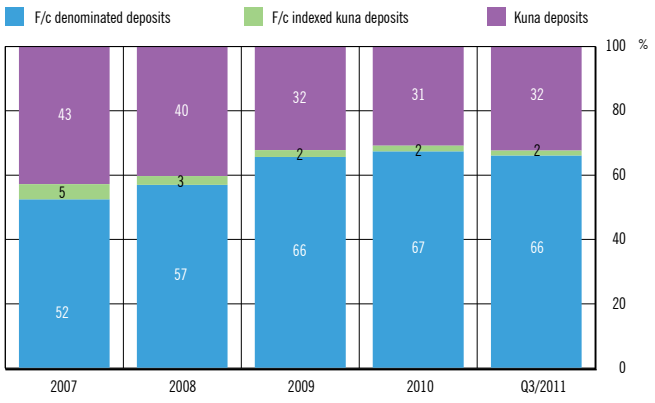
Source: CNB.

Figure 73 Liquidity indicators



Source: CNB.

Figure 74 Currency breakdown of deposits



Source: CNB.

Banking sector liquidity decreased slightly in the first three quarters of 2011. Banks mostly reduced their holdings of less liquid foreign securities and retained more liquid foreign deposits, while increasing their reliance on short-term funding sources. Therefore, the ratio of foreign liquid assets to foreign short-term liabilities decreased noticeably in the first three quarters of 2011, notwithstanding a slight recovery late in the period. As kuna liquidity reserves increased in the same period, indicators of overall liquidity stayed almost unchanged (Figure 73).

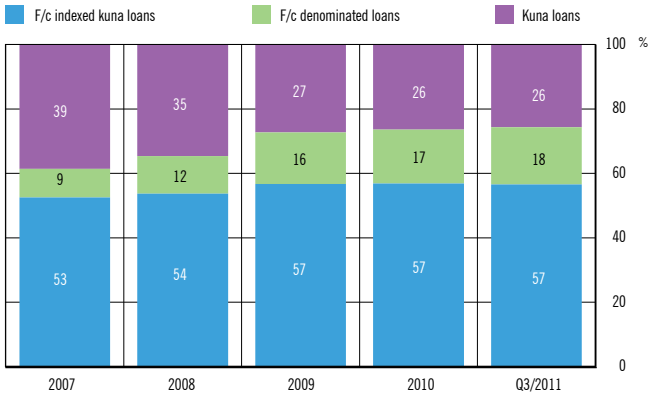
The currency structure of bank's balance sheets did not change much; the shares of foreign currency sources and assets stayed high. Heavier reliance on foreign owners and the parallel growth in household foreign currency deposits, particularly noticeable in the context of heightened uncertainty in international markets, particularly since mid-2011, contributed to the continued domination of foreign currency sources. Foreign currency deposits accounted for more than two-thirds of total deposits in late third quarter 2011 (Figure 74).

As banks adjust the currency structure of loans to that of deposits, the share of foreign currency-indexed and denominated loans, which had started to move up when the financial crisis began, was close to 74% at end-September 2011. Its upward trend was reinforced by the slight weakening of the kuna against the Swiss franc and the euro in the previous two years, as well as the rise in the share of (mostly foreign currency-indexed) housing loans in total household loans and the increase in foreign currency loans to government units (Figure 75). The impact of exchange rate changes was particularly evident in Swiss franc-denominated loans; the franc strengthening slowed down the fall in the share of loans linked to that currency. Swiss franc-indexed loans still accounted for more than 40% of all foreign currency-indexed housing loans in September 2011, although for several years no such loans have been made, while the share of Swiss franc-indexed loans in total car loans fell to below 60% (Figures 76 and 77).

The changes in the currency structure of assets and liabilities of banks had no major impact on their net open foreign exchange position, which stayed well below the regulatory limit at the system level; it was only 2.1% of own funds at end-September 2011. Bank exposure to direct interest rate risk also stayed low, while the difference between the share of loans granted with interest rates variable within a year and the share of corresponding deposits and loans received increased slightly (Figure 78).

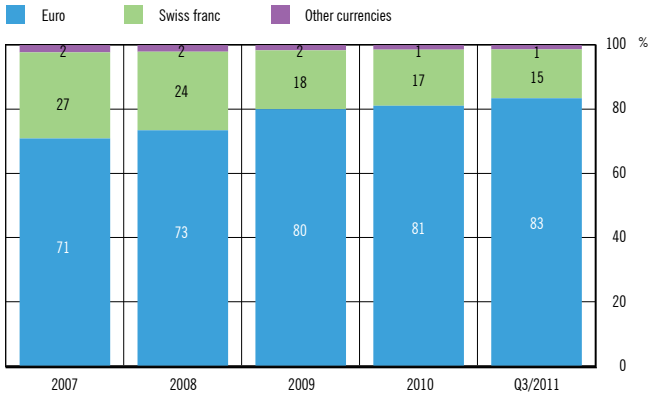
The marginal decrease in bank exposure to direct currency risk was accompanied by the rise in exposure to indirect currency risk. The share of unhedged loans in total loans exposed to currency-induced credit risk (CICR) increased, mostly on account of the rise in exposure to the household sector, i.e. the segment of other household loans, while the share of unhedged housing loans decreased. With regard to the corporate sector, a slight drop in the share of loans granted to economic activities that are less protected against currency risk (e.g. construction) ended the rise in the share of unhedged loans to total loans ex-

Figure 75 Currency breakdown of loans



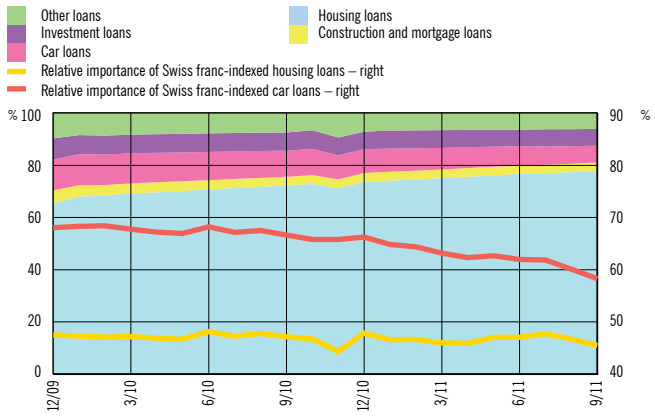
Source: CNB.

Figure 76 Currency breakdown of non-kuna loans



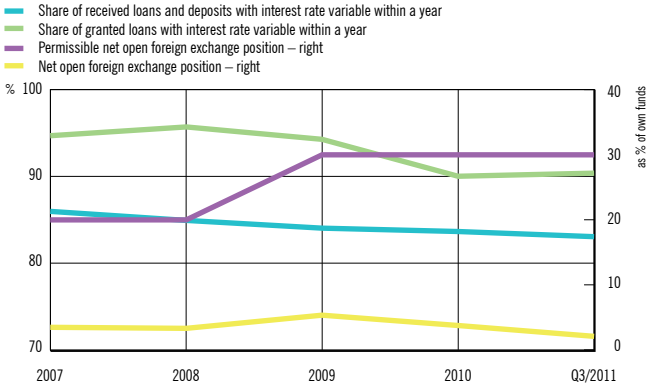
Source: CNB.

Figure 77 Breakdown of Swiss franc-indexed loans



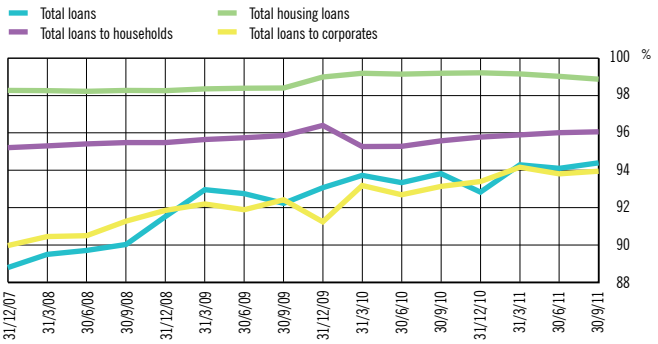
Source: CNB.

Figure 78 Bank exposure to direct currency and interest rate risks



Source: CNB.

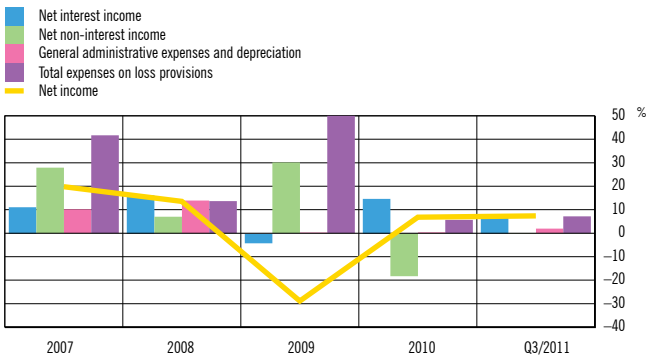
Figure 79 Share of unhedged loans in total loans exposed to CICR[a]



[a] Under new rules, CICR and several other risks have been transferred to the second pillar of the new framework of capital calculation, i.e. regulations on internal capital of credit institutions.

Source: CNB.

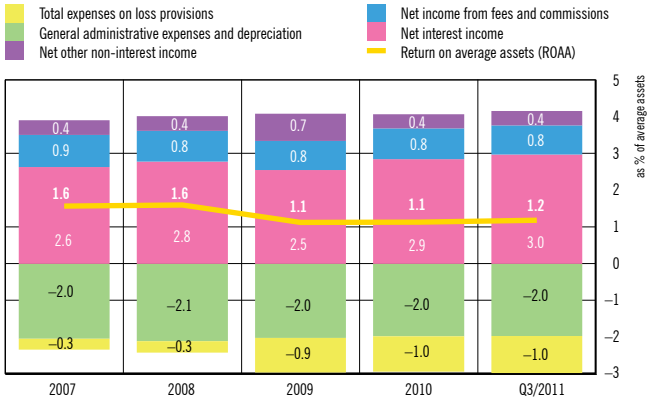
Figure 80 Change in selected business performance indicators[a], year-on-year rates of change



[a] Total expenses on loss provisions increased by around 220% in 2009.

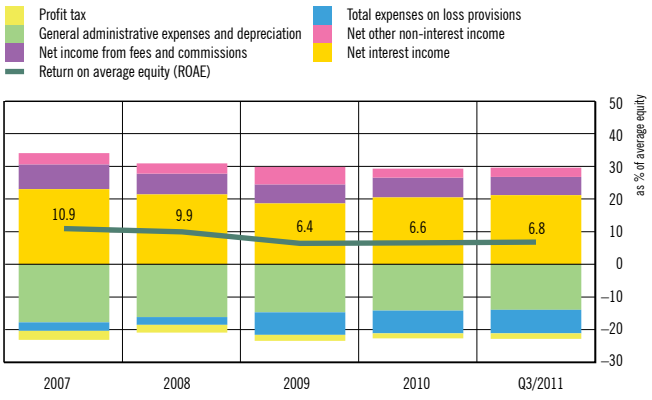
Source: CNB.

Figure 81 Contribution of ROAA categories



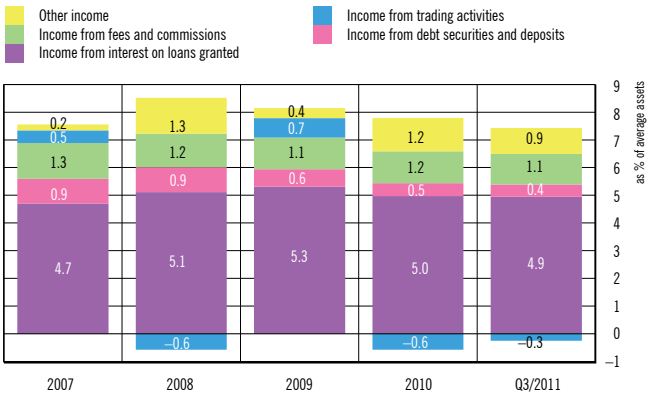
Source: CNB.

Figure 82 Contribution of ROAE categories



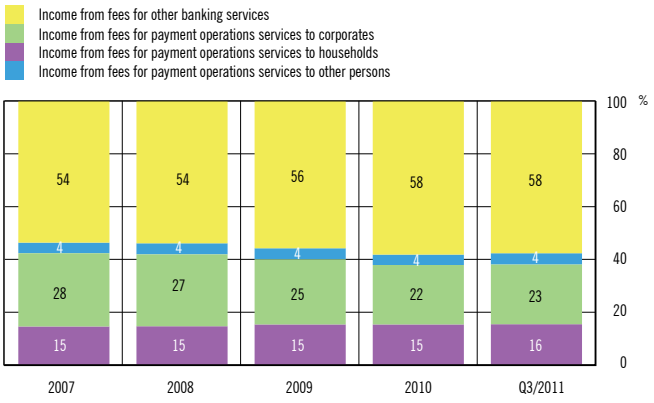
Source: CNB.

Figure 83 Structure of total income



Source: CNB.

Figure 84 Structure of income from fees and commissions



Source: CNB.

posed to CICR, but this share stayed at a high level (Figure 79). At the same time, the steady move towards longer maturity of new loans indicates a decrease in the refinancing risk for bank clients and lower credit risk of banks (Figure 88).

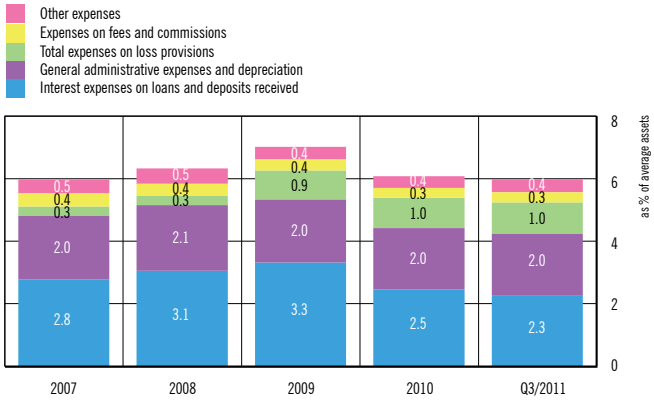
In the period of crisis banks continued to transfer direct currency and interest rate risks to their clients and thus limited their own direct exposure to these risks. However, should there be any strong currency or interest rate shock in 2012, these risks could materialise in the form of credit risk.

Strategic risks[4]

As banks' business performance steadily improved on the back of the mild economic recovery, banks' net income grew by around 7.5% in the period up to September 2011. The aggregate result was largely influenced by the decrease in interest expenses being stronger than the fall in interest income, so that the net effect of interest rate changes on bank earnings was positive. The decline in interest rates was mostly due to the fall in expenses on household time deposits, which was triggered by the cut in deposit rates, and trends in benchmark interest rates, i.e. the maintenance of ZIBOR and EURIBOR at exceptionally low levels, as well as the maintenance of the country's risk premium at a somewhat lower level up to mid-2011 (Figure 87). As lending rates on total loans, approximated by interest income, decreased more slowly in the same period, the interest margin of banks continued to rise and hit a five-year high at end-September 2011. In the same period, the interest spread, which takes into account only newly-granted loans, continued to trend down due to the fall in the share of short-term loans (which are, as a rule, granted with higher nominal interest

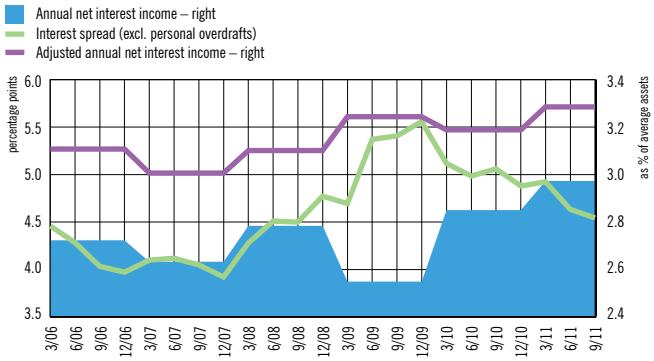
4 Income statement items for September 2011 were annualised to be comparable with those for preceding whole year periods. This was made by summing up banks' business results in the last quarter of 2010 and the first three quarters of 2011.

Figure 85 Structure of total expenses



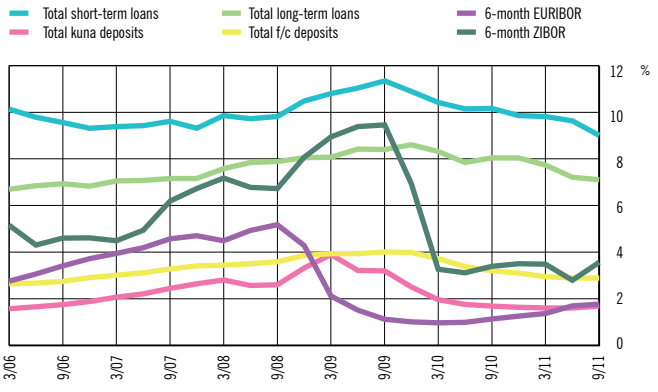
Source: CNB.

Figure 86 Interest spread (quarterly average of monthly interest rates on newly-granted loans) and annual net interest income



Note: Net interest income of banks has been adjusted by income from trading activities and exchange rate differences.
Source: CNB.

Figure 87 Selected interest rates (quarterly average of monthly interest rates)



Source: CNB.

rates) and the rise in the share of housing loans (with the lowest nominal rate) in newly-granted loans (Figures 86 and 88). Net interest income of banks thus grew by almost 7% in the first nine months of 2011 from the end of 2010 (Figure 80).

The slower growth in irrecoverable loans had no major impact on the dynamics of loan loss provisions, which continued to increase at a pace similar to that in 2010. They grew by around 7% from end-September 2010 to end-September 2011 (Figures 80 and 85). The rise in the share of irrecoverable loans also had a negative effect on the ratio of interest income to assets of banks, but it was mitigated by the higher share of loans in total assets. At the same time, non-interest income dropped due to the slight fall in income from fees and commissions (Figures 83 and 84).

On the back of these trends, ROAA grew from 1.1% at end-2010 to 1.2% in the first nine months of 2011, while ROAE went up from 6.6% to 6.8%. Profitability indicators thus stayed much lower than in the period preceding the crisis (Figures 81 and 82).

Notwithstanding the improvement in business results of the entire sector, which was due to the rise in net interest income and the continued prudent management of administrative expenses, the dispersion of earnings among banks and bank groups widened. The improvement in business results of the sector was due to only a few universal banks, the largest among them, that, thanks to credit portfolio diversification and prudent credit risk management, proved to be relatively resilient to adverse macroeconomic conditions and recorded solid earnings. By contrast, the number of small corporate and retail banks with negative results increased from five at the end of 2010 to nine at the end of September 2011.

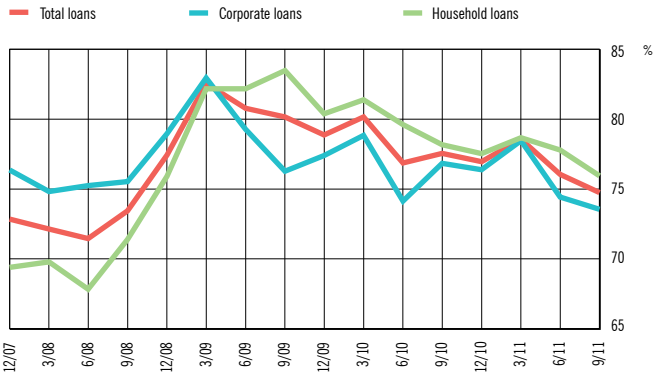
The current turmoil in international markets threatens good banking sector performances. The possible exacerbation of the economic crisis in the eurozone and increase in the country's risk premium could result in increasingly expensive and scarce funding for banks in 2012. Under such a scenario, which would lead to stronger recessionary tendencies in the Croatian economy, weak demand for loans would limit the possibility of further increases in interest rates. Coupled with the steady rise in charges for value adjustments, this would decrease earnings.

Credit risk and bank capital adequacy

The quality of almost all loan categories continued to deteriorate in 2011, but at a much slower pace than in 2010. The ratio of non-performing loans to total loans to the private sector[5] stood at 14.0% at end-September 2011, up by 2.6 percentage points on the same period in 2010. Owing to the strong increase

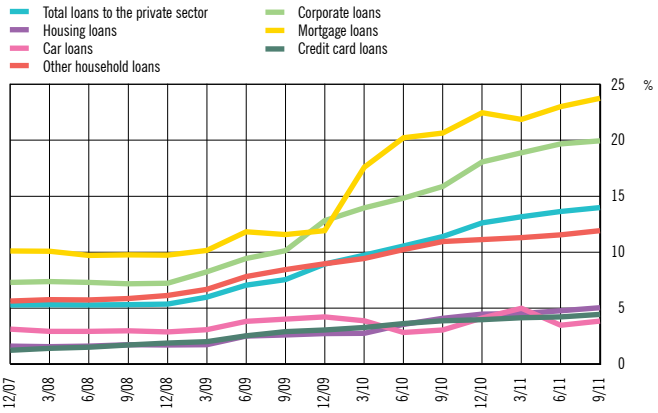
5 The private sector includes households and all enterprises.

Figure 88 Share of short-term loans in total newly-granted loans (quarterly average)



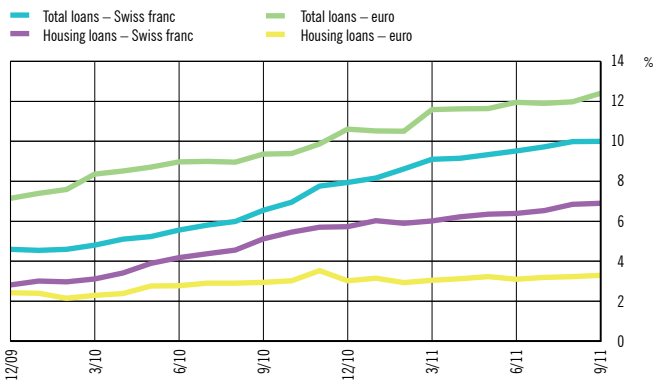
Source: CNB.

Figure 89 Ratio of non-performing loans to total loans



Source: CNB.

Figure 90 Ratio of non-performing loans to total loans by loan categories and the currency of indexation



Source: CNB.

in low-risk loans to the government, the share of total non-performing loans in total loans grew somewhat more slowly and stood at 12.2% in late September 2011. These developments in the aggregate indicator were again mostly due to the dynamics and riskiness of corporate loans (accounting for some 40% of total loans and 70% of total non-performing loans), 19.9% of which were non-performing at the end of September 2011. Although there are still large differences among individual subcategories of household loans, all categories recorded growth in the share of non-performing loans, with the exception of the relatively small share of car loans; the ratio of non-performing household loans to total household loans (NPLR) was 8.5% at end-September 2011 (Figure 89).

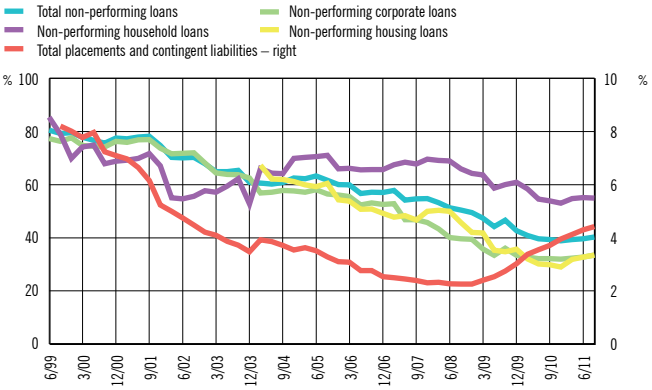
A somewhat larger contribution of household loans to the rise in total non-performing loans in 2010 and 2011 compared with the previous years may be attributed to adverse developments in the labour market and the sharp appreciation of the Swiss franc. As the kuna depreciated much more against the Swiss franc than against the euro (20% and 3.5% vs 1% and 1.4%) in 2010 and the first nine months of 2011, the difference between NPLR for Swiss franc-indexed housing loans and NPLR for euro-indexed housing loans steadily grew, reaching some three percentage points at end-September 2011 (Figure 90).[6] This suggests that Swiss franc-indexed housing loans, notwithstanding their gradual decrease, could stay an important source of credit risk materialisation for some time.

The long-lasting downward trend in the coverage of non-performing loans by value adjustments was reversed in 2011 (Figure 91). In the previous period, the coverage exceeded the level targeted by banks so they reduced value adjustments. By contrast, the need for greater coverage increased in 2011 in line with the stronger materialisation of risks, which again triggered the rise in value adjustments. The improved coverage of non-performing loans by value adjustments may be attributed to the ageing of the significant portion of the portfolio that had turned to be non-performing in the early stage of the crisis. In view of the strong increase in non-performing loans over the preceding three years, this process could continue to burden bank operations in the upcoming years.

While the level of coverage of non-performing loans by loan loss provisions hides potential risks to capital adequacy, the relatively high average risk weight that banks use to calculate the capital adequacy ratio (CAR) is a reserve for improving the capital adequacy. In 2011, banks increasingly used the option to reduce risk weights in line with Basel II rules (replacement and reduction of risk weights). Coupled with the rise in exposure to the government, this slightly lowered the average weight for credit risk calculation and increased the CAR to 19.3% at end-September 2011. Still, the unweighted capital-to-assets

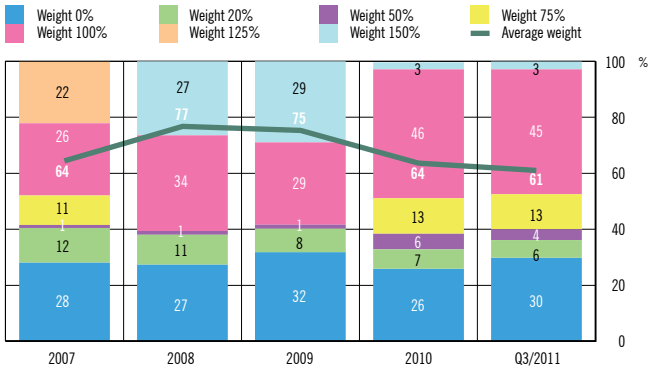
6 The quality of Swiss franc-indexed loans was also affected by specific circumstances in which they were granted. For more on the issue of loans indexed to the Swiss franc, see Box 5 Materialisation of currency-induced credit risk in Swiss franc-indexed loans, Financial Stability, No. 6, January 2011.

Figure 91 Coverage of total placements and contingent liabilities by value adjustments



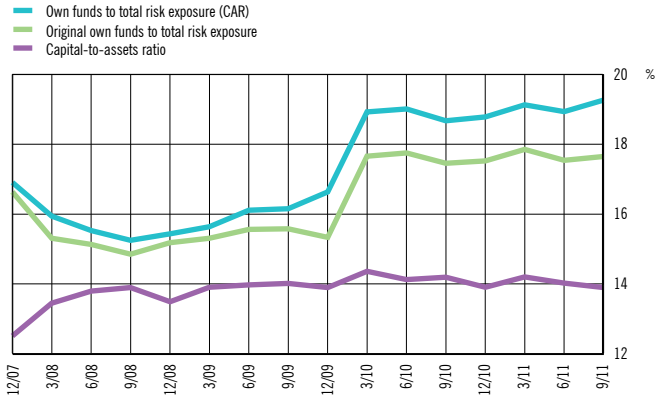
Source: CNB.

Figure 92 Distribution of bank assets by assigned weight and the average weight[a]



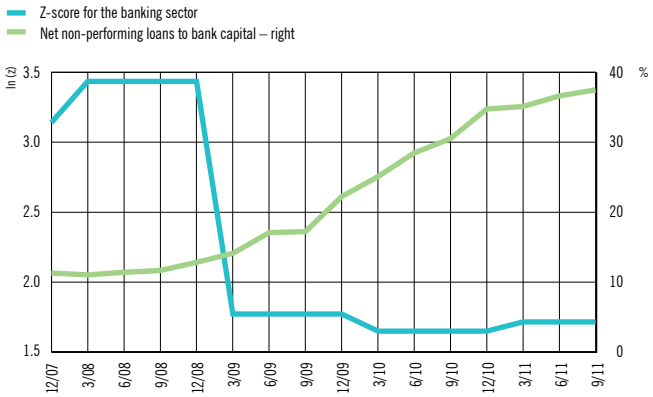
[a] Due to changes in the methodology, data before and after 2009 are not comparable.
Source: CNB.

Figure 93 Capital adequacy ratios



Source: CNB.

Figure 94 Solvency indicators of the banking sector



Source: CNB.

ratio of banks has been holding steady at around 14.0% for several years. In addition to the relatively high capital-to-assets ratio, sector stability is also positively influenced by the high quality of the capital itself due to the large share of original own funds in own funds (Figures 92 and 93).

The uncovered portion of non-performing loans that exerts increasing burden on capital still poses a significant risk to banking sector stability in view of potential costs that would arise from any further deterioration of that part of the loan portfolio. Banks' insolvency risk in terms of Z-score[7] slightly decreased but has stayed well above the pre-crisis level (Figure 94).

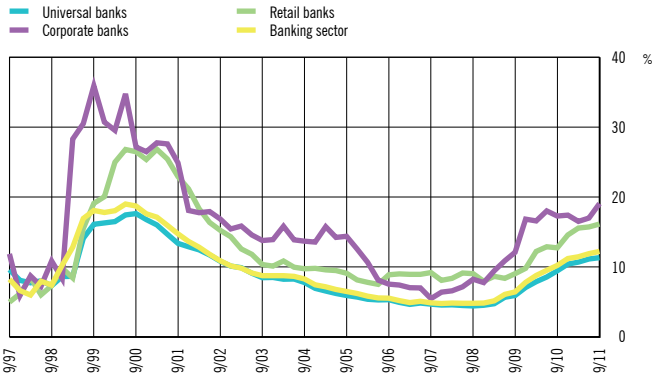
Banking sector resilience

All strategic bank groups have recorded a rise in non-performing loans since the onset of the crisis, with the increasing differentiation regarding the proportion of the deterioration in the credit portfolio quality, which continued into 2011.[8] The increase in the riskiness of placements by universal banks is, in view of their dominant impact on the sector as a whole, closely linked with the growth dynamics of the aggregate credit quality. In late September 2011, the NPLR for the group of universal banks was 11.3%, only slightly less than the aggregate level of the sector, which was 12.2%. The NPLR for retail banks, which grew much more rapidly, was higher (16.1%). After holding steady at a high level for a relatively long time, non-performing loans of corporate banks increased sharply in 2011, to 19.1% of total loans in late September (Figure 95). The increase could be tied to reduced refinancing and rescheduling of loans, which

7 For a more detailed description of Z-score see Box 5 Assessing banking sector stability in terms of Z-score, Financial Stability, No. 1, June 2008.

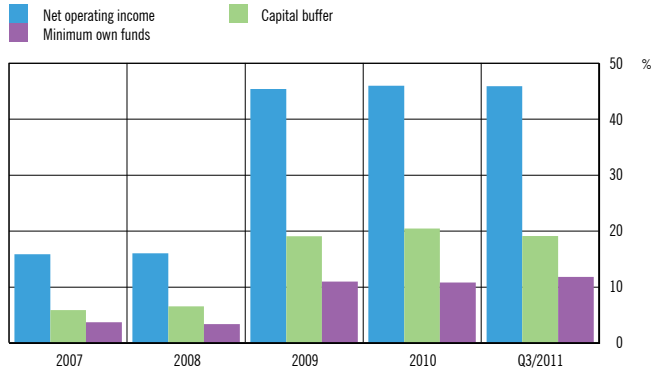
8 Strategic bank groups are described in more detail in Box 6 Revision of the stress-testing methodology, Financial Stability, No. 3, August 2009.

Figure 95 Dynamics of NPLR by bank groups



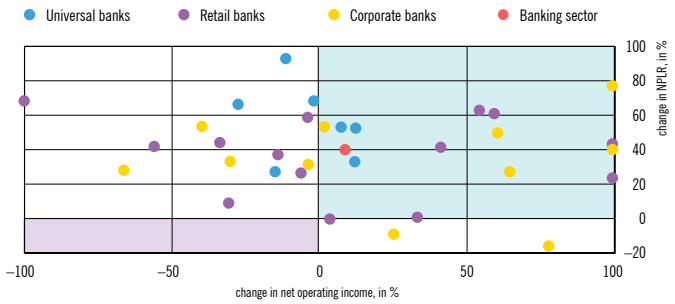
Source: CNB.

Figure 96 Relative importance of charges for value adjustments



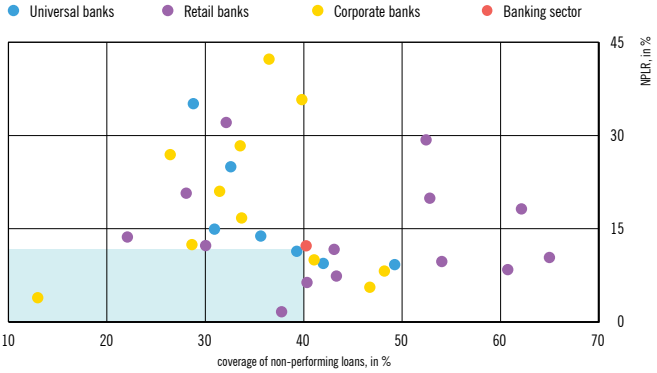
Source: CNB.

Figure 97 Change in bank earnings and NPLR in the first three quarters of 2011 relative to the previous three years' averagge[a]



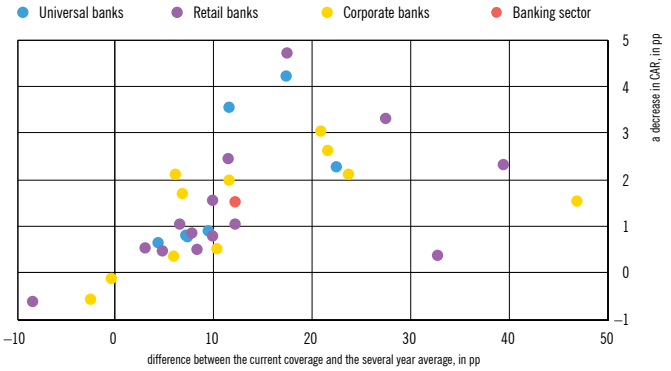
[a] The light blue shaded area shows banks with more solid business results and a more prudent risk assessment of the credit portfolio relative to the previous three years' average. The purple shaded area encompasses banks in which earnings declined but which made more optimistic assessments of their credit portfolio quality despite a deterioration in macroeconomic conditions.
Source: CNB.

Figure 98 Coverage of non-performing loans by value adjustments and NPLR by bank groups, as at 30/9/2011



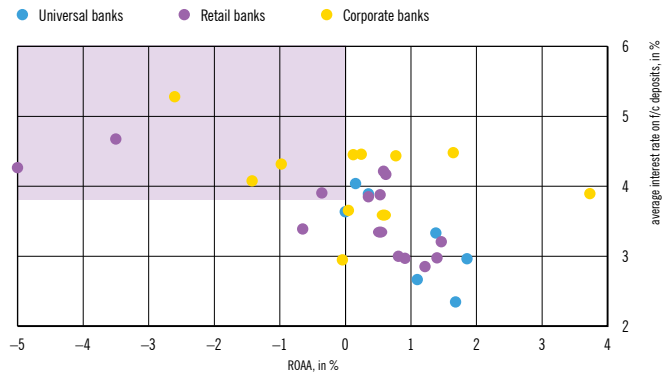
Source: CNB.

Figure 99 Adjustment of the CAR as at 30/9/2011 by the fall in the coverage of non-performing loans relative to the average (2003 – 2011)



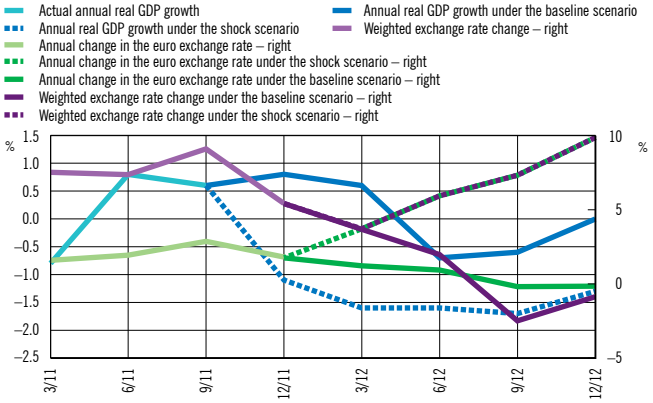
Source: CNB.

Figure 100 Annual ROAA and average annual interest rate on f/c deposits at end-September 2011



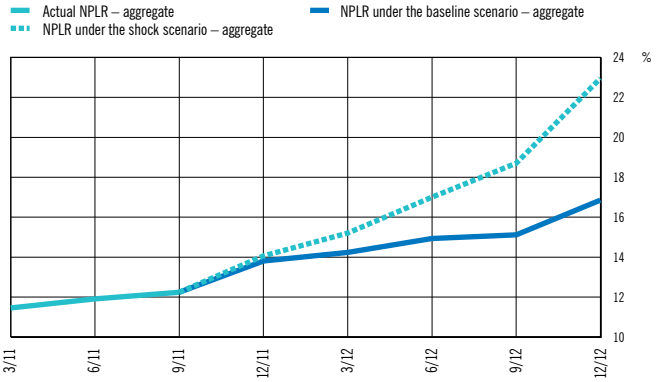
Source: CNB.

Figure 101 Projections of macroeconomic variables under various scenarios



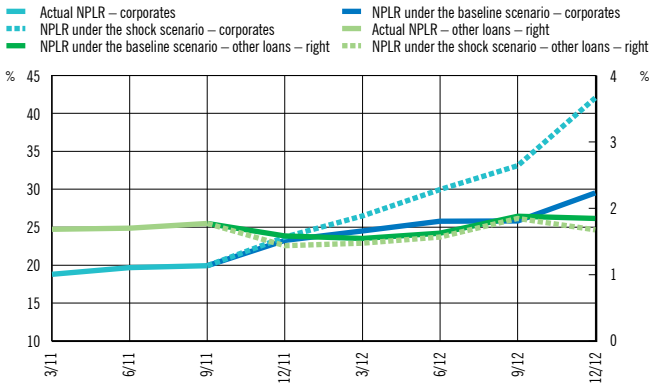
Source: CNB.

Figure 102 Projections of NPLR under various scenarios



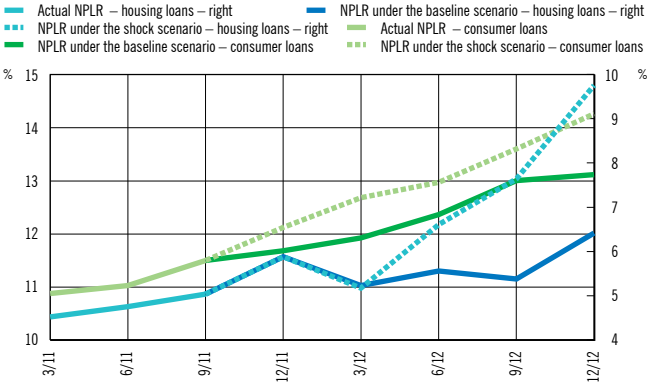
Source: CNB.

Figure 103 Projections of non-performing loans to corporates and other loans under various scenarios



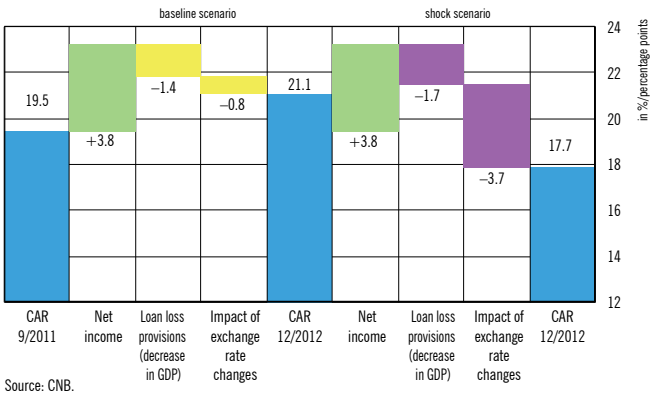
Source: CNB.

Figure 104 Projections of non-performing housing and consumer loans under various scenarios



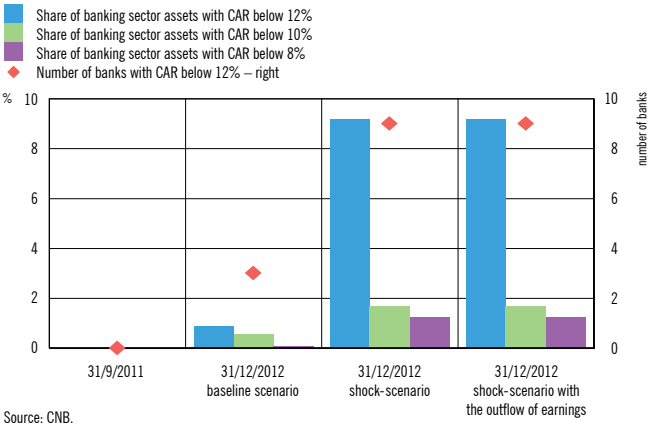
Source: CNB.

Figure 105 Contribution of individual components to the change in CAR under various scenarios



Source: CNB.

Figure 106 Breakdown of banks and their assets by CAR under various scenarios



Source: CNB.

Table 6 Dynamics of NPLR and CAR under various scenarios by bank groups

	30/9/2011	31/12/2012					
		Baseline scenario		Shock scenario		Shock scenario with the outflow of earnings	
	CAR (%)	CAR (%)	CAR relative to 30/9/2011	CAR (%)	CAR relative to 30/9/2011	CAR (%)	CAR relative to 30/9/2011
Banking sector	19.5	21.1	1.6	17.7	–1.8	17.4	–2.0
Retail banks	17.9	17.7	–0.2	14.9	–2.9	14.9	–3.0
Corporate banks	15.2	15.8	0.6	13.1	–2.0	12.8	–2.3
Universal banks	19.9	21.7	1.8	18.2	–1.7	17.9	–2.0

Source: CNB.

had been used to postpone the recognition of the deterioration in the credit portfolio quality. Among other things, this was the reason why in 2011 there were no more banks that assessed the increase in their credit portfolio quality relative to the decrease in net income. In previous periods, retail banks were usually assessed as risky under this criterion. Recently, they have either begun to assess the quality of their credit portfolios more conservatively or managed to increase their operating income (Figure 97).

The higher coverage of non-performing loans by loan loss provisions in 2011, particularly in banks with relatively low NPLR and coverage of non-performing loans, had a positive impact on financial stability (Figure 98). The potential shock that would arise from the correction in the coverage of non-performing loans to the average level from 2003 to 2011 was thus somewhat reduced relative to the previous period (Figure 99). Coverage of non-performing loans serves as one of discretionary measures to banks; they may use it somewhat to influence their business results, to the extent permitted by regulatory rules (see Box 3). Still, only a few retail and corporate banks continue to report relatively low levels of both indicators observed and are potentially exposed more to a double shock in recessionary conditions: the continued inflow of new non-performing loans and the rise in charges for value adjustments on previously granted non-performing loans. These risks indicate that caution is warranted in interpreting the stress test results (given below), which somewhat underestimate the potential fall in the CAR.

The problem of moral hazard, which is evident from a combination of high deposit rates and losses incurred, still exists in several banks. This category mostly includes corporate banks, which recorded a sharp increase in NPLR over the several previous quarters (Figure 100).

Stress test results for 2012 show that existing buffers at the sector level are adequate even under extreme but plausible adverse macroeconomic shocks.[9] Against the setting of the unfavourable international environment and strong domestic fiscal adjustment, the baseline scenario, in other words the most likely outcome, assumes a 0.2% fall in real GDP and the maintenance of a relatively stable exchange rate of the kuna against the euro and the Swiss franc in 2012. The shock scenario, which represents stress testing for a highly unlikely but plausible combination of shocks, assumes a 1.6% decline in real GDP. In view of expectations that foreign funding will be less available and more expensive during the projection horizon, the scenario also includes the impact of the cumulative 10% depreciation of the exchange rate of the kuna against the euro and the Swiss franc in 2012[10] (Figure 101).

Under the baseline scenario, NPLR could reach around 17% by the end of 2012. The shock scenario assumes a sharper increase in NPLR, to around 23% by the end of the projection horizon (Figure 102).

As a rule, the corporate loan portfolio makes the largest contribution to the dynamics of non-performing loans. Under the baseline and shock scenarios, the share of non-performing corporate loans stands at 30% and 42%, respectively, at end-2012. A somewhat smaller increase in the risk is associated with consumer loans, where the share of non-performing loans under the baseline and shock scenarios reaches around 13% and around 14%, respectively. The share of non-performing housing loans would grow mildly under the baseline scenario, to around 6%, and to around 10% under the shock scenario (Figures 103 and 104).

Under the baseline scenario, projected net income of banks[11] should continue to be more than sufficient to absorb overall expenses on value adjustments, so that, assuming that earnings

9 The stress tests conducted rely on sectoral models of credit risk presented in Financial Stability No. 7, which enable a simulation of the impact of macroeconomic shocks on changes in the riskiness of individual loan groups. Thereby, the impact of the macroeconomic scenario on each bank is manifested depending on the structure, i.e. the risk profile of its credit portfolio (corporate, housing and consumer loans and other loans).

10 Projected GDP values under the shock scenario were obtained based on quantile vector autoregressions to which financial condition indices and GDP growth rates for Croatia and the EU were introduced. The shock scenario was constructed as the outcome that covers 5% of the worst outcomes for the given baseline scenario.

11 Net income of banks is projected by the internal model based on banks' business performance in the first nine months of 2011 and developments in interest rates and balance sheet items expected in the remainder of the year. Under the baseline scenario, net income of the banking sector in 2012 is 5% higher than in 2011, while this buffer remains unchanged under the shock scenario.

are reinvested, the CAR of the banking sector would grow by slightly less than two percentage points relative to September 2010. This mostly refers to large universal banks. The expected aggregate net income of corporate banks is slightly higher than projected loan loss provisions so their CAR increases marginally, while loan loss provisions of retail banks exceed net income and lead to a slight decrease in the capital adequacy (Table 6).

Loan loss provisions would be even higher under the shock scenario than under the baseline scenario. In addition to the impact of the decline in GDP, this is primarily due to exchange rate changes that activate currency-induced credit risk. Furthermore, any kuna weakening would automatically bring about a decrease in the capital adequacy ratio as banks' capital is expressed in kuna, while their assets are predominately denominated in euro (Figure 105). Under the shock scenario, the capital adequacy ratio of the banking sector would drop by 1.8 percentage points and be more than three percentage points less than under the baseline scenario. The smallest decrease would be recorded in universal banks (1.7 percentage points), while it would be 2.0 percentage points and 2.9 percentage points, respectively, in corporate and retail banks (Table 6). Under the shock scenario, by end-2012, the CAR would fall below 12% for nine banks holding around 9% of banking sector assets and below 8% for four banks holding 1.2% of bank assets (Figure 106).[12]

Bearing in mind the high capital adequacy of domestic banks and pressures faced by foreign owners due to the crisis in the eurozone, stress tests included the possible outflow of earnings. In previous tests, earnings were automatically used as a form of capital injection to banks.[13] Under the shock scenario in which any profit is paid to owners, the banking sector would stay stable and well capitalised, while the aggregate CAR would fall by around 2 percentage points by the end of 2012. This decrease would be somewhat smaller in universal banks (2 percentage points) and greater in retail and corporate banks, 2.3 percentage points and 3.0 percentage points, respectively (Figure 106 and Table 6).

12 All these projections are based on the assumption that banks neither raise additional capital nor reduce capital in the period under review.

13 The test includes the restriction under which a bank may not reduce its capital adequacy ratio to below 12% as a result of the payment of earnings.

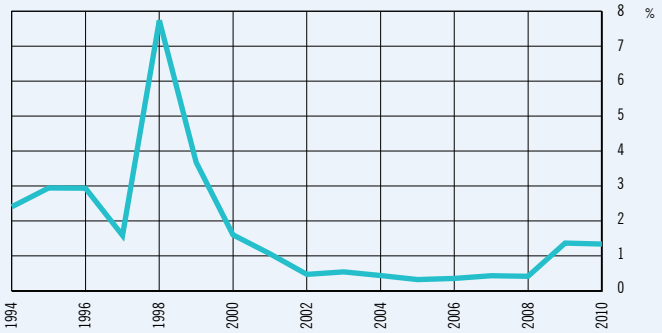
Box 3 The loan loss provisioning policy: a potential source of instability?

The reform of global financial regulation is primarily aimed at lowering the probability of crises and building a more resilient financial system that will reduce economic and fiscal costs of potential future crises. Analyses have shown that current regulatory practices requiring loan loss provisions to be made only after loans become non-performing have been a major cause of the financial sector's pro-cyclical behaviour pattern that increases the amplitudes of business cycles. On the eve of the crisis, banks worldwide were relatively optimistic about the quality of their portfolios and maintained low levels of provisions and capital, thus accelerating credit growth and generating high profits. However, the crisis-induced deterioration of portfolio quality and the resultant sharp increase in provisions have eroded banks' profits and capital, undermining their stability and putting a halt to lending, which has in turn had adverse effects on economic activity.[1] A possible regulatory solution to the pro-cyclicality of provisioning policies can be found in the so-called dynamic provisioning approach that requires banks to make loan value adjustments based on experience acquired over a longer period of time. Recent empirical research has confirmed the stabilising role of this approach in the current crisis.[2] In this context, the main aim of this research is to examine systematically loan loss provisioning policies of banks in Croatia in order to shed more light on the link between regulation and domestic financial system stability, especially in the time of crisis.

The provisioning model applied in Croatia, primarily in compliance with International Accounting Standards and International Financial Reporting Standards, is based on expected loan losses, mainly arising from overdue repayments. The Croatian banking sector was therefore in the past exposed to strong fluctuations in provisions for potential losses on non-performing loans, which had negative effects on the sector's stability.[3] Due to adverse macroeconomic trends and banks' weak risk management policies in the late 1990s, and within the existing regulatory framework, provisioning surged, which resulted in large losses and the dissolution of a quarter of the banks (Figure 1). Having peaked in the late 1990s, total provision expenses, measured by their share in total bank loans, decreased sharply in the following few years, holding steady at low levels until the outbreak of the current crisis, when they grew strongly once again, although remaining considerably below the historical maximum.

As a rule, provisions set aside by credit institutions should be sufficient to cover their expected losses and their capital ought to be sufficient for

Figure 1 Ratio of annual provisions for identified loan losses to net loans



Source: CNB.

the coverage of unexpected losses (Figure 2). However, if the expected loss estimate is based exclusively on realised losses, strong fluctuations in provision expenses can make the existing buffers in the form of accumulated provisions and capital insufficient. The potential vulnerability of financial institutions stemming from the use of realised losses as a measure of expected losses can be alleviated by implementing a statistical model of provisioning for potential losses whose parameters are based on asset quality trends through the whole business cycle. The best known is the Spanish dynamic provisioning model.[4] Under this model, the effect of the overly optimistic valuation of assets during the upswing phase on the provisions set aside and, consequently, on banks' income and profit, is corrected by increasing loan loss provisions in the expansion phase and releasing accumulated provisions during the recession phase when risks materialise. An *ex ante* recognition of potential losses can protect capital from severe shocks at the time when irregularities in the loan collection occur and funding becomes tighter and more expensive. Fluctuations in lending activity would also subside in that case, to the extent to which they are caused by the lack of capital, as has been confirmed by empirical research.[5]

In regimes without pro-cyclical provisioning, such as the Croatian, banks can, employing discretionary provisioning practices, to some extent independently smooth provision fluctuations by classifying non-performing loans into sub-categories and setting aside provisions within each sub-category, which can also be related to valuation of collateral.

1 Financial Stability Forum: *Report of the Financial Stability Forum on Addressing Procyclicality in the Financial System*, April 2009; Ecofin: *Council conclusions on pro-cyclicality*, July 2009.

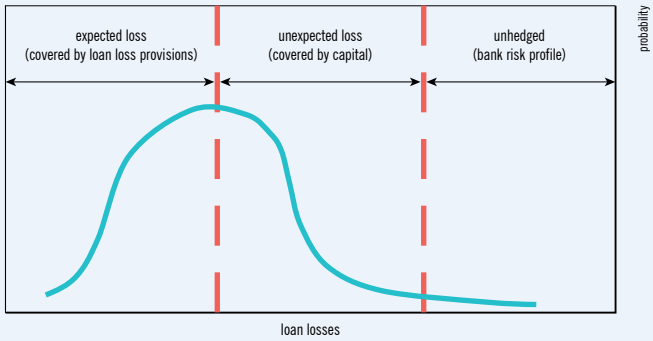
2 See Beatty, A., and Liao, S.: *Regulatory Capital Ratios, Loan Loss Provisioning and Pro-cyclicality*, Kellog School of Management Working Paper, 2009; Bouvatier, A., and Lepetit, L.: *Provisioning Rules and Bank Lending: A Theorethical Model*, 2009; Bouvatier, A., and Lepetit, L.: *Effects of loan loss provisions on growth in bank lending: some international comparisons*, 2010.

3 Loan loss provisions are expected loan losses and, as such, a deduction item in the calculation of their net value (loan value adjustment). Accordingly, the difference in the balance of value adjustments represents expense for the bank.

4 A dynamic provisioning model that automatically ensures the counter-cyclical effect of loss provisioning by protecting banks' profit and capital through the cycle was incorporated into Spanish banking regulations in June 2000 (for more details see Fernández de Lis, S., Pagés, J. M. and Saurina, J.: *Credit growth, problem loans and credit risk provisioning in Spain*, Banco de España – Servicio de Estudios Documento de Trabajo, No. 0018, 2000. For recent analyses of the effects of this approach, see for example Fillat, L. J., and Garriga, M. J.: *Addressing the pro-cyclicality of capital requirements with a dynamic loan loss provision system*, Federal Reserve Bank of Boston, 2010.

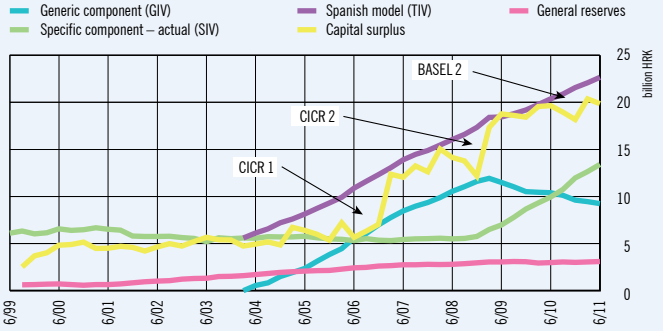
5 See for example Fernández de Lis, S., and García Herrero, A.: *The Spanish Approach: Dynamic Provisioning and other Tools*, BBVA, Economic Research Department N0918, 2009. They suggest that the Spanish model made a significant contribution to building buffers in the credit expansion period and reduced the pro-cyclicality of provisions in Spain.

Figure 2 Potential risks and the anticipated structure of the hedge against loan losses



Source: CNB.

Figure 3 Simulation of the application of the Spanish model of provisioning to the Croatian banking sector



Note: The structural breaks in the capital surplus series, caused by the introduction of the currency-induced credit risk (CICR) and the implementation of Basel II, are shown separately. A somewhat weaker impact on the capitalisation level of the banking system was produced by the marginal reserve requirement introduced in 2004 and its tightening in 2006 and 2007.
Source: CNB.

In order to test the assumption on the stabilising effects of dynamic provisioning ("through the cycle") using the example of Croatian banks, we will attempt to identify banks that in practice actually rely on this more flexible approach to forming expectations about potential losses and analyse these banks' behaviour during the current crisis. We will use various approaches based on a simulation of dynamic provisioning using the example of the Croatian banking sector.[6]

In the Spanish dynamic provisioning model, trends in loan loss provisions depend on currently estimated losses and cyclical swings in current lending activity:

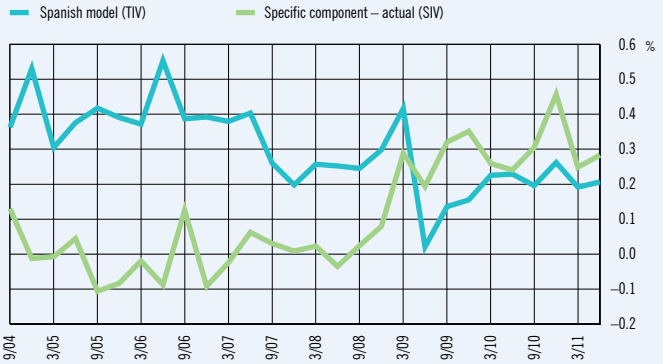
$$TIV_t = SIV_t + GIV_t = SIV_t + \sum_{i=1}^{x} \alpha_i \Delta C_{it} + \sum_{i=1}^{x} \left(\beta_i - \frac{SIV_{it}}{C_{it}} \right) C_{it}$$

$$= \sum_{i=1}^{x} \alpha_i \Delta C_{it} + \sum_{i=1}^{x} \beta_i C_{it}$$

where: *TIV* is total loan loss provisions, *SIV* – specific (actual) loan loss provisions based on individual loan quality estimates, *GIV* – generic loan loss provisions, *C* – gross loan amount, α – a parameter vector indicating a historical average estimate of losses in the loan portfolio of a certain degree of risk, β – a parameter vector indicating a historical average of the coverage of gross loans by provision expenses, *i* – the risk category (the sensitivity of loan loss provisions in the model is conditioned on the changes in loan portfolios of homogeneous degrees of risk – x = 4 loan portfolios were defined for the Croatian banking sector: government loans, housing loans, consumer loans and corporate loans[7]).

The performed simulation of the dynamic provisioning model at the level of the whole Croatian banking sector shows the following: (a) its application would result in the accumulation of a considerably higher amount of value adjustments (the total difference in June 2011 was slightly above 2% of net loans), (b) the existing general provisions reduce this difference (by one third),[8] (c) cost pressures on banks in a crisis period would be lower, and (d) high capital surplus levels serve both as buffers against unexpected losses and against potential imprecise estimates of the bank's risk profile. This role of capital is closely related to CNB measures that significantly increased the capitalisation of the banking sector in the pre-crisis period (Figures 3 and 4).

Figure 4 Ratio of quarterly loan loss provisions to net loans in two regimes



Source: CNB.

The simulation results point to a possibility that the actual regulatory framework for loan loss provisions in Croatia could have had a pro-cyclical effect on banks' lending activity. The effect that the provision smoothing has on lending activity was analysed using a panel regression with fixed

6 The simulation was conducted as of the beginning of 2004 since it makes the most sense to introduce a dynamic provisioning model at the beginning of credit expansion.

7 The parameters with housing loans and government loans were constructed directly since historical data cover the whole cycle. As this is not the case with consumer and corporate loans, historical data for strategic bank groups in which these loans dominate were used. For each portfolio (government, home, consumer and corporate loans), a parameter vector α (1.36%, 1.27%, 6.20%, 9.29%) and parameter vector β (0%, 0.04%, 0.25%, 0.15%) were estimated.

8 General provisions (provisions for A quality placements) amount to between 0.85% and 1.2% of assets. They provide additional security against potential inaccuracies in the estimation of non-performing placements.

effects.[9] The independent variables affecting the lending dynamics in the estimated model included the annual growth in gross loans (at the constant exchange rate), the increase in banks' net earnings before taxes and a corrected capital adequacy ratio (with the effect of regulatory changes excluded). Also included were two dummy variables, the first marking recession periods (from the third quarter 2008), and the second representing banks that are classified as banks that tend to resort to smoothing under one of the approaches used. The effect of the provision smoothing was estimated based on the interaction of the two dummy variables. Three approaches were employed for the classification of banks:

(a) The first approach uses the extent to which banks engage in discretionary smoothing of loan loss provisions based on the similarity between actual and simulated provisions.[10]

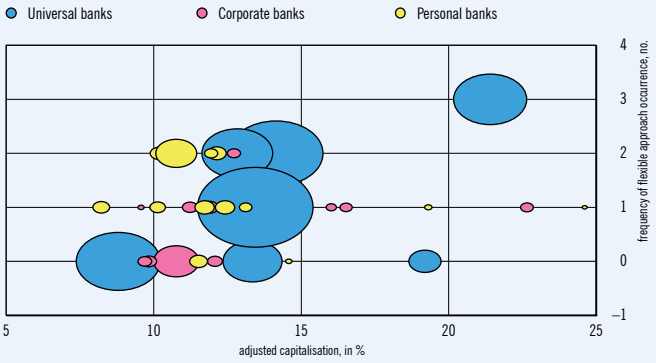
(b) Under the second approach, banks are classified based on the residual rank correlation between actual and simulated loan loss provisions and short-term deviations from the trend of banks' net earnings.[11]

(c) The third approach is based on a standard income smoothing analysis that examines the extent to which a bank's loan loss provisions are correlated with trends in its net operating income.[12]

The identification of banks having a more flexible approach to provisioning is sensitive to the choice of methodology: almost two thirds of the banks tested show an inclination to smooth loan loss provisions according to at least one approach. The difficulties in establishing the patterns of bank behaviour to some extent undermine the robustness of the findings shown below. However, the differences in the classification of banks are probably due to the differences in provision management policies, so that the selected methodologies are more appropriate for the identification of some of the forms of provision smoothing.

A positive coefficient with the interaction of indicator variables, which is significant in most of the estimated models, shows that during recession lending decelerated at a slower rate in banks that tend to smooth provisions, i.e. their approach to provisioning resulted in a lower pro-cyclicality of lending. However, this mostly refers to smaller, personal and relatively less capitalised[13] banks, although a number of larger banks (relatively better capitalised) also to some extent apply the more flexible approach. These findings therefore point to a potential benefit of the dynamic provisioning in terms of curbing the pro-cyclical behaviour of some larger banks (Figure 5). This benefit also depends on the extent to which banks' financial condition limits credit growth, given that in recession periods demand for loans is effectively also a limit.

Figure 5 Loan loss provisioning policy with respect to bank features



Note: The size of the bubble is proportionate to the value of bank assets.
Source: CNB.

To conclude, recent international experience and research on loan loss provisioning policies mostly suggest potential benefits of a more flexible approach to loan loss provisioning, which was to some extent shown using the example of Croatia. However, strengthening banking sector capitalisation and linking it to a position in the cycle, as intended by the reforms of the international regulatory framework, can also provide an alternative to the pro-cyclical provisioning system. As banks can additionally intensify or alleviate the effects of the new regulatory framework by changing their approach to the formation of provisions, its impact will also depend on their behaviour.

9 The regression was estimated on quarterly data for 32 banks in the period from the first quarter of 2004 to the second quarter of 2011.

10 The measure of similarity between actual and simulated time series combines the differences in accumulated value adjustments and quarterly provision expenses.

11 This procedure resembles the one proposed by Taktak, N.B., Shabou, R., and Dumontier, P.: *Income Smoothing Practices: Evidence from Banks Operating in OECD Countries*, International Journal of Economics and Finance, Vol. 2, No. 4, 2010.

12 The robustness of the results was tested varying the set of control variables (bank size and capitalisation), which remained unchanged.

13 In the panel regressions used, a positive linear effect of capitalisation on lending activity was isolated.

List of figures and tables

Abbreviations and symbols

Abbreviations

bn	– billion
CAR	– capital adequacy ratio
CBS	– Central Bureau of Statistics
CDCC	– Central Depository & Clearing Company
CDS	– credit default swap
CEE	– Central and Eastern European
CES	– Croatian Employment Service
CICR	– currency-induced credit risk
CM	– Croatian Motorways
CNB	– Croatian National Bank
EAD	– exposure at default
EBA	– European Banking Authority
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
HREPI	– hedonic real estate price index
HRK	– Croatian kuna
ILO	– International Labour Organization
IMF	– International Monetary Fund
m	– million
MoF	– Ministry of Finance
MRR	– marginal reserve requirements
NPLR	– ratio of non-performing loans to total loans
OECD	– Organisation for Economic Co-operation and Development
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
SDR	– special drawing rights
yoy	– year-on-year
ZIBOR	– Zagreb Interbank Offered Rate
ZSE	– Zagreb Stock Exchange

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

ISSN 1846-9264 (print) • ISSN 1847-0017 (online)