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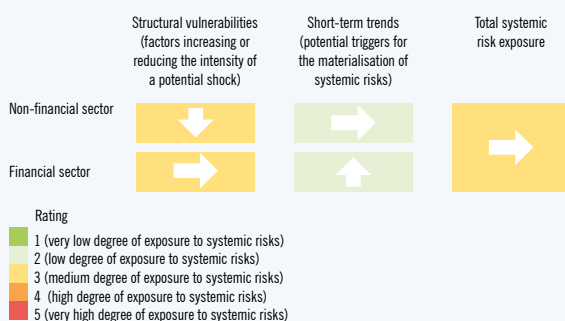
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Contents

Overall assessment of the main risks and challenges to financial stability policy	5
1 Macroeconomic environment	7
Box 1 Revision of the financial stress index for Croatia	12
2 Government sector	14
Box 2 Aggregate index of fiscal risk	18
3 Household sector	21
Box 3 Characteristics of indebted households in Croatia	27
4 Real estate	32
Box 4 Government's housing loans subsidy programme	35
5 Non-financial corporate sector	38
6 Banking sector	42
7 Stress testing of credit institutions	51
8 Macroprudential policy instruments	57

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

Risk map, first quarter of 2019



Note: Arrows indicate the changes relative to the Risk map in the fourth quarter of 2018 published in Macroprudential Diagnostics, No. 7, January 2019.
Source: CNB.

In 2018, continued economic growth and the decline of structural imbalances, such as public and private sector debt, external imbalances and unemployment, were recorded in Croatia. Taking into account these trends and the progress achieved in the implementation of structural reforms, in February 2019, the European Commission published its assessment that the macroeconomic imbalances in Croatia were no longer excessive. Soon afterwards, the S&P credit rating agency announced Croatia's return to investment grade, while Moody's affirmed the country's speculative rating at the end of April, but changed its credit rating outlook from stable to positive. According to the most recent forecasts, the economic growth outlook for 2019 decreased only slightly relative to the previous expectations, mainly due to unfavourable developments in the international environment. Despite favourable domestic trends, significant structural weaknesses were still present in Croatia because of which the Croatian economy remained vulnerable to potential changes in financing conditions in the international markets.

After the volatility in global financial markets that had marked the end of the previous year eased in early 2019, there were growing uncertainties regarding the strength of the global growth slowdown and the possible recessionary tendencies in the significant world economies.

Although this led to reduced risks from monetary policy tightening in the USA and the euro area, the prolonged period of low interest rates might additionally deepen the vulnerability in the financial and non-financial sector in a number of countries and increase the unfavourable effect of the possible price adjustment of global risks in the medium term. Such a change in financing conditions might occur even earlier, in the event of a stronger than expected slowdown of global growth or heightened political and economic uncertainties. The materialisation of such a scenario would have a particularly unfavourable effect on countries with accumulated structural imbalances, among which is Croatia.

Taking into account the reduction of structural imbalances in Croatia, as well as rising uncertainty in the global financial markets, it is estimated that the overall exposure of the Croatian financial system to systemic risks has not changed since the previous assessment (Macroprudential Diagnostics, No. 7) and remains at a moderate level. A stronger than expected slowdown in global and domestic economies and a not very likely but still possible increase in interest rates remain an important source of risk.

In 2018, the growth of real economic activity in Croatia slowed down slightly, mainly due to the weakening of foreign demand, while all components of domestic demand continued contributing equally to growth. Although foreign trade decelerated in the conditions of weakening global trade, a further surplus in the current account of the balance of payments was recorded, with the external deleveraging of domestic sectors. This continued the several-year trend of decline of external imbalances, but they were still relatively high as a result of the previously accumulated liabilities. A general government surplus was recorded for the second consecutive year, despite the increase in expenditures as a consequence of the assumed guarantees for shipyard debt. In addition, the needs for government financing were reduced, liabilities were refinanced under more favourable conditions and the spread between economic growth rate and the implicit interest rate was positive. However, the public debt-to-GDP ratio, despite its decrease, remained considerably elevated at 75% at the end of 2018. The currency structure of public debt, with a high portion of financing in foreign currency, is still an important source of vulnerability.

Consumer optimism increased in the conditions of economic recovery, positive labour market trends and historically low interest rates. Thus, in 2018, household debt increased moderately, mainly due to the increase in general-purpose cash loans. Housing loans also increased slightly, partially driven by the government's subsidy programme. As kuna loans with a fixed interest rate accounted for the dominant share in newly-granted loans, the exposure to interest rate and currency risks declined. The fall in interest rates, coupled with the growth of disposable income, mitigated the impact of credit growth on the debt and repayment burden in the sector. At the same time, household assets continued to grow moderately, driven by the growth of deposits and pension fund shares. Systemic risks in the household sector were still not assessed to be excessive, although the interest debt structure, and in particular the currency debt structure, still remained relatively unfavourable. With regard to the distribution of debt within the household sector, the Household Finance and Consumption Survey results (carried out in spring 2017) have shown that two fifths of households in Croatia have some form of debt, mainly non-housing (consumer) debt, while the largest share of the total debt value still relates to housing debt because the amounts are much higher than in consumer debt.

Favourable macroeconomic developments and the implementation of the government's housing loans subsidy programme had an impact on the increase in debt related to the real estate market and contributed to its recovery. Thus, the number of sales contracts in the residential real estate market increased in the past two years, with market activity predominantly taking place in Zagreb and on the Adriatic coast. The majority of subsidies granted through the government's programme were directed at the city of Zagreb, but due to the changes in the subsidy amount, which was higher for the less developed units of local self-government, from 2018, subsidies in other parts of Croatia grew more strongly. Nevertheless, the rise in prices was still significant only in Zagreb and on the Adriatic coast and in 2018 it even accelerated moderately at the aggregate level from the previous year. It is estimated that the prices of real estate at the end of 2018 did not deviate significantly from the macroeconomic fundamentals, although a positive gap started to widen slightly. Risks related to this market in the medium term are estimated to be moderate because unfavourable demographic trends are expected to limit the dynamics in the housing loans' cycle and the prices of residential real estate, despite the favourable macroeconomic environment.

In contrast to households, non-financial corporations increased their total debt in 2018 because external deleveraging, mainly of public enterprises, offset the slight increase in domestic borrowing by private enterprises. The debt-to-GDP ratio of non-financial corporations continued to decline. The reduction of vulnerability of this sector, in addition to the earnings, was also driven by the favourable impact of the continued decline in financing costs. The structure of new financing contributes to a further reduction of interest rate risk, while the total exposure of the non-financial corporate sector to currency risk remained at high levels. It is precisely the relatively unfavourable currency and interest rate structure of total corporate debt that contributed to the continued assessment of structural risks of this sector as moderate. The change

in the structure of newly-granted loans by purpose, with an increase in the share of investment loans, had a favourable impact on the long-term outlook.

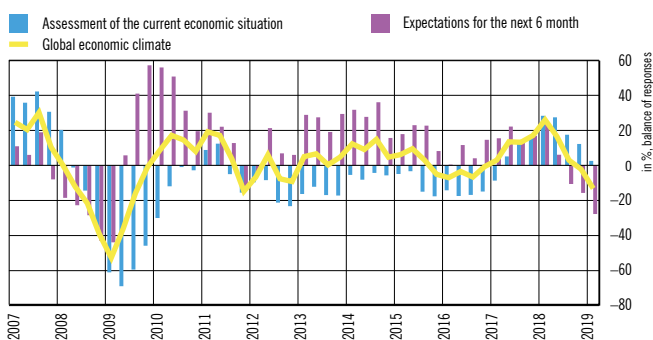
The intensification of credit activity in 2018, after several years of contraction and stagnation, led to a growth in the assets of the banking system, financed by a significant rise in deposits. Owing to the described reduction of household and corporate exposure to interest rate and currency risks, induced credit risks for the banks decreased, too. The credit portfolio quality continued to improve under the effect of the process of banks' balance sheet clean-up from non-performing placements, as well as favourable developments in the macroeconomic environment. The profitability of banks recovered after the high losses in 2017 related to credit risk materialisation at the Agrokor Group, with capital and liquidity surpluses maintained at relatively high levels. On the other hand, risks are still present, arising from the growing market concentration and the interconnectedness between the financial system and the central government. Overall, the banking system's resilience was maintained at a relatively high level, and the results of the integrated stress tests of credit institutions also confirmed their resilience to losses that might arise in the case of an unlikely but possible global crisis, even in the conditions of the existing structural vulnerabilities of the economy. Even though the system's vulnerability to disturbances was generally smaller than in the last year's testing, the simulation pointed to the growing diversification of vulnerability among credit institutions.

Despite a moderate growth of total loans to the private sector, risks arose, associated with the increased financing of the household sector through general-purpose cash loans. Banks granted such loans to relatively high amounts with original maturities of ten and more years, most frequently unsecured, applying more lenient creditworthiness assessment criteria than in the case of housing consumer loans. An additional source of risk stems from the fact that the Croatian Registry of Credit Obligations (HROK) has still not resumed operation, making it significantly more difficult for the banks to ascertain the actual amount of total debt of consumers and to assess properly their ability to service the debt.

In line with the assessment of a moderate and unchanged exposure to systemic risks, in 2018 and early 2019, the CNB did not change the level of capital buffers for credit institutions. However, in early 2019, the CNB reacted to the increase in credit risk in the banking system triggered by the fast growth of cash loans granted to consumers, and issued the Recommendation on actions in granting non-housing consumer loans, aimed at harmonising, to a large extent, the criteria for the assessment of creditworthiness of consumers among different types of long-term consumer loans. On the same occasion, within its supervisory powers, the CNB requested banks to include all risks arising or that might arise from general-purpose cash loans in their internal capital adequacy assessment processes. In addition, banks were recommended to systematically collect data on loans, consumers and collateral at the level of the individual loans, which will enable the CNB to set up a database for the purpose of monitoring the development of credit risk and the calibration of future measures.

1 Macroeconomic environment

Figure 1.1 Global economic climate deteriorated

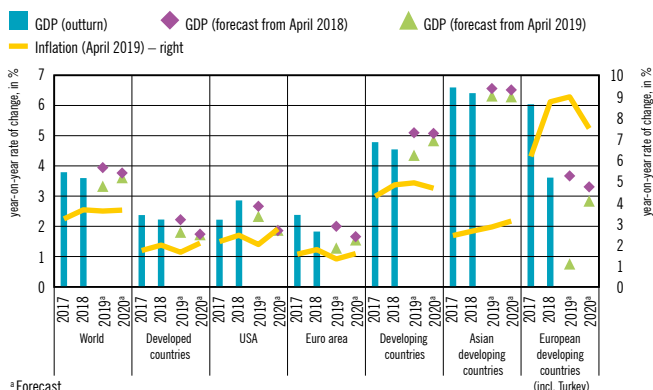


Notes: The Ifo World Economic Climate indicator is based on the quarterly survey of the current economic situation and short-term expectations and is weighted using the GDP based on purchasing-power-parity of each country. The indicator value may range between -100 and 100. Positive values represent a positive assessment of the economic climate and vice versa.

Source: Ifo World Economic Survey (WES) I/2019.

Under the impact of the slowdown in global economic growth and less optimistic expectations, risks for global financial stability increased moderately. The deferred monetary tightening in globally significant economies and the extended period of low interest rates might spur an additional accumulation of risk and thus increase the unfavourable impact of the potential price adjustment of global risks in the medium term. With regard to the domestic economy, structural imbalances continued to decrease, but vulnerability to potential financial shocks is still present.

Figure 1.2 Global economic growth decelerated and projections were revised downwards



*Forecast.

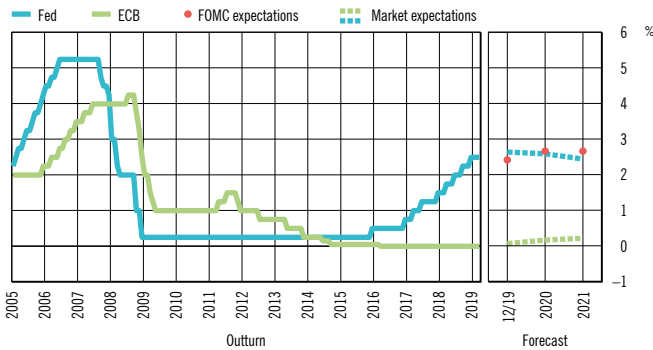
Source: IMF (WEO, April 2019/April 2018).

International environment

Global economic growth decelerated slightly in 2018 to 3.6%, amid the significant slowdown of global economic activity in the second half of the year. Almost all member states in the euro area, including Germany, Italy and France, recorded slower economic growth. Among developed countries, economic growth intensified only in the USA, while in the developing countries it decelerated, mainly due to the slowdown in the Chinese economy and weaker economic activity in the European developing countries. On a global level, the trend of accelerating inflation continued in 2018, driven by the increase in the prices of oil in the world markets.

The Ifo World economic climate indicator points to the slowdown in global economic activity in early 2019 (Figure 1.1), while growth projections of the world economy and the most important economies were revised downwards (Figure 1.2). Developing countries will remain the generators of growth, in particular Asian countries led by India and China, while growth in the European developing countries will be much slower,

Figure 1.3 Announced tightening of the monetary policies of the USA and the euro area deferred

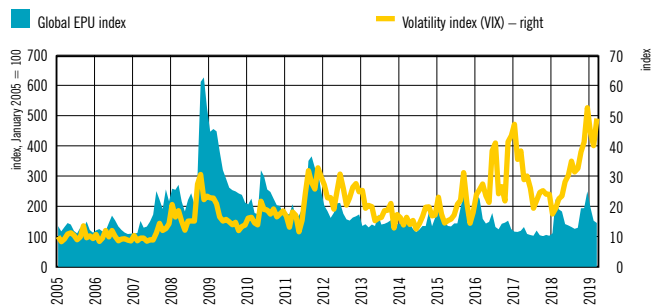


Notes: The figure shows Fed and ECB benchmark interest rates. The dashed lines in the forecast represent market expectations from March 2019, while dots represent FOMC expectations from the meeting held on 20 March 2019. Source: Bloomberg.

especially in 2019, under the effect of the strong weakening of economic activity in Turkey. With regard to developed countries, economic growth in the euro area might accelerate very moderately only in 2020, and the US economy could slow down gradually due to the weakening of fiscal stimulus effects. Inflation might still remain subdued on a global level.

The announced tightening of the monetary policy of the USA and the euro area has been deferred. In 2018, the USA continued tightening its monetary policy in accordance with expectations, but the guidelines with regard to the dynamics of further tightening in 2019 were significantly mitigated. The Governing Council of the ECB postponed the foreseen increase in interest rates, announcing additional stimulus measures of long-term financing of banks to boost lending. In such circumstances, financing conditions in the euro area might remain favourable for some time.

Figure 1.4 Strong increase in economic and political uncertainties and volatile capital market

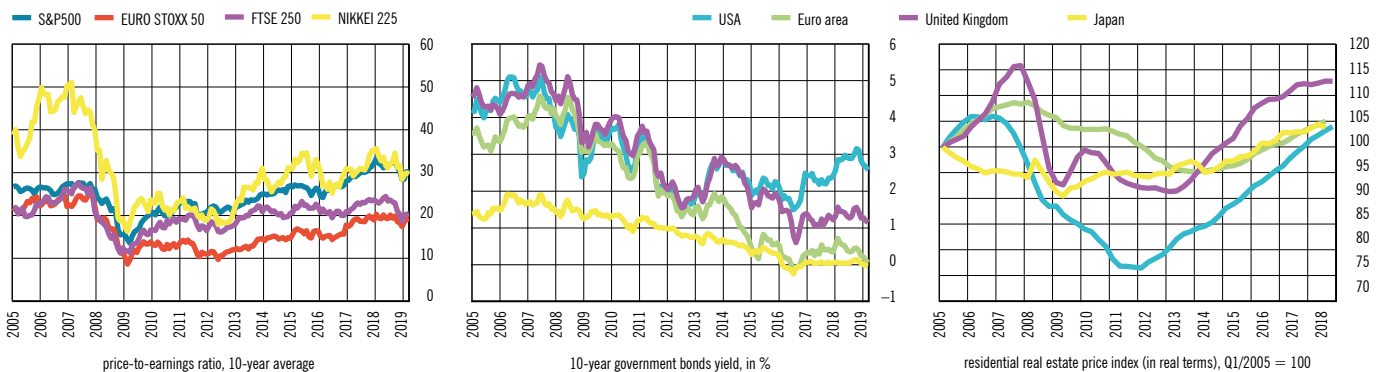


Notes: VIX is a measure of expected implicit fluctuations in the S&P500 options, calculated and published by the Chicago Board Options Exchange (CBOE). The global Economic Policy Uncertainty Index (EPU) is an index that shows uncertainty in the future policy-related economic issues and it is weighted using PPP-adjusted GDP of the included countries. Sources: Bloomberg and Policyuncertainty.com.

Political and economic uncertainty reached extremely high levels, at which it remained in the beginning of 2019. Such developments mainly resulted from escalated trade tensions between the USA and China, the temporary US federal government shutdown at the end of 2018 and in the beginning of 2019, uncertainties present in Europe, in particular those surrounding the objectives of fiscal policy in Italy and the timing and terms of the UK's exit from the European Union, increased instability in some emerging markets, such as Argentina and Turkey, and less optimistic expectations of the private sector.

Volatility in the world capital market increased in 2018, but a decrease was recorded in the beginning of the current year (Figure 1.4), partly as a result of the deferral of monetary tightening. Yields on the long-term government bonds of developed countries did not change significantly. However, the spread between long-term and short-term yields on government bonds narrowed additionally and remained at low levels in early 2019,

Figure 1.5 Residential real estate prices are still growing, while equity valuation is less optimistic



Note: Price-to-earnings ratio for the US market (S&P500) was taken from Robert Shiller's website. Sources: Bloomberg, OECD and <http://www.econ.yale.edu/~shiller/>.

too (Figure 1.6). The price-to-earnings ratio declined, suggesting less optimistic investor expectations. At the same time, residential real estate prices continued the upward trend (Figure 1.5).

In 2018, the US dollar appreciated against other major currencies (Figure 1.7). Favourable economic developments in the USA and the increased demand for safer US assets amidst the heightened instability in some emerging markets and reduced investor risk appetite supported the strengthening of the US dollar. By contrast, the euro, in addition to the US dollar, also weakened slightly against the Japanese yen and the Swiss franc, partially under the impact of the slowdown of economic growth in the euro area.

Current risks in the international environment

Risks for global financial stability increased moderately, as a result of the noticeable slowdown of the global economy and less optimistic expectations. Potential vulnerabilities in the important world economies are still significant, in particular the high indebtedness of the private and the public sector in developed countries. Apart from structural limitations, an important risk for EU member states arises from the uncertainty concerning the terms and the timing of the UK's exit from the EU.

Risks related to a possible tightening of monetary policy diminished after the Fed and the ECB mitigated their forward guidance on interest rates. However, the prolonged period of low interest rates might spur an additional accumulation of risk and thus increase the unfavourable effect of the potential global risk repricing in the medium term. Moreover, the possible absence of expected economic growth in the medium term, in particular in the euro area, in addition to the prolonged period of low interest rates, might threaten bank margins and profitability and have an unfavourable impact on financial stability.

Domestic environment

Growth of real economic activity in Croatia slowed down moderately in 2018. Economic growth was mostly driven by favourable results of all the components of domestic demand, in particular of personal consumption, while the growth of the exports of goods and services slowed down (Figure 1.8). The growth of real economic activity might slightly slow down further in 2019, compounding the slowdown in foreign demand growth due to weaker economic activity of the main Croatian foreign trading partners, Germany and Italy, coupled with a further positive contribution of all the components of domestic demand and favourable labour market developments. At the same time, after a slight acceleration in 2018, inflation might decelerate due to the reduced VAT rate on certain products and lower prices of oil in the world markets.

Figure 1.6 Spreads between 10-year and 2-year government bond yields decreased additionally

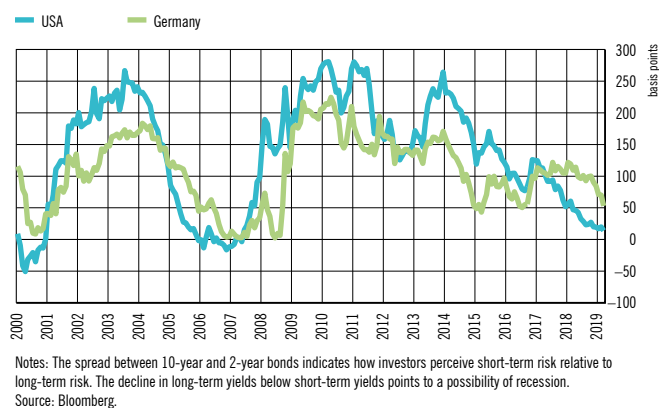


Figure 1.7 The year 2018 was marked by the appreciation of the dollar against leading global currencies

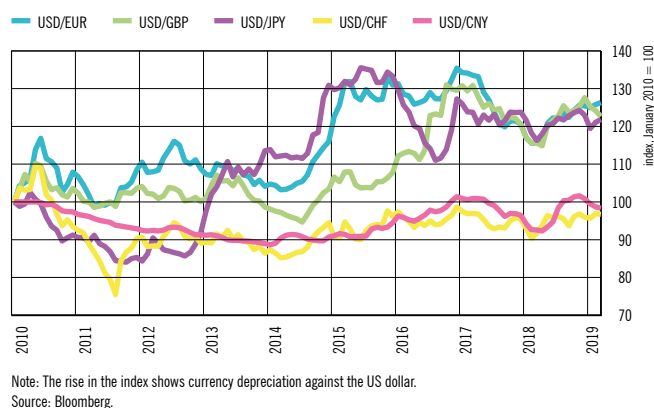


Figure 1.8 Stable domestic demand is the main generator of economic growth

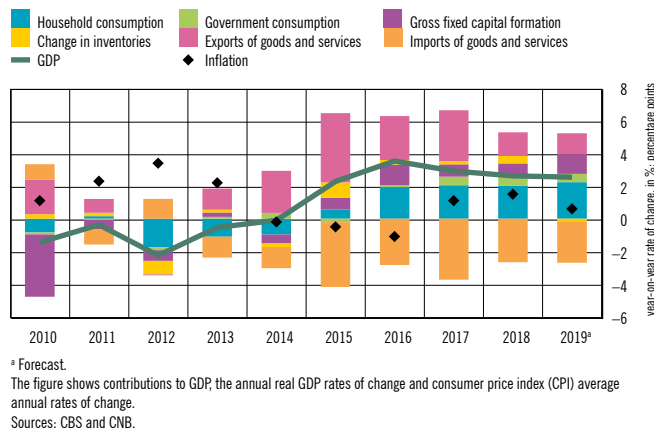
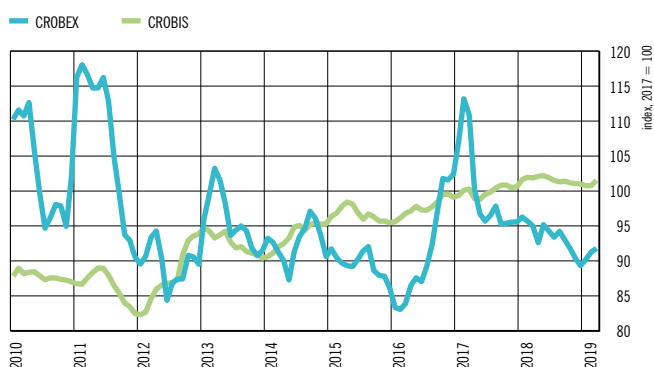
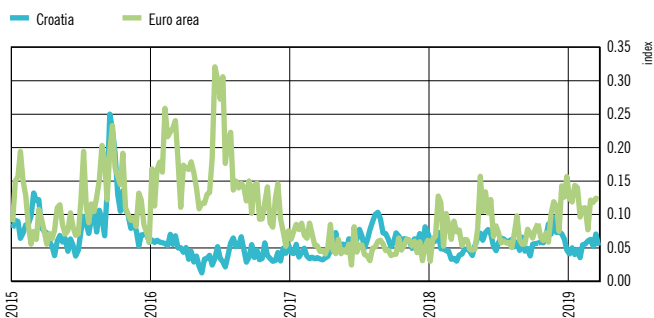


Figure 1.9 In 2018, investor sentiment in the capital market was less optimistic



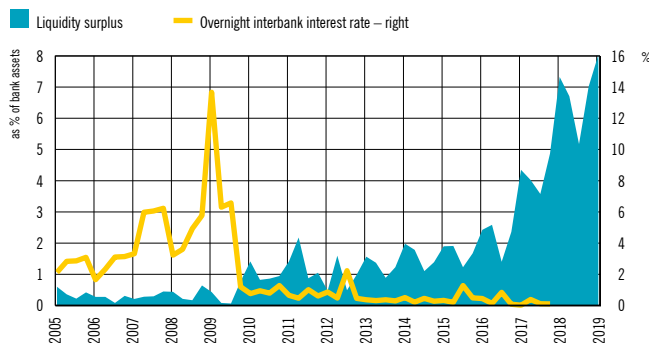
Source: Zagreb Stock Exchange.

Figure 1.10 Financial stress index in the Croatian financial market is at low levels



Note: The figure shows the Composite Indicator of Systemic Stress (CISS) in the financial system of the euro area and the financial stress index in Croatia (for more on methodology, see Box 1 Revision of the financial stress index for Croatia). Sources: ECB and CNB.

Figure 1.11 Very high kuna liquidity abolished the need for the interbank market



Note: Liquidity surplus is the difference between the balance in bank settlement accounts with the CNB and the amount that banks are required to hold in their accounts after the calculation of reserve requirements. Source: CNB.

The predominantly negative sentiment among investors marked the domestic capital market in 2018, while moderate recovery was observed in the beginning of the current year (Figure 1.9). After the strong correction in 2017, CROBEX ended 2018 on a slightly negative note. By contrast, in the first half of 2018, CROBIS continued to grow moderately, but there was a reversal of this trend in the second half of the year and the prices of bonds remained relatively stable from the end of the previous year. However, a slight rise in optimism in the domestic capital market, accompanied by the growth of CROBEX and CROBIS, was recorded in the beginning of 2019, partially reflecting the movements in the international capital market.

The financial stress index for Croatia mostly remained at low levels with regular volatility (Figure 1.10), mainly due to the easing of financial conditions in the domestic financial markets. The continued decline in interest rates in the money market, the prices of government financing in the bond market and a slightly lower exchange rate of the kuna against the euro had a favourable effect on the level of measured financial stress in Croatia. It is worth noting that the above mentioned movements in the domestic capital market (Figure 1.9) were not reflected significantly in index movements, primarily due to the economically relatively low importance of the capital market relative to the other domestic financial markets (for more on index composition, see Box 1, Revision of the financial stress index for Croatia). On the other hand, the composite stress indicator in the financial system of the euro area increased slightly under the impact of heightened volatility in the capital market, spurred by the uncertainty concerning the trade conflict between the USA and China, the economic crisis in Turkey and, to a lesser extent, the crisis in Italy and the uncertainty concerning the terms of the UK's exit from the EU.

Kuna liquidity of the domestic banking sector reached very high levels under the effect of the CNB's expansionary monetary policy. Kuna liquidity surplus at the end of 2018 increased by over 50% from the previous year, while noticeable growth continued in 2019 (Figure 1.11). In such circumstances, transactions in the domestic interbank market were not recorded after July 2018.

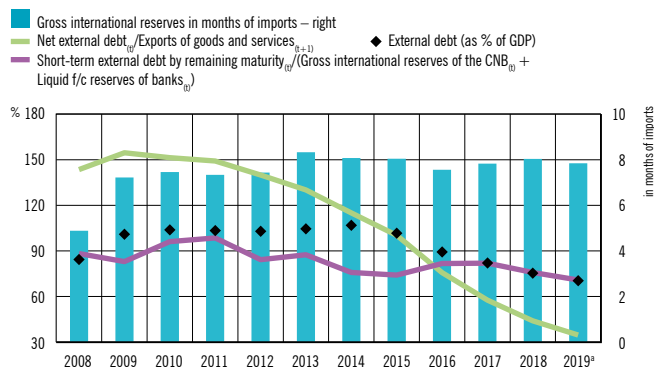
Risks for the external position are still present, although the trend of a decline of external imbalances continued in 2018. This mainly refers to the high level of external debt, which, despite the several-year trend of decline, still represents a considerable structural risk. The maintained surplus in the current account of the balance of payments, coupled with only a slight deceleration of economic growth in 2019, should drive a further decline of external imbalances (Figure 1.12). In terms of internal vulnerabilities, the still high level of public debt stands out, despite the noticeable decrease in the previous years (for more details, see chapter 2 Government sector).

Current risks in the domestic environment

The slowdown of global economic growth, in particular that in the euro area, might be reflected in the domestic economy. The potential trigger that might cause such an unfavourable course of events includes a global strengthening of trade protectionism and its possible impact on the slowdown of global trade. Equally, uncertainty concerning the timing and terms of the UK's exit from the EU could have an unfavourable effect on economic activity in the euro area countries, and indirectly impact the domestic economy as well through important foreign trading partners.

The worsening of financing conditions in international markets and their spillover to the domestic economy still pose a significant risk for financial stability. Although the USA eased its monetary policy stance, and the Governing Council of the ECB delayed the increase in interest rates, the high level of political and economic uncertainty on the global level might lead to rising global risk aversion and drive the outflow of capital to safe havens. The materialisation of such a scenario would have a particularly unfavourable effect on countries with accumulated structural imbalances, including Croatia.

Figure 1.12 Trend of decline of external imbalances continued in 2018



^a Forecast.
Source: CNB.

Significant risks that prevail in the medium and long term arise from the strong emigration pressures and negative demographic trends faced by the domestic economy. Such unfavourable trends have already contributed to labour shortages in some sectors, and their continuation might have an unfavourable effect on the growth of the domestic economy and its competitiveness in the global markets.

Box 1 Revision of the financial stress index for Croatia

High-frequency (daily) indicators, aggregated into the financial stress index, are often used to enable a regular and systematic monitoring of movements in the financial markets and the detection of individual stress events on time. It is precisely such indices that can, among other things, serve as a useful instrument for monetary and macroprudential policy makers in their communication with the public when adopting appropriate measures. The proper identification of stressful episodes is possible only with a valid methodological approach, covering as large a number of financial markets as possible and a comprehensive selection of indicators. For this reason, taking the methodology of the European Central Bank as a model¹, the composite stress indicators were revised, their construction so far having relied on the methodology described in Dumičić (2014)².

There are four key changes in the construction of the composite index of financial stress. Firstly, the above index included three markets – the foreign exchange and money markets and the securities market. This latter market only partially covered the trends in the bond and equity markets, which are now observed separately, so that the calculation is based on four subindices that monitor the individual segments of the financial market (Table 1). Thus, for example, information on situations in which large cumulated losses occur in the capital market (e.g. a continued decline in stock prices) was not provided previously, except with respect to those that occurred with high volatility. Secondly, the same number and type of indicators are assigned to each market, so that each of the four subindices is computed as a simple average of the three indicators, which refer to liquidity, volatility and cumulated losses in that market.³ Thirdly, the index transformation method was changed because, so far, standardisation had been applied, by which the value of the individual indicator at any moment was reduced by the average value and divided by the realised standard deviation. Since this procedure requires variables to be distributed normally, which is often not the case in the indicators used, by expanding the sample, the values of the average and the standard deviation changed considerably. In order to reduce the impact of outliers on the transformed indices, the cumulative distribution function (CDF) is now used, for it neutralises the effect of one-off and large changes on the intensity of movements of the composite index, because each value is replaced by its relative position in the empirical distribution.

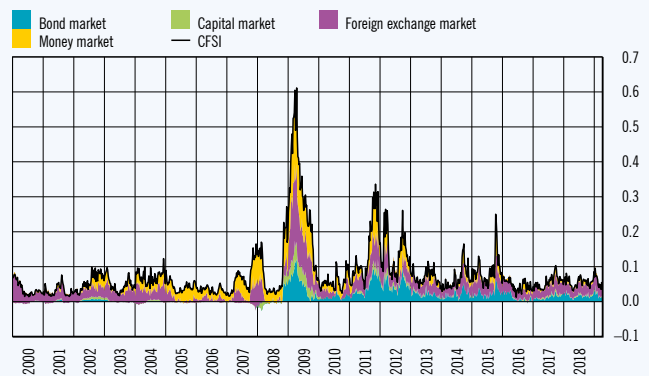
Finally, the previous construction of a composite financial stress index by simple averaging of all of the transformed indices did not take into consideration the interconnectedness and the significance of certain

1 For a detailed description of the methodology presented in this Box see Holló, D., M. Kremer, and M. Lo Duca: *CISS – A Composite Indicator of Systemic Stress in the Financial System*, ECB Working Paper 1426, March 2012.

2 Dumičić, M. (2014): *Financial Stress Indicators for Small, Open, Highly Euroised Countries – the Case of Croatia*, CNB, Working Papers W-41.

3 In the case of the bond market, the cumulated loss measure, due to the time series being too short, is replaced by the relative measure of the perception of the risk of the country.

Figure 1 Croatian financial stress index and contribution of individual markets



Source: CNB.

financial markets, which are very important because of the spillover and propagation of shocks (the horizontal segment of financial stress). Therefore, the new computation method⁴ is based on the theory of portfolio risk measuring, and the overall index is computed as the multiple of the individual subindices, their correlation matrix and the weights of each subindex in the overall index (Figure 1). By applying the correlation matrix, greater emphasis is given to situations in which financial stress is present simultaneously in a number of markets, and by an estimation using the specific weight of each subindex their proper representation is ensured. The weights of the individual subindices are estimated based on the relative importance of the appropriate financial market for the economy, by using the linear VAR model, which includes the subindices of the individual financial markets and movements in industrial production in Croatia.⁵ The weights for foreign exchange, monetary, bond and capital markets are estimated in this way as 35%, 32%, 25% and 8% respectively.

According to the described methodological approach, the composite stress index assumes a value between 0 and 1, and the higher value indicates the increase in financial stress in one or more markets. The maximum index value is achieved when the following conditions are met simultaneously: financial stress materialises at the same time in all of the observed markets, movements in the markets at that time are perfectly positively correlated (correlation equals 1) and the values of the individual indicator are the highest relative to all of the previously recorded values. Although historically we have not witnessed such a stressful episode, index values at levels even lower than 1 can reflect a high intensity of stress, although at that moment a perfect correlation of the market does not have to exist. Therefore, in analysing the results obtained, it can be observed that the index identifies three significant

4 A similar calculation methodology was described in 2014 (Financial Stability, No. 12, Box 1 High-frequency financial stress indicators).

5 Since the estimate of the impact of the individual financial market on the economy is carried out on the monthly data, the model estimates the decomposition of the variance of the monthly rate of change in the seasonally adjusted manufacturing production index.

episodes of increased stress in the domestic financial market that reflect serious disturbances.

The first such episode was marked by a strong increase in global risk aversion under the impact of the global financial crisis. Such developments resulted in a significant decrease in liquidity in the market, growth in interest rates in the money market, a sharp rise in the risk premium for Croatia, as well as exchange rate depreciation pressures.

The beginning of the second episode of heightened stress level was identified in the second half of 2011, correlated with the strengthening of the crisis in the public debt market in the peripheral euro area countries. The repeated decline in investor risk appetite was reflected in the increase in the risk premium for Croatia and the volatility in the

domestic bond market. Rising insecurity in the financial markets due to the prolonged effects of the debt crisis at the beginning of 2012 and the repeated actualisation of the debt crisis in Greece at the end of the year, yet again intensified volatility in the public debt markets.

The most recent period of heightened risks was recorded at the end of September 2015, in connection with the implementation of the conversion of loans in Swiss francs. On this occasion, the domestic foreign exchange and money markets were briefly under somewhat stronger pressures for the depreciation of the exchange rate of the kuna and an increase in interest rates in interbank financing. Finally, it is worth noting that this stress episode, in contrast to others, was not identified by the previous financial stress index, which indicates that the revised index is in its way fairly robust.

Table 1 Indicators used in the construction of the financial stress index for Croatia

Market	Indicators	Start of sample	Transformation
Foreign exchange	Spread between purchase and sale price of exchange rate of the kuna against the euro	3 January 2000	daily values
	EUR/HRK exchange rate volatility	4 January 2000	absolute daily spread of logarithmic values relativised by the standard deviation of the spreads in the previous decade (2,609 working days)
	Cumulative increase in EUR/HRK exchange rate in the last two years	3 January 2000	CMAX transformation ^a
Money	Liquidity in interbank market	8 March 2005	ratio of daily turnover in interbank market and liquidity surplus ^c
	Volatility of overnight ZIBOR	5 January 2000	absolute daily differences of logarithmic values relativised by the standard deviation of the differences in the previous decade (2,609 working days)
	Spread between three-month ZIBOR and interest rates on 91 days T-bills	30 July 2002	daily values
Bond	Liquidity measured by CROBIS index	23 November 2007	ratio of daily turnover and market capitalisation of bonds included in CROBIS index
	CROBIS index volatility	26 November 2007	absolute daily spread of logarithmic values relativised by the standard deviation of the differences in the previous decade (2,609 working days)
	EMBI spread ^b	1 May 2000	daily values
Capital	Liquidity measured by CROBEX index	23 November 2007	ratio of daily turnover and market capitalisation of CROBEX shares
	CROBEX index volatility	5 January 2000	absolute daily spread of logarithmic values relativised by the standard deviation of the differences in the previous decade (2,609 working days)
	Cumulative loss in the past two years	2 January 2002	1-CMAX transformation ^a

Notes:

^a By the CMAX transformation, the value of indices is in each day replaced by the ratio of its value in that day and the maximum values in the last two years (521 working days).

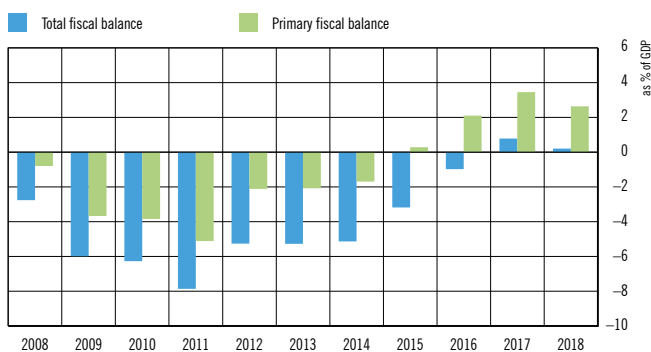
^b EMBI spread (Emerging Markets Bond Index spread) is the difference between the weighted yields on the German and Croatian government bonds denominated in euro.

^c The daily values of liquidity surplus always have a positive sign because they are values in the individual day minus the minimum value of the whole series.

Sources: Bloomberg and CNB.

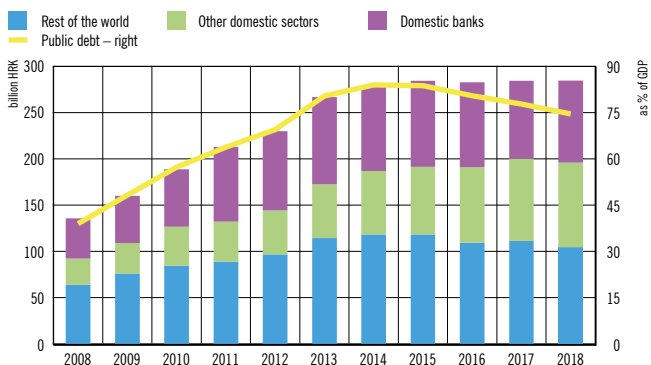
2 Government sector

Figure 2.1 General government budget surplus achieved for the second consecutive year



Source: Eurostat.

Figure 2.2 General government debt continued to decrease and fell to 74.6% of GDP



Sources: CBS and CNB.

The year 2018 was marked by the continuation of favourable fiscal developments, which point to the reduction in government sector risks to financial stability. A consolidated general government budget surplus (0.2% of GDP) was achieved for the second consecutive year despite the increase in general government expenditure due to the guarantees assumed for the debt of the shipyards, while the share of public debt continued to decrease and fell to 74.6% of GDP. On the other hand, the still high level of public debt makes the domestic economy vulnerable to the possible changes in financing conditions in the international markets. The exposure of the banking sector to the government is also high.

Favourable fiscal developments also marked 2018. A general government budget surplus was recorded for the second consecutive year and stood at 0.2% of GDP, slightly lower than in 2017 (Figure 2.1). The deterioration of fiscal results reflected the activation of government guarantees for the Uljanik Group in the amount of HRK 4.4bn, of which HRK 2.5bn was recorded on the expenditure side of the budget (capital transfer) in 2018, while the remaining amount will be recorded during 2019. Total general government revenues increased in 2018 by 5.6%. Revenues from indirect taxes and social security contributions, related to personal consumption growth and favourable labour market developments, made the strongest contribution to the growth of revenues. With regard to general government expenditure, the above mentioned assumptions of government guarantees of the Uljanik Group and strong growth of expenditures for investments had a dominant impact on their dynamics.

Expenditures for social benefits also increased as a result of the adjustment of pensions with gross wage and consumer price index movements. By contrast, the refinancing of public debt continued, under much more favourable conditions, which was reflected in a further decrease in general government interest expenses, which dropped to 2.4% of GDP (Figure 2.5).

Public debt fell to 74.6% of GDP in 2018. The level of public debt increased moderately from the previous year¹, while the public debt-to-GDP ratio decreased and stood at 3.2 percentage points, reflecting a strong nominal GDP growth and the appreciation of the exchange rate of the kuna against the euro (Figure 2.2). In all, in the period from 2014 to 2018, the share of public debt in GDP decreased by slightly more than 9 percentage points.

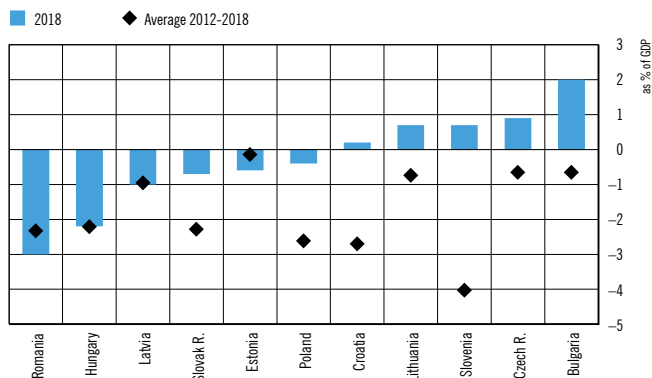
The Standard & Poor's credit rating agency upgraded Croatia's credit rating in the beginning of 2019 to investment grade. The main reasons for restoring the credit rating to investment grade after almost seven years include solid fiscal results and broad-based economic growth. Moody's confirmed Croatia's speculative rating at the end of April, but changed its outlook from stable to positive.

Croatia is still the country with the highest public debt-to-GDP level among the countries of Central and Eastern Europe (Figure 2.4), despite the noticeable decrease in the share of public debt in GDP in the previous four years. However, the very high public debt in Croatia reflects the fact that Croatia has partially frontloaded the future pension expenses. In 2002, a pension reform was implemented, under which the second pillar of the pension system was introduced, based on individual capitalised savings. As a result of the reform, public finance incurred momentary costs and an increase in public debt, but on the other hand, in the future this will lead to smaller expenditures for pensions and savings in the budget. Unlike Croatia, most of the CEE countries suspended pension system reforms to a certain extent during the crisis. This was particularly true for Hungary and Poland, which permanently cancelled most of the previously implemented pension reforms, which reduced the level of public debt noticeably in these two countries. However, this will be reflected unfavourably in the future fiscal developments.² The road sector (CM, CR and ARZ) and the CBRD is also included in the public sector in Croatia. Due to the currently high level of public debt in Croatia, interest expenses remain relatively high, compared with other countries (Figure 2.5).

1 Within the April Fiscal Notification for 2019, the institutional units sector was further adjusted with the ESA 2010 methodology, due to which general government debt increased by about HRK 1.0bn, including the guarantees activated for the Ujjanik Group, which raised the public debt level.

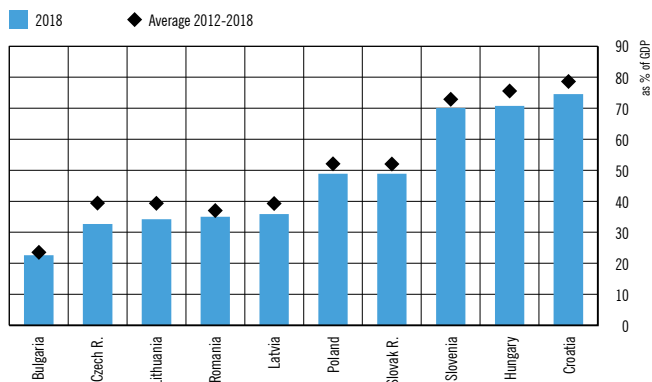
2 Hungary completely cancelled the pension system reform and transferred all assets from the second to the first pension pillar, which is based on intergenerational solidarity. In Poland, the assets invested in government bonds were transferred from the second to the first pillar.

Figure 2.3 Majority of CEE countries also achieved a surplus in 2018



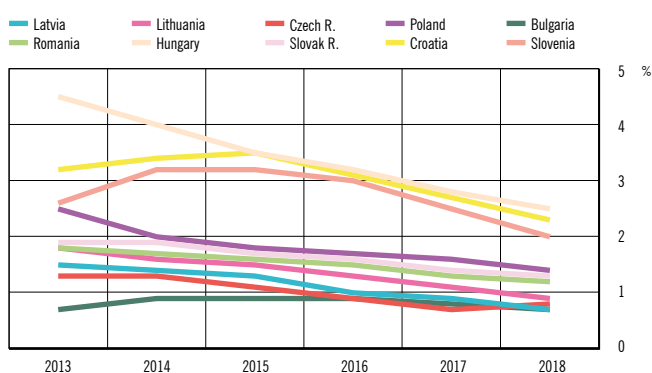
Source: Eurostat.

Figure 2.4 Croatia remains the country with the highest public debt-to-GDP ratio



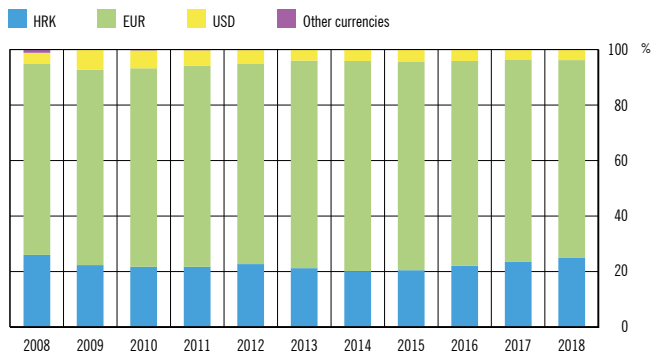
Source: Eurostat.

Figure 2.5 General government interest expenses are decreasing in CEE countries



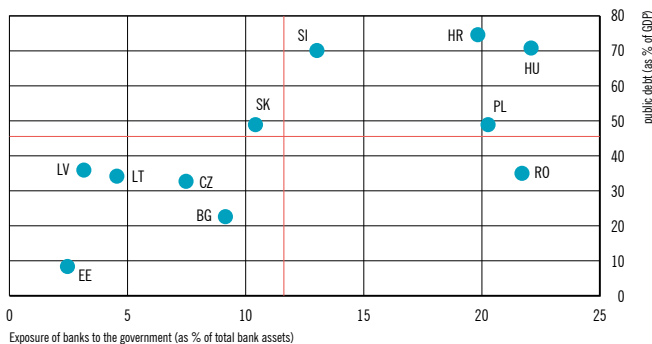
Source: Eurostat.

Figure 2.6 The euro still prevails in the public debt currency structure



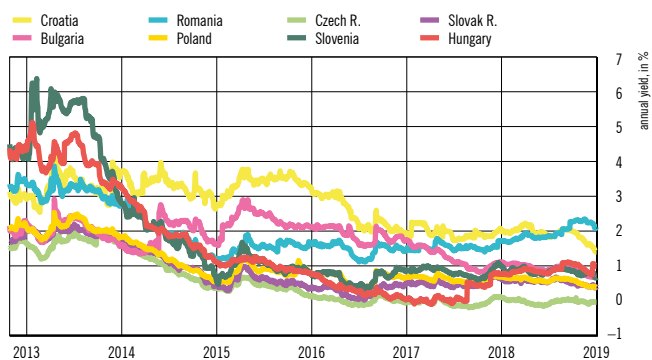
Note: Amounts include T-bills.
Source: CNB.

Figure 2.7 Countries with a higher level of bank exposure to the government have a higher share of public debt in GDP



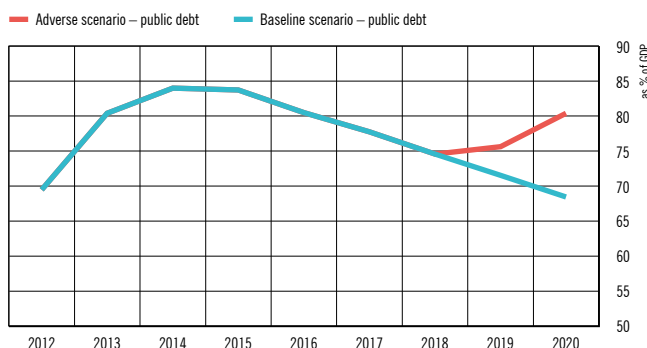
Note: Data for 2018.
Sources: Eurostat and ECB.

Figure 2.8 Yields on generic government bonds are relatively low in all CEE countries



Source: BoA Merrill Lynch.

Figure 2.9 Public debt in stress scenario would increase by 10 percentage points by 2020



Sources: Eurostat, Convergence Programme of the Republic of Croatia for the period 2019-2020 and CNB calculations.

The currency and maturity structure of public debt continued to improve in 2018, but the share of public debt in foreign currencies remained very high. Although the share of foreign currency public debt is constantly decreasing, 75% of public debt is still denominated in foreign currencies (euro and US dollar), making the currency structure of public debt unfavourable (Figure 2.6). For this reason, the government sector still remains very vulnerable, taking into account the risks that may arise from a potential depreciation of the kuna against the euro (the largest share of dollar-denominated debt is hedged against the risk of exchange rate changes relative to the euro). By contrast, the public debt structure is also characterised by the high portion of long-term debt and debt contracted at a fixed interest rate, which facilitates public debt management and decreases interest rate risk.

With regard to funding sources, the government mostly relies on domestic funding. Sixty-three per cent of debt was issued in the domestic financial market, with placements to the government accounting for about 20% of total bank assets (Figure 2.7). Such interconnectedness between the banks and the government may contribute to the vulnerability of the financial system should the financial position of Croatia deteriorate, which is emphasised additionally by the still high public debt level (for more details, see chapter 6 Banking sector).

Yields on government bonds of CEE countries were at very low levels in 2018, and yields on Croatian bonds decreased further in the beginning of 2019. This was attributed to the still favourable financing conditions in the global markets, despite the divergent monetary policies in Europe and the USA, the absence of a deal on Brexit and the rising risk to the sustainability of public finances in Italy. The political turmoil in Italy in early 2018 resulted in the strong growth of yields on Italian government bonds, as well as the increase in the risk premium of the Italian banks, but such developments so far have not spilled over to other European markets and to Croatia. For this reason, the risk premium for Croatia in 2018 and in the beginning of 2019 was at very low levels (Figure 2.8).

According to the projections of the Government of the Republic of Croatia, a moderate general government deficit of 0.3% of GDP is expected in 2019, as a result of the assumed smaller portion of the shipyards' debt and the expected unfavourable effect of tax changes on general government revenues (the most significant impact is expected from the introduction of the lower VAT rate on additional goods categories). The Convergence Programme of the Republic of Croatia for the period 2019-2020 also foresees a further decrease in public debt to 71.6% and 68.5% of GDP in 2019 and 2020 respectively.

The financing needs are not expected to grow considerably in the forthcoming years, and thus contribute to the stability of the financial system. In accordance with the expected continuation of refinancing of the existing debt under more favourable conditions, the financing needs in 2019 are estimated at about 15% of GDP, which also includes about 8% of GDP of T-bill maturity.

If the path of public debt in a stress scenario is analysed, including a strong decline in economic activity and the depreci-

ation of the kuna of 10% (for full details on the stress scenario, see chapter 7 Stress testing of credit institutions), public debt in such circumstances might increase to 80% of GDP at the end of 2020 (Figure 2.9).

Current risks to financial stability in the government sector

The analysis presented in Box 2, Aggregate index of fiscal risk, shows that fiscal stress is at the lowest level in the past ten years, but that the high public debt-to-GDP ratio, the currency structure and the high share of elderly population in the total population have an unfavourable impact on fiscal risk for Croatia. A potential accumulation of fiscal risk may intensify the vulnerability of the financial system due to the interconnectedness between the government and the banks, so that, for this reason too, among others, it is necessary to continue with a further decrease in the level of public debt.

Box 2 Aggregate index of fiscal risk

The interconnectedness between banks and the government was subject to particular focus after 2010 and the onset of the crisis of public finances in the periphery countries of the European Union.¹ The nexus between banks and the government is reflected in the fact that banks are significant creditors of the government, but also that the government supports the stability of their operations, directly through the deposit insurance system and indirectly through potential bank resolution (Dell'Ariccia et al., 2018).² The accumulation of imbalances in public finances may be reflected unfavourably in the fiscal sustainability of a country, as well as in the stability of the banking system, in particular if domestic banks are highly exposed to the government. Since in 2018 the share of bank placements to the government in total bank assets in

Croatia stood at 20%, and the ratio of exposure to the government and capital requirements was 155%, which indicates a very high exposure of banks to the government, it is necessary constantly to monitor the potential accumulation of risk in public finance in order to preserve financial stability.

In this Box, the fiscal risk for Croatia is analysed using the fiscal stress index, constructed according to the IMF methodology (Baldacci, et al., 2011).³ The fiscal stress index depends on a broad set of indicators that are classified into three main clusters: basic fiscal indicators, public debt management and long-term fiscal trends (Table 1). In order to assess the movement of this index for Croatia over time, critical thresholds are used, as well as contributions of the individual indicators estimated in Baldacci et al. (2011) on a group of 52 emerging market

Table 1 Construction of the fiscal stress index and values for Croatia for 2017 and 2018

	Direction to be safe	Threshold	Contribution to fiscal stress index	Values for Croatia	
				2017	2018
Basic fiscal indicators					
r - g ** (pp)	<	1.1	11.3	1.9	0.9
General government public debt (as % of GDP)	<	42.8	2.5	77.8	75.0
Cyclically adjusted primary balance (as % of potential GDP)	>	-0.5	9.9	3.3	1.9
			23.72		
Public debt management					
Financing needs (as % of GDP)	<	20.6	2.8	20.0	14.0
Share of short-term public debt in total debt	<	44	9.2	4.8	4.5
Debt denominated in foreign currencies (share in total public debt)	<	40.3	9.9	76.2	73.3
Average maturity of public debt (years)	>	2.3	2.6	5.5	5.3
Short-term external public debt (as % of international reserves)	<	61.8	19.1	4.5	3.6
			43.56		
Long-term fiscal trends					
Fertility rate (deviation from 2.1)	<	1.3	5.2	1.42	1.4
Long-term projections on health care expenditures in 30 years (as % of GDP)	<	2.7	8.2	0.6	0.6
Long-term projections on pension expenditures in 30 years (as % of GDP)	<	4	13.4	-2.8	-2.8
Ratio of population aged 65 and above in population ages 15-64 (projection for 20 years)	<	16.1	5.9	43	43
			32.7		

** Imputed interest rate on general government debt, deflated by the GDP deflator, minus real GDP growth rate. Five year average is analysed.

Note: The periods in which indicators exceed thresholds are given in red.

Sources: Baldacci et al. (2011), CBS, EC Ageing report and CNB.

1 In the period from 2010 to 2011, the excessive deficit procedure (EDP) was activated and applied in 24 EU member states. Croatia was included in the excessive deficit procedure from 2014 to 2017.

2 <https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2177.en.pdf>

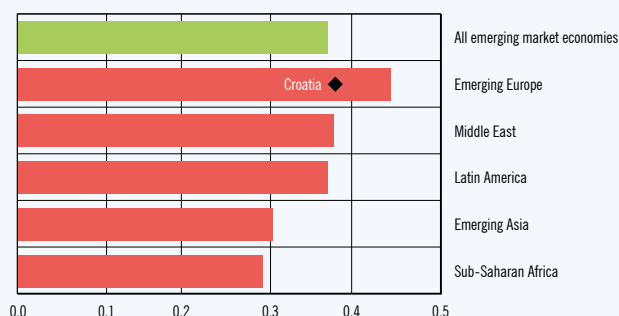
3 <https://www.imf.org/external/pubs/ft/wp/2011/wp11100.pdf>. Alternative indices for fiscal risk assessment are available in the literature, the most prominent being the index of the European Commission (Berti et al., 2012), the index of the Czech national bank (Ambriško et al., 2017) and the index of the European Central Bank (Hernández de Cos et al., 2014). All of the above indices are based on similar methodologies and sets of indicators. Taking into consideration the availability of individual indicators over time for Croatia, in this Box we base the assessment of fiscal risk on the methodology in Baldacci et al. (2011).

4 According to the IMF methodology, a government is exposed to fiscal stress if it restructures its public debt or if it has become bankrupt, if it uses a loan under the IMF arrangement, if it has gone bankrupt and if yields on government bonds exceed two standard deviations from the yield average.

economies in the period from 1970 to 2010. After a fiscal stress period is identified on a panel of countries in the sample,⁴ the authors apply the signal-to-noise ratio (SNR) to assess the critical benchmark values, which enable differentiation between the periods of fiscal stress and the periods in which fiscal stress is not present.⁵ If an indicator exceeds the critical threshold, it is assigned that indicator's estimated contribution to the overall movements of the index. The overall index reflects the sum of contributions of all indicators that exceed the estimated critical threshold, and ranges between 0 and 100. According to the methodology of construction of the aggregate index, its level depends on the number and the type of the indices that cross the threshold, while the intensity of deviation of the individual index from the threshold does not affect the index level.

The dynamics of the index constructed for Croatia shows that the high share of debt denominated in foreign currency in total public debt (public debt management) continually contributed to the fiscal risk level throughout the observed period (from 2008 to 2018; Table 2). According to the estimated thresholds, the share of public debt denominated in foreign currency exceeding 40% is associated with the period of high fiscal risk, and this share in Croatia on average stood at 75% in the observed period, which is significantly higher than the benchmark threshold. Moreover, the unfavourable long-term fiscal and demographic trends also continually contributed to fiscal risk for Croatia from 2008 to 2018. The old age dependency ratio in Croatia is very high, as much

Figure 1 Fiscal stress index for groups of emerging market economies (simple average) for 2011



Source: Baldacci et al. (2011).

as 43%, while according to the IMF, a critical threshold exceeding 16% is associated with a period of fiscal risk.

In contrast, with regard to basic fiscal indicators only (Table 2), their contribution to the aggregate index changed over time. Thus, in the period before the onset of the crisis, their movement was defined by the

Table 2 Fiscal stress index for Croatia in the period from 2008 to 2018

	Values for Croatia										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Basic fiscal indicators											
r - g ** (pp)	Blue	Blue	Blue	Red	Red	Red	Red	Red	Red	Red	Blue
General government public debt (as % of GDP)	Blue	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Cyclically adjusted primary balance (as % of potential GDP)	Red	Red	Red	Red	Blue	Blue	Blue	Blue	Blue	Blue	Blue
Public debt management											
Financing needs (as % of GDP)	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
Share of short-term public debt in total debt	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
Debt denominated in foreign currencies (share in total public debt)	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Average maturity of public debt (years)	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
Short-term external public debt (as % of international reserves)	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
Long-term fiscal trends											
Fertility rate (deviation from 2.1)	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
Long-term projections on health care expenditures in 30 years (as % of GDP)	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
Long-term projections on pension expenditures in 30 years (as % of GDP)	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
Ratio of population aged 65 and above in population ages 15-64 (projection for 20 years)	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Movements of total fiscal stress index for Croatia	26	28	28	40	30	30	30	30	30	30	18

Note: The periods in which indicators exceed thresholds are given in red.
Sources: Baldacci et al. (2011), CBS, EC Ageing report and CNB.

5 The "signalling" approach defines the critical threshold that will maximise the ratio between the percentage of the correctly classified fiscal stress periods and the percentage of incorrectly classified periods without fiscal stress.

high level of cyclically adjusted primary deficit. The continued generation of general government deficit during the period of economic expansion led to public debt accumulation, and in 2009 public debt exceeded the level of 43% of GDP, which, using the IMF methodology, was estimated as risky for emerging market economies. In addition, due to the growth of yields on government bonds in the global markets from 2011 and the several-year-long recession, the difference between the interest rate on public debt and the rate of change of real GDP also exceeds the critical threshold. However, due to the beginning of fiscal adjustment, the cyclically adjusted budget balance dropped below the critical threshold already after 2012. After 2016, the interest rate on public debt was lower than the real GDP growth rate and in 2018, the five-year average of the difference between the interest rate and GDP growth rate did not cross the critical threshold, so that, among basic fiscal indicators, only the level of public debt (share in GDP) indicated increased fiscal stress.

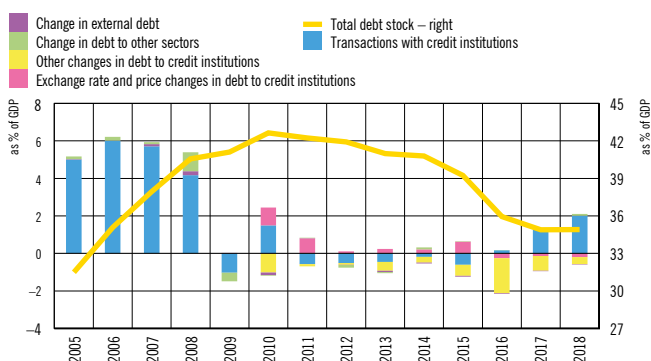
The analysis of the aggregate index over time shows that fiscal stress for Croatia was the most pronounced in 2011. The comparison of the level of indices in Croatia with other emerging market economies (Figure 1) shows that the European emerging markets recorded a raised level of fiscal stress in the same year. After 2012, the fiscal stress index in Croatia held steady at a moderate level. However, it was only in 2018

that it fell below the level recorded immediately before the onset of the crisis (2008).

Indicators that refer to the public debt-to-GDP ratio, the currency structure of public debt and the expected old age dependency ratio still indicated the existence of fiscal risk in 2018. In the next medium-term period, the level of fiscal risk should not change significantly if expectations presented in the Convergence Programme of the Government of the Republic of Croatia for the period 2019-2022 are taken into account. However, there are long-term risks associated with demographic changes, emigration and the decrease in the working age population, which in the long run might lead to a noticeable increase in the level of fiscal risk arising from long-term fiscal trends. On the other hand, the adoption of the euro, as announced in the Government Strategy for the Adoption of the Euro as the official currency in the Republic of Croatia, would eliminate the source of vulnerability arising from the currency structure of public debt and the overall fiscal stress index would be reduced significantly. The relatively high level of public debt should not have a further unfavourable impact on the economy as it is also reflected in the fact that Croatia has partially frontloaded the future pension expenses (for more details, see chapter 2 Government Sector).

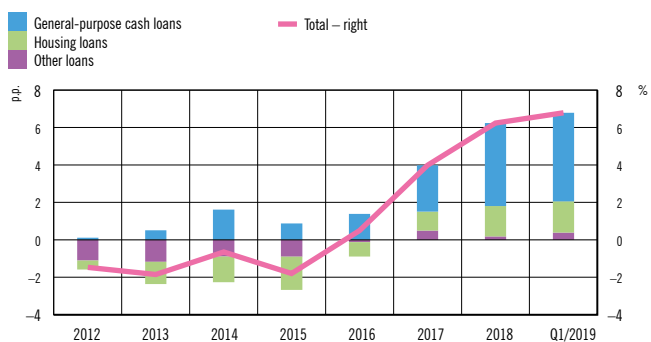
3 Household sector

Figure 3.1 Household borrowing intensified in 2018



Note: Changes in debt to other sectors and the rest of the world are shown as the difference between the end of the previous year and relativized share in GDP.
Source: CNB.

Figure 3.2 Cash loans dominate in the growth of household loans



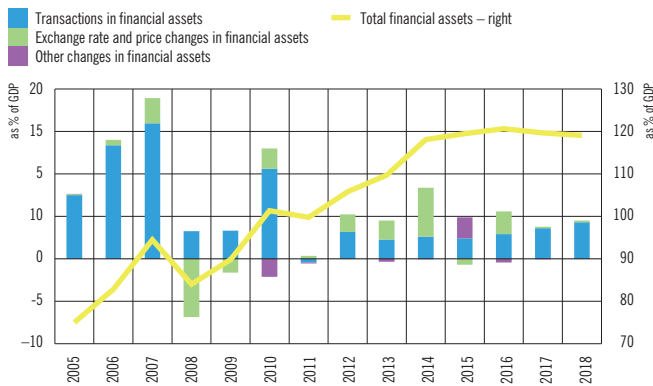
Notes: The figure shows the transaction-based change in debt, which excludes exchange rate changes, price changes and other changes. Data for the first quarter of 2019 refer to the 12-month period until March 2019.
Source: CNB.

In the conditions of continued economic growth and positive developments in the labour market household borrowing intensified in 2018, led by the increase in non-housing loans. Although the positive trends of decreasing exposure of households to currency and interest rate risks continued at the same time, the result of the rise in debt was a slower decline in the systemic vulnerability of the household sector than was noticed in the previous years. Although further acceleration of credit growth could spur the accumulation of systemic risks in the household sector, such risks will not immediately reach the level that would be estimated as excessive.

Strong consumer optimism, spurred by positive trends in the labour market, contributed to the accelerated household sector borrowing. Indebtedness, measured as a share in GDP, held steady at last year's level of 35%, a further decline being prevented by the growth of transactions with credit institutions (the difference between newly-granted loans and the repayment of existing debt), which stood at 2% of GDP, i.e. HRK 7.7bn (Figure 3.1). The increase in debt measured by transactions was mostly attributed to general-purpose cash loans, while the contribution of housing loans was slightly more moderate (Figure 3.2). The impact of other changes in debt to credit institutions made a negative contribution to the dynamics of household indebtedness, although somewhat weaker than in the previous years. Household debt to other sectors and the rest of the world did not change significantly.

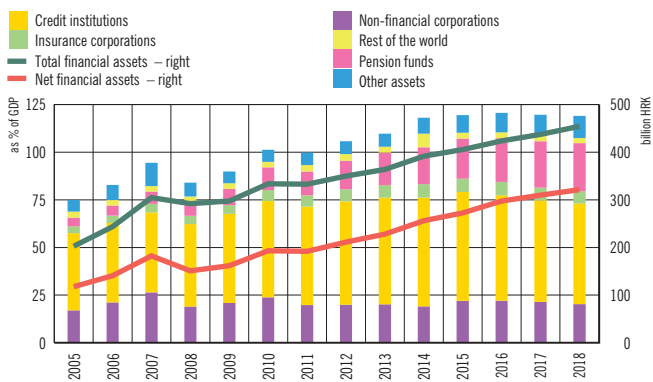
Under the effect of the growth of deposits and pension fund shares, the financial assets of households in 2018 increased by HRK 17.1bn (3.9%). Since the increase in assets was lower than nominal GDP growth, their ratio decreased moderate-

Figure 3.3 Moderate growth of household financial assets follows the dynamics of GDP



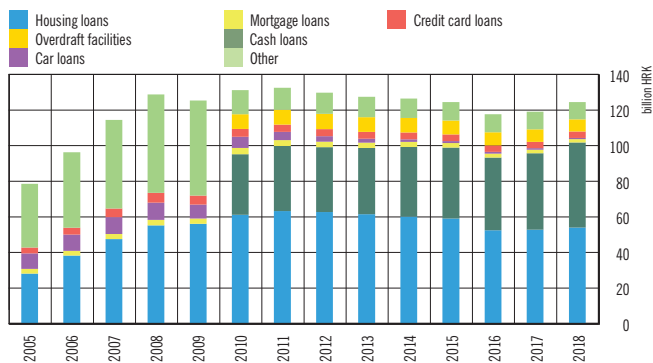
Source: CNB.

Figure 3.4 Pension fund shares increased their share in the financial assets of households



Source: CNB.

Figure 3.5 Housing and general-purpose cash loans prevail in the structure of loans



Note: Cash loans and overdraft facilities have been excluded from the category of other household loans since the end of 2010 because they have become new categories.

Source: CNB.

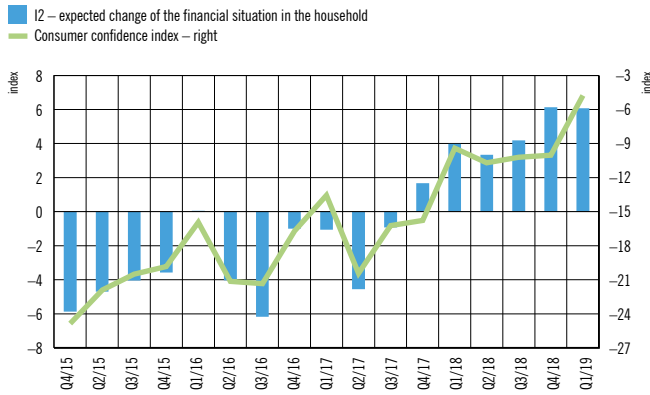
ly to 119% (Figure 3.3). Moreover, in the past two years the financial assets of households grew under the exclusive effect of transactions, which in 2018 stood at 4.3% of GDP (HRK 16.8bn), with the growth of deposits and pension fund shares (2.3% and 1.3% of GDP respectively) being the largest shares. Deposits with financial institutions (44.4% of financial assets) still constituted the dominant form of financial assets (Figure 3.4), although their share decreased gradually, while pension fund shares continued to rise, at the end of 2018 standing at 21.1% of the financial assets of households.

Growth of total household debt to credit institutions continued in 2018 (Figure 3.5). Growth of borrowing was specific in the form of general-purpose borrowing. Its intensification reflected growing consumer confidence, which was, among other things, related to the expectation of a positive change in the financial situation of the household over the next 12 months (Figure 3.6). Similar trends in consumer optimism were also observed in the data of the Bank lending survey data. Banks reported that, in addition to the consumption of durable goods and the prospects in the real estate market, consumer confidence was one of the main drivers of growth in demand for consumer and housing loans in 2018 (Figure 3.7). The main contribution to the growth in optimism and demand for loans came from favourable developments in the labour market (Figure 3.8). For more on the determinants of debt burden by households and the characteristics of leveraged households, see the results of the Household Finance and Consumption Survey (for more details, see Box 3: Characteristics of indebted households in Croatia).

Developments contributing to the attractiveness of borrowing are also present on the supply side, in the form of the decrease in interest rates on the most represented forms of loans (Figure 3.9). A several-year fall in interest rates on newly-granted housing loans was observed, in early 2019 on average standing at 3.25%, or down by 1.7 percentage points from the end of 2015. In the same period, interest rates on newly-granted cash loans also decreased (by 1.9 percentage points), but were still at a level much higher than on housing loans and in the beginning of 2019 on average stood at 6.5%.

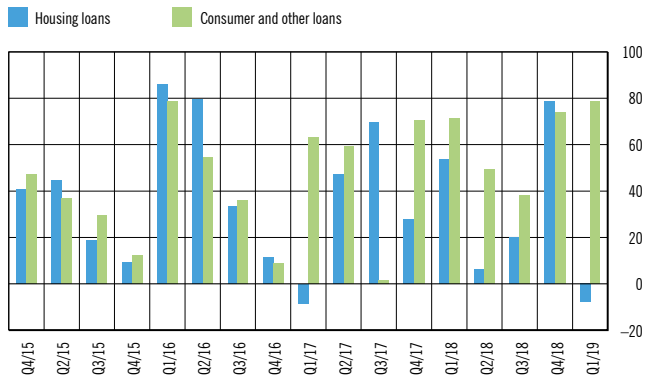
Long-term household borrowing continued to grow in 2018, primarily under the effect of growth in newly-granted cash loans, as well as housing loans (Figures 3.10 and 3.11). The amount of newly-granted general-purpose cash loans with maturity longer than a year was 28% higher than in 2017. The strong intensification of growth in cash loans (see [Diagnostics, No. 7, Box 1](#)), although aiming at reducing interest rate and currency risks because such loans are predominantly granted in the domestic currency and at fixed interest rates, still significantly contributes to the increase in direct credit risk. Loans with an original maturity of ten years or more grow the most among cash loans, and the extension of maturities also enables increases in the amounts of loans, which are granted quickly and easily (without comprehensive documentation, sometimes even without a visit to a branch office, but through mobile and online sales channels) and most frequently unsecured. In

Figure 3.6 Consumer confidence is growing



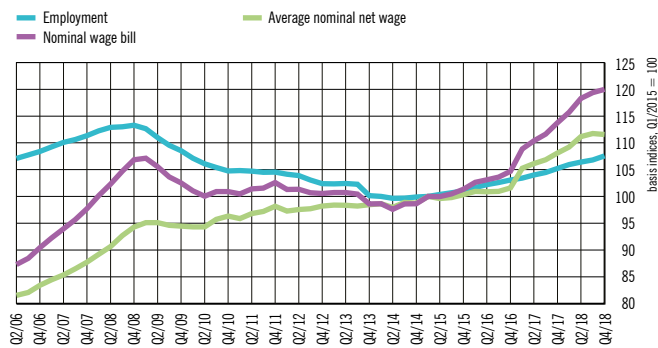
Source: CNB (Consumer Confidence Survey).

Figure 3.7 Banks report growing credit demand



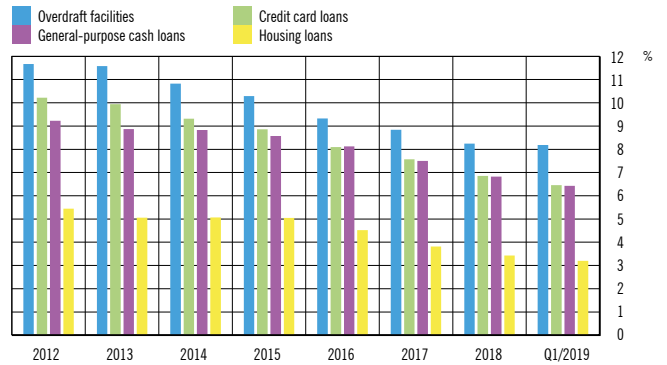
Note: A positive value indicates an increase and a negative value indicates a decrease in demand.
Source: CNB (Bank lending survey).

Figure 3.8 Positive trends in the labour market continued



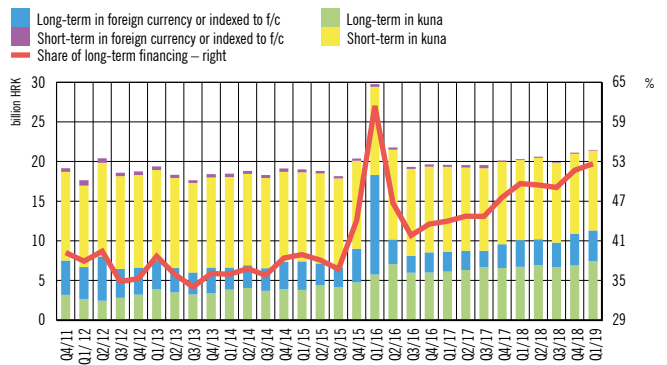
Note: As of 2015, net wage amounts have been reported in accordance with the JOPPD form, which makes it impossible to compare them directly with the amounts in the previous periods.
Sources: CBS and CPII.

Figure 3.9 Downward trend in interest rates on newly-granted loans



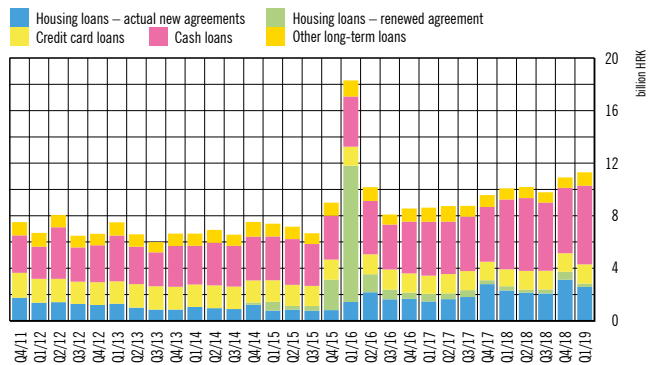
Note: Renewed agreements are excluded for housing loans and cash loans from 2015 onwards.
Source: CNB.

Figure 3.10 Share of long-term loans in total newly-granted loans continued to increase in 2018



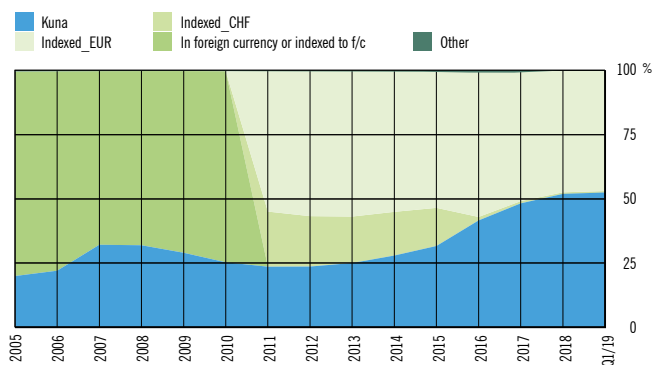
Note: Overdraft facilities and credit card loans are included for the last month in the quarter.
Source: CNB.

Figure 3.11 Cash and housing loans prevail in newly-granted long-term loans to households



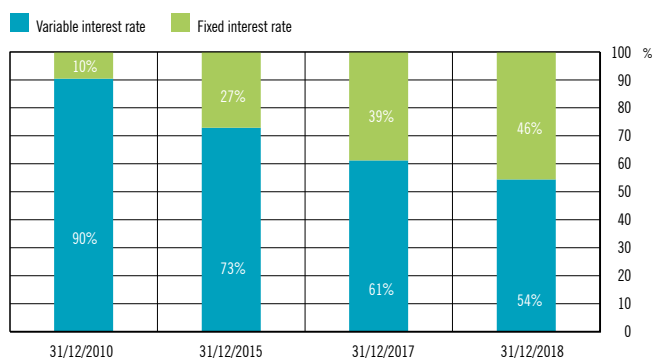
Note: Credit card loans are included for the last month in the quarter.
Source: CNB.

Figure 3.12 Households reduce exposure to currency risk



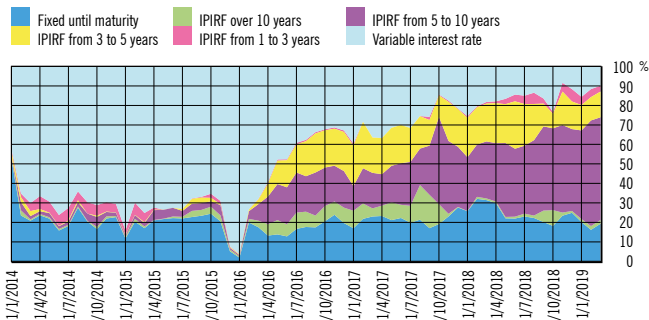
Note: Since the end of 2010, the category of foreign currency loans or foreign currency-indexed loans has been divided into two subcategories: euro-indexed and Swiss franc-indexed loans.
Source: CNB.

Figure 3.13 Share of loans granted with fixed interest rates continues to grow



Source: CNB.

Figure 3.14 Rates that protect consumers from interest rate risk over the long term are highly represented in newly-granted housing loans



Notes: The structure presented is based on the information on the initial period of interest rate fixing (IPIRF) and serves as an approximation. Fixed rates are fixed to maturity and variable rates are those which are variable or fixed up to a period of 12 months.
Source: CNB.

addition, banks mostly apply more relaxed criteria for the assessment of creditworthiness than in housing loans, so that, in February 2019, the CNB reacted by issuing the Recommendation on actions in granting non-housing consumer loans (see chapter 8 Macroprudential policy).

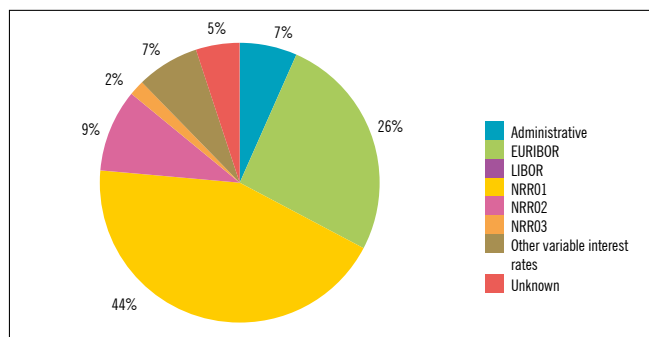
In the same period, newly-granted housing loans also grew more moderately. The strengthening of household lending was also partially attributed to the implementation of the government's subsidy programme. Thus, in 2018, the amount of granted subsidised housing loans reached almost HRK 1.5bn, i.e. 15% of the total amount of newly-granted housing loans (see Box 4 Government's housing loans subsidy programme). However, the increase in newly-granted housing loans was recorded throughout the year, and not only at the time of the programme implementation (the purchase of a residential real estate within the programme is possible only in the last quarter of the year), which reflected the increased propensity to borrow among households, for the purpose of acquiring real estate (Figure 3.10).

Currency risk in the household sector continued to decrease and, in 2018, the share of debt in the domestic currency exceeded a half of total debt (Figure 3.12). Although households slightly increased long-term borrowing in euro, borrowings in kuna still dominate in newly granted long-term loans, driven by the growth in general-purpose cash loans, as well as housing loans, which leads to a reduction of currency risk. The additional limitation of currency risk for debtors results from the provisions of the [Act on Consumer Housing Loans \(OG 101/2017\)](#) that allow a one-off conversion of new housing loans indexed to a foreign currency to kuna housing loans.

The exposure of the household sector to interest rate risk was reduced in 2018, and the share of loans granted at fixed interest rates reached 46% (Figure 3.13). Such developments reflect the growth of general-purpose cash loans, which are predominantly granted with fixed interest rates (in 2018, almost 80%). On the other hand, although the share of newly-granted housing loans with a fixed interest rate is much lower than in cash loans (Figure 3.14), they are nevertheless mostly hedged against interest rate risk during the first period of loan repayment, when a larger portion of interest expense is repaid. Furthermore, the increase in the share of loans with a fixed interest rate in banks' credit portfolios also has a positive impact on the interest rate risk exposure of consumer loans with a variable interest rate. According to the provisions of the [Consumer Credit Act \(OG 143/2013\)](#) the level of interest rates on consumer loans with a variable interest rate is limited by the level of the average interest rate prevailing on the market. In the case of a rise in interest rates, the speed of adjustment of interest rates on consumer loans with a variable interest rate would therefore depend on the adjustment of the average market interest rate, whose snowball-effect risk is directly related to the share of loans with a fixed interest rate in total consumer loans.

Interest rate risk in the household sector is partially limited by the structure of reference interest rates (Figure 3.15).

Figure 3.15 Interest rate risk of households is partially limited by the structure of reference interest rates



Note: The structure of the balance of loans on 31 December 2018 is shown according to the reference parameter to which the change in the variable interest rate is linked, i.e. to which the change in interest rates is linked after the expiry of the initial period of interest rate fixing.
Source: CNB.

More than a half of loans granted at a variable interest rate or an interest rate fixed over a period shorter than loan maturity are linked to the national reference rate. Although such a structure implies higher sensitivity to disturbances in the domestic economy, the transfer of a potential tightening of financing conditions in the international market, caused, for instance, by the growth of global risk aversion, would be slower in such loans.

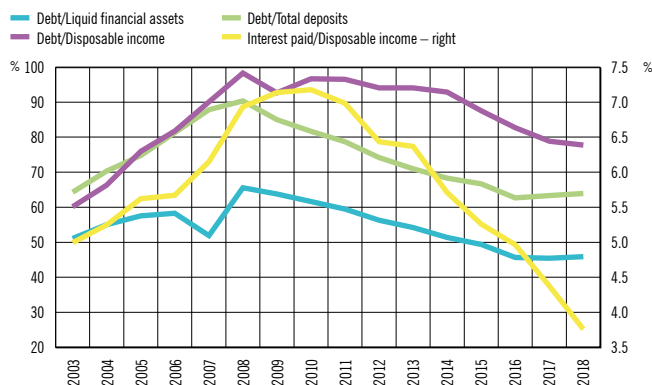
The several-year trend of a fall in the systemic vulnerability of the household sector slowed down in 2018, primarily due to the intensification of new borrowing (Figures 3.16 and 3.17). Positive trends in the labour market and growth in liquid financial assets of households reduced the burden of household debt, as did the fall in interest rates that led to a reduced level of burden of repayments despite the growth of the total debt amount (for more details, see the analytical overview).

Furthermore, the intensification of household borrowing in 2018 contributed to the accumulation of risk and slowed down the long-term trend of reducing the vulnerability of the household sector. Under the impact of the decrease in interest rates, debt servicing risk continued to decrease, but slightly slower than in the previous years. At the same time, the solvency risk indicator stagnated at relatively low levels, reflecting positive trends in the net financial assets of households (Figure 3.4). The volatility of the snowball-effect risk indicator was primarily the consequence of the rise in the disposable income of households, while the implicitly paid interest rate decreased continuously (Figure 3.11).

Current risks in the household sector

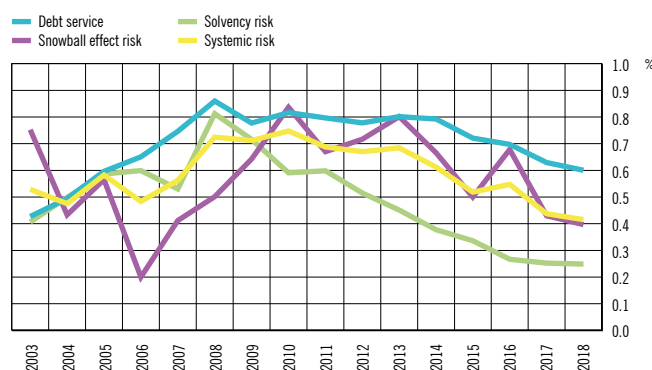
Reduced interest rate and currency risks had a favourable effect on mitigating the systemic vulnerability of the household sector. However, in contrast to the previous years, in 2018, vulnerability was reduced only moderately because the intensification of the growth of general-purpose cash loans accelerated growth in household debt, implying increased vul-

Figure 3.16 Growth of indebtedness slowed down the several-year decrease in household debt burden



Source: CNB.

Figure 3.17 Several-year fall in the systemic vulnerability of the household sector slowed down in 2018



Household sector vulnerability is measured by household systemic risk, i.e. the average of normalised (to the value range 0 – 1) risks, which measure the debt service ratio (DSR), solvency risk (SR) and "snowball effect" risk (SNR), which are defined as follows:

$$DSR_t = \frac{\text{Debt servicing cost}_t}{\text{Disposable income}_t}$$

$$SR_t = \frac{\text{Debt}_t}{\text{Net financial assets}_t}$$

$$SNR_t = \frac{\text{Interest payments}_t}{\text{Debt}_t + \text{Debt}_{t-1} + \text{Debt}_{t-2} + \text{Debt}_{t-3}} \left(\frac{\text{Disposable income}_t}{\text{Disposable income}_{t-4}} - 1 \right)$$

Source: CNB.

nerability should potential shocks occur in the macroeconomic environment. In addition, despite the expected tightening of lending conditions for cash loans, as a result of the alignment with the Recommendation on actions in granting non-housing loans, the intensification of credit growth might continue in 2019, however, with a more even distribution among the different loan types. This is supported by favourable labour market trends, which contribute to the growing consumer optimism and strengthen the consumers' repayment capacity, as well as by the readiness of credit institutions backed up by liquidity surpluses to continue granting loans to households, (see

chapter 1, Macroeconomic environment). Although the acceleration of credit growth could spur the accumulation of systemic risks in the household sector, such risks will not immediately reach the level that would be estimated as excessive.

By contrast, restrictions to credit growth are primarily determined by structural factors, such as emigration and the ageing population, as well as by the relatively low share of employed

working age population, which, despite a mild upward trend, is considerably below the EU average³. The impact of structural factors in the short term could be less significant, and the reversal of the credit growth trend would be possible in the event of unfavourable events in the macro environment, such as the growth of global risk aversion or a stronger than expected slowdown of the global and domestic economy.

Analytical overview: How much are Croatian households burdened with debt repayments?

The burden of households with debt repayments may impact real economy and fluctuations in private consumption, as well as macroeconomic and financial stability because difficulties in debt service by debtors may lead to losses for the banking sector, and in the worst case scenario – to a financial crisis.

One of the broadly accepted indicators of aggregate debt burden is the **debt service ratio (DSR)**, which is defined as the ratio of the sum of interest payments plus amortisation of the loan principal (debt servicing cost) and disposable income. The methodology used for its calculation follows the approach of the Federal Reserve Board for the calculation of the DSR for the household sector in the USA⁴ and the approach of BIS for a selected number of countries⁵. For the calculation of the quarterly debt service cost (DS_t) the following formula is used:

$$DS_t = \frac{i_t D_t}{1 - (1 + i_t)^{-m_t}}$$

where i_t is the quarterly interest rate, D_t is the remaining debt amount, and m_t is the average remaining debt maturity measured in quarters. The cost structure of debt repayment can be divided into the interest cost and amortisation of the principal:

$$DS_t = \underbrace{\frac{i_t D_t}{1 - (1 + i_t)^{-m_t}}}_{\text{interest cost}_t} + \underbrace{\frac{DS_t (1 + i_t)^{-m_t}}{1 - (1 + i_t)^{-m_t}}}_{\text{amortization of the principal}_t}$$

By defining the debt service ratio as $DSR_t = DS_t / Y_t$, where Y_t is the average disposable household income in a quarter, the debt service ratio is calculated as follows:

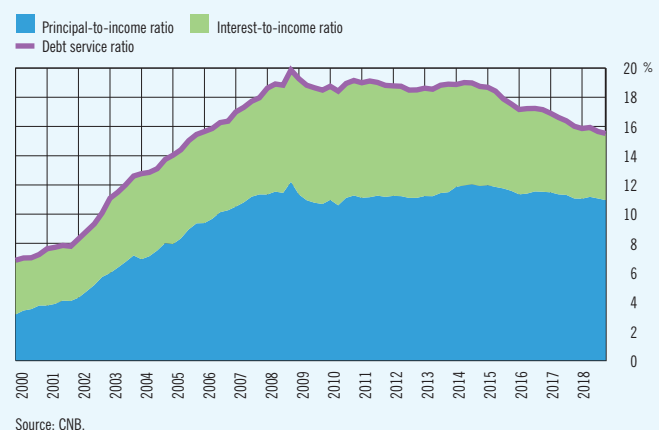
$$DSR_t = \frac{i_t}{1 - (1 + i_t)^{-m_t}} \cdot \frac{D_t}{Y_t}$$

Since the defined indicator is calculated from the aggregate level of debt and the aggregate disposable income, it does not show

the vulnerability of the average household; instead, it is a measure of the burden of the entire sector. In other words, it does not take into account the distribution of debt and income, so it may underestimate the risk if debt is concentrated in the most highly indebted and vulnerable households.

Nevertheless, the DSR clearly shows the trends in debt repayments of the entire household sector. The debt repayment burden of the household sector was at its peak between 2009 and 2015, primarily because of the high costs of interest payments. Later, the decrease in interest rates, and consequently of interest costs, contributed to the reduced burden of households with debt repayments (Figure 1).

Figure 1 Lower interest costs reduced debt repayment burden of households



3 https://ec.europa.eu/eurostat/statistics-explained/index.php/Employment_statistics

4 Dynan, K., K. Johnson, and K. Pence: *Recent changes to a measure of US household debt service*, Federal Reserve Bulletin, vol 89, no 10, October 2003, pp 417–26.

5 Drehmann, M., A. Illes, M. Juselius, and M. Santos: *How much income is used for debt payments? A new database for debt service ratios*, BIS Quarterly Review, September 2015.

Box 3 Characteristics of indebted households in Croatia¹

In spring 2017, the Household Finance and Consumption Survey (HFCS)² was conducted for the first time in Croatia. The collected data enable the analysis of sociodemographic and economic characteristics of indebted households in Croatia.

The starting point for the explanation of the characteristics of indebted households can be given using the life-cycle theory (Modigliani, 1954)³, according to which individuals make decisions on debt assumption in order to "smooth" consumption with regard to income fluctuations and thus maintain a stable level of consumption throughout the life cycle. Therefore, it is expected that younger individuals in the earlier phase of the life and professional cycles will have a higher amount of debt relative to the level of income, which enables them to increase consumption above the level they can finance with their current incomes.

Debt assumed by households during the life cycle can be divided into two main groups: mortgage (collateralised with residential real estate) debt⁴, which is usually assumed for a period of 20 to 30 years, and consumer (non-mortgage) debt, which is usually of short or medium term duration. In the questionnaire used in the Survey, the liabilities of households are thus divided into mortgage debt, which consists of mortgage loans collateralised with the household main residence (HMR) or other real estate property, and consumer (non-mortgage) debt, which covers credit lines/ overdrafts, credit card debt and other non-mortgage loans.

Determinants of households that assume debt

According to the HFCS (Figure 1), almost 41 per cent of households in Croatia in 2016 were indebted, and the share is larger in non-mortgage loans. Thirty-three per cent of indebted households only had non-mortgage debt, five per cent only had mortgage debt and around four per cent of households had both types of debt.

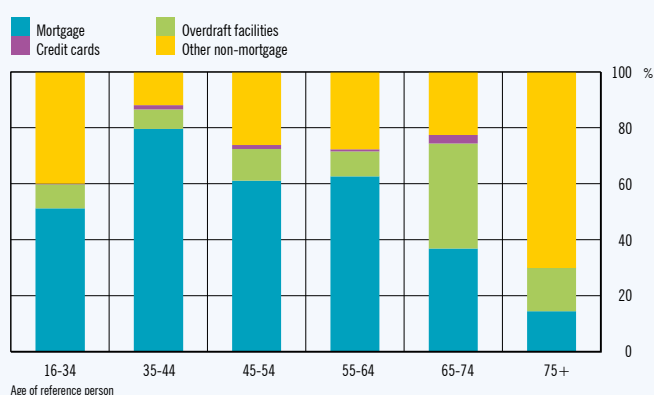
In accordance with the life-cycle theory and the need of individuals to improve their living standard by consumption smoothing, the largest share of debt is concentrated in the younger middle age of adult life, when the reference person⁵ is aged between 35 and 44, after which it declines and reaches the lowest levels in old age when demographic factors that put pressure on consumption growth are less prominent. Since

Figure 1 Share of the number of indebted households in the population and the median value with regard to the type of debt



Source: HFCS.

Figure 2 Debt structure according to the age of the reference person



Source: HFCS.

in the young age individuals purchase their residential real estate or reconstruct or furnish residential property, it is not surprising that in the debt structure of individuals aged between 35 and 44 mortgage loans reach a high 80% of total debt, and stagnate at 60% until retirement age, accounting for a mere 14% of total debt in the population older than

1 The preliminary results of the debt analysis to be published in the paper currently being prepared by Rosan and Zauder (2019) are partially presented in this Box.

2 The HFCS is conducted every two to three years in the euro area countries as well as some other EU member states. The HFCS primarily collects household-level data on different forms of assets, liabilities, income and consumption of households, as well as other data necessary for the analysis and understanding of the economic decisions of the household sector.

3 Modigliani, F., and R. H. Brumberg: *Utility analysis and the consumption function*, [Journal] // Kurihara, K. K., ed., Post Keynesian Economics. New Brunswick: Rutgers University Press, 1954, pp. 388-436.

4 The Survey contains a question about mortgage debt, which in Croatia in the most part covers the category of housing loans.

5 The reference person is defined at the start of the survey in accordance with the Canberra definition (Canberra Handbook, UNECE, 2011). The definition uses the following sequential steps until a unique reference person in the household is identified: (i) household type a) one of the partners in a registered or de facto marriage, with dependent children, b) one of the partners in a registered or de facto marriage, without dependent children, and c) a lone parent with dependent children; (ii) the person with the highest income; (iii) the eldest person.

75 (Figure 2). Such trends can partially be explained by the fact that housing lending to a large extent appeared only within the past 20 years.

With regard to the annual income levels of households, the share of those assuming debt rises with the households belonging to higher income classes, reflecting the higher debt service capacity and easier access to loans, taking into consideration lower risk as perceived by creditors. The share of low-income households that have non-mortgage loans is much larger than the share of those that have mortgage loans, since this type of debt, to a certain extent, is used for covering the costs of living (Figure 3) and is more accessible taking into account the lower amounts (Figure 1).

With regard to the current work status of the household reference person, debt is larger for persons who are employed and self-employed. Since the data refer to the current situation, we do not have information about the status in the labour market at the time the loan was taken. However, the theoretical assumption is that an employed person will have easier access to loans, taking into account the guarantee of a regular income for the creditor, and it is in line with the theories that uncertainty concerning future income reduces borrowing. It is also less probable that the unemployed will participate in the credit market because of the limitation of liquidity on the demand side. In comparison with mortgage debt, it is more probable for the unemployed and pensioners to hold “short-term” non-mortgage debt than long-term mortgage debt.

Table 1 Socioeconomic characteristics of indebted households in Croatia

		Share (%) of households with			Debt median (EUR thousand)	
		Debt	Mortgage debt	Consumer debt	Mortgage debt	Non-mortgage debt
Total		40.7	9.0	35.8	19.9	1.6
Household size	1 member	24.0	2.7	22.7	16.2	0.9
	2 members	36.2	7.1	33.2	10.0	1.1
	3 members	50.0	9.5	45.6	16.7	1.5
	4 members	52.3	17.2	40.9	31.5	1.8
	5+	53.4	13.5	45.4	24.8	2.5
Age of reference person	16-34	42.0	7.1	38.2	42.6	2.8
	35-44	62.7	17.3	50.0	36.2	1.8
	45-54	45.6	14.3	40.4	12.9	1.8
	55-64	44.5	7.6	40.3	16.0	1.3
	65-74	27.4	3.3	25.7	2.3	1.1
	75+	16.1	1.4	15.5	0.8	0.6
Education of reference person	Basic or no education	29.5	2.8	27.9	2.6	1.6
	Secondary	43.5	9.6	37.8	19.0	1.6
	Tertiary	47.5	16.5	40.2	23.3	1.1
Work status of reference person	Employee	53.3	14.0	44.8	25.3	1.7
	Self-employed	55.3	22.6	52.6	13.5	2.4
	Not working	32.6	7.6	30.0	24.9	1.7
	Retired	29.9	3.6	27.8	5.4	1.3
	Other	8.0	0.0	8.0	0.0	1.3
Income – quintiles	Bottom 20%	27.2	4.0	25.2	17.6	1.5
	20% to 40%	29.6	3.8	27.2	4.7	0.8
	40% to 60%	42.8	8.3	38.2	19.9	1.4
	60% to 80%	54.1	12.1	49.1	18.4	1.3
	80% to 100%	50.4	17.2	39.4	29.7	3.1
Net assets – quintiles	Bottom 20%	45.8	4.6	42.5	0.0	1.3
	20% to 40%	38.9	9.5	33.8	12.3	1.0
	40% to 60%	41.5	11.5	34.7	14.9	1.9
	60% to 80%	42.2	9.4	37.9	23.5	1.7
	80% to 100%	35.2	10.2	29.9	29.9	2.6

Source: HFCS.

In order to broaden the understanding of the probability for households to assume debt, we use an econometric analysis with three different model specifications. In the first specification, we model the features that impact the probability for a household to assume debt, and the dependent variable is 1 for all households with any type of debt.

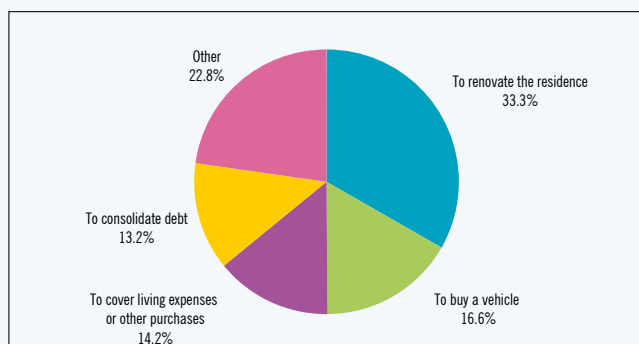
In the second specification, the dependent variable depends on whether the household has mortgage debt, and in the third specification, consumer debt. In each of the above model specifications, the dependent variable may assume only two types of values for each household:

$$Y_t = \begin{cases} 1, & \text{has a certain type of debt} \\ 0, & \text{Does not have a certain type of debt} \end{cases}$$

and it is the function of socioeconomic and demographic features of households. Since the dependent variable is binary, we use the techniques of discrete dependent models and, using a probit model⁶, we assess the probability of a household with certain characteristics assuming debt, as well as the characteristics that determine this.

As independent variables, we use demographic and socioeconomic characteristics that might impact the probability of household borrowing. This includes the age of the reference person, household size, the logarithm of the total equivalenced income of the household and the constructed variables based on the survey responses. The education of the reference person is contained in the binary variable with value 1 if the reference person has completed higher (tertiary) education and 0 if the reference person has basic and secondary education or has

Figure 3 Reason for assuming consumer (non-mortgage) debt



Source: HFCS.

no education at all. The status of the reference person in the labour market is defined by the factor variable (i) employed (employee and self-employed), (ii) unemployed and (iii) other (pensioners, students, unpaid trainees, not working, permanently disabled, etc.). In addition, based on the subjective measure constructed from the response to the question of how much financial risk household members are prepared to assume⁷, we have constructed the binary variable, which assumes value 1 if they take on risk.

Table 2 Probability of participation in the debt market, probit model, marginal effects

	Total debt		Mortgage debt		Non-mortgage debt	
	ME	SE	ME	SE	ME	SE
Age	0.0192**	0.008	0.0125***	0.004	0.0171**	0.007
Age ^ 2	-0.0002***	0.000	-0.0001***	0.000	-0.0002***	0.000
Household size	0.0326**	0.014	0.0112**	0.005	0.0182	0.013
Education: Tertiary	0.0606	0.050	0.0505***	0.019	0.0356	0.048
Work status: Other	0.1131	0.097	0.0034	0.036	0.0879	0.105
Work status: Employee	0.1604*	0.084	0.0199	0.034	0.1239	0.096
Risk: Assumes risk	0.1081***	0.042	-0.0016	0.016	0.1156***	0.039
Log(Income_EQ)	-0.0124	0.035	-0.0241*	0.014	0.0130	0.033
Log(Income_EQ) ^ 2	0.0013	0.003	0.0025**	0.001	-0.0014	0.003

ME – marginal effects, SE – standard error, *p < .1; **p < .05; ***p < .01

6 The probit model is defined by the cumulative standard normal distribution function $\Phi(\cdot)$ and is used for modelling the regression function when the dependent variable is binary (Bernoulli distribution).

$$Pr(Y = 1 | X_1, X_2, \dots, X_k) = \Phi(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k)$$

$$\Phi(z) = Pr(Z \leq z), Z \sim N(0, 1)$$

$$\frac{Pr(Y = 1 | X)}{\partial \beta_k} = \phi(X\beta) \beta_k$$

7 Respondents are asked if they are prepared to assume (considerable, above-average or average) financial risks, while expecting earnings, or if they are not prepared to assume financial risk.

Table 2 shows the estimated marginal effects⁸ of three probit regressions. The results of the estimate of marginal effect on the probability of households holding debt are shown in the first column (holding a debt sub-type in the next two columns), with regard to the features. In the probit regression, as control for the age of the reference person we have used the years of life of the reference person, as well as the age square (both very important in all three specifications) in order to enable non-linearity. The results suggest an inverted U-shaped age curve, implying that the probability of holding debt increases until mid-40s, when it slowly declines towards retirement (Figure 4), which confirms the life-cycle theory. With the increase in the number of household members by 3 percentage points, the probability that households participate in the debt market also rises, i.e. 1 to 2 percentage points, depending on whether they assume mortgage or non-mortgage debt.

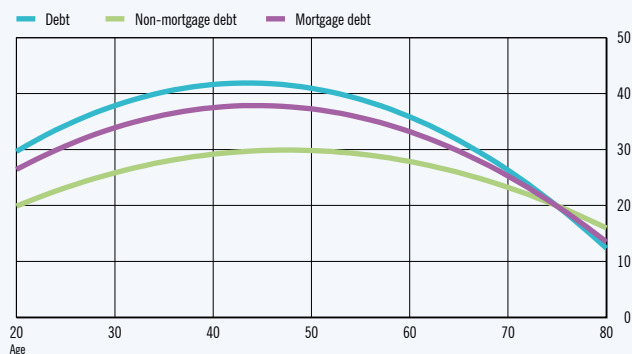
Results have shown that education plays an important role only in the assumption of mortgage debt, and the probability that a household holds debt increases with the level of education. Households whose reference persons have undergraduate or postgraduate education (tertiary degree) are 5 percentage points more likely to hold mortgage debt than households whose reference persons have no education or only have elementary and secondary education. The households whose reference persons are employed, have a higher probability of holding some form of debt than unemployed persons. The probability of having debt for households whose reference persons are employed compared with the households whose reference persons are unemployed is 16 percentage points higher. Results show that status on the labour market does not play an important role when both forms of debt are observed separately, including control for other factors.

Furthermore, the attitude of the household members towards assuming financial risk also plays an important role in taking decisions on debt assumption. The probability of assuming debt in the case when the household members are prepared to assume some levels of financial

risk, compared with the households that are not prepared to assume any financial risk, is 11 percentage points higher, and if the probability of assuming non-mortgage debt is observed, it is 12 percentage points higher, while the attitude toward risk is not significant in mortgage loans of households.

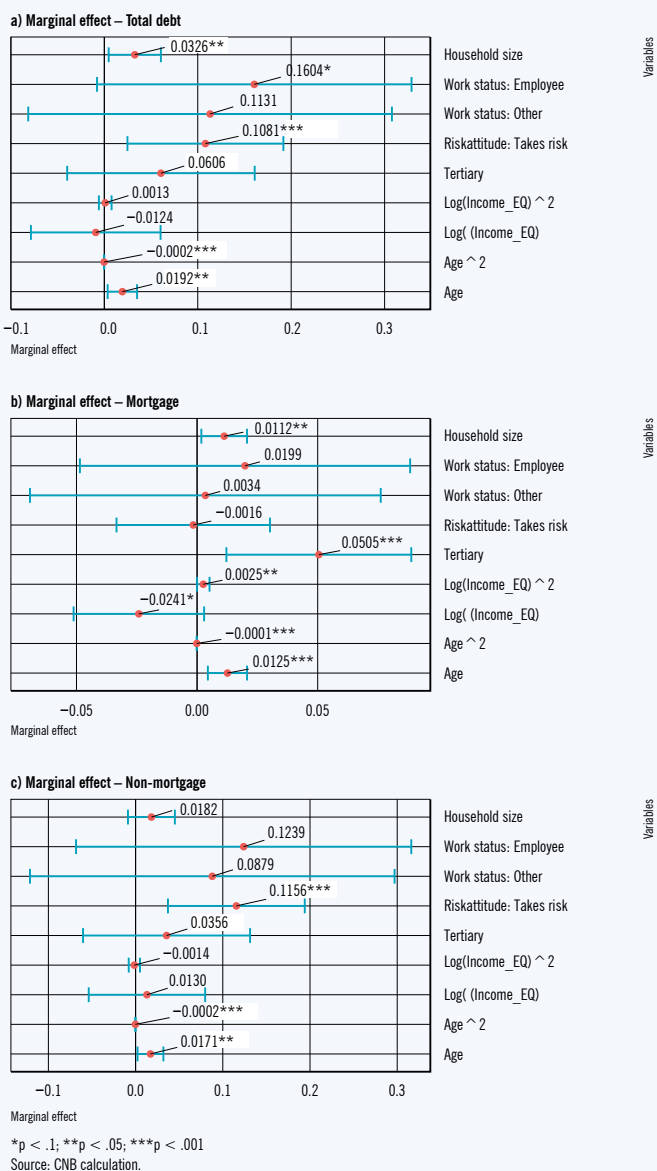
The relationship between the current income and the probability of debt assumption has not been defined unambiguously in the literature. A

Figure 4 Impact of age on the probability of holding debt



Sources: HFCS and CNB calculation.

Figure 5 Chart of marginal effects



8 The estimated regression coefficients in the probit model indicate the sign of reaction, but do not point to the effect the unit change of the explanatory variable has on a certain probability. For this reason, we show and interpret marginal effects of the model in the tables, which are estimated at the medium value of explanatory variables.

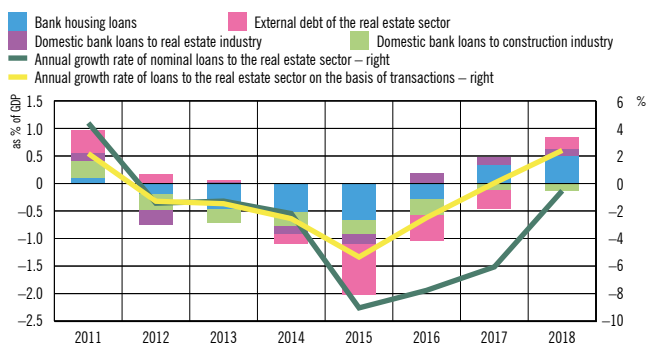
higher current equivalenced income reduces the need for debt assumption. However, with the increase in current income, the demand for debt may rise, in particular if the “permanent shock” to income⁹ is present, because of which the individual can expect to generate higher income during the entire life-cycle, and increases consumption accordingly. The estimated impact of income on the probability of holding debt is statistically significant only in cases in which mortgage debt is assumed,

when the probability for debt assumption has a non-linear relationship with income. This implies that the marginal income effect depends on the level of household income itself because households with lower income levels tend to have limited access to credit. Results obtained by linear extrapolation show that the contribution of income growth to the probability of taking on mortgage debt is positive only at levels above HRK 100,000 annual gross income.

9 Friedman, M. (1957): *The Permanent Income Hypothesis – A Theory of the Consumption Function*, Princeton University Press.

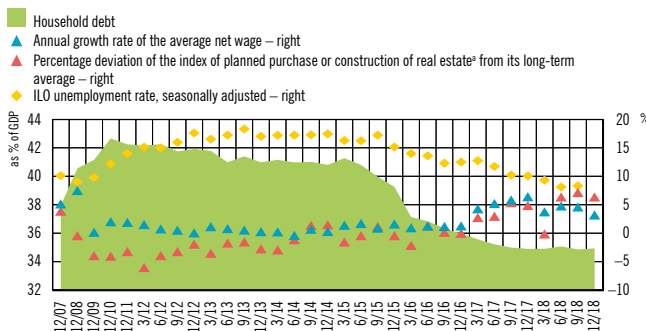
4 Real estate⁶

Figure 4.1 Real estate sector debt slightly increased



Notes: Changes in debt are shown in relation to the same period of the previous year and are based on transaction data. External debt includes the debt of real estate and construction industries. Source: CNB.

Figure 4.2 Continued housing borrowing accompanied by increasing income and consumer optimism



¹ Index of planning the purchase or construction of real estate was calculated according to consumers' answers to the question on plans regarding the purchase or construction of real estate in the next 12 months from the CNB's Consumer Confidence Survey. Sources: CBS and CNB.

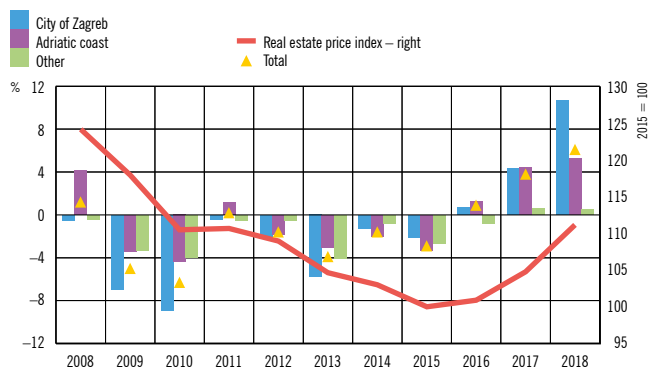
The real estate market continued to recover in 2018, as evident from the lending activity directed at the real estate market, the growth in prices, transaction numbers and movement of volume indicators in construction. Despite the expected continuation in the growth of real estate prices, the risks associated with this market are not assessed as excessive, due to favourable macroeconomic developments.

The real estate market continued to recover in 2018, with the growth of new debt of 0.7% of GDP reduced by repayments (transaction-based). The greatest contribution to this growth came from the increased volume of housing loans which rose by 0.5% of GDP in 2018. At the same time, the loans of domestic credit institutions to real estate companies, as well as their foreign liabilities increased slightly, while construction companies reduced their domestic and foreign liabilities. Nevertheless, the nominal debt balance went down marginally at the end of 2018 from the previous year (by 0.5% on an annual level) primarily due to exchange rate, price and other changes in the debt.

The growth in the prices of real estate continued in 2018, continuing to be unequally distributed among the regions. Real estate prices (measured by the real estate price index) increased on average by 6.1% in 2018. However, despite the considerable recovery over the past two years, the recorded price growth is still much more modest than in the pre-crisis period when the prices of residential units grew in each quarter at (annual) rates of over 10%. The real estate price dynamics continues to be characterised by strong regional heterogeneity (Figure 4.3). The prices in the City of Zagreb and on the Adriatic coast have been rising much faster than in the rest of the country. In

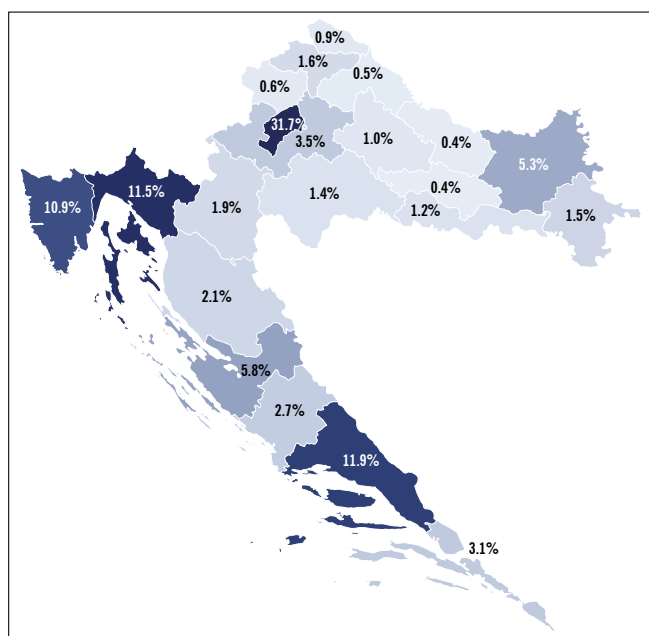
⁶ This chapter analyses developments in the real estate market and monitors operations of non-financial corporations in the construction and real estate activities.

Figure 4.3 Substantial regional differences in the intensity of real estate price changes



Note: The index takes into account qualitative characteristics of the real estate in standardising residential units. Source: CBS.

Figure 4.4 In the period from 2015 to 2018 market activity focused on Zagreb and the Adriatic coast

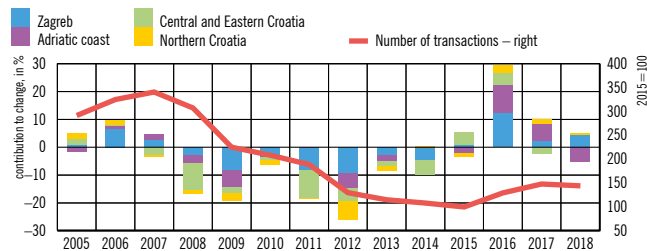


Source: CBS (CNB calculations).

2018, the prices of residential real estate in Zagreb and on the Adriatic coast increased on average by 10.7% and 5.3% respectively, on an annual level, while in the same period prices in the rest of Croatia have not changed much (Figure 4.3).

These trends in the real estate market are a consequence of the favourable macroeconomic environment, historically low interest rates that enable cheap borrowing (Figure 4.7) as well as favourable trends in the labour market that contribute to the growth in consumer optimism in relation to buying residential real estate (Figure 4.2) and the implementation of the

Figure 4.5 Although the number of sale and purchase transactions is on the rise, it is still much lower than ten years ago



Notes: The transaction number index refers to sale and purchase of houses and flats. The data relate to real property transfer tax returns. The Adriatic coast includes the County of Dubrovnik-Neretva, the County of Istria, the County of Lika-Senj, the County of Split-Dalmatia, the County of Šibenik-Knin and the County of Zadar. Northern Croatia includes the County of Koprivnica-Križevci, the County of Krapina-Zagorje, the County of Međimurje, the County of Varaždin and the County of Zagreb. Central and Eastern Croatia includes the County of Bjelovar-Bilogora, the County of SlavonSKI Brod-Posavina, the County of Karlovac, the County of Osijek-Baranja, the County of Požega-Slavonija, the County of Primorje-Gorski Kotar, the County of Sisak-Moslavina, the County of Virovitica-Podravina and the County of Vukovar-Srijem. Source: CBS (CNB calculations).

Government's housing loans subsidy programme which makes the repayment burden easier in the initial period and thus makes real estate financially more easily available (Box 4 Government's housing loans subsidy programme). In addition, the growth of real estate prices is the consequence of the asymmetry between supply and demand for real estate. Price trends on the Adriatic coast and in the City of Zagreb are largely influenced by developments in the tourism sector (daily and weekly rentals), where, among other things, investments are made in real estate for the profits from tourism and/or because this is a good form of long-term investment in a low interest rates environment. In the current conditions of record low interest rates in the domestic banking market and negative experiences in the capital market, surplus funds are being directed to the real estate market instead of to deposits or securities. A positive impulse, although not decisive, to the growth of prices came from Amendments to the Real Estate Transfer Tax Act, which reduced the real property transfer tax rate from 4% to 3% for all agreements concluded in 2019.

Over the past years the number of sale and purchase agreements in the real estate market has increased, market activity being focused on Zagreb and the Adriatic coast. The total number of sale and purchase transactions decreased drastically in the period after the crisis, their recovery being registered only in the past several years. As a result, the number of transactions continues to be considerably below pre-crisis levels (Figure 4.5). The unequal price growth referred to is visible also in the distribution of the number of sales and purchases. Namely, market activity measured by the sale and purchase of flats and houses focused predominantly on Zagreb and the Adriatic coast, which together account for over two thirds of all sale and purchase activities in the period from 2015 and 2018 (Figure 4.5). Data on the number of sale and purchase agreements show that following a years-long uninterrupted fall, 2016 and 2017 registered a strong increase in sale and purchases, which stopped in 2018 (Figure 4.5). However, activity continued to grow in Zagreb and Northern Croatia, by 4.5% and 2.3% respectively, on an annual level. In contrast, in the region that

Figure 4.6 Prices of residential real estate increased slightly above the level based on long-term value of its fundamentals

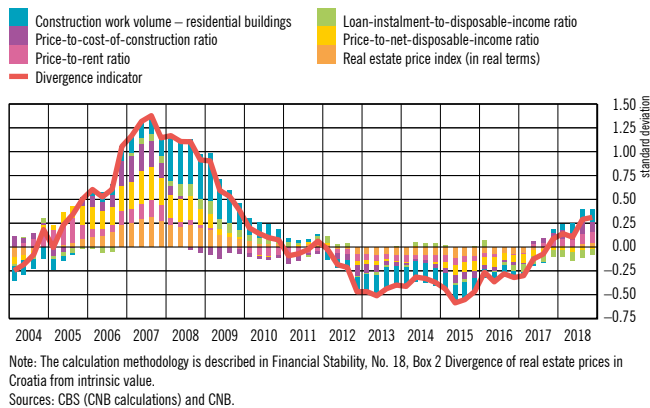


Figure 4.7 Interest rates on housing loans continued to fall

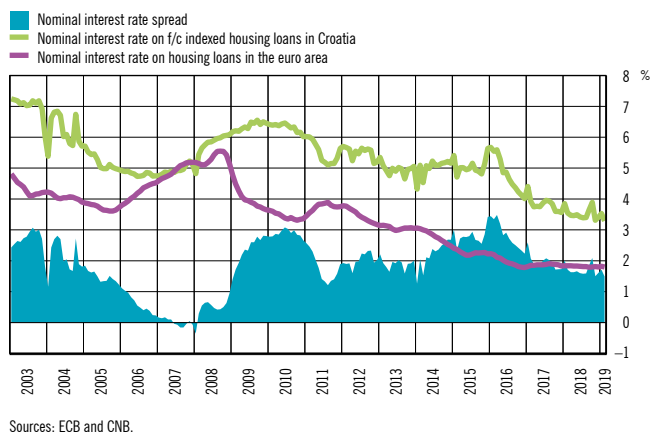
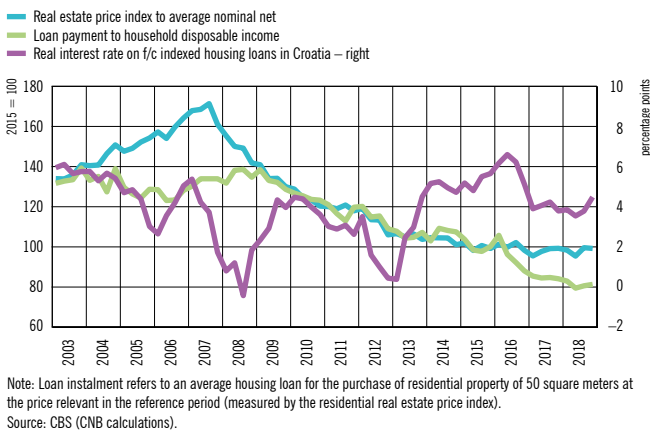


Figure 4.8 Price growth slightly lowered the financial availability of real estate



includes coastal counties sale and purchase transactions went down by 5.3% and in Central and Eastern Croatia by 2.3%.

Despite the aforementioned recovery, real estate prices have not diverged significantly from their macroeconomic fundamentals, although the gap has been slowly increasing; after a six-year period of undervaluation of real estate prices, the indicator of their link with the key determinants of the real estate market (Figure 4.6) began to reflect a very slight overvaluation of real estate prices in 2018. Since the mentioned growth in prices was not accompanied by equally strong growth of household income, the indicators of financial availability of real estate⁸ deteriorated slightly in 2018 (Figure 4.8). Nevertheless, they continue to oscillate around their historical lows. It is noteworthy that these indicators measure the aggregate availability of residential real estate without taking into account the differentiation of the financial availability of residential real estate at the geographical level, i.e. for individual households considering their socio-economic and demographic features.

Current risks in the real estate market

Amid the positive developments in the labour market and continuation of the government’s housing loans subsidy programme, the prices of residential real estate are expected to grow moderately in 2019. The credit cycle in this market will considerably depend on the continuation of positive trends in the labour market and developments in the aggregate income of households. A limiting factor that might affect the dynamics of loans used to finance the purchase of residential real estate are negative migration trends⁹, especially as regards the younger part of the population which accounts for the greatest portion of housing debt (see Box 3 Characteristics of indebted households in Croatia). Furthermore, another limiting factor is also the tighter criteria for assessing creditworthiness when long-term loans to consumers are being approved¹⁰. In these circumstances, it is unlikely that any significant increase in the divergence of real estate prices from the level based on macroeconomic fundamentals would arise, indicating unsustainable growth and representing a potential risk to the preservation of financial stability. Therefore, the risks associated with this market are still considered to be moderate.

7 Measured as the ratio of the average loan payment to average household disposable income and as the ratio of the real estate price index to the nominal net wage.

8 Draženović I., M. Kunovac, and D. Pripuzić (2018): *Dynamics and Determinants of Emigration: The Case of Croatia and Experience of New EU Member States*, Public Sector Economics, 4(42), pp. 415-447.

9 Early in 2018, the CNB’s Decision tightened the criteria for the assessment of creditworthiness of consumers when approving consumer housing loans. Early in 2019, banks were recommended to apply the same criteria to non-housing loans approved with maturity of five or more years (see chapter 8 Macprudential policy instruments).

Box 4 Government's housing loans subsidy programme

Housing loan subsidies¹ are a measure of state aid by the Government of the Republic of Croatia, implemented since 2017 and aiming to alleviate the problem of housing for citizens under the age of 45 who do not own real estate fit to meet their housing needs in the long-term² by subsidising part of housing loan repayments. According to the Government of the Republic of Croatia, the programme aims to spur demographic revival, urban regeneration and prevent young families from emigrating. The subsidy programme is related to housing loans approved for flat or house purchase or for building a house, not exceeding the amount of EUR 1,500 per square meter in kuna equivalent. The overall amount of subsidised housing loan is limited to a maximum of EUR 100,000. The amount paid per square meter and the overall amount of the housing loan may be higher but in that case the difference is not subsidised. The loan repayment period may not be shorter than 15 years.

The initial time limit for subsidising loans contracted in 2017 was four years, which was extended to five years for loans contracted in 2018. The time limit can be additionally extended by two years for live births or children adopted during the life of the subsidised loan.³ In addition, if the applicant or a member of his or her household is a disabled person with a degree of disability higher than 50%, the subsidy time limit may be extended by two years.⁴

The Agency for Transactions and Mediation in Immovable Properties (hereinafter referred to as 'APN') is responsible for the implementation of the programme. Subsidies were approved in 2017 and 2018 and the programme is planned to be continued until the end of 2020. The data on the APN's subsidy programme show that the number of approved subsidies increased from 2,314 in 2017 to 2,972 in 2018 (Figure 1), i.e. by 28% (which altogether makes up 5,286 approved subsidies). In both periods subsidies approved for flat purchase dominated.

As for the total approved amount of subsidies over the entire period of subsidy payments, it decreased from HRK 178m in 2017 to HRK

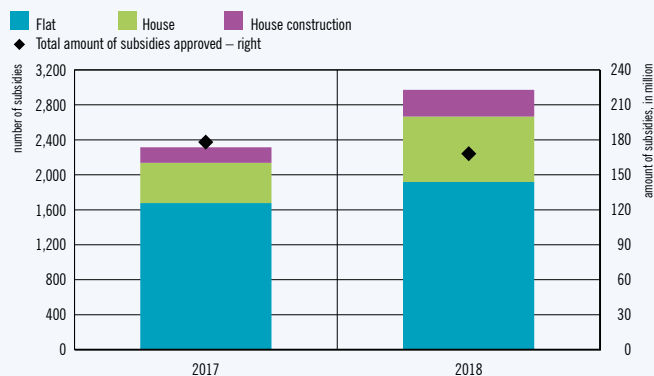
1 Subsidising conditions are regulated by the Act on Housing Loan Subsidisation (OG 65/2017 and 61/2018) and the Instruction on the work of the Agency for Transactions and Mediation in Immovable Properties in Implementing the Act on Housing Loan Subsidies (OG 76/2017).

2 Applications for housing loan subsidisation can be submitted by citizens with residence in the territory of the Republic of Croatia, who fulfil the requirements for housing loan approval as established by the credit institution, who are not older than 45 years, and who, or whose spouse, common law partner, formal or informal living partner, are not owners of a flat or house capable of satisfying the sanitary and technical conditions for living, or who are owners of only one flat or house capable of satisfying the sanitary and technical conditions for living that is being sold preparatory for the purchase of a bigger flat or house, or for the purpose of building a house for their own housing needs.

3 According to the Draft Act on Amendments to the Act on Housing Loan Subsidisation submitted for public consultations in 2019, as of autumn 2019 the subsidy time limit should be additionally extended by one year for each child under 18 years of age at the time of contracting the agreement on a housing loan subsidy.

4 For subsidies contracted in 2017 the repayment period extension was one year.

Figure 1 Subsidies approved, by lending purpose and total amount

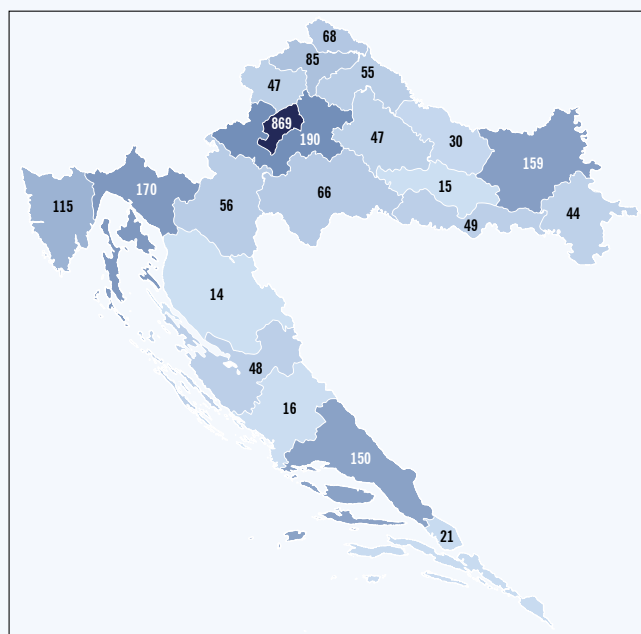


Source: APN.

168m in 2018. The decrease in the overall contracted amount of subsidies in 2018, despite the noticeable increase in the number of subsidies and the extension of the period of subsidy payments by one year, is a result of the changes in the rules defining the amount of the paid subsidy.

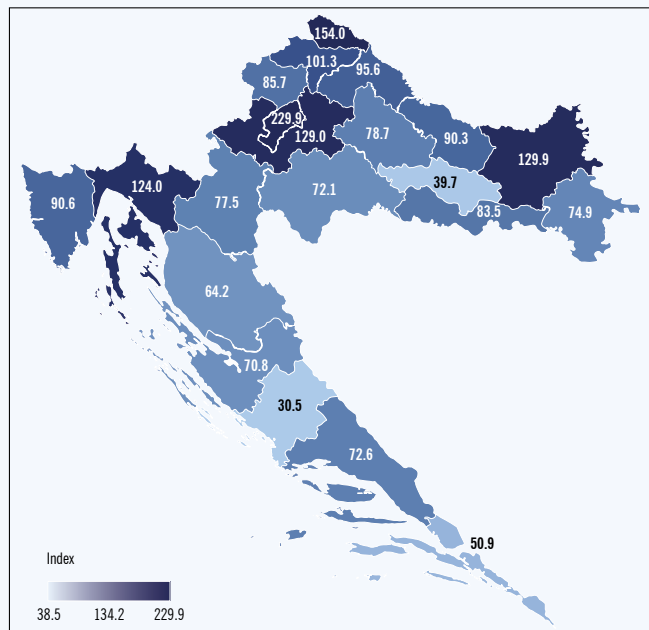
In 2017, the amount of subsidy was limited to a half of the monthly loan repayment instalment, a covenant applying equally in the entire territory of the Republic of Croatia. Therefore the subsidy programme was, as expected, dominated by the City of Zagreb in terms of the number and the amounts of approved subsidies, both in absolute amounts and amounts adjusted by the number of citizens. Amendments to the

Figure 2 Total number of subsidised loans in 2017



Source: APN.

Figure 6 Total number of subsidies approved in 2017 and 2018 adjusted by the number of citizens



Note: The index is calculated as a ratio the total amount of subsidy per person in a county and the total amount of subsidy per person in the RC.
Source: APN.

subsidised loans per number of persons. On the other hand, the number of subsidised loans per person in Dalmatia is noticeably lower than the average registered in the rest of Croatia, given that out of the total number of loans approved under the subsidies programme one tenth was approved in Dalmatia. In contrast, the data on the number of real properties sold (see chapter 3 Real estate) show that approximately one third of all real estate sold in Croatia in 2018 was in Dalmatia (see chapter 3 Real estate, Figure 4.4). As a result, only a small number of approved subsidies can be explained by the fact that trends in the Dalmatian real estate market are to a significant degree determined by tourism.

Finally, the analysis of total approved amount of subsidised loans per person (Figure 6) during both years of the programme's duration (2017 and 2018) reflects the same dynamics as in the number of subsidised loans. The bulk of the funds are directed towards the City of Zagreb. Still, due to the changes in the amount of subsidy, which is, starting from 2018, inversely proportional to the development of the local self-government unit, in the future we expect greater uniformity in terms of approved subsidy amounts among different counties.

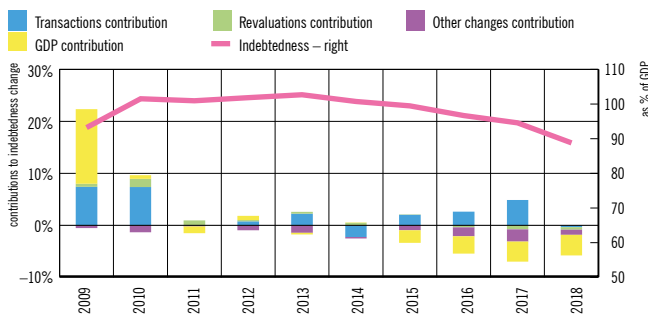
5 Non-financial corporate sector

Figure 5.1 Indebtedness of the corporate sector continued to fall in 2018



Notes: The figure shows the unconsolidated debt of non-financial corporations. The difference between total unconsolidated debt and the sum of external debt to domestic credit institutions is the debt to other creditors (other financial institutions, non-financial corporations and households).
Sources: FINA, HANFA and CNB.

Figure 5.2 Debt measured by net transactions in 2018 stagnates



Notes: The presentations are based on revised data from the consolidated balance of the financial accounts of the non-financial corporate sector and aligned with changes in the sector classification under the ESA 2010 methodology. The figure shows the decomposition of changes in indebtedness (debt/GDP) at an annual level. Revaluation includes foreign exchange differences and price changes, while other changes include sector reclassifications, write-offs, etc.
Sources: FINA, HANFA and CNB.

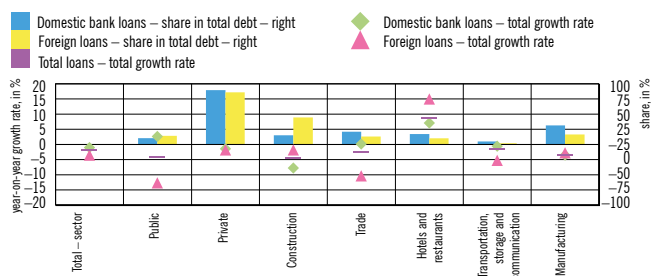
Total debt of non-financial corporations stagnated in 2018 because deleveraging abroad, mostly of public corporations, offset the moderate growth of domestic borrowing of private corporations. The debt-to-GDP ratio of the non-financial corporate sector continued to decrease as a consequence of GDP growth and the appreciation of the exchange rate of the kuna. The smaller debt repayment burden reduced the vulnerability of this sector, and the increase in investment loans had a favourable effect on the sector's prospects.

The total unconsolidated¹⁰ indebtedness of the non-financial corporate sector continued to decline and at the end of 2018 it stood at 90.8% of GDP (Figure 5.1). Economic activity growth was the main factor behind this decline (by a total of 3.8 percentage points of GDP from the end of 2017), in addition, to a much lesser extent, to the appreciation of the exchange rate of the kuna, as well as other changes that also include inter-sectoral indebtedness (Figure 5.2). The contribution of transactions (the difference between newly-granted loans and existing debt repayments) was neutral in 2018. The activation of government guarantees related to the Uljanik Group offset the impact of the noticeable increase in debt of other corporations to domestic banks.

Public non-financial corporations had a predominant impact on the reduction of absolute debt (Figure 5.1). The public corporate sector continued to deleverage with respect to foreign creditors (by about 13%), mainly manufacturing enterprises, as well as transportation and storage.

¹⁰ Unconsolidated debt also includes inter-sectoral claims.

Figure 5.3 Loans to enterprises in the tourism activity increased significantly, while other activities reduced their credit liabilities moderately



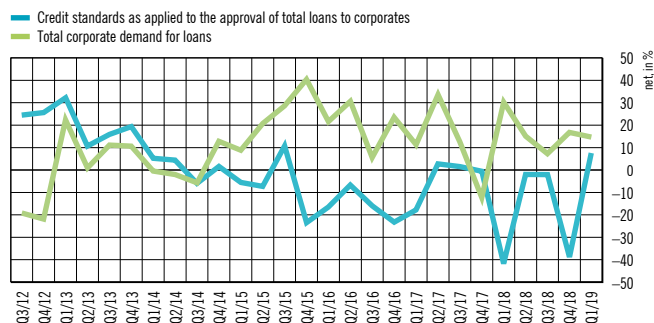
Notes: Annual rates of change (the difference between the transactions of borrowings and repayments) in foreign loans and loans of domestic banks by activity in the period from 31 December 2017 to 31 December 2018. The structure of the change in loans by activity is presented only for the sector of private non-financial corporations. The right hand side axis shows the share of domestic and foreign loans in total domestic and foreign loans respectively. Sources: FINA and CNB.

Private corporations also reduced their credit liabilities in 2018, albeit much more moderately than public corporations. Corporations reduced their liabilities on loans mainly in the activities of trade, transportation, storage and communications, which mostly referred to foreign loans. By contrast, enterprises in the activity of hotel business recorded growth in lending by about 15% from external sources and about 7% from domestic sources (Figure 5.3).

The partial refinancing of foreign loans by borrowing from domestic credit institutions was more pronounced in manufacturing, construction and trade activities. If the activation of bank guarantees for shipyards is excluded, manufacturing industry increased its credit debt to domestic banks by about 2%, while its foreign loans fell by almost 3%. Thus, in addition to the reduction of total credit debt of private non-financial corporations, foreign liabilities were refinanced through domestic borrowing.

The results of the bank lending survey in 2018 point to the continued increase in loan demand by the corporate sector and the relaxation of lending terms, which pertains to all corporate segments and loan categories (Figure 5.4). Such trends in credit demand and standards have been mostly present for the last four years, and are expected to continue in 2019. Among factors that affected the relaxation of standards in 2018 particularly noteworthy were positive expectations regarding overall economic developments, estimated enhanced competition among banks and the high level of liquidity of the banking system. With regard to demand, over half of the respondents from the banking sector mentioned gross fixed capital formation and the financing of inventories and working capital as the key factors of growth in demand, in particular in the group of small and medium-sized enterprises. In parallel, demand intensified due to corporate debt refinancing. Above all, it is worth noting that the movements described were mostly generated by the responses provided by large banks (with the larger share in total corporate loans).

Figure 5.4 Increase in credit demand in 2018 was accompanied by the easing of credit standards for corporate loans

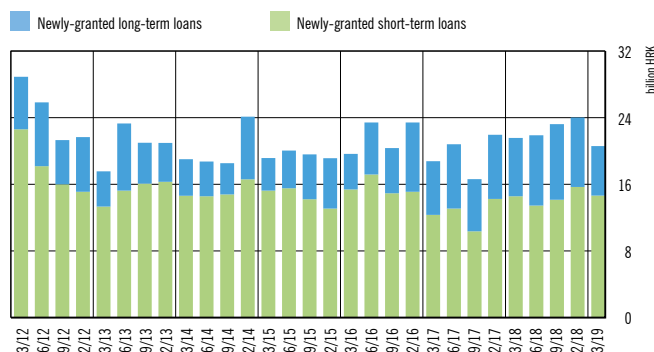


Notes: Positive values show an increase in demand and the tightening of credit standards, whereas negative values show a decrease in demand and the easing of standards. Data show the net percentage of banks weighted by the share in total corporate loans. Source: CNB.

The growth in newly-granted loans of domestic banks (Figure 5.5), which offset foreign financing, does not reduce the exposure of the corporate sector to foreign currencies. The increase in long-term newly-granted corporate loans mostly referred to borrowings indexed to a foreign currency, so that the share of foreign currency loans and loans indexed to a currency clause in total newly-granted loans increased from 42% to 48%. The reasons for these movements of newly-granted long-term loans partially relate to the increase in investment loans during the whole of the previous year, while at the same time the need for loans for working capital financing was reduced.

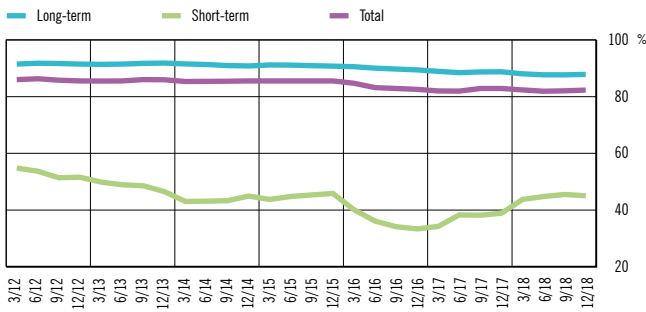
The total exposure of the non-financial corporate sector to currency risk remained at high levels (Figure 5.6). The mentioned deleveraging with respect to foreign creditors in 2018 mostly referred to public corporations and, to a smaller extent, to private corporations, which thus decreased their external debt

Figure 5.5 Corporate lending intensified in 2018 from the previous year



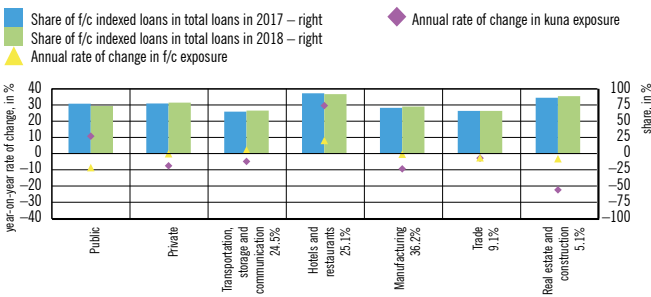
Note: The figure shows newly-granted domestic bank loans to non-financial corporations. Source: CNB.

Figure 5.6 The share of total corporate debt^a in foreign currency stagnated



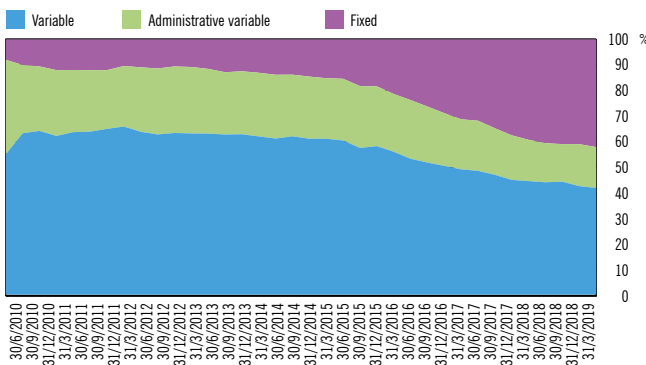
Notes: 1 Presented is the share in total corporate debt (by maturity). 2 * It is assumed that total external debt is denominated in foreign currencies. Debt indexed to foreign currencies (a foreign currency clause) is also included. Source: CNB.

Figure 5.7 Public corporations considerably reduce exposure to currency risk



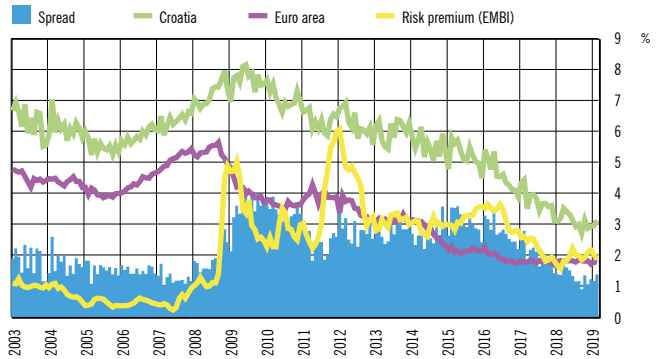
Notes: The figure shows the share of total corporate non-kuna debt in total loans (by sub-sector and activity). Percentages on the horizontal axis indicate the share of export revenues in total revenues of the activity in 2017. It is assumed that total external debt is denominated in foreign currencies. Debt indexed to foreign currencies (a foreign currency clause) is also included. Sources: FINA and CNB.

Figure 5.8 Interest rate risk continues to decrease



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

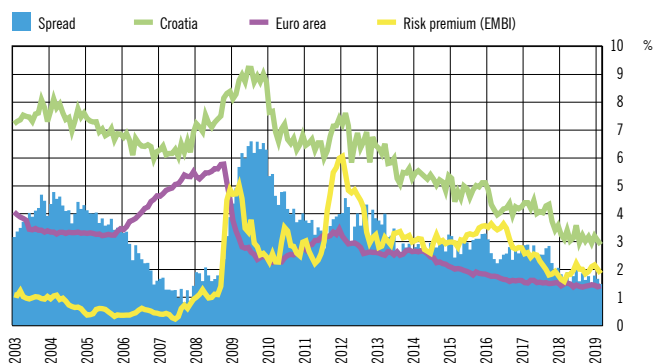
Figure 5.9 As distinct from in the euro area, interest rates on long-term corporate loans in Croatia continued to decrease



Sources: ECB, Bloomberg and CNB.

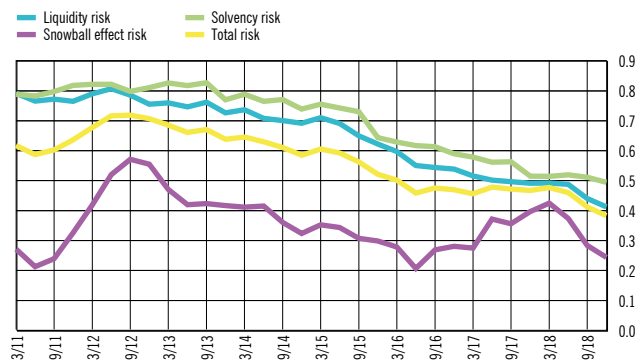
by 13% and 2% respectively. However, the non-financial corporate sector's currency risk remained almost unchanged because private corporations at the same time increased their exposure in foreign currency with domestic creditors. If analysed by activity (Figure 5.7), the largest contribution to the reduced total currency exposure came from corporations that regularly generate low export revenues, i.e. enterprises in the trade, real estate and construction activities. The enterprises in these activities were the ones that also contributed to the major decrease in kuna exposure of the whole sector, due to which the share of debt in foreign currencies in total debt of the activity did not change significantly. However, due to the low share of export revenues of such corporations, the currency risk of the activity of trade and real estate and construction decreased moderately. By contrast, although enterprises in the activity of tourism were the only ones that at the same time increased their exposure in both domestic and foreign currencies in the previous year, this was not

Figure 5.10 Interest rates on short-term corporate loans in Croatia and in the euro area held steady in the major part of 2018



Sources: ECB, Bloomberg and CNB.

Figure 5.11 Improved business performance and lower costs of interest payments reduce the debt repayment burden and overall riskiness



Notes: Vulnerability indicators of the non-financial corporate sector. The vulnerability of the non-financial corporate sector was estimated by three indicators. The liquidity risk indicator was calculated as the ratio of the total debt amount and interest payments of the sector to gross operating surplus (GOS), i.e.:

$$LR_t = 0.5 \cdot \frac{\text{Debt}_t}{\text{GOS}_t} + 0.5 \cdot \frac{\text{Interest payments}_t}{\text{GOS}_t}$$

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

$$SR_t = \frac{\text{Debt}_t}{\text{Equity}_t}$$

The snowball effect indicator is based on the ratio of debt servicing burden $b_{t-1} = \text{debt}_{t-1} / \text{GOS}_{t-1}$, adjusted by implicit interest rates i_t and growth rates of gross operating surplus g_t :

$$SNR_t = \frac{i_t - g_t}{1 + g_t} b_{t-1}$$

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

$$TR_t = \frac{LR_t + SR_t + SNR_t}{3}$$

Sources: CNB and FINA.

ultimately reflected significantly in their currency risk, because of the preponderantly foreign exchange structure of revenues. The currency risk exposure of enterprises engaged in other activities remained mostly unchanged.

The exposure of the non-financial corporate sector to interest rate risk continued to decrease in 2018, but it was still pronounced. The share of loans with a fixed interest rate increased by 3 percentage points in 2018, at a considerably lower intensity than in the previous several years (from the end of 2015), when the increase of this share was up to 10 percentage points per year. Such developments in the previous year were mostly driven by the sale of claims, since, as a rule, the sold claims were older, and accordingly more frequently at variable interest rates. The structure of new corporate financing, where almost a half of newly-granted corporate loans from domestic credit institutions were granted at a fixed interest rate, also contributed to the growth of the share of loans at a fixed interest rate. However, despite the reduced interest rate risk in 2018, the share of loans granted at a variable interest rate in total balances at the end of the previous year stood at a high 60% (Figure 5.8).

Short-term interest rates of domestic banks stagnated during the whole of 2018 at the levels from the end of 2017, while long-term interest rates in the second half of the year dropped to historically low levels. Thus, the price of short-term corporate financing in 2018 stood at an average level of 3.1%, while the price of long-term financing for the first time dropped to levels below 3% (on average 2.9% in the second half of 2018). It is worth noting that the mentioned prices of financing were significantly lower in the previous year than the average for 2017, by 0.90 percentage points (short-term) and 0.65 percentage points (long-term). The favourable movements in interest rates to corporations were mainly driven by the high liquidity of banks, as well as the strengthening of competition among banks (according to the Bank lending survey). However, the country's relatively high risk premium increased moderately in 2018 (by 36 basis points), which is probably one of the factors that limit room for a stronger decrease in the price of corporate financing. Parallel with the above movements of interest rates in Croatia, their downward trend continued in the euro area in corporate financing with shorter maturity (to 1.43% in December 2018), while long-term interest rates held steady throughout 2018 (averaging 1.80%). In such conditions, the spread between interest rates on corporate loans in Croatia and in the euro area narrowed only slightly in 2018, but it was significantly lower than in 2017 (Figures 5.9 and 5.10).

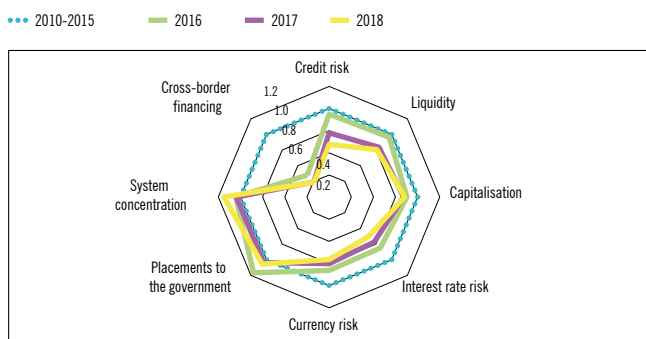
The total vulnerability of the non-financial corporate sector continued to decrease in 2018 (Figure 5.11). Liquidity risk was reduced due to lower interest payments and the simultaneous growth of gross operating surplus (the measure of corporate earnings). At the same time, the stagnation of debt, under the assumption of unchanged capital and reserves, led to a stable solvency risk indicator. After the volatile movements in 2016 and 2017, and thanks to the mentioned growth of gross operating surplus and stable debt of the non-financial corporate sector, the snowball-effect risk decreased. Such movements of the individual indicators had an effect on the continued decrease in the total indicator of the non-financial corporate sector vulnerability.

Key risks linked to the non-financial corporate sector

Despite the decrease in interest rate and currency risks, the still present relatively unfavourable currency and interest rate structure of total debt led to the persistence at a moderate level of the structural risks of the non-financial corporate sector. The reduced debt repayment burden and growth in non-financial corporate earnings had a positive effect on reducing the risks to the sector. However, by contrast, unfavourable demographic trends in the form of the decline in the qualified labour force could limit positive business performances of corporations in the subsequent period.

6 Banking sector¹¹

Figure 6.1 Banks' risk exposure continued to decrease with capital and liquidity surpluses maintained at high levels^a



^a All the indicators were scaled as indices, with an average indicator value for the 2010 to 2015 period amounting to 1. The following indicators are shown: credit risk (the NPLR), cross-border financing (the share of liabilities to non-residents in total liabilities), the banking system concentration (the HHI index of total assets), placements to the government (the share of government loans and securities in total assets), currency risk (the share of foreign currency assets in total assets), interest rate risk (the share of loans with a fixed interest rate in total loans), liquidity (the share of cash and deposits in total assets) and capitalisation (the total capital ratio).
 Note: A higher indicator value signifies an increase in risk or, in the case of liquidity and capitalisation indicators, a decrease in capital and liquidity buffers.
 Source: CNB.

Following several years of contraction and stagnation, the banking sector registered a stronger growth of credit activity in 2018. The decline in bank exposure to certain systemic risks also continued (currency-induced and interest rate-induced credit risk) and was accompanied with conservation of relatively high capital and liquidity surpluses and stable profitability. Credit portfolio quality continued to improve under the influence of banks cleaning their balance sheets of bad placements, as well as favourable developments in the macroeconomic environment. However, risks arising from increasing market concentration or the nexus between the financial system and the central government continue to be present, with new risks surfacing in relation to the increased lending to the household sector via general-purpose cash loans. Ultimately, banking system resilience was maintained at a relatively high level in 2018 (Figure 6.1).

Short-term trends

Banking system assets grew more noticeably in 2018, for the first time since 2011. Following several years of contraction and relatively slow growth in 2017, the growth of banking system assets accelerated in 2018 to 4.4% on an annual level (Figure 6.2), primarily reflecting a broad-based credit growth. The acceleration to 4.6% per annum (transaction-based) was to the

¹¹ The data used in this chapter refer exclusively to banks and savings banks on an unconsolidated basis and do not include branches.

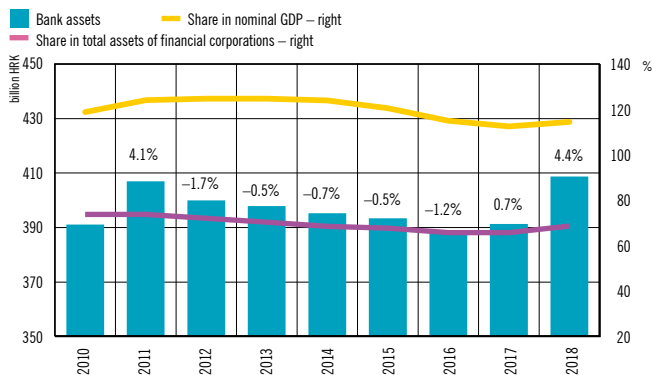
greatest extent a result of loans to the household sector (Figure 6.4), among which most prominent were general-purpose cash loans, growing at 11.9% on an annual level. Despite the fact that general-purpose cash loans are mostly granted in domestic currency at a fixed interest rate, more relaxed creditworthiness assessment standards (than in the case of housing loans) and especially the strong growth of non-collateralised general-purpose loans and of those with initial maturities of ten or more years may in the future lead to increased bank losses, as well as weaker consumer spending (see chapter 3 Household sector and [Macprudential Diagnostics, No. 7, Box 1](#)). These risks prompted the CNB to adopt the [Recommendation on actions in granting non-housing consumer loans](#) (see chapter 8 Macprudential policy instruments). Loans to the non-financial corporate sector also positively contributed to credit growth, particularly loans to corporations providing accommodation and food services (services associated with tourism) (see more in chapter 5 Non-financial corporate sector). Total lending to private non-financial sector (households and non-financial corporations) accelerated from 3.1% in 2017 to 4.4% in 2018 on an annual level (transaction-based), when these loans made up 45% of total bank assets (Figure 6.3).

In 2018, bank lending activity was predominantly directed towards the household sector, with banks granting general-purpose cash loans with higher interest rates, while lending to non-financial corporations was less pronounced (Figures 6.5 and 6.6). In lending to non-financial corporations banks are predominantly granting loans to large corporations¹², especially focusing on large loans (the over HRK 7.5m category). In a review of the relative riskiness of these loan categories, approximated by the observed shares of non-performing loans in total loans, the household sector reflects the poorer credit quality of non-housing loans in relation to housing loans, while in the non-financial corporate sector the quality of loans is proportional to the size of the corporation (Figure 6.7). Interest rates are quite different for different categories of loans to the household in comparison to the non-financial corporate sector. This is probably a result of the greater demand for the mentioned general-purpose cash loans but probably also of the difference in the collateralisation of such loans. An additional risk in relation to lending to households comes from the fact that Croatian Credit Information Registry (HROK) ceased operating on 21 May 2018, which makes it significantly more difficult for banks to assess the actual overall debt of consumers and thus accurately estimate their debt servicing ability.

Given the continued sale of non-performing placements, the non-financial corporate sector's deleveraging abroad and the continuation of economic growth, the overall credit activity has not yet generated risks related to excessive credit growth (Figure 6.8) that would require additional capital buffers. This was

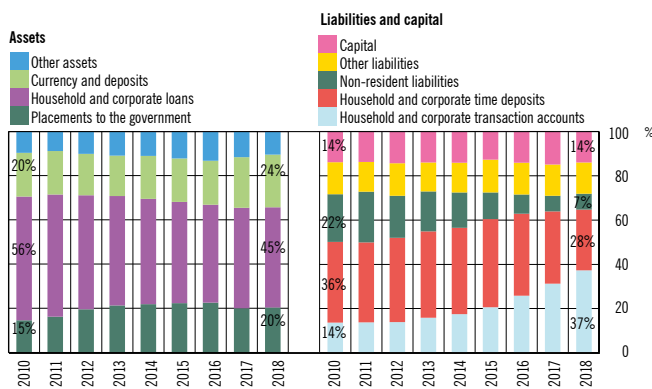
¹² Loan classification by size in accordance with the official definition of the European Commission ([link](#)). Large enterprises are those enterprises that meet two out of the following three criteria: over 250 employees, annual turnover over EUR 50m or annual balance sheet exceeding EUR 43m.

Figure 6.2 Bank assets grew under the influence of increased credit activity in 2018



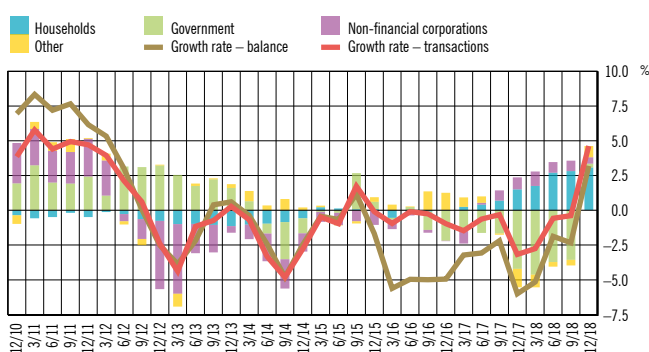
Note: This shows the annual rate of change in total net assets.
Source: CNB.

Figure 6.3 The strong growth of transaction accounts' funds in the balance sheet continued



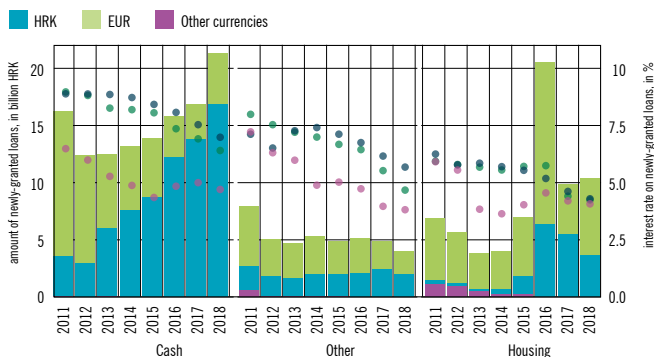
Note: The figures show the shares of individual items in bank balance sheets.
Source: CNB.

Figure 6.4 Household sector contributed the most to 2018 credit growth



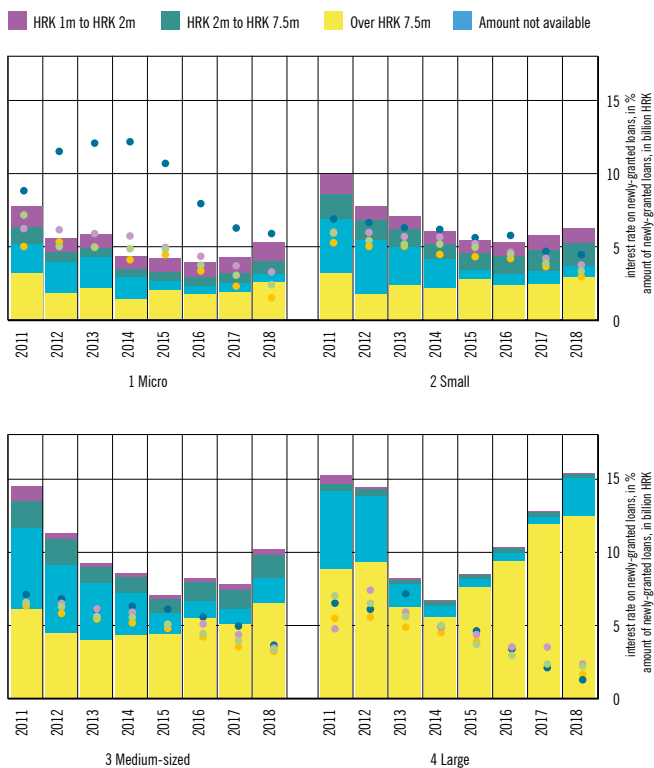
Note: The columns denote the contributions of individual sectors to the annual growth rate of bank loans based on transactions.
Source: CNB.

Figure 6.5 Lending to households dominated by general-purpose cash loans



Notes: The analysis excludes revolving loans, overdraft facilities and credit cards. The columns denote the amounts of newly-granted loans in HRK billion, while dots denote interest rates on these loans.
Source: CNB.

Figure 6.6 Corporate loans were focused on large loans to large enterprises despite the relatively lower interest rate on these loans



Notes: The structure of newly-granted long-term loans to the non-financial corporate sector by the size of enterprise and loan. The columns denote the amounts of newly-granted loans in HRK billion, while dots denote interest rates on loans.
Source: CNB.

also confirmed by an assessment of the reference indicator for the required level of countercyclical capital buffer, which was therefore kept at 0% for another year (see chapter 8 Macroprudential policy instruments).

On the liabilities side, resident deposits registered a substantial growth (6.5% on an annual level), the highest in the period after 2010. This growth is fully driven by the record upsurge in funds on transactions and savings accounts, which grew by 24.5% in 2018 to make up 49.4% of total bank liabilities at the end of December 2018 (Figure 6.9). The increase in funds on banks' transaction accounts is associated with very low interest rates on international financial markets and the introduction of tax on interest income from savings deposits¹³ in 2015, which reduced depositors' propensity to deposit their surplus funds. At the same time, bank reliance on cross-border financing remained at a record low of 7.1% of total liabilities. Such trends make the sources of bank funding less dependent on non-residents, but give rise to maturity mismatch between loans and deposits (Figure 6.10), concurrently increasing interest rate risk, liquidity outflow risk, and, due to their currency structure, banks' currency risk.

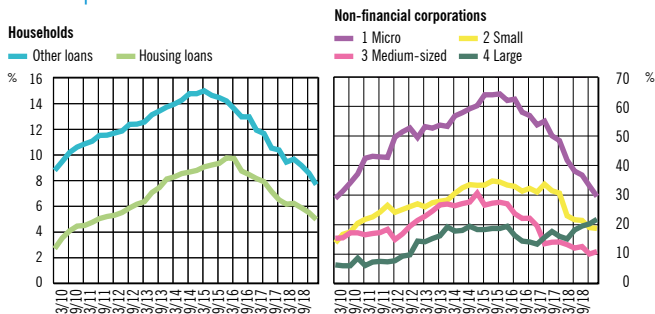
Banks' financing conditions continued to improve in 2018 and interest rates on kuna and foreign currency time deposits hit new historical lows of 0.9% and 0.5% respectively at the end of the year (Figure 6.11). Moreover, the trend of uninterrupted increase in the share of transaction and savings accounts in total bank liabilities mitigated the effect of reduced interest income on profitability since banks pay low interests on funds in transaction accounts. However, banks' overreliance on funds in transaction and savings accounts would also expose them to a considerable interest rate risk should interest rates rise due to clients increasingly opting for depositing these funds with longer maturities and at higher interest rates.

Systemic risks

The high concentration of the banking system and its continued growth constitute a significant structural vulnerability for the banking system (Figure 6.12). The number of banks additionally decreased in 2018, by three banks, so the year ended with 21 operating banks. The HHI market concentration index of the system substantially increased in the last quarter due to the merger of two O-SIIs (Figure 6.12) so at the end of December 2018 the market share of the five largest banks stood at 81.4%. Market concentration has been recognised as a significant structural vulnerability for the banking system, as in a highly concentrated system certain, initially non-systemic, risk may turn faster and stronger into a systemic risk via spillover and contagion channels and, under extreme conditions, result in financial instability (for more details on the system concentration as systemic risk see in [Macroprudential Diagnostics, No. 6, Box 1](#)). Therefore, this system characteristic is taken into

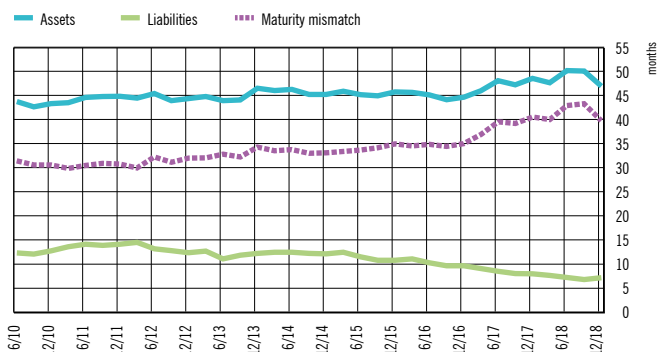
13 The Act on Amendments to the Income Tax Act (OG 143/2014).

Figure 6.7 Credit quality differs by the type of loan to the household sector and size of enterprise for loans to non-financial corporations*



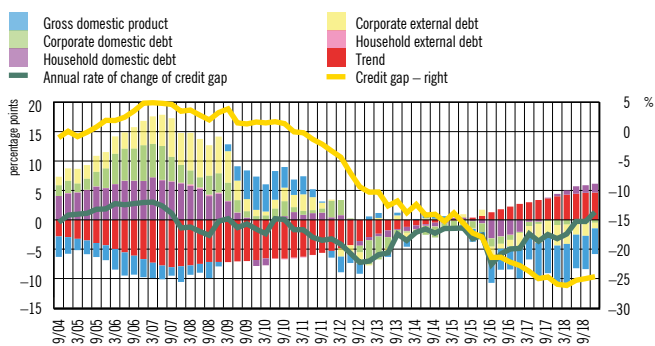
* The growth of the share of non-performing loans in total loans in the sector of large enterprises in the period after 2015 is primarily linked with operating problems in two large groups.
 Note: The figure shows shares of non-performing loans in total loans.
 Source: CNB.

Figure 6.10 Shortening of the maturity of liabilities increases the maturity mismatch between bank assets and liabilities



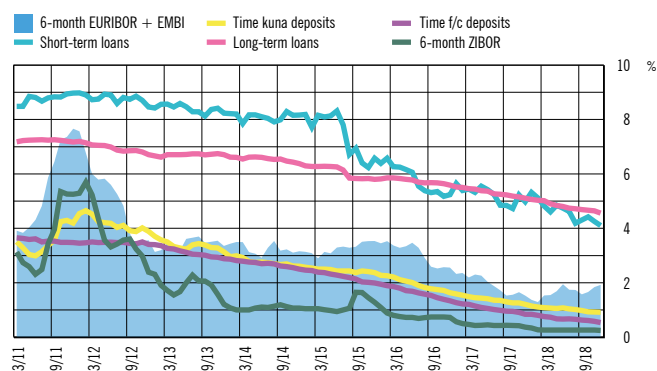
Note: The maturity of listed items is shown in accordance with the principle of remaining maturity of assets and liabilities.
 Source: CNB.

Figure 6.8 Continued absence of excessive growth



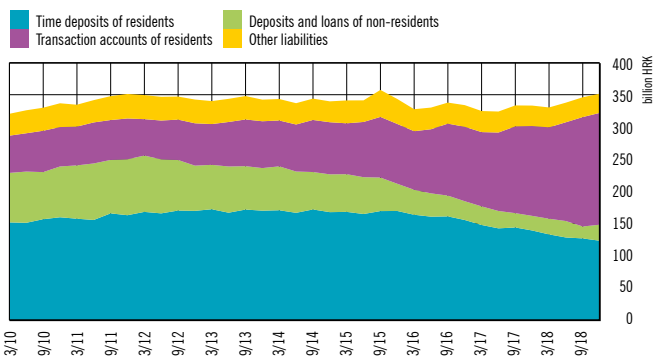
Notes: The figure shows the decomposition of the annual change of the recursive standardised indicator of short-term divergence of relative indebtedness of the household and non-financial corporate sectors (the ratio of loans to gross domestic product) from its long-term trends. For more details on methodology, please refer to following [address](#).
 Sources: CBS and CNB.

Figure 6.11 Continued decline in lending and deposit interest rates



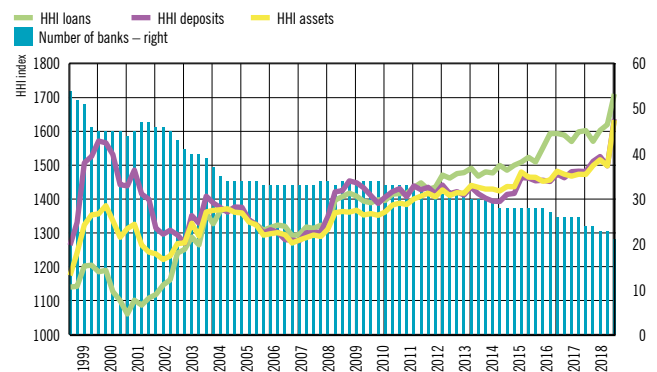
Note: The interest rates on loans and deposits refer to the outstanding amounts of observed items.
 Sources: CNB and Bloomberg.

Figure 6.9 Continued substitution of cross-border funding sources by residents' sight deposits in bank liabilities



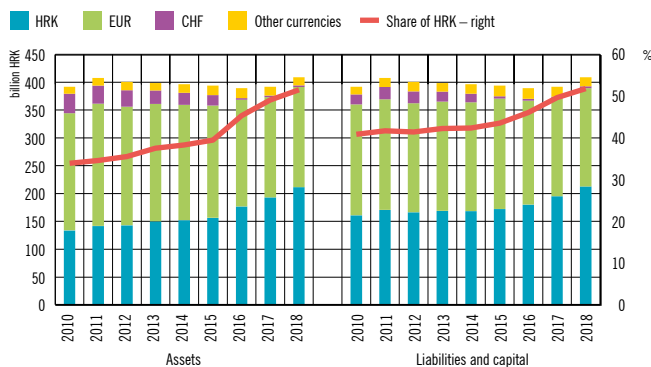
Source: CNB.

Figure 6.12 Banking system concentration increased considerably due to the merger of two systemically important banks



Note: The concentration of items observed is shown by the HHI concentration index.
 Source: CNB.

Figure 6.13 The kuna share exceeds 50% on both sides of bank balance sheets in 2018



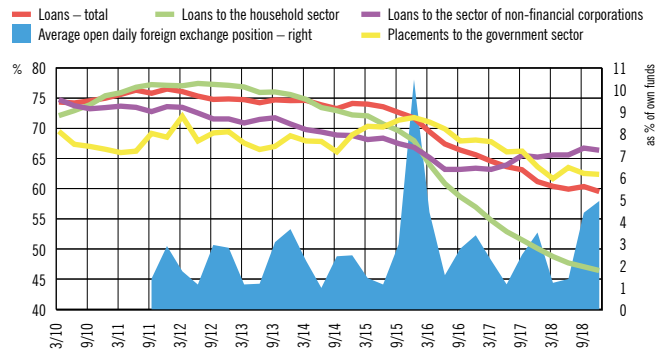
Note: The columns denote the currency structure of banks' liabilities and capital and assets.
Source: CNB.

account in the calibration of the systemic risk buffer (see chapter 8 Macroprudential policy instruments).

The share of foreign currencies in the currency structure of bank assets continued to decrease, which reduced the currency-induced credit risk. Preconditions for an upswing in kuna lending exist on both the demand and the supply sides. Specifically, as funds in current accounts are mostly kuna-denominated, the share of banks' kuna funding additionally grew to account for 51.7% of total bank liabilities at the end of 2018 (Figure 6.13). The increase in kuna sources contributed to the lowering of interest rates on kuna loans i.e. to the decrease in the spread between interest rates on loans in kuna and in euro, which, paired with the negative experience regarding loans indexed to the Swiss franc, increased demand for loans in kuna. On the other hand, the CNB's expansive monetary policy measures and increased competition among banks motivated banks to expand their offer of kuna loans. This continued the substitution of kuna loans for foreign currency loans, which resulted in the reduction of the banks' exposure to currency-induced credit risk. In 2018, the share of foreign currency loans to households and foreign currency placements to the government sector in total loans continued decreasing, while in the non-financial corporate sector it slightly increased (see chapter 5 Non-financial corporate sector). Accordingly, the share of foreign currency loans in total bank loans at the end of 2018 amounted to 59.5% which is 15.5 percentage points lower than at the end of 2010 (Figure 6.14).

Although recent trends in the currency structure have positively contributed to the reduction of bank and client exposure to currency risk, the continuation of such trends will largely depend on depositors' preferences. Namely, although the CNB may offer banks access to longer-term sources of kuna liquidity through structural repo operations, the change in the level of loan euroisation in the system primarily depends on the propensity to save in the domestic currency. Higher currency risk for banks is associated with new foreign currency housing loans given that the [Act on Consumer Housing Loans](#)

Figure 6.14 Banks' exposure to currency-induced credit risk continued to reduce, particularly with regard to households



Note: The lines mark banks' exposures to currency-induced credit risk, which is measured by the share of foreign currency loans in total loans, with placements to the government sector shown.
Source: CNB.

(OG 101/2017) enables bank clients to take advantage of a one-off conversion of housing loans indexed to foreign currency into kuna loans, for all loans contracted after the entry into force of this Act.

In the recent period, banks' clients indicated weaker interest rate risk appetite, which is manifested in the increasing share of loans with fixed interest rates, at least in the initial phase of the loan repayment period. The share of loans with variable interest rates in total bank loans thus decreased to 61% at the end of 2018, which is a decrease of 29 percentage points from the end of 2010 (Figure 6.15). This is an indication that clients' previous negative experiences have made them more active in managing their currency and interest rate risks in the recent period. CNB activities aimed at increasing transparency and reducing the information gap in the loan market have undoubtedly made a major positive contribution to these trends¹⁴.

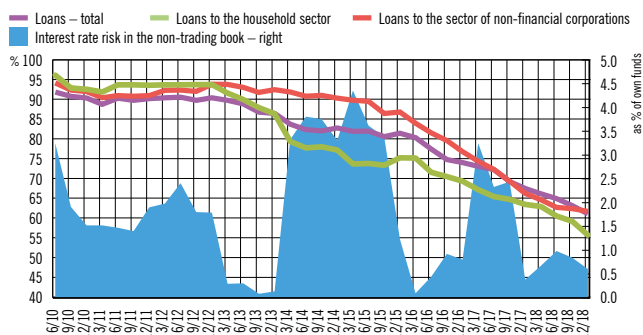
Direct bank exposure to interest rate risk measured by the interest rate risk in the non-trading book, was at an exceptionally low level at the end of 2018 (below 1% of own funds¹⁵, Figure 6.15). However, although it is currently very low, should there be an increase in interest rates in the medium term, direct interest rate risk in banks' non-trading books could rise, linked to a decrease in the interest rate risk for banks' clients.

Banks' exposures to the government remain at high levels. Placements to the government in total bank assets remained at

14 Information list with the offer of loans to consumers and the Decision on the content of and the form in which consumers are provided information prior to contracting banking services (OG130/2012). In September 2017, the CNB adopted the [Recommendation to mitigate interest rate and interest rate-induced credit risk in long-term consumer loans](#), recommending banks to expand their offer of loans by introducing loans with a fixed interest rate, while reducing accompanying costs for consumers to the minimum.

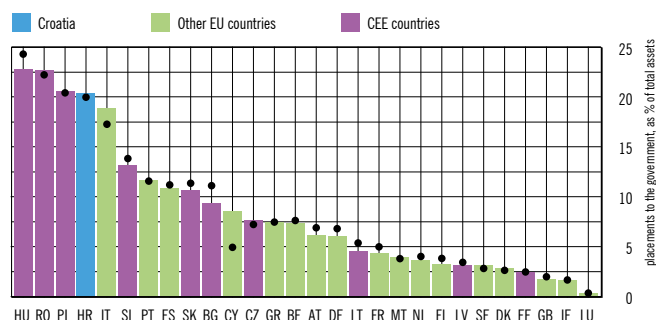
15 Pursuant to the Credit Institutions Act (OG 159/2013), where a credit institution's interest rate risk in the non-trading book exceeds 20% of its own funds, the CNB is obliged to impose supervisory measures on that credit institution.

Figure 6.15 Continued decrease in banks' exposure to interest rate-induced credit risk



Note: The lines mark banks' exposure to interest rate-induced credit risk, which is measured by the share of loans with variable interest rate in total loans.
Source: CNB.

Figure 6.16 Croatia's banking system among those with the greatest government exposures in the EU



Notes: The height of the columns denotes the share of placements to domestic general government in total banks' assets at the end of 2018, while bullets indicate this share at the end of 2017. This indicates the latest available data for Croatia as at the end of December 2018, while data shown for other countries are data as at the end of September 2018.
Sources: CNB and ECB.

a high 20.4% in 2018 (see chapter 2 Government sector, Figure 6.16). This is precisely why the relatively high concentration of banking system exposure is predominantly under the influence of bank exposure to a group of connected persons made up of the central government and persons connected with it. The weakening of this connection was not significantly affected by the cancellation of the preferential regulatory treatment of exposures to central governments and central banks (CGCB) denominated and funded in the currency of another EU member state (Figure 6.24) or the (gradual) termination of their exemption from the limitation of large exposures (see *Financial Stability, No. 19*, chapter 6 Banking sector).¹⁶

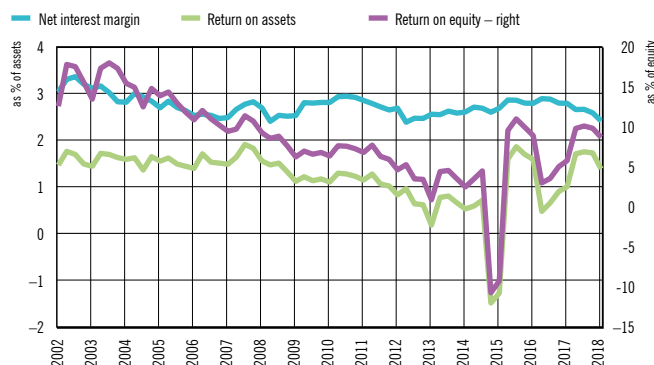
¹⁶ Banks will apply 50% of the risk weight established for CGCB denominated and funded in the currency of another EU member state in 2019, while the full amount of the risk weight established based on credit rating will be applied already in 2020. At the same time, CGCB exposures in domestic currency will continue to be treated as risk-free exposures.

Although in the post-crisis period it stabilised bank earnings, the business model that was based on financing the government added to interconnectedness between the banking system and the government, and consequently increased the strength of potential systemic disturbances. Namely, accumulating imbalances in public finances can negatively affect the fiscal sustainability of a country and the stability of a banking system by influencing the entire economy and indirectly banks, but also directly by exposing banks to a more substantial concentration of credit and market risks (due to investments in government securities). Although it is noteworthy that Croatia's fiscal position has been improving in the past few years and that risks of possible disturbances in the government sector are decreasing (see Box 2 Aggregate index of fiscal risk), if they materialised, they would have a substantial influence on financial system precisely due to their close connection.

Profitability

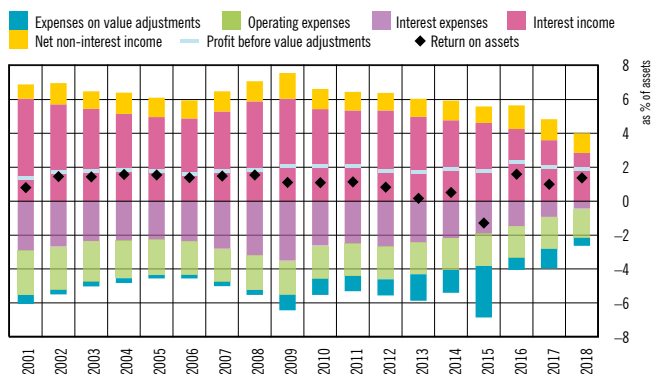
Following increased losses of 2017, which had to do with the materialisation of the credit risk at the Agrokor Group, bank profitability recovered in 2018. Banks' pre-tax profits stood at HRK 5.7bn in 2018, positively contributing to their capacities to cover contingent losses. As in the previous years, bank earnings were primarily determined by movements in charges for value adjustments and provisions (Figure 6.18), which were only 0.5% of assets, their lowest level since 2007. Interest income and interest expenses were also at their lowest levels (2.8% and 0.4% of assets respectively), due to the declining trend in interest rates but also the increasing share of funds in transaction accounts in bank liabilities. In 2018, interest income decreased at a faster pace than interest expenses, which resulted in the reduction of the interest margin by 0.4 percentage points to 2.4% at the end of December 2018 (Figure 6.17). Ultimately, the ROA and ROE of banks were slightly

Figure 6.17 Bank profitability recovers in 2018 despite decreased interest rate margin



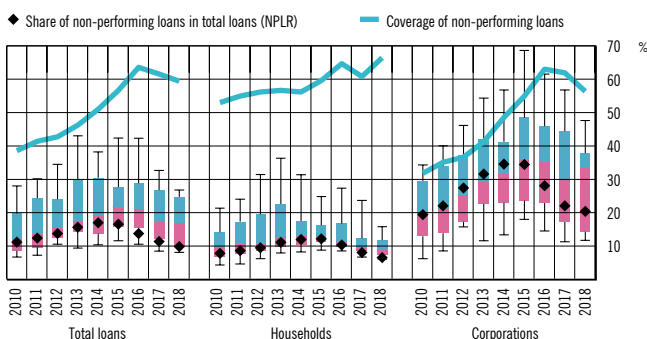
Note: Interest rate margin denotes the ratio of net interest income to total bank assets.
Source: CNB.

Figure 6.18 The greatest contribution to recovery in profitability in 2018 came from decreased charges for value adjustments



Source: CNB.

Figure 6.19 Loan portfolio quality improved in the majority of banks in the system



Note: The NPLR distribution by banks is shown by a box plot presenting the 10th, 25th, 50th, 75th and the 90th percentile. Source: CNB.

higher in 2018 than in the previous year, amounting to 1.4% and 8.7% respectively (Figure 6.17). The said profitability levels were achieved at exceptionally low interest expenses and charges for value adjustments, which leaves banks with exceptionally limited room for additional profitability increase, especially if the rising trend in lending continues, accompanied by a further decrease in interest rates on newly-granted loans. In addition, the profitability of some banks in the upcoming period may be negatively affected by increased expenses on provisions for litigation costs in case of a greater volume of individual law suits inspired by case law in connection with contracted interest rate.

Credit risk

The process in which banks' balance sheets were cleaned up primarily through the sale of non-performing placements was the main reason for the improvement in the quality of the banks' credit portfolios. The ratio of non-performing loans

to total loans (NPLR) stood at 9.8% at the end of 2018, down by 6.8 percentage points from the end of 2015 (Figure 6.20). The coverage of non-performing loans decreased under the influence of the sale of non-performing loans with above-average coverage, as well as the entry of certain new non-performing loans with below-average coverage. Nevertheless, the coverage of non-performing loans amounted to a still relatively high 59.4% at the end of 2018.

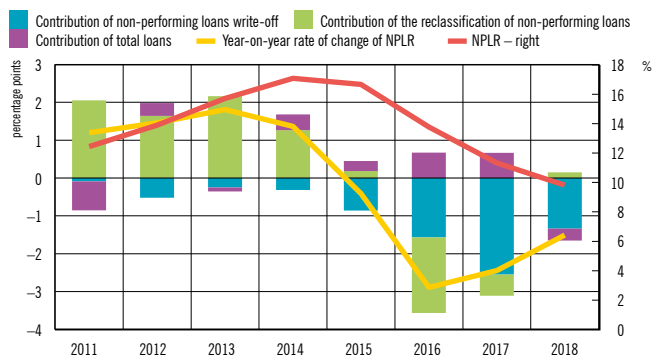
However, if one excludes the effect of write-offs of non-performing loans, predominantly resulting from the increased sale of such loans, the ratio of non-performing loans to total loans (NPLR) increased in 2018 (Figure 6.20). This increase was primarily a consequence of regulatory changes, i.e. of the provisions of the new subordinate legislation on the classification of exposures, in force since early 2018¹⁷. Credit portfolio quality improvement was noticed in all banks, as demonstrated by the lowering of the overall distribution of this indicator (Figure 6.19). This trend is also evident individually in the household and corporate sectors. In the end, loan quality in Croatia at the end of 2018 was still relatively below the EU average (higher NPLR). However, considering the above-average coverage of non-performing loans in Croatia, their pressure on own funds is moderate and comparable with that in other CEE countries with lower rates of non-performing loans to total loans (Figure 6.21). The ratio of net non-performing loans to own funds of banks in Croatia stood at 18.9% at end of the year, which is a decrease of 20 percentage points from the end of 2015 (Figure 6.23).

Future trends in non-performing bank placements will primarily depend on the dynamics of the sale of such placements, as well as on the duration of economic expansion. In addition, it is noteworthy that the application of the International Financial Reporting Standard 9 Financial Instruments, which credit institutions in the RC started as of 1 January 2018, should ensure timely recognition of expected losses even earlier because under this standard the expected credit losses are recognised in the amount in which they are expected, even before they actually occur (the so-called expected loss model)¹⁸. The application of this standard raised the coverage of exposures classified into risk category A by value impairments and provisions in 2018 from 0.79% to 0.89%, with this coverage for risk category A1 ending the year at 0.60% and for risk category A2 at 5.05%.

17 An important influence on the non-financial corporate sector was the obligation of classification of exposures to clients in default into risk categories B or C, while the household sector was under the greatest influence of the introduction of the pulling effect. More information may be found in the [Decision on the classification of exposures into risk categories and the method of determining credit losses \(OG 114/2017\)](#).

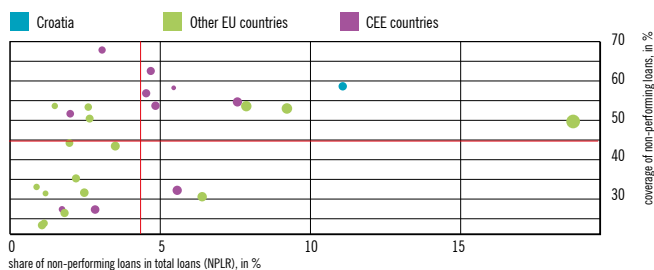
18 In contrast with IFRS 9, the so far existing International Accounting Standard 39 (IAS 39) provided for the recognition of credit loss by credit institutions only when value impairment was clearly evident.

Figure 6.20 Improvement of loan quality primarily due to the sale of non-performing loans



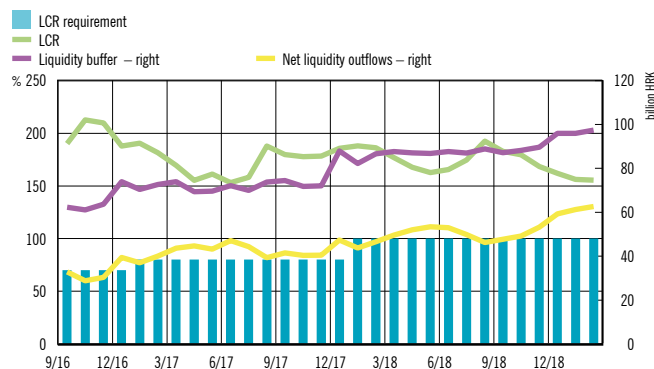
Note: A positive contribution of the reclassification of non-performing loans marks the deterioration of the credit portfolio quality and vice versa.
Source: CNB.

Figure 6.21 Although credit quality in Croatia is relatively poorer than the EU average, the pressure on capital was moderate at the end of 2018



Notes: This indicates the latest available data for Croatia as at the end of December 2018, while data shown for other countries are data as at the end of September 2018. The vertical and the horizontal line mark the average EU values, while the size of the dot of the data denotes the ratio of net non-performing loans to banks' own funds. For more clarity, the overview excludes Greece, whose share of non-performing loans in total loans at the end of September 2018 was much higher than in the rest of the EU (39.4%).
Sources: ECB and CNB.

Figure 6.22 Liquidity coverage ratio (LCR) considerably above the regulatory minimum



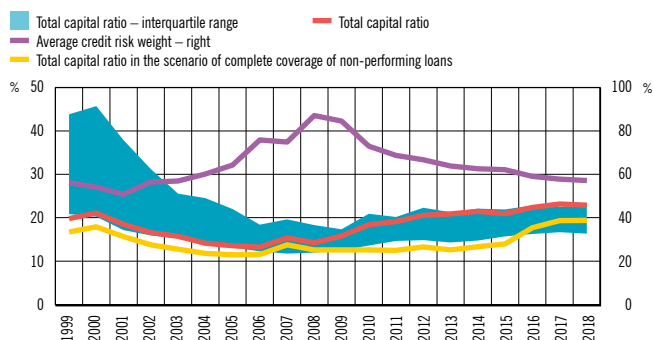
Source: CNB.

Liquidity and capitalisation

System liquidity remains ample, accounting for a historical high of 7% of total assets (see Figure 1.11 in chapter 1 Macroeconomic environment). Ample system liquidity is also demonstrated by the fact that no turnover was registered in the interbank market in the period from July 2018 to March 2019. Throughout 2018, the liquidity coverage ratio (LCR)¹⁹ of the system remained much above the regulatory minimum, which became fully applied in 2018 and totalled 100% (Figure 6.22). Despite the shortening of the maturities of funding sources, the LCR thus remained at an average of 175.6% in 2018.

Capital adequacy indicators of banks remain high, and the total capital ratio of banks stood at 22.9% at the end of 2018 (Figure 6.23). Total capital ratio of banks decreased

Figure 6.23 Capital adequacy remains high in 2018

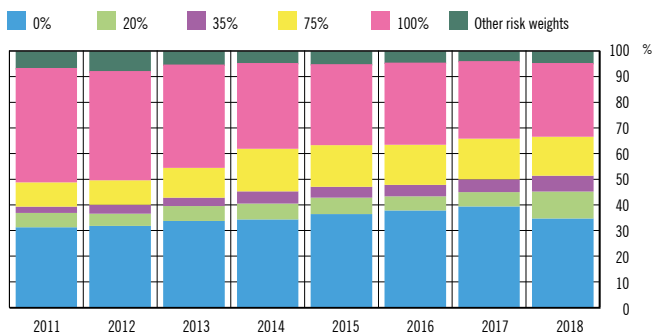


Note: In the scenario of complete coverage of non-performing loans the total capital ratio of banks is assessed by subtracting the amount of net non-performing loans from capital (numerator of the ratio) and risk-weighted assets (denominator of the ratio), i.e. under the explicit assumption that the average risk weight of all non-performing loans equals 100%.
Source: CNB.

by 0.3 percentage points in 2018, primarily under the influence of the HRK 7.5bn increase in total risk exposure, while own funds grew by HRK 1.1bn. Although the overall amount of the risk-weighted assets increased in 2018, the average risk weight decreased by 0.6 percentage points as a result of the stronger growth in bank assets, amounting to 57.2% at the end of the year, which was the lowest level recorded since 2003 (Figure 6.23). Because of the cancellation of the preferential treatment for a portion of CGCB exposures in the structure of exposures of banks that use the standardised approach to calculate risk-weighted exposure amounts there was a substantial rise of the share of exposures subject to a risk weight of 20% (Figure 6.24). In the transition period until 2020, the treatment

¹⁹ One of the important reforms of the EU regulatory framework on capital requirements, aimed at ensuring a higher level of banking system resilience, is the introduction of the liquidity coverage requirement. Banks are obliged to maintain a liquidity buffer covering potential differences between liquidity inflows and outflows during a 30-day stressed period.

Figure 6.24 The share of exposures subject to a risk weight of 20% increased in 2018 because of the cancellation of the preferential treatment for CGCB exposures



Note: The figure shows the structure of bank exposures weighted by credit risk weights under the standardised approach. Source: CNB.

of CGCB exposures denominated in the currency of another member state will be gradually²⁰ adjusted with risk established according to their credit rating assigned by recognised external credit assessment institutions (ECAIs)²¹. Therefore, the trend of risk-weighted assets for respective exposures is greatly reliant on the RC regaining its investment grade credit rating be-

cause this would lead to the reduction in the mentioned full risk-weight from 100% to 50%.²²

Risks associated with the banking sector

Resident deposits grew strongly in 2018, predominantly due to the growth of funds in transaction accounts of bank clients. Although this helped banks to reduce their dependence on cross-border sources of funds substantially, there was a consequent increase in the risk of maturity transformation arising from the shortening of maturity of liabilities. Banks' exposure to currency-induced and interest rate-induced credit risk continued to decrease, although it remained high. In addition, the system continued to register structural weaknesses associated with high and rising market concentration and a strong connection with the central government. Some banks remain exposed to legal risk arising from uncertainty as regards the outcome of individual law-suits. Capital buffers that enable banks to absorb potential shocks, such as profitability, liquidity and capitalisation, gained additional strength in 2018, making system resilience even stronger than before.

²⁰ The risk weight of 20% established based on the credit rating was applied in 2018, the risk weight of 50% is applied in 2019, while the full application of the risk weight established based on the credit rating will begin as of 2020.

²¹ Banks which apply the IRB approach to calculate risk-weighted exposure amounts, use internal rating systems to assess risks.

²² With the return to investment grade, in 2019 these exposures will be subject to the risk-weight not exceeding 25%, and in 2020 not exceeding 50%.

7 Stress testing of credit institutions

The importance of classic stress testing at a credit institution lies primarily in the fact that this specific macroprudential tool helps regulators assess the current ability of credit institutions to withstand unexpected losses after the materialisation of systemic risks. Such information enables the formulation of policies aimed at ensuring more than just the mere business continuity of individual banks for it also endeavours to ensure sufficient system capacity for the uninterrupted provision of financial intermediation services in such stress conditions, consequently limiting their duration and contributing to faster economic recovery

Despite the costs associated with the conversion of loans indexed to the Swiss franc and the crisis in the Agrokor Group, favourable macroeconomic developments and the clean-up of the banks' balance sheets in the past few years have strengthened their loss absorption capacities. Therefore, not even an unlikely scenario of a big global crisis, amid the existing domestic vulnerabilities, would deplete the accumulated capital and liquidity buffers. However, diversification of sensitivity among credit institutions to such blows increased, when compared to last year's testing results.

Initial simulation conditions

a) Macroeconomic developments

Global economic growth is slowing down gradually, reflecting political uncertainties and trade tensions, while the decline in new orders in industry in many countries points to a widespread weakening of aggregate demand. China's economic growth is slowing down, influenced by lower growth rates of gross fixed capital formation and slower export growth, two major propellants of Chinese growth in the last ten years. In early 2019, Chinese authorities adopted a set of new measures of expansionary fiscal policy (greater government investment in infrastructural projects and tax reduction) and monetary policy (reduction of reserve requirements). However, the continuation of the trade war between China and the USA might lead to new negative effects on growth, with a slowdown in the economic activities of the emerging market economies. Such trends might be reflected in company profit and diminish room for new investments that could boost the economy. In addition, the countries of the European Union are also exposed to negative risks found in

the European environment, particularly those associated with Brexit, fiscal uncertainty in Italy and a general strengthening of populism on the European political scene. These negative trends are taking place at a time of limited capabilities of monetary policy easing, with respect to some of the globally important economies in view of low levels of benchmark interest rates and balance sheets of central banks²³, and limited public consumption impulses due to a high level of accumulated debt.

b) State of the domestic banking system

Favourable macroeconomic developments amid relatively extensive efforts of banks to clean up their balance sheets of non-performing placements strengthened banks' loss absorption capacities in the past few years, despite significant costs associated with the conversion of loans indexed to the Swiss franc and the crisis at the Agrokor Group. Even though in 2018 rising risk exposure (partly attributable to new lending) and losses associated with the initial application of International Financial Reporting Standard 9 – *Financial Instruments* (IFRS 9), directly recorded in equity, led to an absence of any significant strengthening of capital and liquidity positions, the banking system is at the beginning of the stress conditions simulation horizon highly liquid and well-capitalised.

Last year's stress testing of credit institutions (Financial Stability No 19) revealed growing differences in the sensitivity of their capital positions to stress. Since then, the number of credit institutions has continued to decline and market concentration to grow (Figure 6.12), increasing, despite a potentially greater stability of individual credit institutions, the potential for contagion in the event of risk materialisation.

Recovery in the profitability of credit institutions facilitates absorption of possible shocks in simulated stress conditions while possible dividend payments could reduce somewhat the surplus capital accumulated in the system. As a result of the sale of well-covered placements and the inflow of loans with payment difficulties (risk categories B and C), in the last two years the level of recognised losses under these loans (i.e. their coverage by value adjustments) declined, assuming higher additional costs for value adjustments and provisions for the existing non-performing placements in stress conditions. Under IFRS 9, credit quality deterioration is recognised before any difficulties with placement repayment (risk categories A1 and A2) take place, by appropriate value impairment and provisions in the amount of the expected credit loss for all exposures, even highest quality exposures. The effects of simulated conditions on income statement and common equity tier 1 capital (justifiably) can thus be observed sooner in the simulation horizon, i.e. they are more procyclical²⁴.

²³ With the exception of the Fed, leading central banks mainly lack room for further interest rate cuts, but may continue to use unconventional measures.

²⁴ Abad, J., and J. Suarez. (2017): *Assessing the cyclical implications of IFRS 9 – a recursive model*, ESRB, Occasional Paper Series No. 12

Scenario features

a) Baseline scenario

The baseline scenario is based on expected macroeconomic and financial developments within the CNB's April projections. Although at a slower growth rate, favourable macroeconomic developments seen in 2018 are thus expected to continue in the simulation horizon. The expected slowdown of the domestic economy is mostly associated with developments in foreign demand, particularly that of the euro area, i.e. of Italy and Germany, the most important of Croatia's trading partners, spurred by a weakening of global demand and by domestic vulnerabilities in individual countries. By contrast, all the components of domestic demand are expected to continue to contribute to growth. Favourable developments in the labour market and high levels of consumer optimism will boost personal consumption, which could continue to make the biggest contribution to total economic growth. At the same time, investment activities of the general government are expected to accelerate, mostly as a result of better use of EU funds, while investment growth of the private sector might slow down slightly. Fiscal developments are expected to continue to be favourable which should spur improvement in general government's indicator of indebtedness and bring about a better investor risk perception of the Republic of Croatia.

Global inflationary pressures in the projected period are expected to remain subdued and so are the pressures in the domestic environment, despite growth in domestic demand and cost pressures. This will be supported by a reduction in the VAT on certain products. Monetary policy is expected to maintain an expansionary character amid a relative stability of the exchange rate of the kuna against the euro and high monetary system liquidity.

b) Adverse scenario

Taking into account the described vulnerabilities of the global and domestic economy, the initial shock of a global recession would lead to a sudden deterioration in global financial conditions. The significant interconnectedness of global financial markets and cross-border contagion might amplify the initial negative effects. GDP contraction in Europe would instigate a fall in the demand of Croatia's main trading partners, which would in turn lead to a fall in goods and services exports, a negative impact on economic activity, a weakening of the exchange rate and a strengthening of inflationary expectations in Croatia.

Since the financial conditions in the European and Croatian markets are mainly influenced by global developments, a sudden negative response of the financial markets through an increase in risk premiums on the global market would spill quickly into the local markets. The costs of government and other sectors' borrowing would rise and have an unfavourable effect on the level of debt and debt sustainability and the process of fiscal consolidation. This, in conjunction with vulnerabilities in the domestic economy, which, although smaller, still remain

relatively high some ten years after the last financial crisis, would increase the perception of country risk and lead to a fall in credit rating and an increase in the risk premium. The considerable exposure of the financial system to the domestic government, coupled with exposure concentration and a relatively high public debt, might boost shock propagation in the system.

The imagined adverse scenario takes place in the transitional period of regulatory provisions that increase the difference in the treatment of risk exposures to central governments and central banks (CGCB) denominated in kuna (treated as risk-free) and those in other EU member states' currencies (assigned a risk weight of 50% in 2019, depending on the credit rating and

a risk weight of 100% in 2020). A rising share of CGCB exposures in the currency of another EU member state is not subject to exemption from the limit on large exposures, with the application of restrictions on these exposures gradually tightening²⁵.

In addition to the mentioned imbalances, global recession would also erode the confidence in the domestic currency and increase exchange rate volatility which would, under the assumption of a level shift exchange rate shock in the form of depreciation of the exchange rate of the kuna against the euro of 10%, in the conditions of a persistently high exposure of the private sector to currency risk, lead to a deterioration in credit portfolio quality or pressures on bank earnings. In such a case, interest rates on the money market would respond strongly to liquidity shortage which would lead to an increase in the cost of financing of the private sector, which, despite deleveraging, remains highly indebted. Increased maturity transformation resulting from a fast growth of funds in transaction accounts could also spur liquidity outflows, additionally supporting interest rates growth. Amid such conditions, domestic aggregate demand would decline sharply. This would be reflected in particular on reduced demand for residential real estate and lead to a price correction on that market thereby making residential real estate a poorer quality collateral on credit institutions' balance sheets.

Table 7.1 Macroeconomic scenario

Indicators	Baseline scenario		Adverse scenario	
	2019	2020	2019	2020
Financing conditions on the foreign market				
ECB main ref. rate, %	0.00	0.10	0.00	0.00
Fed funds tar. rate, %	2.75	2.65	1.75	0.25
EURIBOR 3M, %	-0.26	-0.20	0.29	0.89
GDP (real growth in the EU), %	1.50	1.70	-1.70	-2.70
Financing conditions on the domestic market				
Bond yields, average change in p.p.	0.07	0.20	1.13	0.87
Long-term interest rates, average change in p.p.	0.12	0.25	1.13	1.64
Short-term interest rates, average change in p.p.	0.11	0.08	2.08	2.20
Money market interest rates, average change in p.p.	0.10	0.08	1.67	5.01
Exchange rate				
EUR	7.41	7.41	7.96	8.14
Real sector				
Investment, real (yoy, %)	6.0	4.9	0.1	-7.6
Personal consumption, real (yoy, %)	3.9	3.4	-0.6	-3.6
GDP, real (yoy, %)	2.5	2.3	-0.9	-4.0
Unemployment rate (%)	8.7	8.0	9.2	10.1
Real estate prices (yoy, %)	6.8	4.8	3.2	-5.1
Consumer prices (yoy, %)	0.6	1.2	1.6	2.1
Memo:				
Credit quality step for the risk weight of exposure to the central government		4		5

Notes: Changes in interest rate averages (long-term, short-term and interest rates on the money market) relate to the change in the respective year average in relation to the previous year average. Changes in average bond yields relate to the change in the average of the fourth quarter of the respective year in relation to the average of the fourth quarter of the previous year.

Source: CNB.

Quantification of scenarios and result sensitivity

a) Quantification of simulated conditions

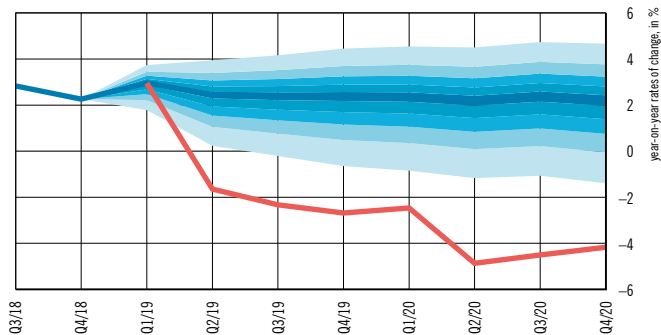
The assumed global crisis which leads to a contraction in demand of all main trading partners, taking into account the described domestic vulnerabilities, would lead to a recession as soon as in 2019 (-0.9%) and to a fall in economic activity of 4.0% in the following year. The contraction of real investment in 2020 (7.6%) would exceed the fall in GDP, partly as a result of the assumed restrictions on government investment in the context of fiscal position worsening triggered by negative economic developments. The described trends would have a limiting effect on the possibility of use of a countercyclical fiscal policy in the struggle with the fall in aggregate demand. Under such a scenario, GDP notably lies outside the 95th percentile of the distribution of the projected developments under the baseline scenario. In other words, the probability of such a shock is very small (Figure 7.1.a). The global fall in the demand for goods and services would also, to a degree, keep in check the inflationary pressures in the domestic market spurred by the

²⁵ Regulation 2017/2395 enabled competent authorities to continue applying the exemption to CGCB exposures denominated in the foreign currency of a member state, which was adopted by the CNB in the Decision on amendments to the Decision on large exposures (OG 12/2018). Such exposures made before 12 December 2017 are completely exempted from the application of the limit on large exposures, while the limits applied to those that were made on that day or subsequently are to be gradually strengthened – up to 75% of tier 1 capital in 2019 and 50% of tier 1 capital in 2020.

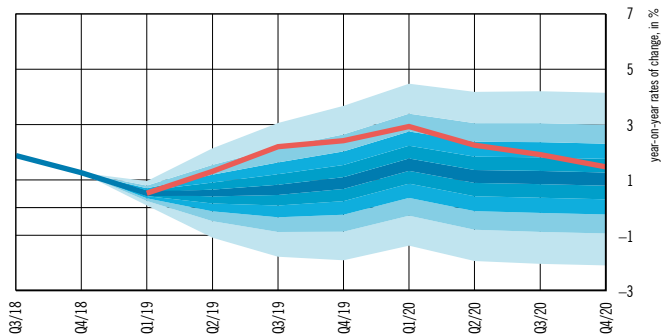
weakening of domestic currency (Figure 7.1.b). A rise in the unemployment rate is limited, partly by migration of the working age population, with the average unemployment rate in the first and second year of simulation standing at 9.2% and 10.1% respectively, in contrast with 8.7% and 8.0% respectively under the baseline scenario.

Figure 7.1 Adverse scenario probability

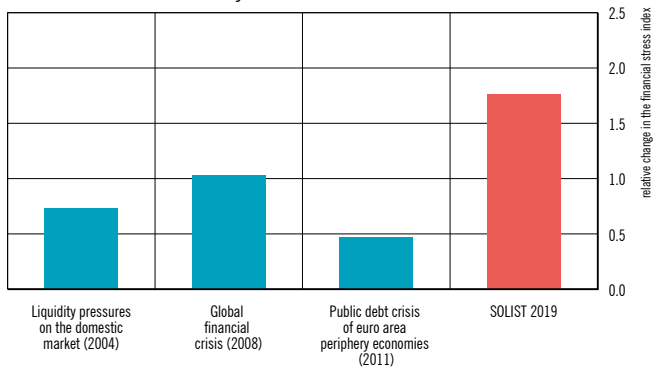
a) GDP dynamics under the adverse scenario relative to the risks of materialisation of the baseline scenario



b) Consumer price dynamics under the adverse scenario relative to the risks of materialisation of the baseline scenario



c) Degree of disturbance in the financial market induced by stress conditions in the economy



Note: The baseline scenario is in line with the monetary projection of the CNB; red is used for the path of the underlying variable under the adverse scenario.
Source: CNB.

A sudden change in the globally suppressed risk premium also leads to a deterioration in financing conditions on the domestic market with short-term interest rates growing the fastest, driven by panic. The yields on government bonds rose by 113 basis points in the first year of the simulation horizon, which translates into a decrease in the value of government bonds in banks' portfolios of approximately 7.4%. As regards depreciation of the kuna against the euro, it is assumed that it could reach historical extremes from the end of the last century – with a level shift shock in the first year of simulation of almost 10% – with the level of the exchange rate achieved keeping steady until the end of the horizon. Though lower than under the last year's testing, the intensity of the simulated stress disturbance of the domestic financial market still surpasses the cases recorded in the previous decade (Figure 7.1.c).

Such conditions would contribute to increased country risk perception, which would be reflected in a change in the credit rating under the adverse scenario. The simulated fall in the credit rating of the Republic of Croatia involves the downgrading of credit quality step from 4 to 5, which still does not cause the increase in risk weight for exposures to the government, i.e. does not lead to an additional fall in capital adequacy under the adverse scenario in relation to the baseline scenario. Nevertheless, gradual regulatory alignment of the treatment of exposure to central governments and central banks with the risk determined in accordance with their credit rating will affect, through an increase of the risk exposure amount, the capital adequacy of credit institutions, under both the baseline and the adverse scenarios. In accordance with the assumption of the static balance sheet, it is assumed that all such exposures that mature in the simulation horizon are renewed with the same characteristics.

b) Sensitivity to conditions in the baseline scenario

The quality of the credit portfolio of credit institutions under the baseline scenario continues to improve, albeit at a slower pace than in the previous years. This slower improvement is due to credit risk materialisation in the past few years which slowed down the recovery in credit portfolio quality led by extensive sale of placements. Nevertheless, operating earnings under the baseline scenario are expected to be at 2018 level and the common equity tier 1 ratio is rising from 21.8% at the beginning of the simulation horizon to 24.5% at the end of 2019, i.e. 26.4% at the end of 2020. Even in such conditions, some (smaller) credit institutions might generate operating losses, which will, in addition to an increase in risk exposure amount due to gradual regulatory alignment of the treatment of a part of exposure to central governments and central banks with the risk determined based on their credit rating, lead to a more widely dispersed common equity tier 1 ratio among credit institutions. The interquartile range of common equity tier 1 distribution across credit institutions is rising from 5.4 percentage points at the beginning of the simulation horizon to 7.1 percentage points at the end.

The high level of short-term liquidity of the financial system over the next two years under the baseline scenario is not

expected to be exhausted by the observed credit expansion, with the liquidity coverage ratio (LCR) at system level remaining more than 60 percentage points above the required regulatory minimum of 100%. Under the baseline scenario, all credit institutions meet the prescribed short-term liquidity standards; however, there are visible differences between them in terms of their short-term liquidity.

c) Sensitivity to conditions in the adverse scenario

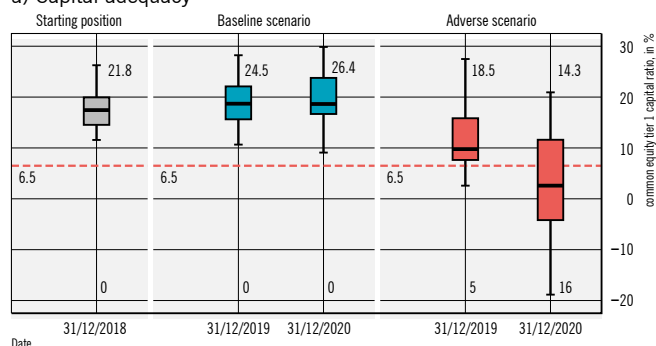
After the share of non-performing placements fell below the level of 10% at the end of 2018, in simulated stress conditions, the credit portfolio would deteriorate strongly. Thus, the share of non-performing placements in total placements could reach 15.8% by the end of 2019 and by end-2020 further credit portfolio deterioration might push it to the level of 16.8%, very close to the highest level in the past ten years (17.3%). The biggest contribution to the inflow of non-performing placements is made by the deterioration of the credit portfolio of non-financial corporations in which the share of non-performing placements might exceed the level of 30% already by the end of the first year of simulation and 37.6% by the end of the following year. Exposures to households prove to be somewhat more resilient

to simulated economic and financial shocks, with the share of non-performing placements to households in the simulation horizon rising from 6.6% to 9.5%. Under IFRS 9, in addition to inflows for value impairment and provisions for placements in default (new and existing non-performing placements of risk categories B and C), also estimated are the inflows for appropriate value impairment and provisions in the amount of the expected credit loss for placements not yet in default.

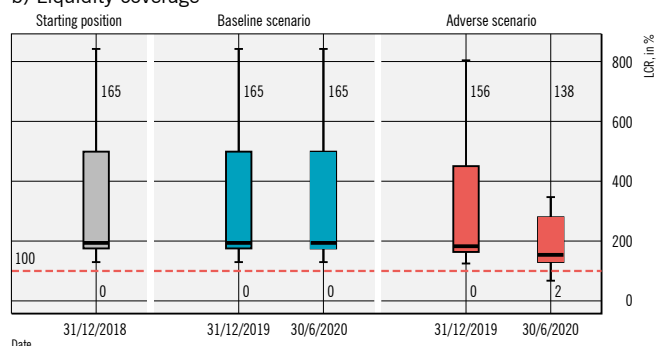
In addition to credit portfolio worsening i.e. the increase in value impairment and provisions based on credit risk exposure, capitalisation in stress conditions is also adversely affected by (i) an increase in the risk exposure amount due to kuna depreciation, (ii) an increase in the risk exposure amount due to regulatory alignment of the treatment of a part of exposure to central governments and central banks and (iii) trading portfolio revaluation according to the assumed haircuts. Under the adverse scenario, the common equity tier 1 ratio is down to 18.5% by the end of the first year and 14.3%, respectively, by the end of the second simulation year, with five credit institutions failing to meet the capital standards in the first year and 16 in the second year. The number of credit institutions in need of recapitalisation is such conditions is not negligible, but since it accounts for a relatively small proportion or 7.3% of the total assets of the banking system and the shortage of common equity tier 1 for 4.2% of the amount at the beginning of simulation horizon, the capitalisation at system level remains significantly above the critical test threshold (6.5%) and implies a robust resilience to simulated rare and extreme shocks.

Figure 7.2 Solvency and liquidity of credit institutions in the baseline and the adverse scenario

a) Capital adequacy



b) Liquidity coverage



Notes: a) Red line indicates the threshold value of the capital adequacy ratio of common equity tier 1 capital (6.5%), i.e. the liquidity coverage ratio (100%).
b) Values in the figure relate to liquidity coverage ratio at system level, i.e. capital adequacy at system level.
c) The number of institutions that have not passed the test (in the solvency and liquidity block) is shown in the lower right angle.
Source: CNB.

Short-term liquidity of the system in simulated stress conditions in the first year eroded by less than 10 percentage points, with the LCR holding steady at 156%. This was due to only an initial correction of the price of the available government portfolio, which did not initiate liquidity pressures, so that none of credit institutions' LCRs fell below the critical test threshold (100%). Slightly bigger losses in liquidity buffers can only be seen in the second year of the simulation horizon, under pressures arising from the difficulties a certain number of institution would experience with their solvency. The assumed responses involved a retrieval of lost liquidity buffers in two credit institutions with the lowest LCR and in two credit

Expected credit loss estimation

The simulation of credit quality deterioration in the non-financial corporations sector for placements not yet in default (risk categories A1 and A2) is done by recalibrating the existing model of probability of default (PD) and using assumptions that take into account the prescribed supervisory level of loss given default. Since the required data on default rates and risk characteristics are not available for the household sector, the effect of an increase in the expected credit loss for exposures to that sector is estimated using the assumption of an equal relative degree of risk in the household sector and the non-financial corporation sector at individual credit institution level.

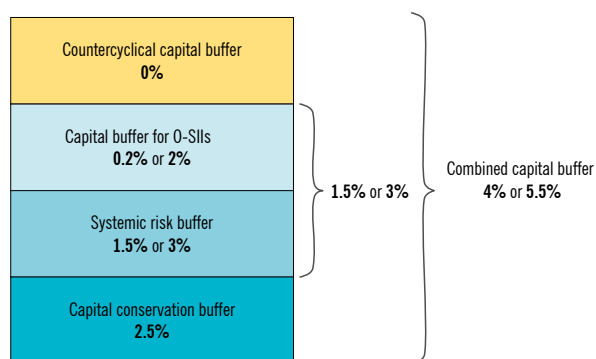
institutions witnessing the biggest loss in short-term liquidity. The mentioned shocks would decrease the system's LCR in the second year to the level of 138%, with two credit institutions failing to meet the liquidity standards.

The results of integrated tests confirm the system's resilience to possible losses, which could materialise in the case of an imagined global crisis even amid the existing structural vulnerabili-

ties of the economy. Even though system sensitivity to disturbances is generally lower than in the testing done last year, the exercise has shown a rising diversification of sensitivity among credit institutions. It is also evident that the banking system would find it hard to withstand any permanent multiplication of simulated blows or the materialisation of additional risks not captured by this exercise.

8 Macroprudential policy instruments

Figure 8.1 Combined capital buffer requirement



Source: CNB.

The assessment of the financial system’s exposure to systemic risk has not changed much from the previous year so there was no need to adjust capital buffers in 2018 and early 2019. Early in 2019, the CNB reacted to the rise in credit risk caused by fast growing consumer loans by issuing a Recommendation on actions in granting non-housing consumer loans, which aims to level out the criteria for determining consumer creditworthiness among different types of long-term loans to consumers. In addition, the CNB reciprocated macroprudential measures adopted by Finland and Belgium, which have been recommended for reciprocation by the European Systemic Risk Board.

Croatia applies the combined capital buffer requirement of 4% or 5.5% in total, depending on the size of a credit institution’s assets (Figure 8.1). All credit institutions maintain a capital conservation buffer of 2.5% of total risk exposure. In addition, there is the systemic risk buffer which stood at 1.5% or 3% of the total amount of risk exposure, depending on the size of the credit institution. Two sub-groups of credit institutions to which these two rates apply are determined on the basis of a three-year share of assets of the credit institution or a group of credit institutions in total assets of the national financial sector. Credit institutions with shares higher than or equalling 5% apply the systemic risk buffer rate of 3%, and others a rate of 1.5%. The systemic risk buffer rate is reviewed at least once in two years in accordance with the provisions of the [Decision on the application of the structural systemic risk buffer](#) (OG 78/2017). It was last reviewed in 2017, and the next review is envisaged in mid-2019.

Table 8.1 Macroprudential policy instruments in Croatia

Measure	Year of adoption	Required rate
Macroprudential measures envisaged by CRD and CRR		
Capital conservation buffer	2014	2.5%
Systemic risk buffer	2014	1.5% or 3%
Systemically important institutions buffer	2015	0.2% or 2%
Countercyclical capital buffer	2015	0%
Risk weights for exposures secured by mortgages on residential property	2014	Stricter definition of residential property for preferential risk weighting
Risk weights for exposures secured by mortgages on commercial property	2016	100%
Additional criteria for the assessment of consumer creditworthiness in granting housing consumer loans	2017	Minimum costs of living in accordance with the Foreclosure Act
Other measures of macroprudential interest		
Recommendation to mitigate interest rate and interest rate-induced credit risk	2017	
Recommendation on actions in granting non-housing consumer loans	2019	

Source: CNB.

The identification of other systemically important credit institutions (O-SIIs), carried out by the Croatian National Bank once a year, was conducted at the end of 2018. Seven O-SIIs were identified, one less than the year before, which was a consequence of the completed merger of two systemically important banks (Table 8.2). One out of seven credit institutions was identified as systemically important according to expert evaluation and additional indicators of systemic significance, although it did not exceed the materiality threshold. The capital conservation buffer for O-SIIs for six institutions was set at 2.0%, while for one institution it was set at 0.2% of total exposures to risk. However, the said capital buffer is effectively not applied because the systemic risk buffer rate is higher so in accordance with the provisions of the Credit Institutions Act only the higher of the two buffers must be maintained.

The countercyclical capital buffer rate continues to be applied at a rate of 0%. Given that regular quarterly analytical assessments of the evolution of cyclical systemic risks show that there are no cyclical pressures in addition to the mild recovery of lending to the private sector that would require corrective action by the CNB, the 0% rate will be applied in the next one year period (until mid-2020).

In addition to capital buffers there are other macroprudential measures applied in Croatia (Table 8.1). These are measures directed at the real estate market, which is considered to be relatively illiquid (risk weights for exposures secured by

residential (2014) and commercial (2016) real estate) and the criteria for approving consumer housing loans. **Decision on the additional criteria for the assessment of consumer creditworthiness and on the procedure of collection of arrears and voluntary foreclosure**, which is aligned with the EBA Guidelines on creditworthiness assessment (EBA/GL/2015/11) and the EBA Guidelines on arrears and foreclosure (EBA/GL/2015/12) and which entered into force on 1 January 2018, requires the maximum amount of repayment of a housing loan to be dependent on consumer income. As a consequence of this decision, credit institutions' lending standards for housing loans became tighter, especially for consumers with below-average income. Credit institutions must, according to the Decision, factor the minimum costs of living into the calculation of a consumer's creditworthiness; these costs cannot be lower than the salary share that is exempt from forced collection, as laid down by the Foreclosure Act. This protected amount equals two thirds of the average net salary in the Republic of Croatia for all consumers, and three quarters of their income for consumers with below-average income (up to two thirds of the average net income in the RC) and is higher than the amount banks set earlier as the portion of income that must remain available to the consumer after contracted credit obligations are settled.

Recent acceleration in the growth of non-housing loans to consumers motivated the Croatian National Bank to adopt a measure whose aim is to mitigate credit risk associated with non-housing loans to consumers (for more details on risks see chapter 3 Household sector and chapter 6 Banking sector and Box 1 of *Macroprudential Diagnostics, No. 7*). At the end of February 2019, the Croatian National Bank issued a **Recommendation on actions in granting non-housing consumer loans** recommending all credit institutions to take into account minimum costs of living in accordance with the protected portion of salary laid down by the Foreclosure Act when assessing consumers creditworthiness for non-housing loans with initial maturity equal to or exceeding five years. This recommendation aims to level out the conditions for assessing creditworthiness for housing and non-housing loans to consumers with longer maturities and thus avoiding the possible arbitrage between different types of loans. In addition, within its supervisory powers,

Table 8.2 Other systemically important credit institutions

Other systemically important credit institutions	Buffer rate	
	for O-SIIs credit institution	for structural systemic risk
Zagrebačka banka d.d.	2.0%	3.0%
Erste&Steiermärkische Bank d.d.	2.0%	3.0%
Privredna banka Zagreb d.d.	2.0%	3.0%
Raiffeisenbank Austria d.d.	2.0%	3.0%
OTP banka Hrvatska d.d.	2.0%	3.0%
Addiko Bank d.d.	2.0%	3.0%
Hrvatska poštanska banka d.d.	0.2%	1.5%

Source: CNB.

the CNB asked banks to include in their internal assessments of capital requirements potential losses arising from general-purpose cash loans and to ensure in their internal by-laws clear mechanisms for repayment of banking bonuses should excessive loans arise from these placements.

In addition to national macroprudential policy, the Croatian National Bank acted in accordance with the recommendations of the European Systemic Risk Board on the reciprocation of macroprudential policy measures adopted by other

EU member states. In accordance with the amendments of the Recommendation on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures (ESRB/2018/1 and ESRB/2018/5), the CNB reciprocated measures adopted by the macroprudential authorities of Finland (in April 2018) and Belgium (in April 2019). Both decisions on the reciprocity were adopted applying exemptions for credit institutions whose respective exposures do not exceed the recommended materiality threshold. Croatia currently applies this exemption to all credit institutions.

List of figures and tables

Figure 1.1 Global economic climate deteriorated	7	Figure 2.4 Croatia remains the country with the highest public debt-to-GDP ratio	15
Figure 1.2 Global economic growth decelerated and projections were revised downwards	7	Figure 2.5 General government interest expenses are decreasing in CEE countries	
Figure 1.3 Announced tightening of the monetary policies of the USA and the euro area deferred	8	Figure 2.6 The euro still prevails in the public debt currency structure	16
Figure 1.4 Strong increase in economic and political uncertainties and volatile capital market	8	Figure 2.7 Countries with a higher level of bank exposure to the government have a higher share of public debt in GDP	16
Figure 1.5 Residential real estate prices are still growing, while equity valuation is less optimistic	8	Figure 2.8 Yields on generic government bonds are relatively low in all CEE countries	16
Figure 1.6 Spreads between 10-year and 2-year government bond yields decreased additionally	9	Figure 2.9 Public debt in stress scenario would increase by 10 percentage points by 2020	16
Figure 1.7 The year 2018 was marked by the appreciation of the dollar against leading global currencies	9	Box2	
Figure 1.8 Stable domestic demand is the main generator of economic growth	9	Table 1 Construction of the fiscal stress index and values for Croatia for 2017 and 2018	18
Figure 1.9 In 2018, investor sentiment in the capital market was less optimistic	10	Figure 1 Fiscal stress index for groups of emerging market economies (simple average) for 2011	19
Figure 1.10 Financial stress index in the Croatian financial market is at low levels	10	Table 2 Fiscal stress index for Croatia in the period from 2008 to 2018	19
Figure 1.11 Very high kuna liquidity abolished the need for the interbank market	10	Figure 3.1 Household borrowing intensified in 2018	21
Figure 1.12 Trend of decline of external imbalances continued in 2018	11	Figure 3.2 Cash loans dominate in the growth of household loans	21
Box 1		Figure 3.3 Moderate growth of household financial assets follows the dynamics of GDP	22
Figure 1 Croatian financial stress index and contribution of individual markets	12	Figure 3.4 Pension fund shares increased their share in the financial assets of households	22
Table 1 Indicators used in the construction of the financial stress index for Croatia	13	Figure 3.5 Housing and general-purpose cash loans prevail in the structure of loans	22
Figure 2.1 General government budget surplus achieved for the second consecutive year	14	Figure 3.6 Consumer confidence is growing	23
Figure 2.2 General government debt continued to decrease and fell to 74.6% of GDP	14	Figure 3.7 Banks report growing credit demand	23
Figure 2.3 Majority of CEE countries also achieved a surplus in 2018	15	Figure 3.8 Positive trends in the labour market continued	23
		Figure 3.9 Downward trend in interest rates on newly-granted loans	23

Figure 3.10 Share of long-term loans in total newly-granted loans continued to increase in 2018	23	Figure 4.5 Although the number of sale and purchase transactions is on the rise, it is still much lower than ten years ago	33
Figure 3.11 Cash and housing loans prevail in newly-granted long-term loans to households	23	Figure 4.6 Prices of residential real estate increased slightly above the level based on long-term value of its fundamentals	34
Figure 3.12 Households reduce exposure to currency risk	24	Figure 4.7 Interest rates on housing loans continued to fall	34
Figure 3.13 Share of loans granted with fixed interest rates continues to grow	24	Figure 4.8 Price growth slightly lowered the financial availability of real estate	34
Figure 3.14 Rates that protect consumers from interest rate risk over the long term are highly represented in newly-granted housing loans	24	Box 4	
Figure 3.15 Interest rate risk of households is partially limited by the structure of reference interest rates	25	Figure 1 Subsidies approved, by lending purpose and total amount	35
Figure 3.16 Growth of indebtedness slowed down the several-year decrease in household debt burden	25	Figure 2 Total number of subsidised loans in 2017	35
Figure 3.17 Several-year fall in the systemic vulnerability of the household sector slowed down in 2018	25	Figure 3 The number of subsidies approved in relation to the development of the unit of local self-government and the amount of the envisaged subsidy	36
Figure 1 Lower interest costs reduced debt repayment burden of households	26	Figure 4 Annual change in the number of subsidised loans (2018 in relation to 2017 measured by the index)	36
Box 3		Figure 5 The index of the total number of subsidies in 2017 and 2018 adjusted for differences in the number of citizens	36
Figure 1 Share of the number of indebted households in the population and the median value with regard to the type of debt	27	Figure 6 Total number of subsidies approved in 2017 and 2018 adjusted by the number of citizens	37
Figure 2 Debt structure according to the age of the reference person	27	Figure 5.1 Indebtedness of the corporate sector continued to fall in 2018	38
Table 1 Socioeconomic characteristics of indebted households in Croatia	28	Figure 5.2 Debt measured by net transactions in 2018 stagnates	38
Figure 3 Reason for assuming consumer (non-mortgage) debt	29	Figure 5.3 Loans to enterprises in the tourism activity increased significantly, while other activities reduced their credit liabilities moderately	39
Table 2 Probability of participation in the debt market, probit model, marginal effects	29	Figure 5.4 Increase in credit demand in 2018 was accompanied by the easing of credit standards for corporate loans	39
Figure 4 Impact of age on the probability of holding debt	30	Figure 5.5 Corporate lending intensified in 2018 from the previous year	39
Figure 5 Chart of marginal effects	30	Figure 5.6 The share of total corporate debta in foreign currency stagnated	40
Figure 4.1 Real estate sector debt slightly increased	32	Figure 5.7 Public corporations considerably reduce exposure to currency risk	40
Figure 4.2 Continued housing borrowing accompanied by increasing income and consumer optimism	32	Figure 5.8 Interest rate risk continues to decrease	40
Figure 4.3 Substantial regional differences in the intensity of real estate price changes	33	Figure 5.9 As distinct from in the euro area, interest rates on long-term corporate loans in Croatia continued to decrease	40
Figure 4.4 In the period from 2015 to 2018 market activity focused on Zagreb and the Adriatic coast	33		

Figure 5.10 Interest rates on short-term corporate loans in Croatia and in the euro area held steady in the major part of 2018	40	Figure 6.14 Banks' exposure to currency-induced credit risk continued to reduce, particularly with regard	46
Figure 5.11 Improved business performance and lower costs of interest payments reduce the debt repayment burden and overall riskiness	41	Figure 6.15 Continued decrease in banks' exposure to interest rate-induced credit risk	47
Figure 6.1 Banks' risk exposure continued to decrease with capital and liquidity buffers maintained at high levels	42	Figure 6.16 Croatia's banking system among those with the greatest government exposures in the EU	47
Figure 6.2 Bank assets grew under the influence of increased credit activity in 2018	43	Figure 6.17 Bank profitability recovers in 2018 despite decreased interest rate margin	47
Figure 6.3 The strong growth of transaction accounts' funds in the balance sheet continued	43	Figure 6.18 The greatest contribution to recovery in profitability in 2018 came from decreased charges for value adjustments	48
Figure 6.4 Household sector contributed the most to 2018 credit growth	43	Figure 6.19 Loan portfolio quality improved in the majority of banks in the system	48
Figure 6.5 Lending to households dominated by general-purpose cash loans	44	Figure 6.20 Improvement of loan quality primarily due to the sale of non-performing loans	49
Figure 6.6 Corporate loans were focused on large loans to large enterprises despite the relatively lower interest rate on these loans	44	Figure 6.21 Although credit quality in Croatia is relatively poorer than the EU average, the pressure on capital was moderate at the end of 2018	49
Figure 6.7 Credit quality differs by the type of loan to the household sector and size of enterprise for loans to non-financial corporations	45	Figure 6.22 Liquidity coverage ratio (LC Figure 6.23 Capital adequacy remains high in 2018 R) considerably above the regulatory minimum	49
Figure 6.8 Continued absence of excessive growth	45	Figure 6.23 Capital adequacy remains high in 2018	49
Figure 6.9 Continued substitution of cross-border funding sources by residents' sight deposits in bank liabilities	45	Figure 6.24 The share of exposures subject to a risk weight of 20% increased in 2018 because of the cancellation of the preferential treatment for CGCB exposures	50
Figure 6.10 Shortening of the maturity of liabilities increases the maturity mismatch between bank assets and liabilities	45	Table 7.1 Macroeconomic scenario	53
Figure 6.11 Continued decline in lending and deposit interest rates	45	Figure 7.1 Adverse scenario probability	54
Figure 6.12 Banking system concentration increased considerably due to the merger of two systemically important banks	45	Figure 7.2 Solvency and liquidity of credit institutions in the baseline and the adverse scenario	55
Figure 6.13 The kuna share exceeds 50% on both sides of bank balance sheets in 2018	46	Figure 8.1 Combined capital buffer requirement	57
		Table 8.1 Macroprudential policy instruments in Croatia	58
		Table 8.2 Other systemically important credit institutions	58

Abbreviations and symbols

Abbreviations

bn	– billion
CAR	– capital adequacy ratio
CBS	– Central Bureau of Statistics
CCE	– Croatian Chamber of Economy
CDCC	– Central Depository & Clearing Company
CDS	– credit default swap
CEE	– Central and Eastern European
CES	– Croatian Employment Service
CICR	– currency-induced credit risk
CIHI	– Croatian Institute for Health Insurance
CIs	– credit institutions
CM	– Croatian Motorways
CNB	– Croatian National Bank
CPII	– Croatian Pension Insurance Institute
DAB	– State Agency for Deposit Insurance and Bank Resolution
EAD	– exposure at default
EBA	– European Banking Authority
EBITDA	– earnings before interest, taxes, depreciation and amortisation
EC	– European Commission
ECB	– European Central Bank
EFSS	– European Financial Stability Facility
EIZG	– Institute of Economics, Zagreb
EMBI	– Emerging Market Bond Index
EMU	– Economic and Monetary Union
EONIA	– Euro Overnight Index Average
ERM	– Exchange Rate Mechanism
ESM	– European Stability Mechanism
EU	– European Union
EULIBOR	– Euro London Interbank Offered Rate
EUR	– euro
EURIBOR	– Euro Interbank Offered Rate
f/c	– foreign currency
FDI	– foreign direct investment
Fed	– Federal Reserve System
FINA	– Financial Agency
FRA	– Fiscal Responsibility Act
FSI	– financial soundness indicators
GDP	– gross domestic product
GFS	– Government Finance Statistics
HANFA	– Croatian Financial Services Supervisory Agency
HBS	– Household Budget Survey
HH	– households
HREPI	– hedonic real estate price index
HRK	– Croatian kuna
IBIR	– interbank interest rates
ILO	– International Labour Organization

IMF	– International Monetary Fund
IR	– interest rate
LTIR	– long-term interest rates
m	– million
MoF	– Ministry of Finance
MRR	– marginal reserve requirements
NFC	– non-financial corporations
NPLR	– ratio of non-performing loans to total loans
OECD	– Organisation for Economic Co-operation and Development
OF	– own funds
ON USLIBOR	– overnight US dollar London Interbank Offered Rate
pp	– percentage points
RC	– Republic of Croatia
ROAA	– return on average assets
ROAE	– return on average equity
RR	– reserve requirements
RWA	– risk-weighted assets
SDR	– special drawing rights
TTIP	– Transatlantic Trade and Investment Partnership
yoy	– year-on-year
ZIBOR	– Zagreb Interbank Offered Rate
ZSE	– Zagreb Stock Exchange

Two-letter country codes

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

Symbols

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

