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Introduction

Strong economic expansion, in spite of tight financing conditions and heightened uncertainty caused by geopolitical tensions, supported the income of households and boosted corporate business performance, while having a positive effect on the stability of the financial system. The main structural weaknesses of the domestic economy remained unchanged, however, and were reflected in the high exposure of the banking sector to the government and low rates of labour force participation, which, coupled with adverse demographic and migration trends, curbs the potential for economic growth. The total exposure of the financial system to systemic risks decreased only slightly from a moderately elevated level. The main sources of risk to financial stability stem from potential flare-ups of geopolitical tensions and growing geoeconomic fragmentation, which might have a negative effect on global economic flows and indirectly on the domestic economy which, as a small and open economy, is highly susceptible to the spillover of impacts from the environment. In addition, should inflationary pressures remain elevated, the persistently high interest rates might have an adverse effect on the sustainability of domestic private sector debt. In addition, the two-digit rise in residential real estate prices continued, which contributed to the growth in risks associated with the real estate market.

A strong labour market and income increases boosted household lending, especially in the segment of general-purpose cash loans. Borrowing of households from banks intensified against the backdrop of a steady growth in employment and a strong increase in real income, and thus the growth of general-purpose cash loans continued its upward trend. The growth of housing loans stabilised at moderate levels. However, due to the rise in the prices of residential real estate and interest rate hikes, consumers took out loans with increasingly long maturities and a rise in the debt service-to-income ratio. This increases their vulnerability should there be unfavourable economic circumstances. On the other hand, interest rates on existing household loans recorded almost no growth owing to a large share of fixed rate loans and regulatory caps on interest rates. The gradual shift of funds from transaction accounts to time deposits has driven up the national reference rate (NRR), which will, with a certain lag, have an impact on the rise in the repayment costs of some existing loans, especially those with longer remaining maturities.

The residential real estate market has remained in a mature phase of the cycle, although there was an uninterrupted decline in turnover and a gradual slowdown in the rise of prices. However, residential real estate prices still grew more than in other euro area countries in 2023, due to a strong rebound in economic activity and income and to the implementation of the last round of the government housing loan subsidy programme amid a relatively moderate increase in interest rates on housing loans. Non-resident demand fell considerably. The residential real estate market was also influenced by investment demand for residential real estate intended for short-term rentals, particularly on the Adriatic coast, which has reduced the supply of dwellings, pushed up their prices and rents, caused a deterioration in housing affordability indicators and increased risks to financial stability.

The commercial real estate market is still characterised by a shortfall in the supply of commercial premises. All market segments recorded a rise in rents, with a slight increase in the number of purchase and sale transactions. However, the shallowness of this market in Croatia makes it very susceptible to economic shocks. While banks' direct exposures to commercial real estate market – including exposures to construction and real estate activity – are limited, the main source of risk to financial system stability stems from real property serving as collateral the value of which might diminish suddenly in the case of systemic disruptions.

Robust domestic economic growth and good business performance of non-financial corporations have so far reduced their vulnerability in the light of tight financing conditions. Lending to firms was subdued in 2023 and early 2024, under the influence of interest rate hikes and the reduced need for working capital financing, with a steady growth of investment

loans. A slight further growth of the already relatively high corporate debt increases risks to debt repayment capacity should business activity decrease, especially if accompanied by persistently high interest rates and a further rise in financing costs due to refinancing of maturing loans by new loans made at higher interest rates. A years-long substitution of bank financing by increased reliance on own funds and loans from other corporations has reduced the dependence of non-financial corporations on bank lending, even though this has exposed them to contagion risk, which might lead to sudden funding shutdowns and the worsening of business prospects in the case of unfavourable macroeconomic conditions.

The banking sector generated record-high profits in 2023 and remained highly capitalised and liquid, which has boosted its resilience. In addition, the results of banking system solvency and liquidity stress testing have confirmed a high degree of banking system resilience to highly unlikely and highly-intensive shocks. However, financing costs have continued their upward trend, while banks have seen a relatively high share of placements granted at fixed interest rates and a growing gap between the maturities of assets and liabilities. This has driven up the interest rate risk taken by banks, which might have an adverse effect on their profitability. Non-performing loans were at record-low levels, even though the rise in the share of stage 2 loans might point to a deterioration in asset quality over the medium term. The already high exposure to central government rose even further, reflecting banks' increased investment in government bonds, although sound fiscal indicators have cushioned the associated risks.

Against this background, the CNB's macroprudential policy remained focused on boosting the resilience of the banking sector by maintaining high capital buffer levels. Despite favourable base projections, global macroeconomic trends are subject to high uncertainty, with persistent risks of materialisation of highly unlikely, but very adverse scenarios, which would also spill over to the domestic economy. Persistently high interest rates might also cause a deterioration in the still very good quality of bank assets. Against this background and considering banks' high profitability, maintaining high capital buffer levels helps to preserve bank resilience in the case of a deterioration of macroeconomic or financial conditions and prevents negative effects on loan availability. With its gradual build-up of the countercyclical capital buffer in 2022 and 2023, the CNB created room for potential counter-cyclical action in the event of sudden shocks. The economic cost of financing the increased requirements for the whole economy was relatively low, given that banks were able to cover it from the existing capital surplus and current profits. At system level, the capital requirement for other systemically important banks was increased from the beginning of 2024, reflecting higher banking system concentration and the strengthening of the link between capital requirements and the systemic importance of each credit institution. The highly capitalised and liquid banking system is thus able to support the financing of the economy in all phases of the financial cycle and contribute to economic growth.

I Risks to financial stability

A Macroeconomic environment

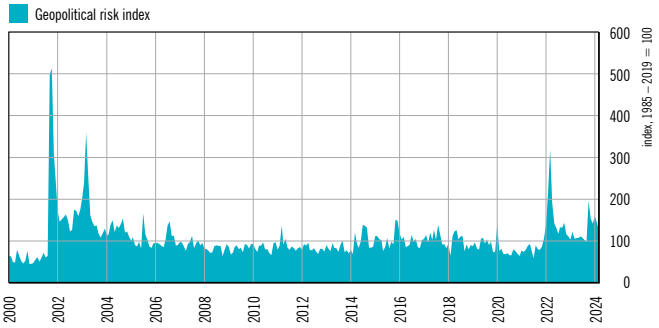
The most significant sources of risk to global financial stability stem from potential flare-ups of geopolitical tensions and growing geoeconomic fragmentation, which might have an adverse effect on global economic flows. In addition, inflation pressures, although considerably weaker, have remained solid, while valuations in some segments of the global financial market suggest that risks might be underestimated. As regards the domestic environment, favourable macroeconomic conditions have supported system resilience, while the main structural weaknesses of the domestic economy have remained largely unchanged. The total exposure of the financial system to systemic risks has edged down, but is still hovering around a moderately elevated level.

A.1 Risks in the international environment

Potential further escalation of geopolitical instability is the main source of risk to global financial stability. The possible escalation of military conflicts, especially in Ukraine and the Middle East, and their negative effects on global trade and the prices of raw materials, as well as growing geoeconomic fragmentation and possible further worsening of relations between the US and China are particularly concerning. In addition, uncertainties regarding elections to be held in a number of large economies worldwide in 2024, including the elections for the European Parliament in June and presidential elections in the US in November, amplify uncertainty, both political and that regarding the direction of future economic policies, which might have a negative effect on economic activity and business conditions on a global scale (Figures A.1 and A.2).

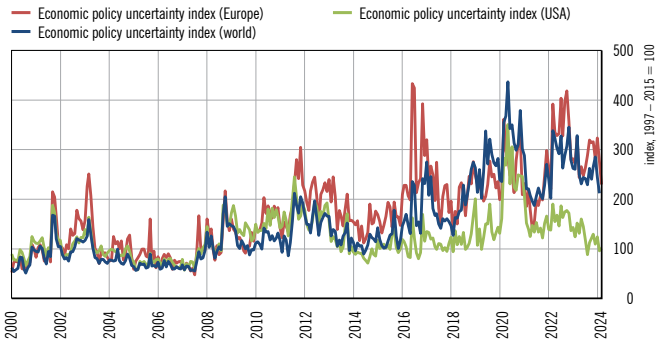
Despite current challenges, the growth of the global economy in 2023 slightly exceeded initial expectations (Figure A.3). This was largely due to an upswing in economic activity in the US due to a strong fiscal expansion and favourable labour market developments and, to a lesser extent, economic developments in emerging market countries. The global economy has shown surprising resilience in an environment of geopolitical uncertainty and tightened monetary policy, even though global growth in the current and next year might be slightly slow in

Figure A.1 Geopolitical instability is the most significant source of risk to global financial stability



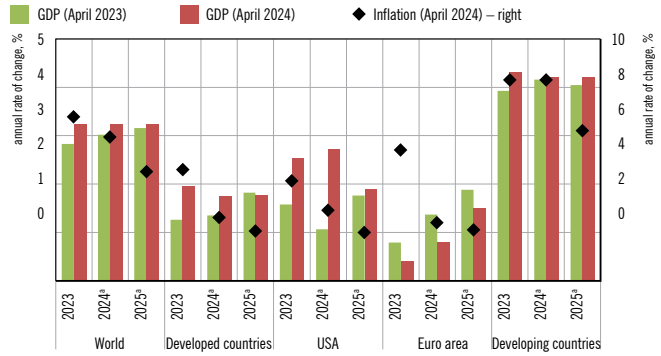
Note: The geopolitical risk index reflects the results of an automated text-search of the electronic archives of ten newspapers.
Source: matteoiacoviello.com.

Figure A.2 Uncertainty regarding the direction of economic policy on a global scale is elevated



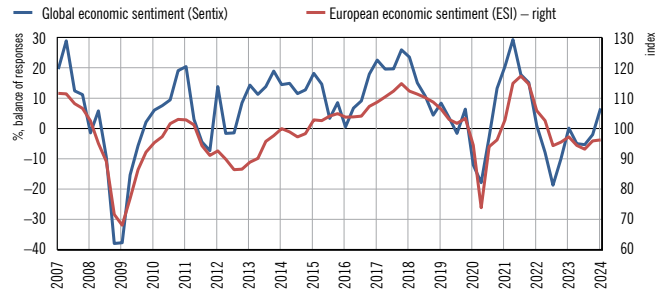
Note: The economic policy uncertainty indices measure uncertainty regarding the direction of economic policy.
Source: policyuncertainty.com.

Figure A.3 Euro area economic outlook is markedly weaker than global expectations



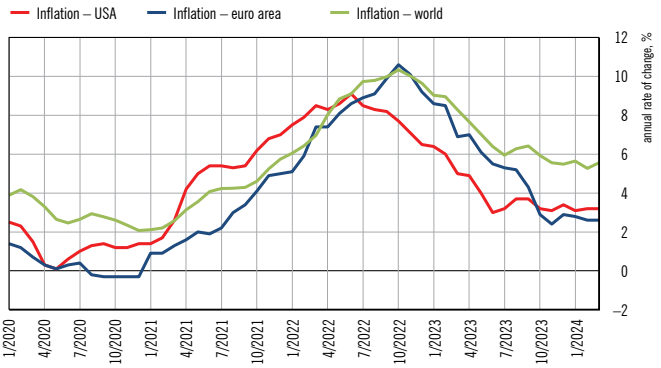
a Forecast
Source: IMF (WEO, April 2024 / April 2023)

Figure A.4 Euro area economic sentiment has remained low



Notes: The sentiment indicator (Sentix) monitors investors' sentiment on a global level, their expectations and estimates of the current economic situation. It is based on a survey and its value may range between –100 and 100. Positive values point to a positive assessment of the economic situation and vice versa. ESI indicator monitors economic sentiment in the EU, where values above 100 point to economic sentiment better than the actual long-term average.
Sources: Bloomberg, European Commission.

Figure A.5 Considerable easing of inflationary pressures worldwide



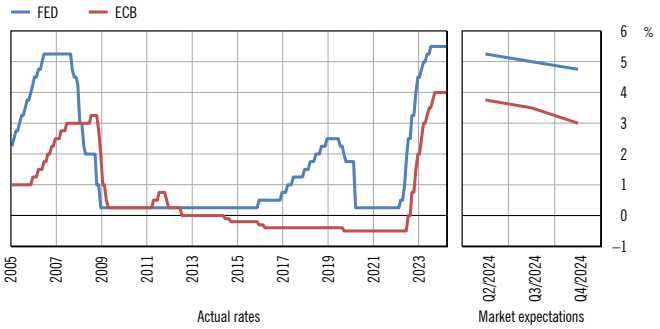
Source: Bloomberg.

comparison with past trends. The Chinese economy continues to be burdened with problems in the real estate sector, while geopolitical instability might adversely affect global trade. Similarly, factors supporting personal consumption might weaken given that savings accumulated during the pandemic have been falling significantly, with signs of a gradual slowdown in the labour markets of some advanced economies.

The European economy recorded only a modest growth in 2023, with rather weak expectations regarding economic recovery. Economic sentiment remained low and considerably below the long-term average, with prevailing negative risks largely arising from the increased cost of living and tightened borrowing conditions (Figure A.4). There is also a considerable difference in the dynamics of economic activity across member states, with somewhat less favourable developments in major economies and Croatia's major trading partners such as Germany and Italy.

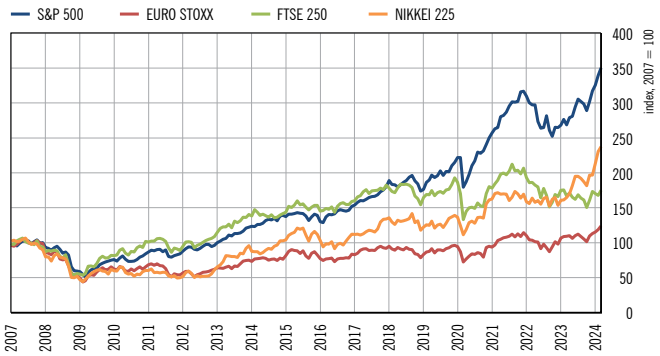
Price pressures have abated considerably on a global level, even though inflation remains above its pre-pandemic level (Figure A.5). The greatest contribution to the decrease in inflation came from the fading effect of past shocks caused by the spikes in the prices of energy, food raw materials and other raw materials and from the easing of pipeline pressures, with a slowdown in demand influenced by restrictive monetary policy. In the last two years, the Fed raised its benchmark rate eleven times. With the last increase to 5.5% in July 2023, it reached the highest level in the past 23 years (Figure A.6). Similarly, the ECB's deposit facility rate (currently a relevant indicator of ECB monetary policy) has been the highest since the introduction of the euro as a currency, standing at 4% since the end of the ECB's monetary policy tightening cycle in September 2023. It is expected that the Fed and the ECB might gradually ease their monetary policies in the course of the current year.

Figure A.6 Benchmark rates have exceeded the high levels seen before the global financial crisis



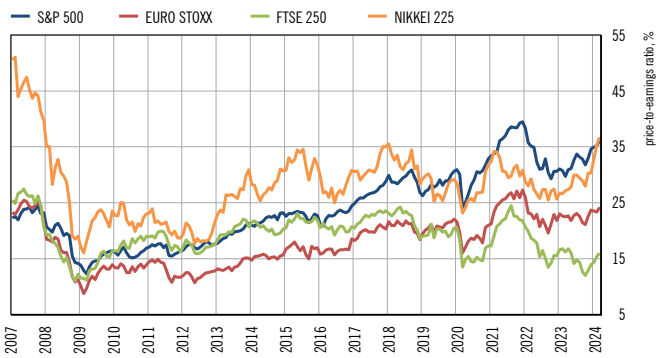
Note: The figure shows the Fed's benchmark rate (upper bound) and the ECB's deposit facility rate.
Source: Bloomberg.

Figure A.7 A leap in leading global equity indices



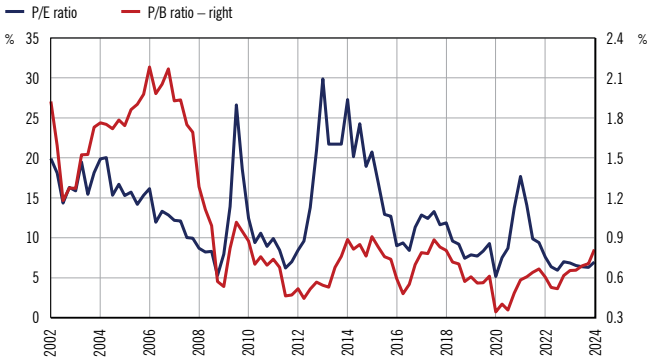
Source: Bloomberg.

Figure A.8 The price-to-earnings ratio went up owing to enhanced investor confidence



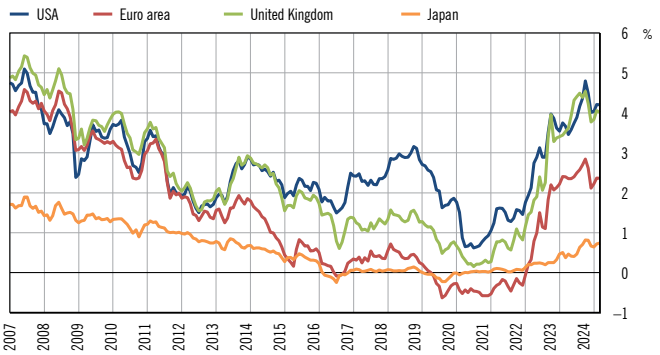
Source: Bloomberg.

Figure A.9 Increase in the valuation of shares of European banks



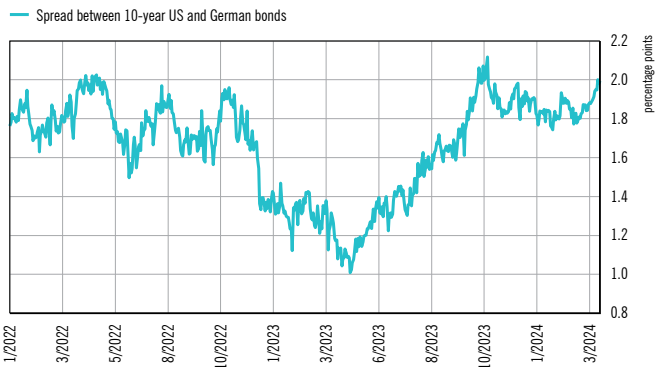
Source: Bloomberg.

Figure A.10 A slight increase in yields on long-term bonds in the first months of 2024



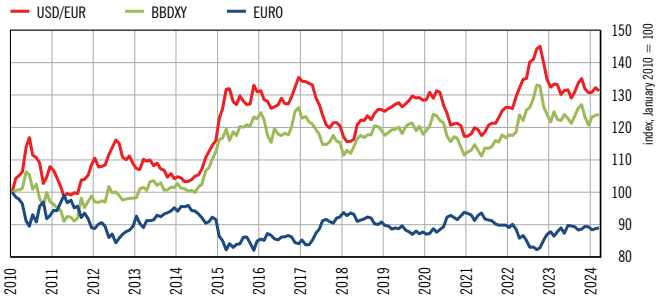
Source: Bloomberg.

Figure A.11 The spread between the US and German long-term bonds has widened again



Source: Bloomberg.

Figure A.12 US dollar depreciated slightly versus most other currencies in 2023



Notes: BBDXY (EURO) tracks the performance of the US dollar (euro) versus the basket of currencies of the major trading partners. The rise in the index suggests the appreciation of the US dollar (euro). USD/EUR tracks the performance of the euro against the US dollar, with the rise in the index indicating euro depreciation.
Source: Bloomberg.

A sharp rise in leading global equity indices reflects increasing risk appetite and points to a possible overvaluation in some market segments. Influenced by optimistic investor expectations and favourable corporate business performance, leading global equity indices fully recovered in the second half of last year and continued to trend up in the first months of 2024 (Figures A.7 and A.8). The technology sector contributed largely to such developments. In 2023, the combined yield on shares of the largest technology companies included in the S&P500 index stood at around 107%. Following the increased volatility induced by the short-lived banking turmoil in the US and Switzerland in spring 2023, shares of European banks also recovered and recorded an increase in their market capitalisation-to-asset ratio (Figure A.9). Yields on the long-term bonds of developed countries grew for most of 2023. This trend reversed in the last quarter of 2023, even though the growth continued in the first months of 2024 (Figure A.10). The spread between the long-term US and German bonds also widened, as a result of a strong upswing in economic activity in the US and weakened economic outlook in the euro area (Figure A.11). Investor confidence, especially on the equity market, might lead to possible overvaluations, which might cause increased market volatility in the event of revisions of risk premia among investors.

The debt servicing risk remained elevated in a number of emerging market economies that mostly borrow in a currency other than their own. The US dollar ended last year somewhat weaker than the basket of currencies of the major trading partners, but remained at high levels (Figure A.12). In addition, the US dollar exchange rate appreciated slightly in the first months of 2024, largely due to stronger-than-assumed economic growth in the US and the expectations that the Fed might postpone a cut in the benchmark rate over the short term. The euro remained relatively stable in the first quarter of 2024, following a slight appreciation against the US dollar and the basket of currencies of the major trading partners last year. In the light of protracted geopolitical uncertainty and possible further escalation of military conflicts, the direction of the Fed's monetary policy might be the main driver of developments in the global foreign exchange market in the upcoming period. Any postponement of the shift in the course of the Fed's monetary policy might feed a strong demand for the US dollar, while an easing of monetary policy would have the opposite effect.

A.2 Risks in the domestic environment

The improvement of macroeconomic conditions in the domestic environment has had a positive effect on financial stability in the Republic of Croatia, while risks mostly stem from developments in the international environment. The exposure of the financial system to systemic risks in the domestic macroeconomic environment has edged down, but still hovers at a moderately elevated level. Robust domestic activity, a noticeable slowdown in consumer price inflation, an improvement in the fiscal position and an almost complete elimination of currency risk following the introduction of the euro as the official currency at the beginning of last year contributed most to enhancing system resilience.

The main structural weaknesses of the domestic economy remained broadly unchanged. Particularly noteworthy are unfavourable demographic trends and imbalances in the labour market. Namely, despite a record-low unemployment rate and the steady rise in the number of employed persons, the labour force participation rate in the Republic of Croatia is still very low, ranking among the lowest in the EU. Paired with negative demographic trends, this has continued to curb the potential for economic growth (Figure A.13). Labour market deficiencies are also reflected in the large gap between supply and demand for workers. Another important structural vulnerability is the large significance of tourism earnings in economic activity[1], which is particularly visible in the environment of heightened geopolitical and security risks, since Croatia, as a small and open economy, is highly susceptible to the spillover of the effects from the international environment.

Prospects for domestic economic growth are favourable, even though the subdued pace of economic growth in the euro area poses an important risk. In 2023, domestic activity continued to grow considerably faster than the euro area and EU average, as a result of the continuation of economic convergence. Favourable domestic economic developments can largely be attributed to a robust demand for tourist services, use of EU funds, expansionary fiscal policy and the rise in personal consumption due to favourable labour market trends and an increase in real income (Figure A.14). Domestic economic sentiment held steady at a level above the long-term average and came very close to the pre-pandemic level, with very high business confidence in the services and trade sectors. Consumer

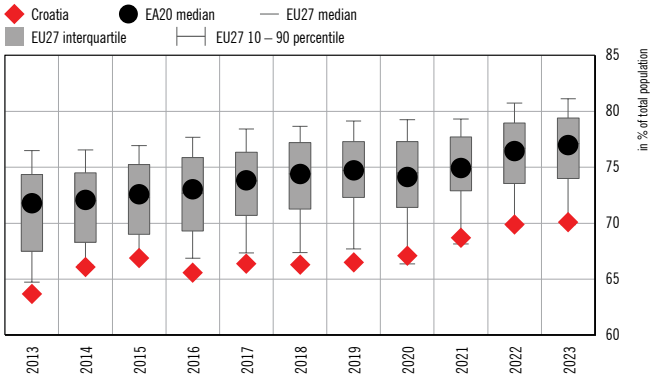
1 Revenues from foreign tourist arrivals reached 19.2% of GDP in 2023.

confidence has been growing for several consecutive months (Figure A.15). However, despite the rise in optimism in the domestic economy, risks appear slightly negative, reflecting the weak outlook for economic growth in major trading partners.

Short-term risks to inflation decreased considerably, even though they still persist. The easing of inflationary pressures has become increasingly prominent since the end of last summer and is broad-based across individual components, with a decrease in energy prices and a slowdown in the growth of the prices of industrial products and food (Figure A.16). Core inflation declined somewhat slower than headline inflation, as a reflection of pressures stemming from the robust demand for tourist services and solid domestic demand underpinned by favourable labour market developments and rising wages. In the upcoming period, inflation might continue to slow down, with inflation risks mostly stemming from protracted services inflation, a potentially stronger-than-expected rise in wages and persistent geopolitical uncertainties and their potential unfavourable effect on the prices of energy and other raw materials. If price increases are not accompanied by growth in domestic productivity, the competitiveness of the domestic economy could be undermined, which poses a significant risk for future economic growth.

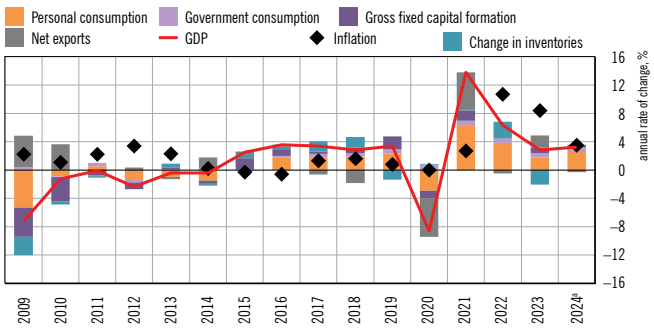
Favourable labour market trends, paired with a leap in the real income of households, contributed to the gradual recovery of savings. Last year saw a sharp rise in wages, which grew almost at the same pace in the public and in the private sector. This growth neutralised the real decline seen last year. Real wages were up by 10% in December 2023 from the same period last year (Figure A.17), while real wages are expected

Figure A.13 Activity rate in the domestic labour market is very low



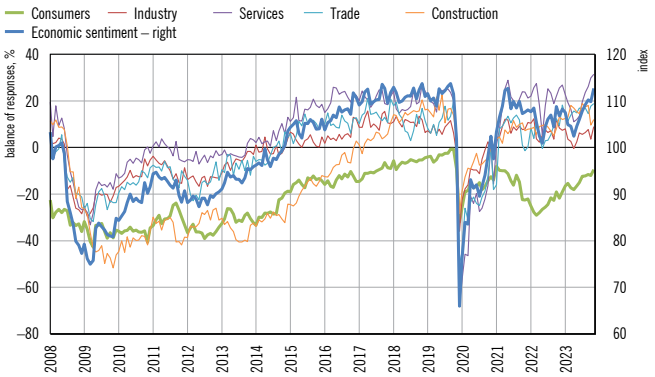
Source: Eurostat.

Figure A.14 Economic activity momentum was preserved by a robust personal consumption



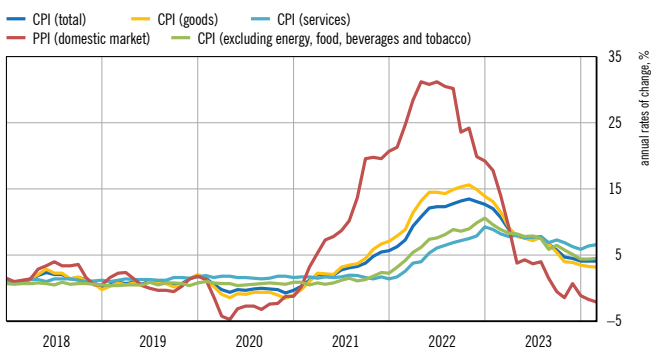
[a] CNB's forecast from March 2024.
Note: The figure shows contributions to GDP growth, the annual rates of change in real GDP and the average annual rate of change in the consumer price index (CPI).
Sources: CBS and CNB.

Figure A.15 Economic sentiment exceeded its long-term average level and came very close to its pre-pandemic level



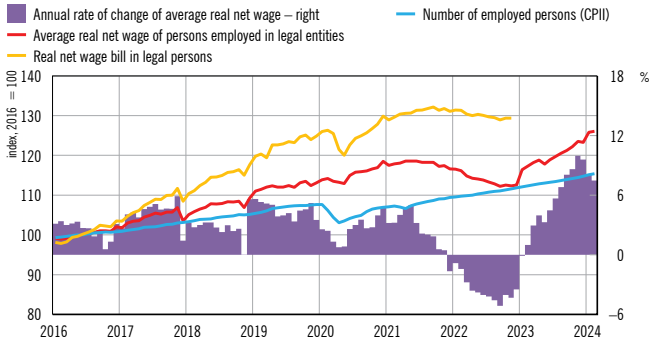
Source: European Commission.

Figure A.16 Price pressures have abated



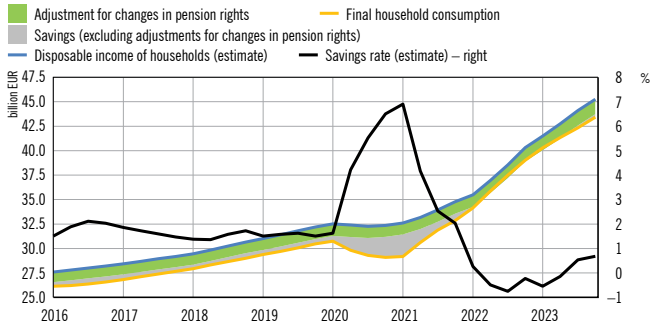
Note: The figure shows annual rates of change in consumer price index (CPI) and producer prices of industry on the domestic market (PPI).
Source: CNB.

Figure A.17 The growth of real net wages accelerated in 2023



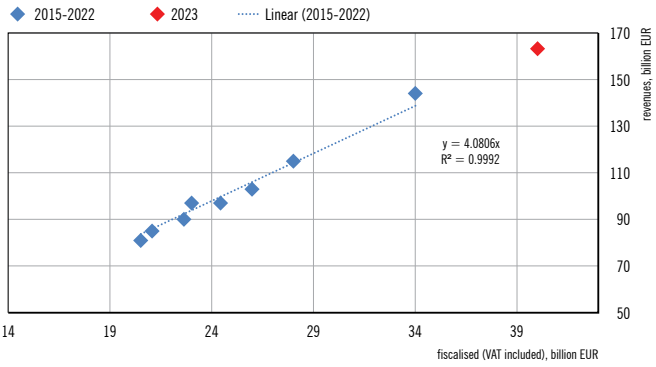
Notes: The shown data have been seasonally and calendar adjusted. The data series showing the real net wage bill of persons employed in legal entities shows data up to 2022 as the data on employed persons for 2023 onwards are preliminary and are thus unreliable.
Sources: CBS, CNB and CPII.

Figure A.18 Household savings rate gradually recovered in late 2023



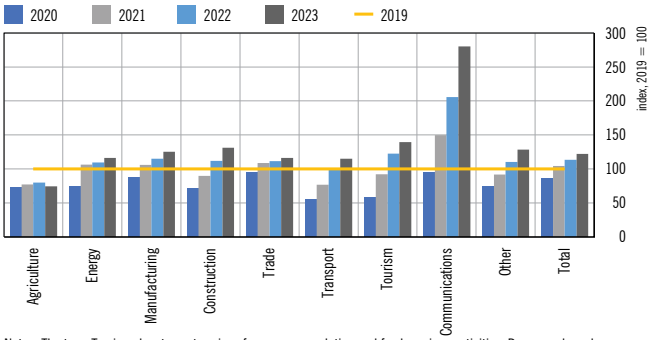
Notes: Quarterly disposable income values have been estimated using the Chow-Lin method and a series of employee compensation and gross operating surplus and mixed income as indicators. The savings rate is calculated as the ratio of the estimated nominal amount of savings and estimated disposable income and excludes adjustments for changes in pension rights. All data series have been calculated as a moving sum of the last four quarters.
Sources: Eurostat and CNB calculations.

Figure A.19 It is estimated that business performance in 2023 was robust



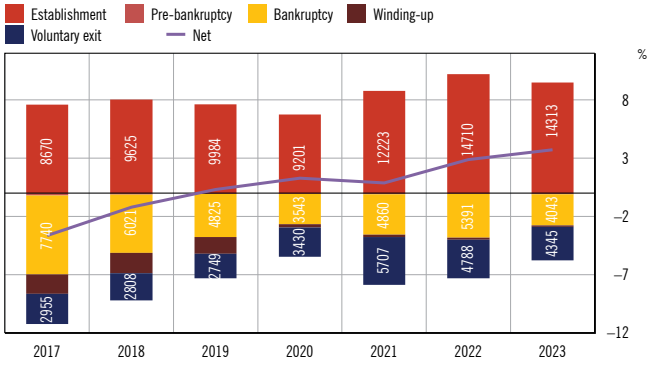
Sources: Tax Administration and CNB.

Figure A.20 Fiscalised receipts mostly grew faster than inflation



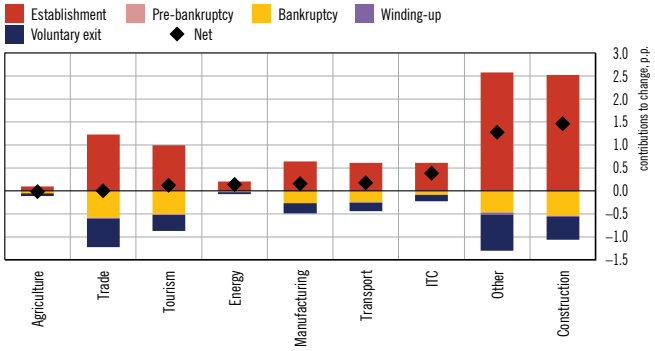
Notes: The term Tourism denotes enterprises from accommodation and food services activities. Revenues have been deflated by the consumer price index.
Source: Tax Administration.

Figure A.21 The number of active companies in Croatia continues to grow



Sources: CNB and Commercial Court Registry.

Figure A.22 The annual increase in net entries of enterprises was most pronounced in the construction sector

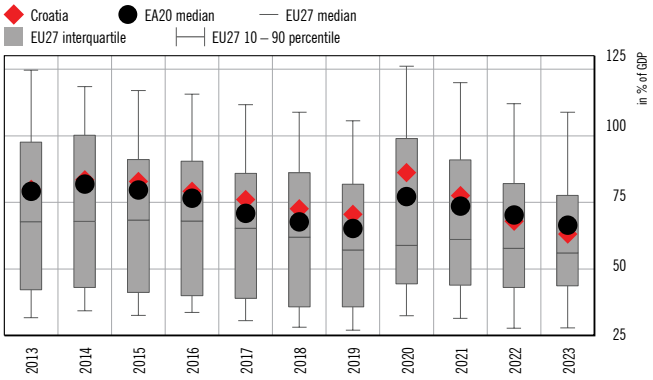


Notes: The figure shows contributions to change in the rate of net entries of enterprises, which stood at 3.7% in 2023. The term Tourism denotes enterprises from accommodation and food services activities.
Sources: CNB and Commercial Court Registry.

to continue their upward trend in 2024 (see CNB's Spring macroeconomic projections, March 2024). It is estimated that the savings rate was in negative territory in 2022 and early 2023 since wages grew at a slower pace than consumption. However, this trend reversed in the second half of 2023, when the rise in real net wages was accompanied a gradual recovery in the savings rate (Figure A.18).

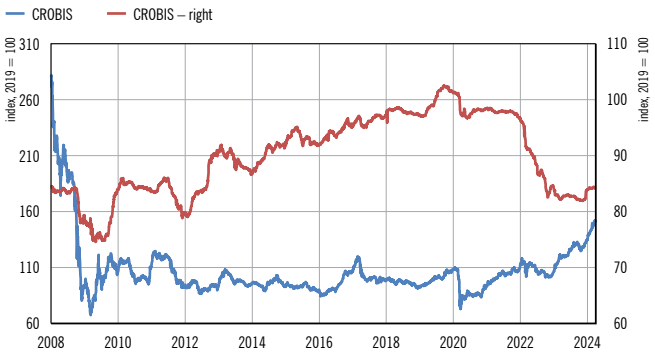
A favourable business environment and rising income have strengthened the resilience of non-financial corporations. The nominal amount of fiscalised receipts grew by approximately 20% in 2023 (a growth of 7% in real terms) and continued its upward, albeit somewhat slower, trend in the first months of 2024. The largest increase in real terms was recorded in the communications sector, followed by construction and tourism (Figures A.19 and A.20). However, despite the sharp rise in income, if operating expenses grew at a faster pace, especially influenced by a strong wage growth, it may be that profit margins of corporates decreased. The total number of active companies in Croatia continued to rise last year, while the annual increase in net entries[2] of enterprises stood at an all-time high of 3.7%, largely driven by the fall in the number of bankruptcy cases and voluntary exits of enterprises from the market (Figure A.21). The largest number of newly established corporations was recorded in construction, other service activities and trade (Figure A.22).

Figure A.25 Public debt continued its downward trend



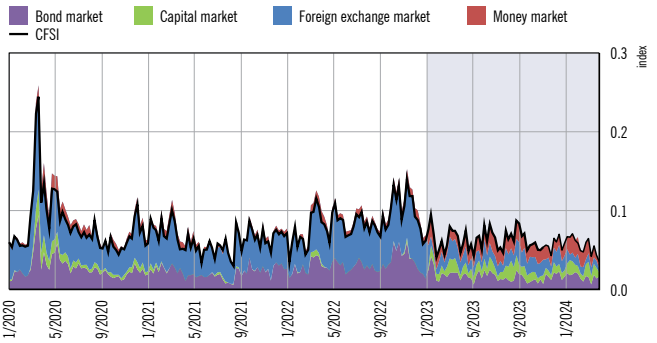
Source: Eurostat.

Figure A.23 Value of the CROBEX index spiked



Source: Zagreb Stock Exchange.

Figure A.24 The Croatian financial stress index held steady at low levels



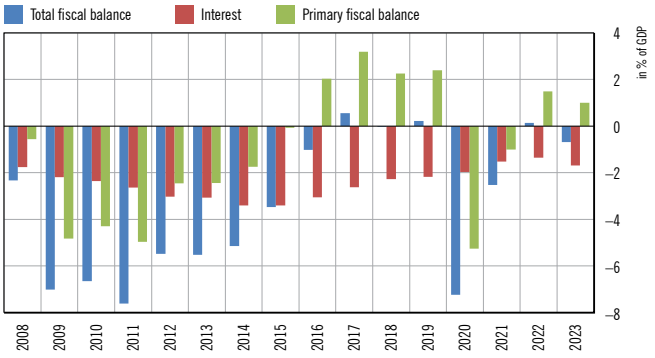
Notes: The old CFSI is shown for the period up to 31 December 2022. A new and revised CFSI (for methodology description see Financial stability No 24) is shown by the shaded area as of 1 January 2023.
Source: CNB.

Last year was marked by very positive investor sentiment and a strong recovery in the domestic equity market. The value of the CROBEX increased sharply from the very low levels recorded for many years and reached levels last observed in 2008 (Figure A.23). The positive investor sentiment can mostly be attributed to favourable business performance and better valuations of listed companies due to the rebound in economic activity and the continued convergence towards the euro area standard, as well as to international trends. The structural characteristics of the domestic equity market remained unchanged, meaning that it is highly concentrated and characterised by low liquidity.

Developments in the domestic bond, money and foreign exchange markets did not depart from the usual trends. Last year was marked by a very low level of financial stress (Figure A.24). Turnover on the bond market increased, although the value of the CROBIS remained almost unchanged, following its decrease in 2022 influenced by growing inflation and key interest rate increases. With a slight increase in trading and a higher level of interest rates, the developments on the money market remained stable amid high liquidity in the domestic banking

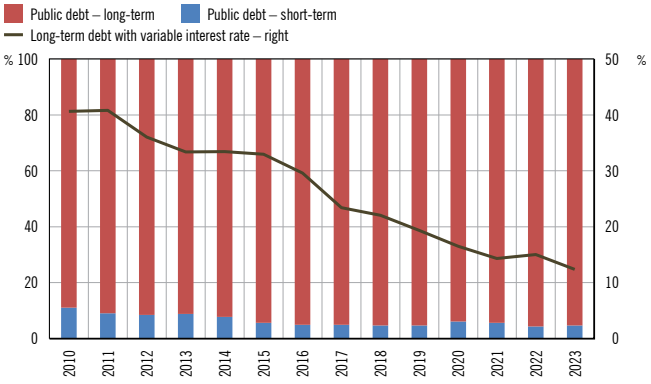
2 The net entries of enterprises are defined as the difference between entries (establishment) of enterprises and exits (bankruptcy, pre-bankruptcy, winding-up and voluntary exit) of enterprises from the market. In September 2023, the S&P credit rating agency changed Croatia's long-term rating outlook from stable to positive and upheld its record high investment rating (BBB+), which was confirmed by Fitch in October.

Figure A.26 Fiscal results improved in previous years



Source: CNB.

Figure A.27 The maturity and interest rate structure of public debt remained favourable

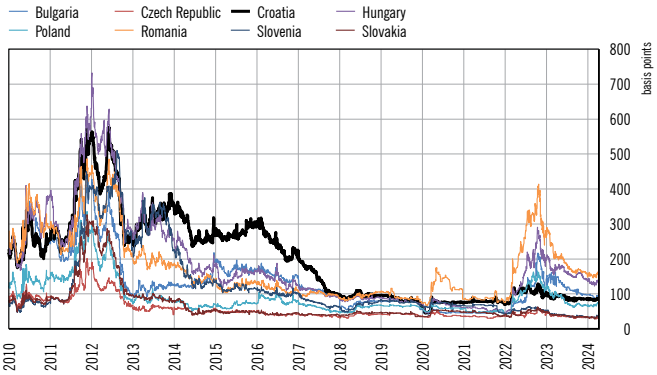


Source: CNB.

system. The foreign exchange market, observed through trends in the euro exchange rate against a basket of selected currencies, also remained stable.

Country risk held steady at a moderate level. Public debt-to-GDP ratio continued to decrease and stood at 63% at the end of 2023, still slightly above the Maastricht convergence criterion of 60% and somewhat below the median level of public debt of the euro area countries (Figure A.25). Such developments are mostly due to the increase in nominal GDP and favourable fiscal results in previous years (A.26). The maturity structure of public debt remained exceptionally favourable, with a very low share of short-term public debt in total debt and a slight extension of the average maturity to over six years. The share of long-term debt with a variable interest rate in the total long-term debt moderated further, which has largely mitigated the impact of interest rate risk amid elevated interest rates, with a positive effect on debt sustainability (Figure A.27). Long-term government bonds are still issued at a relatively favourable cost, with a low level of country risk premium measured by credit default swap (CDS) and improved outlook for Croatia's credit ratin[3] (Figure A.28 and Table A.1).

Figure A.28 Country risk premium measured by CDS remained low



Source: Bloomberg.

Table A.1 Matured and issued bonds in 2023 and the first months of 2024

Year	Matured bonds						Issued bonds					
	Amount	Currency	Interest rate	Date of issue	Date of maturity	Maturity in years	Amount	Currency	Interest rate	Date of issue	Date of maturity	Maturity in years
Domestic												
2023	11,300,000,000	HRK	1.750	27/11/2017	27/11/2023	6	1,250,000,000	EUR	3.750	24/11/2023	24/11/2033	10
International												
2023	1,500,000,000	USD	5.500	4/4/2013	4/4/2023	10	1,500,000,000	EUR	4.000	14/6/2023	14/6/2035	12
2024	1,750,000,000	USD	6.000	26/11/2013	26/1/2024	10	1,500,000,000	EUR	3.375	12/3/2024	12/3/2034	10

Note: The table shows bonds with a maturity of five years and more.
Source: Ministry of Finance.

3 In September 2023, the S&P credit rating agency changed Croatia's long-term rating outlook from stable to positive and upheld its record high investment rating (BBB+), which was confirmed by Fitch in October.

B Risks in the real estate market

Activity on the residential real estate market continued to decelerate in 2023, with a continued decrease in the number of purchase and sale transactions and a slight slowdown in the intensity of price growth, although prices continued to grow at a faster pace than in other EU member states. Activity was supported by a strong economic growth and an increase in income, as well as by the implementation of the eighth round of the government housing loan subsidy programme, whose effects were particularly visible around the middle of the year. An opposite effect was produced by a drop in non-resident demand, which was more intense than the decrease in domestic demand, and by the tightening of domestic financing conditions, which was somewhat less pronounced than in other EU member states due to specific circumstances. The commercial real estate market is still characterised by a shortfall in the supply of commercial premises. Rents rose in most segments of prime commercial premises, which has increased investors' yields on the market. Despite a slight increase in the number of purchase and sale transactions, the market remained very shallow, which makes it susceptible to economic shocks. Considering banks' limited exposure to firms whose business performance is directly dependent on real estate market developments, the main source of risk to the financial system stems from a possible decrease in the value of real estate held as collateral in the event of unfavourable economic conditions.

B.1 Trends in the residential real estate market

Residential real estate prices continued to rise steeply in 2023, albeit at a slower pace than in the previous year. Demand for real estate was supported by a strong labour market, wage increases and the government housing loan subsidy programme. Despite increased supply (see Chapter B.3), the growth in prices continued and stood at 11.9%[4] on average in 2023 (Figure B.1). Throughout 2023, prices grew at a slower pace than in the previous year, and the annual growth rate slowed down slightly. The growth of the general level of consumer prices also decelerated, so that the real annual rate of growth in prices ranged from 3% to 4% for the third consecutive year. Real estate asking prices in the first three months of 2024 (based on an index constructed by using data from a property listing website[5]) suggest that price growth might continue to slow down in 2024.

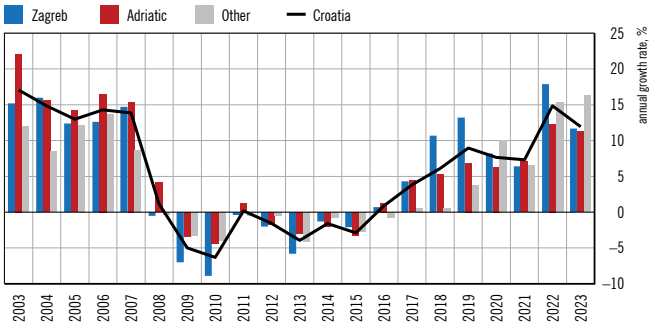
The increase in the prices of residential real estate in Croatia was the highest among EU member states because the market cycle reversed in most countries in 2023. In 2023, residential real estate prices fell by 0.3% on average in the whole of EU, while in the euro area the prices dropped by 1.2% (Figure B.2). The fall in prices was more pronounced in North-West European countries, which is in line with the worse macroeconomic indicators in these countries. On the other hand, apart from Croatia, a relatively sharp rise in prices was recorded mostly in new member states (Bulgaria, Lithuania, Poland), even though this growth was less pronounced than in Croatia.

The slowdown in the growth of prices in Croatia was accompanied by the steady fall in the number of real estate purchase and sale transactions. The number of purchase and sale transactions went down by 6.3% in 2023 on an annual basis, while the growth in their value over the same period de-

4 Of which one half (6 p.p.) was accounted for by the pass-through effects of a very strong growth in the second half of 2022.

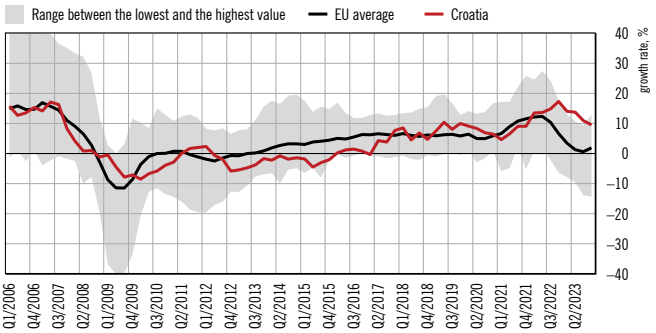
5 The asking price index was constructed based on data obtained from www.njuskalo.hr. The asking price index was assessed by applying the hedonic regression approach, in which the logarithm of the listed residential property price is explained by real estate characteristics and time effects, which represent the part of the price not related to real estate characteristics, which allows for a direct comparison. For more details on hedonic regression, see Surveys S-37 – Kunovac, D. and Kotarac, K. (2019): Residential Property Prices in Croatia.

Figure B.1 Residential real estate prices in Croatia continued to rise steeply, despite a slowdown in their growth



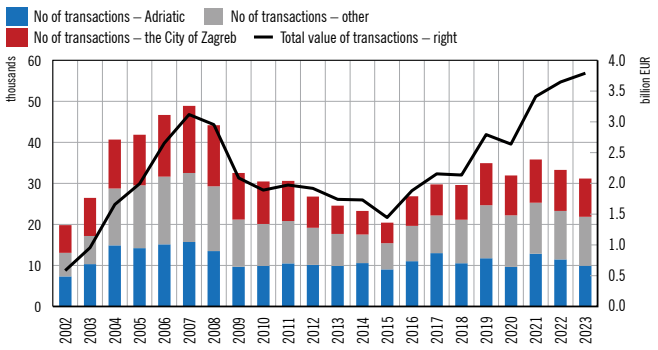
Note: For details on the construction of the nominal index, see Kunovac, D. and Kotarac, K. (2019): Residential Property Prices in Croatia.
Source: CBS.

Figure B.2 Croatia is at the top EU member states in terms of the increase in residential real estate prices



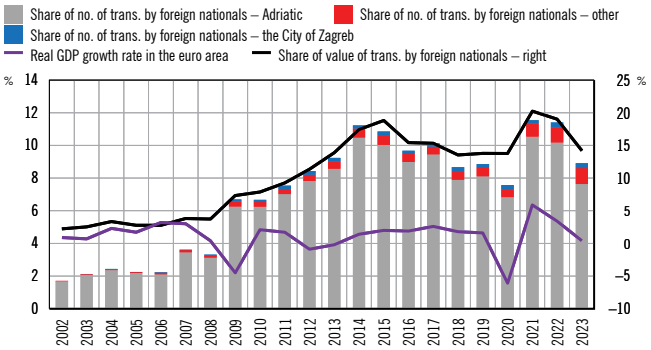
Note: Grey shaded area represents the range between the lowest and the highest value of annual rates of change of residential real estate prices in EU member states.
Source: Eurostat.

Figure B.3 The number of transactions continued to decrease despite the rise in total value, which was particularly pronounced on the Adriatic coast



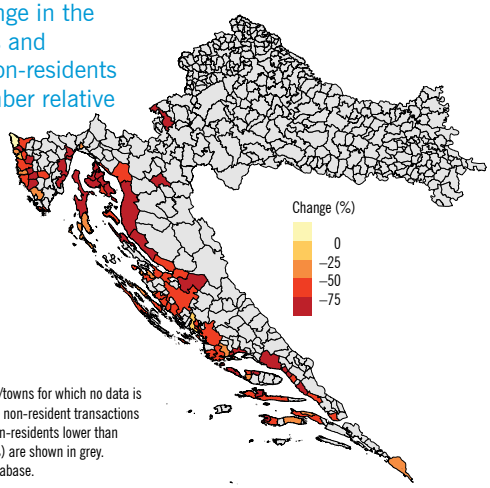
Source: Preliminary Tax Administration data.

Figure B.4 The decline in the number of purchases on the Adriatic coast was accompanied by the simultaneous drop in the share of foreign nationals



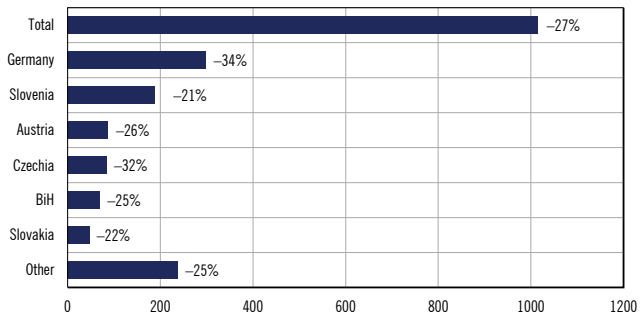
Sources: Preliminary Tax Administration data and Eurostat.

Figure B.5 Change in the number of sales and purchases by non-residents in the total number relative to 2022



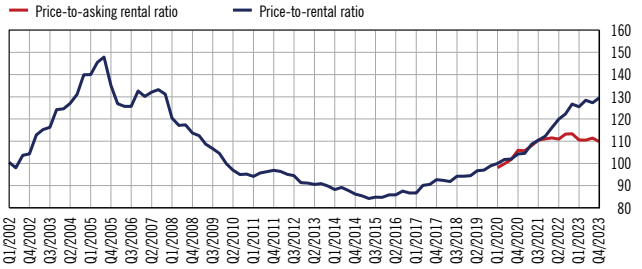
Note: Municipalities and cities/towns for which no data is available or with less than five non-resident transactions and those with the share of non-residents lower than Croatia's average in 2023 (9%) are shown in grey.
Source: Tax Administration database.

Figure B.6 Change in the number of purchases by non-resident buyers, broken down by country



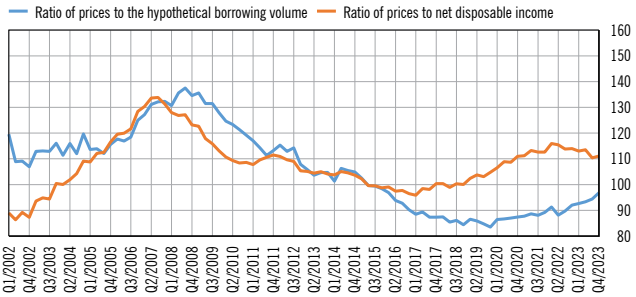
Note: The x-axis shows the nominal decrease in the number of sales and purchases, with relative changes shown in numbers next to bars.
Source: Tax Administration database.

Figure B.7 Rental prices show signs of growth, following the dynamics of real estate prices



Notes: The figure shows the ratio of the residential real estate price index to rental index. The blue line is based on data from residential real estate rental index (CP041) included in the calculation of the consumer price index (source: Eurostat), while the red line is based on data on asking rental prices available on the website njuškalo.hr. The asking price index was assessed by applying the hedonic regression approach, in which the logarithm of listed rental price is explained by real estate characteristics and time effects which represent the part of price not related to real estate characteristics, which allows for a direct comparison.
Sources: Eurostat and CNB calculations (Tax Administration data and njuskalo.hr).

Figure B.8 Although the increase in income exceeded the growth of prices, facilitating real estate purchases, loan financing has become increasingly difficult



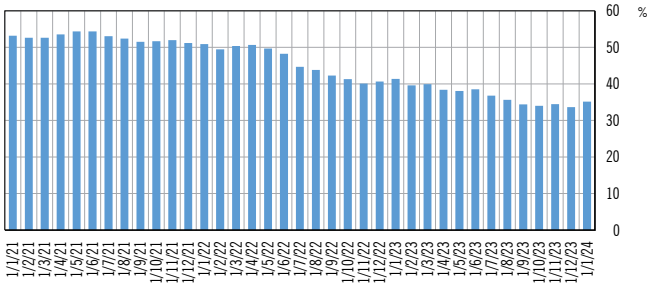
Note: Ratio of real estate price to the hypothetical borrowing volume has been calculated in line with Hertich, M. (2019): https://www.bundesbank.de/en/publications/research/discussion-papers/a-novel-housing-price-misalignment-indicatorfor-germany-806946.
Sources: CBS, Eurostat and CNB.

celerated and stood at 3.9% (down from 6.9% in 2022). The fall in the number of purchase and sale transactions was largely caused by a decrease in market activity on the Adriatic coast (by almost 20%) and in Zagreb, while this number remained almost unchanged in the rest of Croatia (Figure B.3).

The impact of foreign demand on the residential real estate market also declined. Transactions involving non-residents accounted for 8.9% of the total number of sales and purchases in 2023 and 14.2% of their value (Figure B.4), which is close to pre-pandemic levels, but below the levels recorded in the previous two years. The share of non-residents decreased the most on the Adriatic coast (by around 30%, Figure B.5), which is generally characterised by a concentration of foreign demand. This is a reflection of deteriorating financing conditions and a weak economic situation in the EU (Figure B.6). The number of buyers from Germany and Slovenia declined the most, with a fall in the number of buyers from Austria, Bosnia and Herzegovina, the Czech Republic and Slovakia.

Residential real estate rental prices have continued to grow more slowly than real estate prices, despite the accelerated growth of rental prices in 2023. Although the ratio of real estate prices to rental costs has recorded a strong growth ever since 2016, suggesting that the increase in demand for real estate had a stronger effect on purchase prices than on rents (Figure B.7), it may be that these trends are starting to reverse. Namely, the rise in residential real estate prices in the last eight years was faster than the growth of rental prices, which caused a reduction in real estate yields and impaired the attractiveness of such form of investment. However, if trends in asking rents are observed (by using data from property listing websites) instead of the reported value of rent, which is included in the calculation of the consumer price index, it can be seen that the price-to-rent ratio has stagnated ever since the end of 2021.[6] As the asking rental prices relate to new contracts, while the rental index is constructed by taking into account all the currently applicable rental prices, there is an additional time lag between the two series. It should be noted that rental market is strongly affected by the conversion of real estate into short-term rentals due to tourist demand, especially on the Adriatic coast and in Zagreb (see Box 1 Short-term rental market in Croatia).

Figure B.9 The share of listed properties with asking price that can be financed without additional own funds has decreased significantly over the last three years

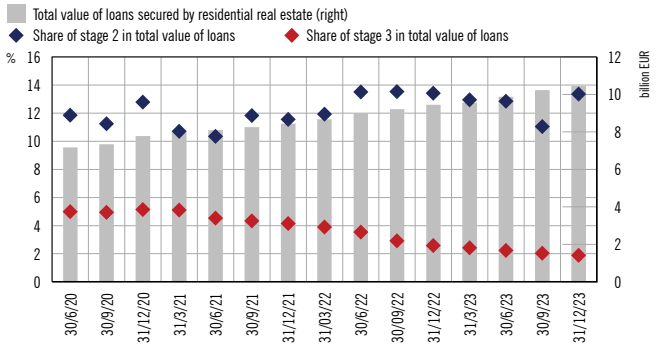


Note: The figure shows the share of listed properties whose asking price can be financed through a housing loan under standard conditions (with average interest rate and repayment period of 22 years, with monthly instalments not exceeding half of income of a household with two average salaries).
Sources: www.njuskalo.hr, Tax Administration database and CNB.

The tendency of deteriorating housing affordability was reversed in the past two years by a strong growth in disposable income, even though rising interest rates have continued to exacerbate the affordability of loan purchases. Since the growth of disposable income in 2023 exceeded the increase in residential real estate prices, their affordability recovered slightly last year (Figure B.8). On the other hand, the affordability of

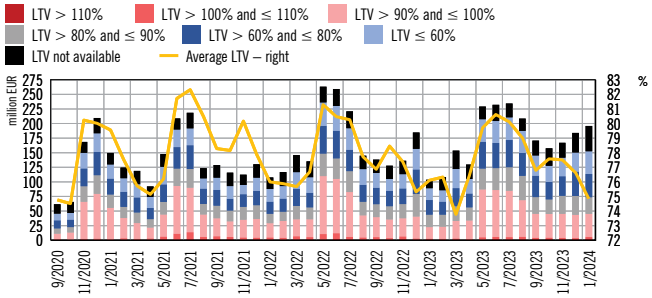
6 Different movements in rental prices from the two sources might be explained by unreported rental arrangements on the market and by the fact that reports on subsequent changes to agreed rents are not up-to-date or are delayed.

Figure B.10 Limited exposure of banks to changes in the residential real estate market



Note: Loans in stage 2 refer to performing loans witnessing a considerable increase in credit risk and loans in stage 3 refer to non-performing loans witnessing a loss.
Source: CNB.

Figure B.11 In the periods of no disbursements of subsidised loans, new loans are granted with a relatively low loan-to-value (LTV) ratio



Notes: For loans collateralised by real estate under development, the LTV ratio has atypically high values as the value of collateral is the value of land and not the expected value of real estate after it has been developed, so that such loans are included in the group "LTV not available". Also included in that group are housing loans without collateral.
Source: CNB.

real estate purchases by credit financing was further decreased by the tightening of financing conditions and the rise in interest rates on housing loans. The potential maximum loan amount households with average incomes could get for the purchase of residential property of 50 square meters under the given conditions in the financial market (hypothetical borrowing volume) continued to grow more slowly than real estate prices. Also, the last three years have seen a sizeable drop in the share of listed real properties whose purchase (by considering asking prices and under standard credit conditions, that is, the average interest rate and repayment period of 22 years) involves a loan with monthly instalments that do not exceed half of income and that can be financed by a household with two average monthly salaries (Figure B.9).

A moderate bank exposure to housing loans has mitigated the risks to financial stability associated with the residential real estate market. In Croatia, housing loans account for 24% of total bank loans, while the euro area average stands at around 30%. The quality of these loans has continued to improve slightly: the share of stage 2 loans secured by residential real estate (with a considerable increase in credit risk) in total loans remained relatively stable compared with the same period last year, while the share of stage 3 loans (that is, non-performing loans) edged down (Figure B.10). A relatively mild increase in interest on new housing loans, a sharp rise in employment and wages and the widely-used practice of interest rate fixation with regulatory restrictions on the maximum permitted interest rates on existing loans have alleviated systemic risks associated with the residential real estate market (see Chapter I.C on lending and interest rate risks). In addition, the ratio of loan principal to the value of real estate (loan-to-value ratio, LTV) continued to follow seasonal patterns, with spikes in the periods of subsidised housing loans disbursement and a decrease thereafter, when the average LTV dropped below 80% (Figure B.11).

Box 1 The short-term rental market in Croatia

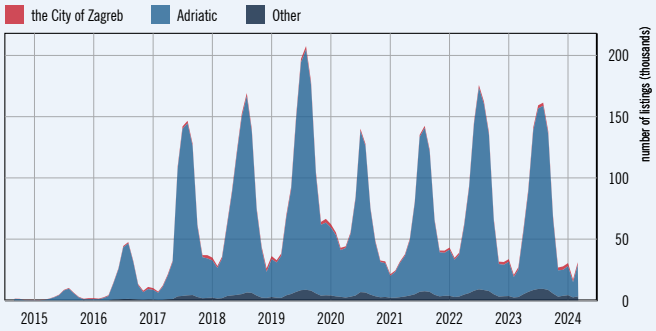
Residential real estate has both housing and economic purposes. In Croatia, this is particularly pronounced due to tourism. Relative to Mediterranean competitors, Croatia's tourism is characterised by a large share of private rentals in the total number of tourist nights. This raises the question of how the use of real estate for short-term tourist rental purposes impacts the demand for residential real estate and housing stock, and thus the movements in prices on the real estate market. By using the population of all listings on the popular Airbnb platform, this box analyses the dynamics and spatial heterogeneity of short-term rental and compares developments in short-term and long-term rental prices. As expected, short-term rentals are dominant on the Adriatic coast, while the short-term rental price index displays volatility which corresponds to the tourist season. Also, active short-term rentals in some coastal cities/towns and municipalities have absorbed a considerable share of the total number of housing units. The impact of short-term rentals on long-term rental prices is also reflected in the relatively consistent price movements in these two market segments. Prices in both segments have increased relatively strongly over the past two years (especially in the short-term rental segment), before showing signs of a slower growth early in 2024.

Demand for "tourist" real estate, combined with a reduced supply of dwellings and their use for short-term rentals can boost house prices, undermine housing affordability and increase risks associated with lending for real estate purchases, with significant implications for the stability of the financial system. Tourist activity in Croatia is characterised by a relatively large share of stays in private accommodation[1]. Paired with a high rate of real estate ownership[2], this gives a dual functional character to real estate property – it is used for residential purposes, but also for economic, tourism-related purposes. This duality can spill over to the real estate market through two economic channels: total demand for real estate can increase because owning a real property generates a return, while the supply of residential property can be reduced for the benefit of real estate used for economic purposes.

The short-term rental market in Croatia was described with reference to data obtained from the Airbnb platform, which offers a wide array of accommodation to travellers. For each listing, monthly data on the generated income and the number of reservations, as well as the characteristics and location of each property, are available. The analysis focuses on active listings which generated income in the observed period, and on whole-unit rentals (around 95% of the total sample).

Apart from being dominantly concentrated in coastal areas, the rentals listed on Airbnb show high seasonality, while the widespread use of the platform began in 2017 (Figure 1). Although private property rentals for tourist purposes are very common in Croatia, digital platforms only started to be used in the last decade. Offering accommodation via Airbnb in Croatia intensified in 2017, while the use of the platform

Figure 1 Monthly number of active Airbnb listings

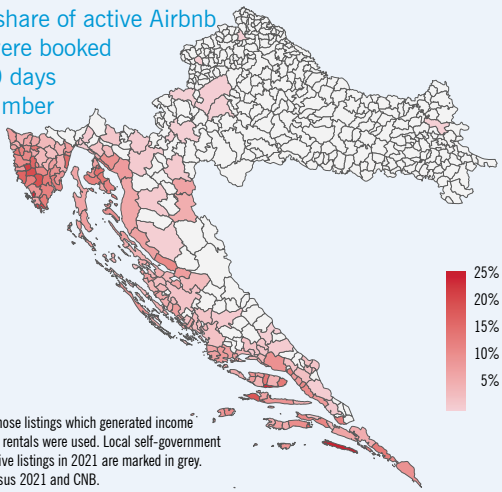


Notes: Active listings are those listings which generated income in a given month. The figure shows whole-unit rentals. The latest observations are for March 2024.
Sources: AirDNA and CNB.

reached its peak in August 2019, when 206 thousand accommodation units generated income from rental via Airbnb. The number of active listings in Croatia displays high seasonality corresponding to the tourist season.

Short-term rentals are largely concentrated in coastal cities/towns and municipalities, where active listings account for around 7% of the total number of housing units on average, while in some coastal municipalities, such listings account for up to 25% of the total number of housing units. Active listings are concentrated in coastal cities/towns and municipalities, and account for around 90% of the total number of Airbnb listings in Croatia on average. As well as in cities/towns and municipalities on the Adriatic coast, these listings are also widespread in some municipalities located away from the coast, especially in the inland parts of Istria and the Dalmatian hinterland. Short-term rental pressure on the real estate market is most pronounced in tourist cities/

Figure 2 The share of active Airbnb listings that were booked for at least 60 days in the total number of permanent housing units in Croatia in 2021



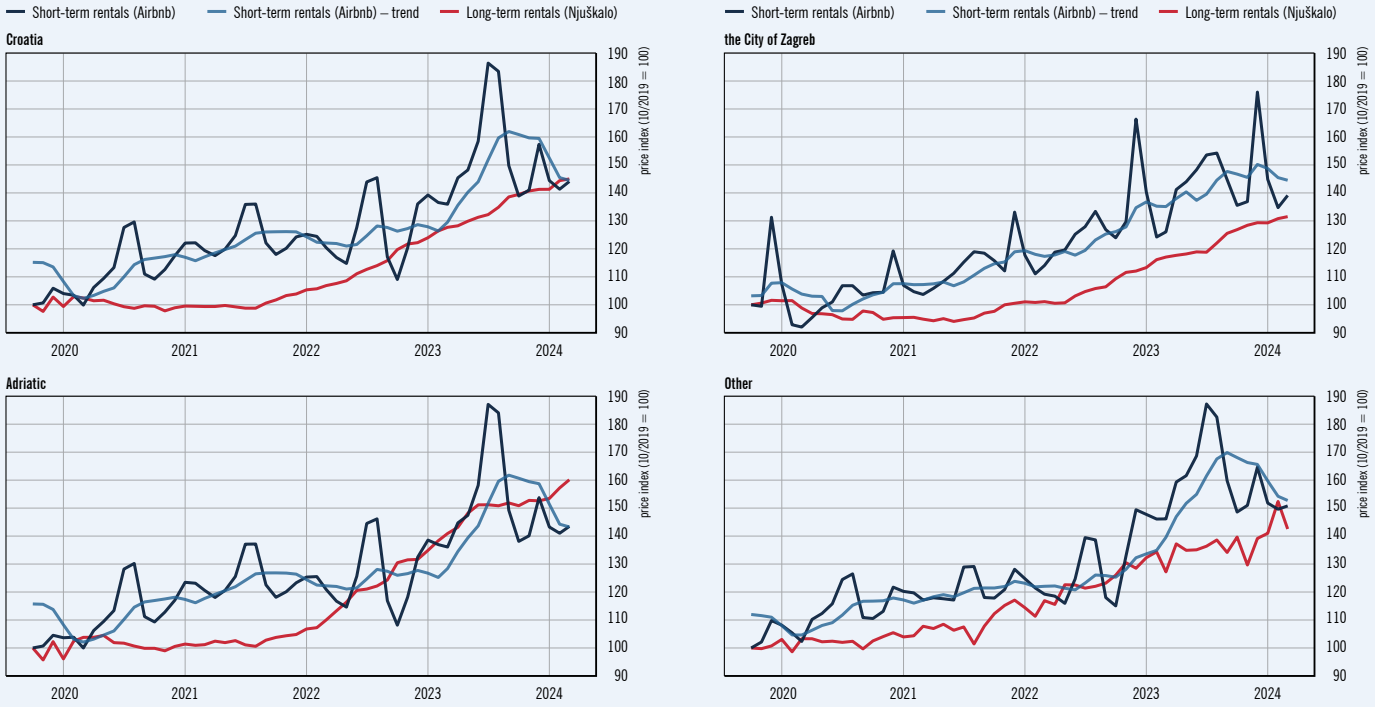
Notes: Active listings are those listings which generated income in 2021. Airbnb whole-unit rentals were used. Local self-government units with less than 20 active listings in 2021 are marked in grey.
Sources: AirDNA, CBS Census 2021 and CNB.

1 According to eVisitor data for 2023, around 40% of total nights in Croatia were spent in household facilities.

2 See the results of the Household Finance and Consumption Survey, e.g. CNB Issue I-57 – Kunovac, M. (2020.): Households' wealth distribution in Croatia.

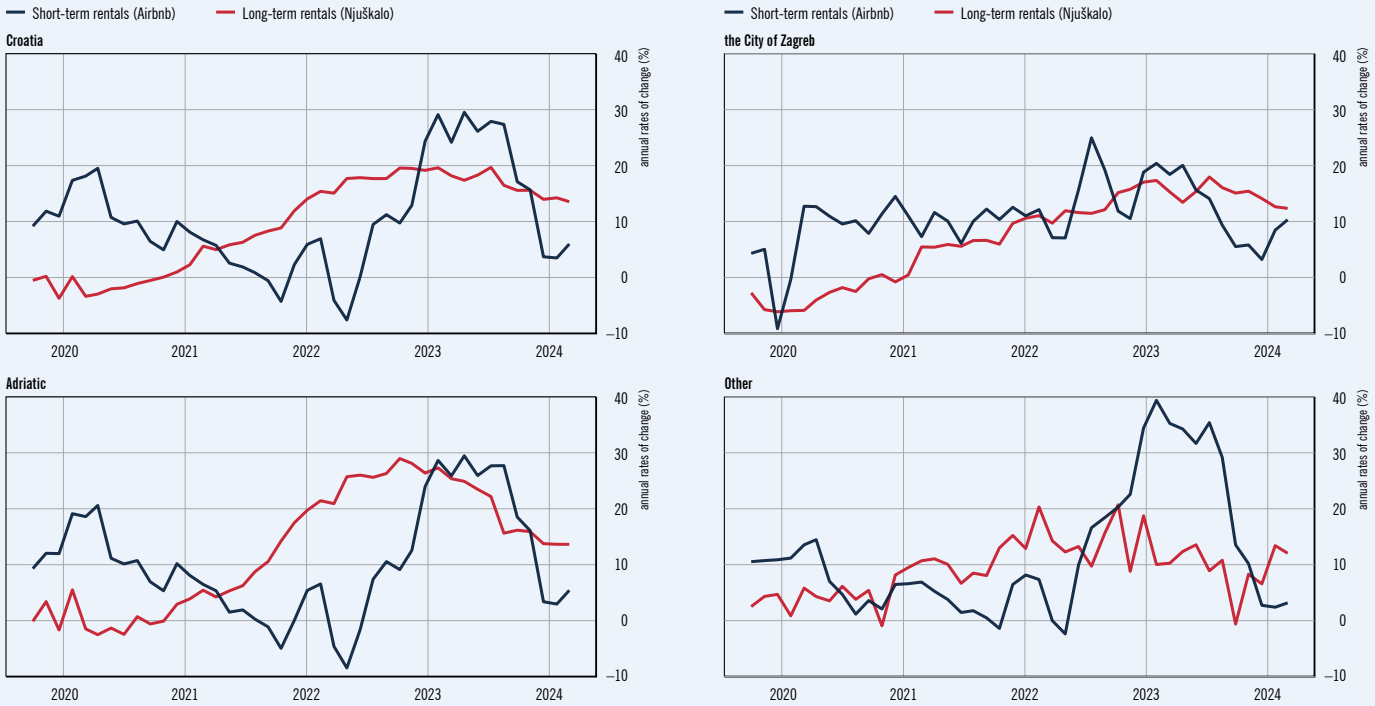
3 According to data for 2021, the year when the census was carried out.

Figure 3 Short-term and long-term rental price indices in Croatia



Note: The latest observations are for March 2024.
Sources: AirDNA, www.njuskalo.hr and CNB.

Figure 4 Annual rate of change in short-term and long-term rental price indices in Croatia



Note: The latest observations are for March 2024.
Sources: AirDNA, www.njuskalo.hr and CNB.

towns and municipalities (Figure 2[3]), where active listings, booked for at least 60 days in a year, account on average for around 7% of the total number of permanent housing units. However, in some coastal municipalities, active Airbnb listings account for up to a high 25% of the total number of permanent housing units.

To gain an insight into the evolution of short-term rental prices, a hedonic index[4] was constructed, which included active whole-unit rentals that generated income and which was estimated for the whole of Croatia and separately for the City of Zagreb, the Adriatic region (coastal local self-government units) and other.

The short-term rental price index shows a trend of a sharp rise in prices, with a pronounced seasonal profile over the summer months (Figure 3). Short-term rental prices trended up sharply, especially in 2023. In August 2023, short-term rental prices in Croatia as a whole were 26% higher than the levels recorded in August 2022. On the Adriatic coast, prices rose considerably over the summer months, while in Zagreb, a famous Christmas market destination, prices went up in December. Other cities/towns and municipalities have also witnessed index fluctuations during summer, albeit to a lesser extent.

Short-term and long-term rental price indices have shown a similar trend, even though they cover different markets. While the short-term rental price index is determined by tourism, which is largely influenced by foreign demand, the long-term rental price index is influenced by domestic demand for residential property. Also, short-term and long-term rental agreements have different durations, meaning that short-term rentals are characterised by more frequent price changes because they reflect the current market situation. Thus, unlike the short-term rental price index, the long-term rental price index, estimated by using data obtained from Njuškalo[5], another platform which offers long-term accommodation to people wishing to rent a dwelling, does not depend on the season. Until the end of 2022 and in 2023, short-term rental prices trended up faster than long-term rental prices in Croatia as a whole (Figure 4). However, although short-term rentals and long-term rentals differ in terms of the use of residential real property and are influenced by different factors, their indices follow a similar pattern. Accordingly, 2022 and 2023 saw a sharp increase in the prices of long-term rentals and even a more pronounced growth of short-term rental prices, with signs of a slowdown at the beginning of 2024. This correlation between long-term and short-term rental prices reflects the interrelation of different segments of the real estate market in Croatia.

4 A hedonic regression approach was used in estimating the short-term rental price index. To be more precise, by relying on data on active listing level, the logarithm of the price per night is explained by real estate characteristics and time effects which represent the part of the price not related to real estate characteristics, which allows for a direct comparison. Control variables in hedonic regression at real property level included fixed effects on the type of property (e.g. house or apartment), fixed effects on the number of rooms, fixed effect on the number of bathrooms, fixed effects on the maximum number of guests, fixed effects on booking cancellation policy (e.g. strict or flexible), variable indicator for pool and air conditioning in the facility and fixed effects on the local self-government unit where the facility is located. The shown indices were not estimated over the whole period (as this would impose a fixed return on characteristics across the whole period). Rather, a hedonic regression over the last 13 months was estimated for each month (in order to include the same month last year in the estimation) and was then used in order to construct the overall index. For more details on hedonic regression, see Surveys S-37 – Kunovac, D. and Kotarac, K. (2019): Residential Property Prices in Croatia.

5 The long-term rental asking price index was based on data obtained from www.njuskalo.hr. To be more precise, by using data on the active listing level, the logarithm of the asking rental price is explained by real property characteristics and time effects. Control variables in hedonic regression at real property level included the logarithm of dwelling area, fixed effects on the type of property (e.g. house or apartment), fixed effects on the number of rooms, fixed effects on the number of floors, variable indicator for elevator and air conditioning, variable indicator for new dwellings and fixed effects on the local self-government unit where the facility is located. The index constructed for the City of Zagreb used city districts instead of local self-government units for fixed effects. Like the short-term rental price index, the shown indices were not estimated over the whole period; rather, a hedonic regression over the last 13 months was estimated for each month and was then used to construct the overall index. It should be noted that the long-term rental index from the mentioned property listing website is methodologically different from the actual rentals for housing index (a component of the consumer price index), because the property-listing website lists asking rental prices, and not achieved rental prices, and because data from the property-listing website reflect prices of new rentals, while the official statistical data also include existing long-term rental agreements.

B.2 Trends in the commercial real estate market

As with residential real estate, the growth of asking prices of commercial real estate has started to decelerate. According to data obtained from real estate-listing websites, which include prime and other real estate in the whole of Croatia, the rise in asking prices first started to moderate in the retail segment and then in the segment of hotels and logistics and industrial space (Figure B.12). The exception is office space. Despite the work-from-home trend, impacted by limited supply, the rise in asking prices of office space remained stable and held steady at around 15% in early 2024, growing slightly more than prices in other segments.

After a sharp fall last year, the total amount of commercial real estate transactions edged up in 2023. According to data from Colliers real estate agency, total commercial real estate turnover in 2023 increased by around 23% from the year before, largely supported by the hotel segment, following a very poor performance in the previous year (Figure B.13). Investment activity in the office space segment has returned to relatively low values after a spike in 2022. These trends suggest that the commercial real estate market in Croatia has remained shallow; as a result, some market segments have witnessed considerable fluctuations in purchase and sale transactions, either as a result of changes in demand or due to a limited supply.

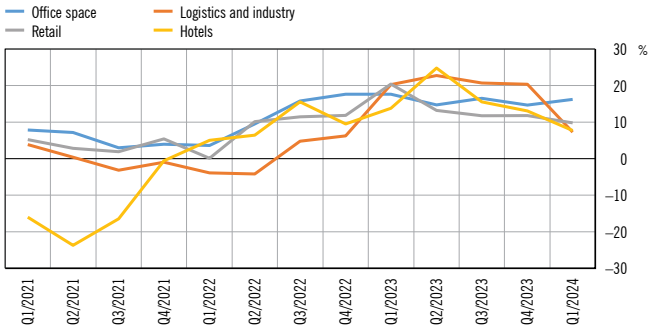
Prime commercial real estate market is still marked by robust demand and a relatively limited supply. According to data obtained from real estate agencies, the vacancy rate held steady in the segment of logistics and prime retail spaces, while the availability of prime office space continued to decline (Figure B.14). The availability of prime office space dropped to 2%, while the rate of available logistics space also stood at similarly low levels. Given the limited supply of office space and very low availability of prime location properties, structural changes such as the widespread practice of working from home and the rise in energy costs did not deter renewals of the existing lease agreements and did not have a significant impact on the occupancy of office space.

Despite the limited supply of existing properties and ample demand, rents of commercial premises in prime locations rose only slightly. Rents in the segment of prime office space held steady in 2023, which is partly attributable to higher price sensitivity of tenants. On the other hand, rental prices in the segment of logistics increased due to demand factors related to the construction of new port terminals on the coast, Croatia's entry into Schengen area and near-shoring trends. Growth in disposable income and a favourable economic environment improved the business performance of retailers and also led to a rise in rents for prime retail space.

Yields on investment in the prime commercial real estate market edged up due to a rise in rents. Growth from the levels recorded last year was seen in the segment of prime retail space and logistics space (Figure B.15) owing to a relatively sharp rise in rent compared to the value of commercial premises. Regarding office space, the yield on prime locations held steady due to a stagnation in rents and stable valuations of office space. In 2023, the average yield ranged between 7.5 and 7.6% in all three market segments.

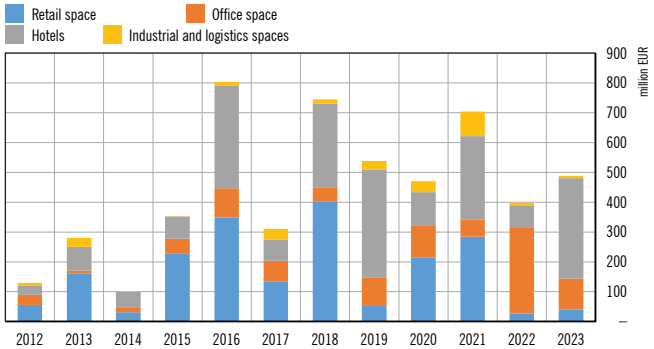
Due to the shallowness of the commercial real estate market, unfavourable trends on this market can affect the banking system. Even though banks have relatively low direct exposure to corporates whose revenues depend on the prices and activity in the real estate market (see Chapter B.3), which stands at around 2% of the banking sector's total assets, commercial real

Figure B.12 The growth of asking prices of commercial real estate on property listing websites has slowed down



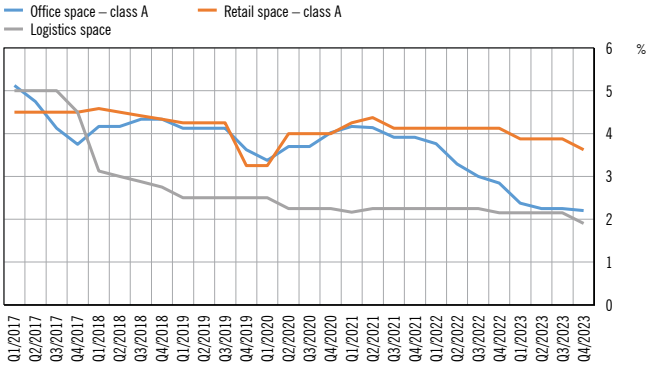
Notes: Asking prices of commercial real estate on property listing websites relate to a wide sample of real estate relative to data collected from real estate agencies. In addition to prime real estate, they also include commercial premises in other segments and in various locations in Croatia.
Sources: CNB calculations and www.njuskalo.hr.

Figure B.13 The volume of transactions on the commercial real estate market edged up in 2023



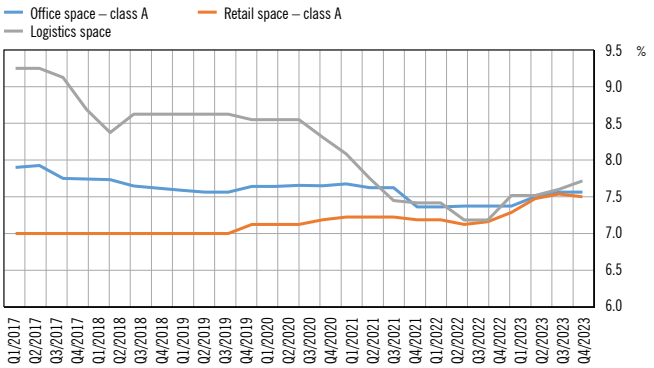
Note: The assessment does not cover total transactions but only investment deals, and does not include investments in construction.
Source: Colliers.

Figure B.14 A drop in the vacancy rate points to a limited supply of commercial premises



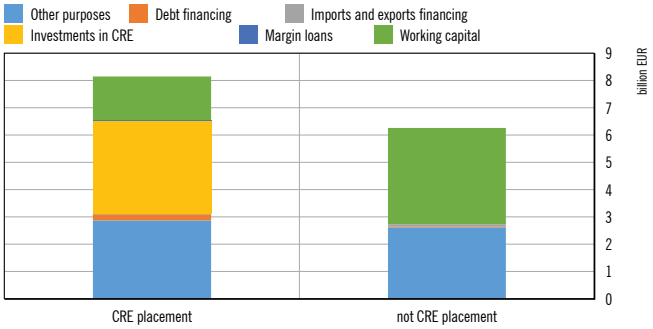
Note: Data refer to the City of Zagreb and its surroundings.
Sources: CBRE, Colliers, CW CBS International and Spiller Farmer.

Figure B.15 Yields on the market of prime commercial properties



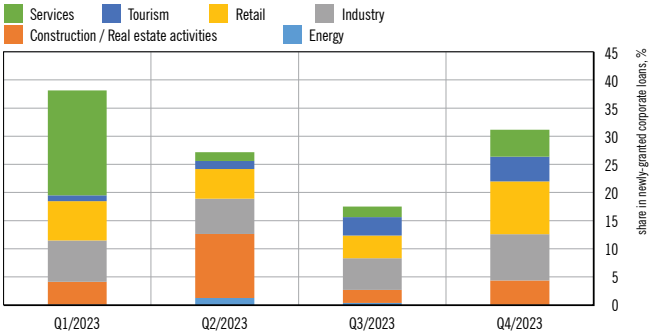
Note: Data refer to the City of Zagreb and its surroundings.
Sources: CBRE, Colliers, CW CBS International and Spiller Farmer.

Figure B.16 More than 50% of total exposure to corporates is accounted for by loans related to commercial real estate market



Notes: CRE placements are placements associated with the commercial real estate market. The data for Croatia include all credit institutions from Croatia, excluding branches of foreign banks. Stock of loans as of 29 February 2024.
Source: CNB (AnaCredit).

Figure B.17 Loans related to commercial real estate market account for a smaller share in new loans to the non-financial corporate sector

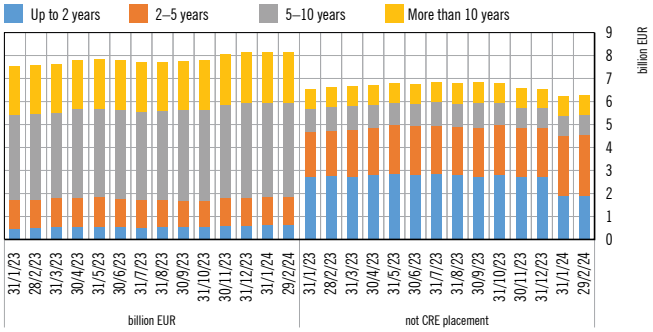


Notes: CRE placements are placements associated with the commercial real estate market. The data for Croatia include all credit institutions from Croatia, excluding branches of foreign banks.
Source: CNB (AnaCredit).

estate is often used as collateral in lending to corporates, and this form of financial system exposure to commercial real estate market has a much greater importance (for more information, see Box 1 Analysis of banks' exposures to non-financial corporations associated with commercial real estate, Macroprudential Diagnostics No 22). Credit exposures to construction companies and real estate companies and other corporate loans with commercial real estate held as collateral together account for 10% of total bank assets (Figures B.16 and B.17) and more than a half of placements to non-financial corporations. In lending to corporates, banks often use commercial real estate as collateral when providing financing to corporates intended for investing in plant, equipment and/or commercial real estate. On the other hand, exposures not secured by commercial real estate largely involve loans to finance working capital with shorter maturities (Figure B.18).

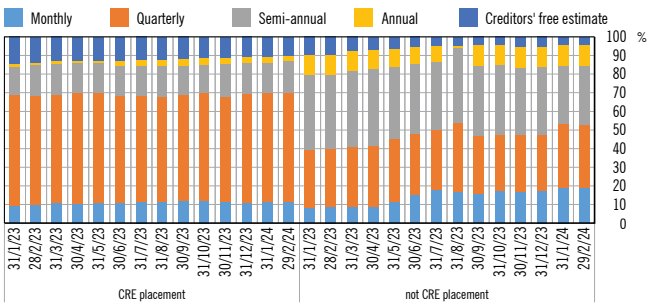
The quality of loans related to the commercial real estate market continued to improve. Considering that loans related to the real estate market have, as a rule, longer maturities, a higher frequency of interest rate changes (Figure B.19) and higher loan amounts, their quality is more dependent on the performance of corporates and their debt-servicing capacity. Accordingly, in the event of a negative economic shock, the quality of loans related to commercial real estate market could deteriorate much faster and more sharply than the quality of other placements to non-financial corporations. In 2023, loans related to commercial real estate market witnessing a considerable increase in credit risk (stage 2) remained largely unchanged, with a slight increase in commerce (Figure B.20). However, the share of non-performing loans related to commercial real estate market went down by 0.5 p.p. and stood at 6% at end-2023 (Figure D.21), although their decrease was

Figure B.18 CRE placements have longer repayment periods



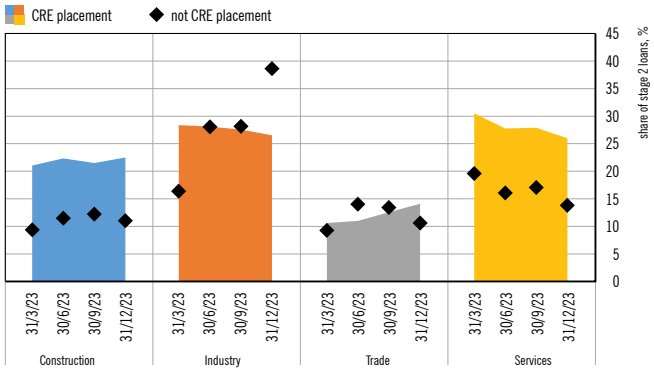
Notes: Loan repayment period means original maturity at origination. CRE placements are placements associated with the commercial real estate market. The data for Croatia include all credit institutions from Croatia, excluding branches of foreign banks.
Source: CNB (AnaCredit).

Figure B.19 More frequent interest rate changes in CRE placements make them more sensitive to changes in interest rates



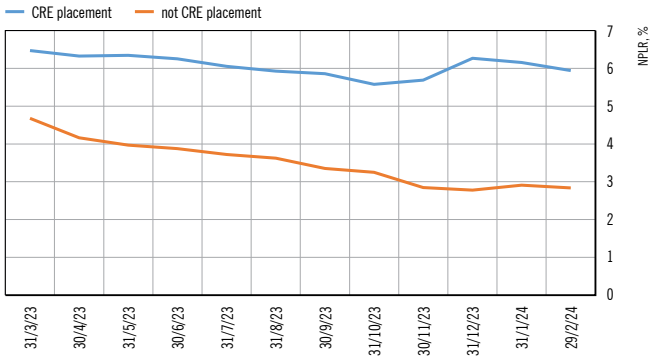
Notes: The figure shows the structure of loans by frequency of interest rate changes only for loans granted at a variable interest rate. CRE placements are placements associated with the commercial real estate market. The data for Croatia include all credit institutions from Croatia, excluding branches of foreign banks.
Source: CNB (AnaCredit).

Figure B.20 Industry has the largest share of stage 2 loans related to commercial real estate market



Source: CNB (AnaCredit).

Figure B.21 Loans related to commercial real estate market are riskier than other loans

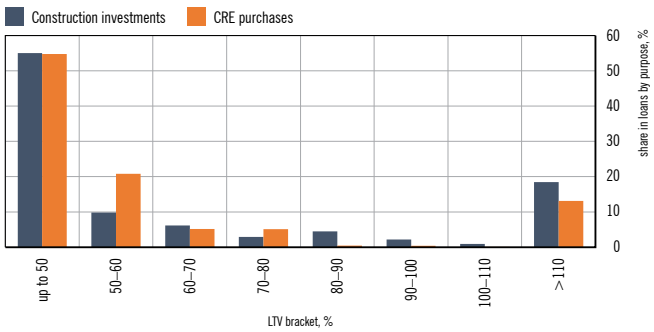


Source: CNB (AnaCredit).

slower relative to other loans to non-financial corporations (by 2 p.p.).

Loans related to commercial real estate market are mostly subject to relatively tight credit standards (Figure B.23), while loan-to-value (LTV) ratio is lower in the segment of loans collateralised by commercial real estate[7] and property for own use than in the segment of loans collateralised by residential real estate. However, some segments of the loan portfolio have a very low coverage of loans by the value of real estate held as collateral (that is, a high LTV ratio). In terms of the distribution of the current LTV ratio by loan purpose, loans for investment in own operations (buildings, plants, commercial premises and

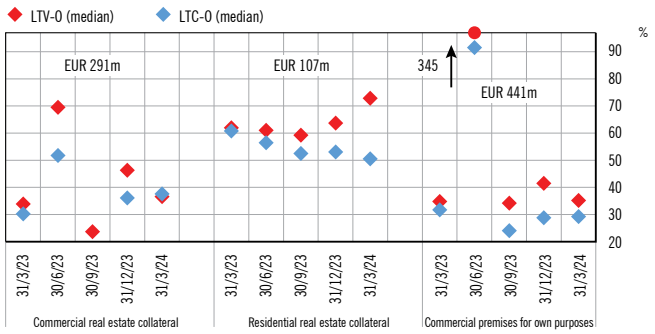
Figure B.22 Some exposure concentrations have high LTV ratios



Notes: Distribution of loans includes all loans intended for investment in commercial real estate which are collateralised by commercial real estate. The shown distribution refers to the stock of loans as at 29 February 2024.
Source: CNB (AnaCredit).

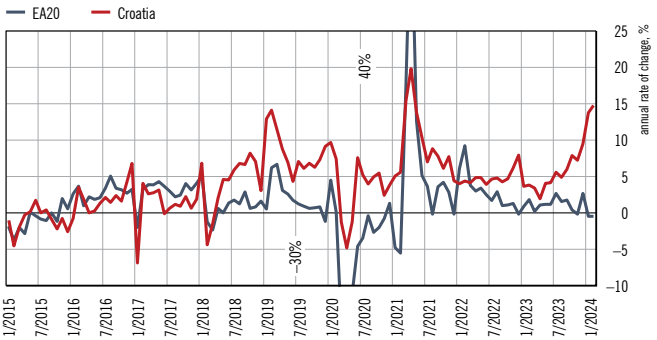
7 Commercial real estate means real estate whose cash flows and value have an impact on the credit risk of their owner. Commercial real estate by type is broken down into offices, retail outlets, industrial property and residential real estate owned in corporate ownership, other.

Figure B.23 CRE placements are subject to relatively tight credit standards



Notes: The shown amounts refer to the total amount of newly granted loans in the last 14 months collateralised by the selected type of commercial real estate. Collateral in the form of residential real estate refers to residential real estate owned by a legal entity and held as collateral.
Source: CNB (AnaCredit).

Figure B.24 Acceleration of construction activity



Note:The figure shows the annual rate of change in the volume index of construction works in a given month.
Source: Eurostat.

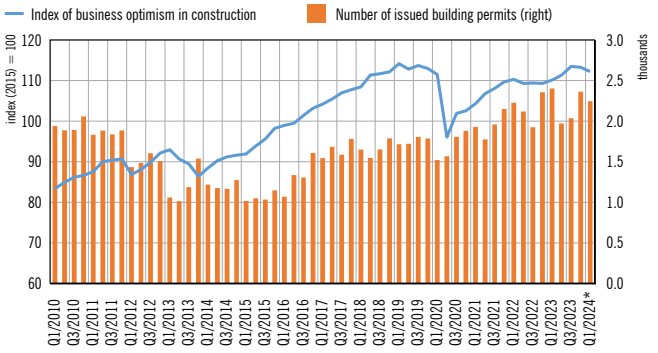
land) have witnessed a larger share of risky placements than commercial real estate loans (Figure B.22). Half of loans with very high LTV ratios are collateralised by commercial real estate but also have additional collateral for credit claims and thus a lower loan-to-collateral ratio. As regards the other half, loan amounts significantly exceed the estimated collateral value.

B.3 Corporate operations in construction and real estate activities

Real estate supply is gradually responding to a robust demand, with the number of real estate projects growing. The growth in the volume of construction works in Croatia accelerated from 3.8% in February 2023 to 14.8% in February 2024, in contrast with the euro area where the volume of construction works stagnated (Figure B.24). While the rise in the volume of construction works can partly be attributed to post-earthquake reconstruction and investments to infrastructure financed by the record-high inflows from EU funds, the increase in the number of issued building permits for residential real estate suggests that residential construction has continued its upward trend (Figure B.25). Business optimism remains above its long-term average, pointing to the continued growth in the number of new construction projects.

The rise in the costs of construction of new buildings slowed down considerably from the levels recorded in 2022, which has reduced upward cost pressures on real estate prices. Costs of construction materials, which spiked during the pandemic due to disruptions in logistics amid strong demand, have seen a slowdown in their growth (Figure B.26). By contrast, labour costs have continued to grow sharply, influenced by protracted labour shortages. Despite the increase in the costs of labour and material, growth rates of total construction costs stabilised

Figure B.25 Increase in the number of issued building permits

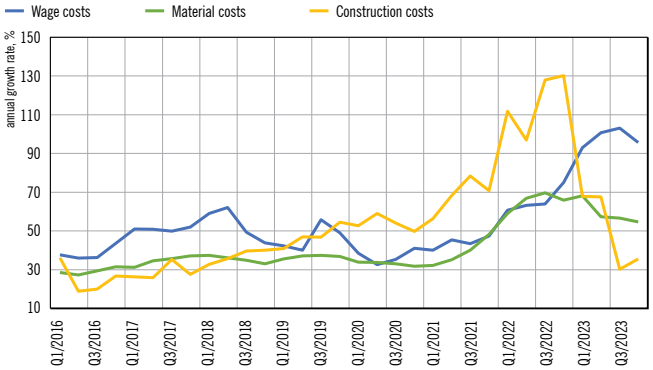


Note: Data on the number of building permits relate to the last month of 2023 and the first two months of 2024.
Source: Eurostat.

in the second half of 2023, which implies stabilisation of profit margins in the construction sector over the same period. The slowdown in the growth of construction costs might dampen upward pressures on the prices of newly-built real estate and have a positive effect on the profit margins of corporates in the construction sector.

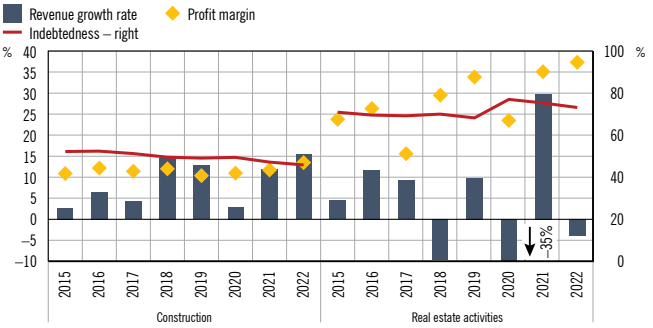
The environment of rising real estate prices has had a favourable impact on corporate business performance in the segment of construction and real estate activities (Figure B.27). In recent years, enterprises in construction have recorded a steady growth in income, with stable profit margins at the level of about 13%, and have managed to reduce their indebtedness levels. On the other hand, the operating revenues, profit margins and realised profit after tax of real estate companies have been much more volatile and these companies are consid-

Figure B.26 Cost pressures have abated



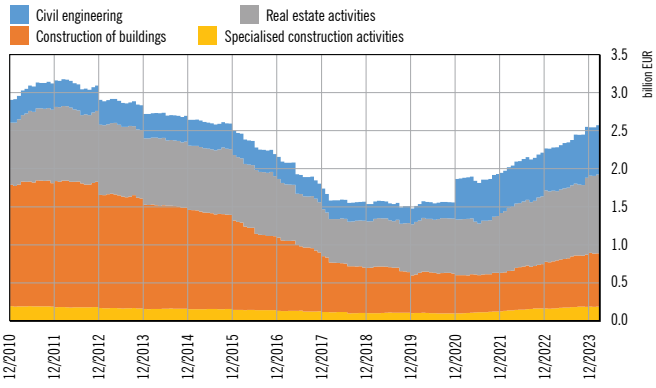
Sources: Eurostat and CBS.

Figure B.27 The price increase was reflected in satisfactory business performance in construction



Notes: Profit margin refers to EBITDA margin, that is, the ratio of earnings before interest, taxes, depreciation and amortisation and revenue. Indebtedness refers to the ratio of total debt (sum of short-term and long-term liabilities) to total assets.
Source: FINA.

Figure B.28 Growing exposure of banks to corporates active in real estate market



Source: CNB.

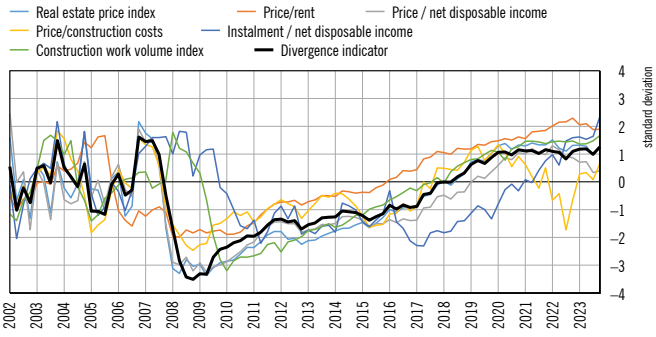
erably more dependent on external financing. Given the fundamental differences in business models, a possible slowdown in the real estate market might have a greater impact on the operations of real estate companies and increase their credit risk.

The exposure of the banking system to corporates associated with the real estate market increased over the past three years, while the quality of loans held steady. This increase resulted from a larger exposure to corporates dealing with building construction activities and real estate companies (Figure B.28) due to borrowing in the form of investment loans to finance investment in new projects. The quality of loans is quite satisfactory, as the share of non-performing loans in total loans to construction and real estate sectors dropped to 7%, the lowest level since 2010 when statistical data started to be observed. A large share of non-performing loans is accounted for by old loans that have been in default for more than five years. The share of loans witnessing a considerable increase in credit risk (stage 2) held steady at slightly less than 16%. However, the specific characteristics of business models and financing through special purpose vehicles (SPV), which are mostly established for the purpose of developing a project and whose affiliation with other legal entities is difficult to discern, might lead to a rapid credit risk materialisation and hampered collection of non-performing loans should there be a slowdown in demand and a decrease in real estate prices.

B.4 Prospects in the real estate market

Residential real estate market is in a mature phase of expansion marked by a continued decline in the number of transactions and a gradual slowdown in price growth. Various indicators of the relationship between residential real estate

Figure B.29 Residential real estate prices are above the level determined by fundamentals



Notes: The figure shows standardised cyclical components of various indicators relevant for the developments in real estate prices obtained using a one-sided recursive Hodrick-Prescott filter ($\lambda = 400{,}000$) included in the composite divergence indicator. The construction work volume index refers to buildings.
Sources: CBS, Tax Administration, Eurostat and CNB.

prices and their macroeconomic determinants have remained elevated, with signs of stabilisation (Figure B.29). The gap in the ratio of residential real estate prices to household income contracted slightly relative to the long-term trend, even though the ratio remained elevated. The ratio of loan payment to disposable income also increased amid rising interest rates, while the ratio of real estate prices to construction cost also increased and returned to a level above its long-term trend.

The persistently high level of real estate prices relative to their macroeconomic determinants has increased the probability of risk materialisation in the form of a fall in prices and the intensity of a possible fall in prices. Such a reversal in the market might trigger a sudden contraction in demand, driven by adverse economic or financial shocks. However, even without such shocks, demand for residential real estate has weakened. This weakening is particularly pronounced in the foreign demand segment, reflecting tighter financing conditions and weak economic activity in the euro area, while domestic demand also weakened slightly following the end of the government housing loan subsidy programme.

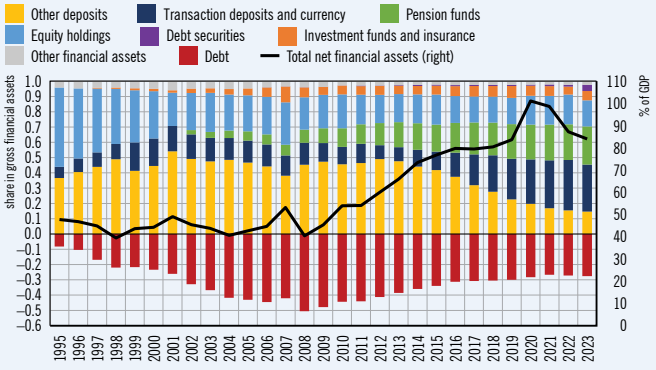
The commercial real estate market is still in the upward phase of the cycle, but it is vulnerable to possible sudden changes. The fall in the vacancy rate of office space and a slight increase in rents in all segments signal a favourable outlook for the commercial real estate market. However, the market remains relatively shallow and faces poor liquidity, which has increased susceptibility to potential shocks that might lead to disruptions in the operations of enterprises whose revenues depend on market developments and to a significant fall in commercial real estate prices. Bank exposure to construction companies and real estate companies increased as construction activity strengthened. However, considering the larger exposure of the banking system to the commercial real estate market via the collateral channel, in the form of real estate whose cash flows affect debtors' credit risk and in the form of property for own use, low valuations in the commercial real estate market might additionally decrease collateral coverage and reduce the recoverability of non-performing receivables due to credit quality deterioration.

Box 2 Can assets mitigate risks to financial stability associated with household debt?

The growth in the financial assets of households in Croatia exceeded the growth of indebtedness over the past twenty years. As in peer member states with similar income levels, total net assets have been at the bottom of the range of the European Union in the past years. As regards systemic risks, partial data on debt and asset distribution suggest that assets in Croatia do not have a mitigating effect on risks to financial stability arising from household debt. Namely, the distribution of debt and assets among natural persons in Croatia is such that deposits and loans are mostly concentrated in different groups of natural persons. However, there are some mitigating effects in the case of debtors with housing loans, as in most cases the value of their residential real estate exceeds the value of their debt.

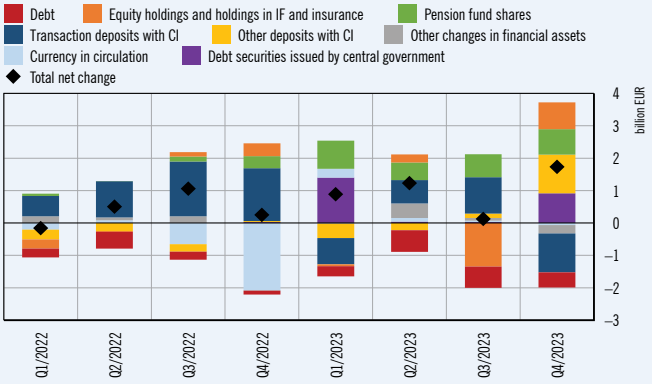
Although there was a strong increase relative to GDP between the global financial crisis and the pandemic, ever since 2020 the growth in financial assets of households in Croatia has lagged behind the increase in GDP (Figure 1). From the mid 1990s to the global financial crisis, the value of net financial assets of households grew at a pace similar to that of GDP and fluctuated around 45% of GDP. During this period assets increased, but household debt and GDP also grew strongly, so that the ratio of financial assets to GDP was stable. However, following the outbreak of the global financial crisis, households increased their savings from current income and started to deleverage vis-à-vis banks. On the other hand, the growth of GDP was relatively subdued, so that the ratio of net assets to GDP trended up strongly for more than a decade. Following the outbreak of the pandemic, financial assets almost equalled GDP as household savings surged, while nominal GDP contracted sharply. However, economic recovery and the pick-up in inflation have led to a reduction in savings[1], so that the ratio of net financial assets to GDP trended down to 84% at end-2023.

Figure 1 The ratio of net financial assets to GDP has spiked over the last 15 years



Notes: The left y-axis shows the share in total assets. Other deposits primarily comprise time deposits.
Source: Eurostat.

Figure 2 The several-year spillover from time deposits to transaction deposits was halted in 2023



Notes: IF refers to investment funds. CI refers to credit institutions.
Source: CNB.

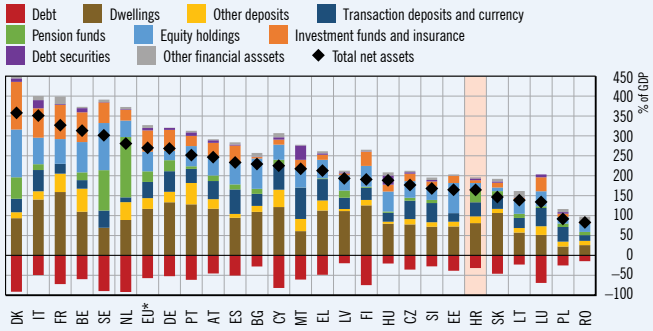
The structure of total (gross) financial assets of households is largely dominated by liquid assets in the form of deposits, although their share in this millennium has gradually decreased. The share of deposits in total financial assets spiked in the late 1990s (up from 48% in 1995 to 71% in 2001) and gradually decreased afterwards to 45% at end-2023. This largely stemmed from the gradual accumulation of individualised mandatory pension savings (II pillar) and the strengthening of voluntary pension savings (III pillar) following the pension reform in 2002. The value of shares in pension funds grew steadily and amounted to 25% of the financial assets of households at the end of 2023. The share of equity holdings in firms declined and this form of financial assets has lost most of its relevance, having decreased from 52% in 1995 to 17% at end-2023.

Less developed EU member states are characterised by a relatively low level of total net assets and their concentration in residential real estate (Figure 3). The share of net assets of households (net financial assets increased by the estimated value of dwellings[2]) in GDP is among the lowest in the European Union, which is characteristic of other new member states, such as Slovenia, Estonia, Slovakia and Lithuania. As in the mentioned countries, total assets of households in Croatia are dominated by dwellings (82% of GDP). In comparison to peer countries, Croatia has recorded a higher share of deposits (53% of GDP) and pension funds (28% of GDP), and a somewhat lower share of equity holdings (20% of GDP), with a similar level of indebtedness (around 31% of GDP). On the other hand, households in the most developed EU member states such as Denmark, Italy, France, Belgium, Sweden and the Netherlands, have a significantly higher level of net assets (around 310% of GDP on average, relative to 164% in Croatia), both in the form of dwellings and in various forms of financial assets.

1 CNB's analyses concerning household savings are also available in Macroeconomic Developments and Outlook No 13, Box 1 and Macroeconomic Developments and Outlook No 10, Box 3.

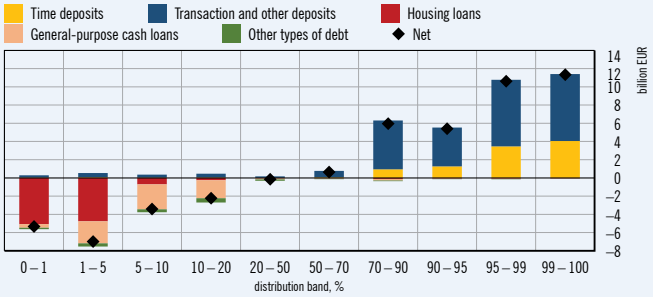
2 Net financial assets of households were increased by the estimated value of dwellings, available in the non-financial balance sheet of national accounts.

Figure 3 Ratio of net household assets to GDP is among the lowest in the European Union



Notes: Data on the value of dwellings was obtained from non-financial balance sheets of national accounts and refer to 2021, the year of last available data. The EU average does not include Greece due to the unavailability of data.
Source: Eurostat.

Figure 4 Borrowers mostly do not hold significant liquidity reserves, while bank clients with high deposit amounts do not borrow in general

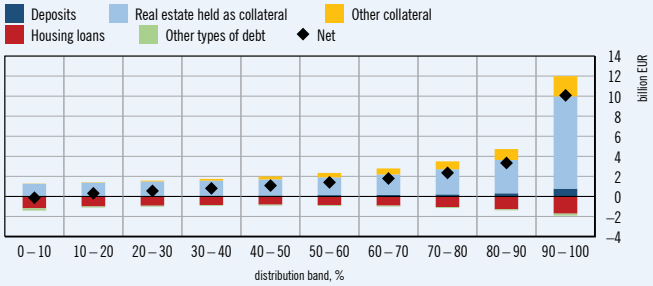


Notes: The figure shows the distribution of nominal amounts of loans and deposits of natural persons with credit institutions by bands of distribution of the net position of natural persons as at 31 December 2023, calculated as the difference between total debt and deposits with credit institutions. Each percentile band includes 38,407 natural persons, while all natural persons holding deposits with credit institutions or with debt to credit institutions as at 31 December 2023 have been included.
Source: CNB.

Although a high level of financial assets can alleviate vulnerabilities associated with debt, the partial data on assets suggest that deposits and loans are mostly concentrated in different households, so that the effect of the availability of financial assets on mitigating credit risk is very limited[3]. Deposits in banks serve as liquidity reserves to bank borrowers, enabling them to continue to regularly meet their liabilities even in the case of temporary unfavourable financial circumstances. However, even if financial assets are much higher than financial liabilities, this does not mean that each borrower has significant amounts of financial assets. Indeed, loan beneficiaries generally do not have large liquidity reserves. Around 20% (about 770 thousand) of clients with the bulk of liabilities to banks own a very small share of total deposits (Figure 4). On the other hand, most deposits in the system are held by the around 30% of clients who rarely borrow. Clients with very small amounts of debt are positioned in the middle of the distribution. Clients

3 Data combine data on loans, credit cards and overdrafts collected by the CNB at the individual loan level and data on deposits collected by the CNB on the individual deposit level, for around 3.84 million clients of all banks, showing distribution of their net assets (deposits less debt to credit institutions).

Figure 5 Debtors with loans collateralised by residential real estate mostly have a positive net position vis-à-vis banks



Notes: The figure shows the distribution of nominal amounts of loans and deposits of natural persons with credit institutions for consumers with loans collateralised by residential real estate, by bands of distribution of the net position calculated as the difference between total debt, deposits and the value of collateral of such consumers. Each percentile band includes 1764 natural persons; all natural persons with outstanding debt to credit institutions from loans collateralised by residential real estate as at 31 December 2023 have been included.
Source: CNB.

positioned between the 20th and the 50th percentile of the distribution have almost no debt or deposits, while persons positioned between the 50th and the 70th percentile of distribution hold very small amounts of debt (around 0.6% of total debt, EUR 170 on average) and hold only slightly larger amounts of deposits (around 2.2% of total deposits, EUR 1000 per depositor on average).

Slightly more than half of household debt is accounted for by housing loans collateralised by real assets, that is residential real estate whose value mostly exceeds the amount of debt. By taking out housing loans, consumers generally acquire real properties that are pledged as collateral, possibly together with other types of collateral, while their assets increase in parallel with debt. If a debtor's net position is estimated by increasing the amount of debt by the estimated value of pledged real estate, it is evident that only 5% of housing loan users have a negative net financial position vis-à-vis credit institutions[4]. It is also possible that real estate valuations do not fully reflect the growth in the value of real property provided as collateral. This suggests that the value of assets generally exceeds the value of debt of housing loan users and that accordingly they are not exposed to solvency risk, even though they might face limited liquidity (Figure 5).

Financial assets greatly exceed the value of household debt, but their distribution across households is such that they do not have a mitigating effect on banks' credit risk arising from household lending. In the past years, the value of financial and total assets of households held steady at a level close to the bottom of the range of the European Union, which is consistent with the situation in other member states with a comparable level of income. Assets are mostly concentrated in residential real estate and bank deposits. Although assets can in principle mitigate the credit risk faced by banks, this is not the case in Croatia since deposits and loans are mostly concentrated in different groups of households. However, debtors with housing loans also possess residential real estate whose value generally exceeds the amount of debt.

4 The calculation includes only real estate held as collateral because information about other real estate owned by housing loan users is not available within the scope of credit institution reporting.

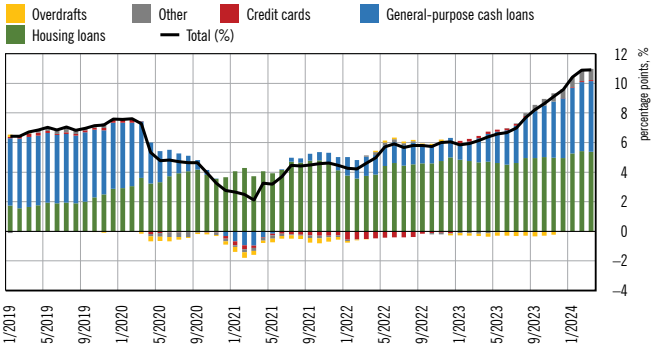
C The risks of lending to the private non-financial sector

Prompted by monetary policy tightening, interest rates on new loans increased. However in the household sector this increase was more gradual and moderate than in the corporate sector. Accordingly, given the strong income growth and rising consumer confidence, lending to households accelerated strongly especially in the segment of general-purpose cash loans. In contrast, corporate lending was subdued dXue to the decreased need for the financing of working capital and stable growth of investment loans. The risks related to household lending arise predominantly from the relaxation of credit standards in the form of the lengthening maturity and the increasing DSTI ratio of housing loans, and in the corporate sector from the increased share of debtors with a high debt-to-income ratio. The materialisation of risks related to total debt and debt repayment ability has thus far been limited by the rising income, high share of fixed interest rates, and with regard to households, the absence of any increase in interest rates on most loans with variable interest rates. However, disruptions in the macroeconomic environment paired with lingering higher interest rates might lead to the materialisation of risks in a some vulnerable corporations and households.

C.1 Household sector

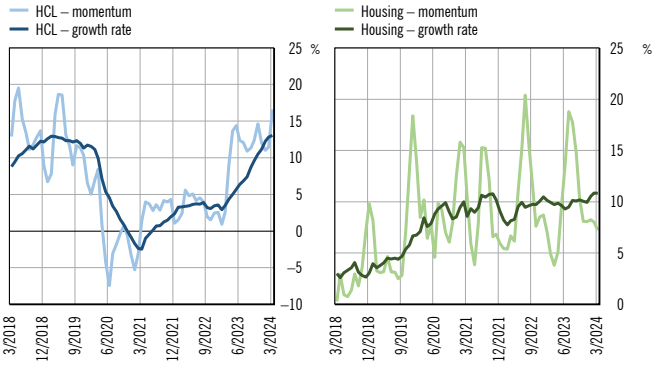
The growth of household loans, primarily of general-purpose cash loans (Figure C.1) accelerated strongly in 2023 and at the beginning of 2024. The annual growth rate of total loans to households totalled 10.9% at the end of March 2024, accelerating by 4.8 b.p. from the same month the previous year. In this period, housing loans accelerated due to payments under the government housing loans subsidy programme, their quarterly growth rate (on an annual level, momentum) reaching almost 18%. However, shortly thereafter their growth slowed down, to 7.2% at the end of March (Figure C.2). On the other hand, the growth in general-purpose cash loans suddenly accelerated, starting in March 2023 and continuing into the first three months of 2024. At the end of March 2024, the momentum of these loans reached 16.6%, up 7.6 b.p. within one year. The strong growth of general-purpose cash loans and housing loans considerably diverges from the situation in large euro area countries which predominantly witnessed the stagnation

Figure C.1 Accelerated growth of household loans headed by cash loans



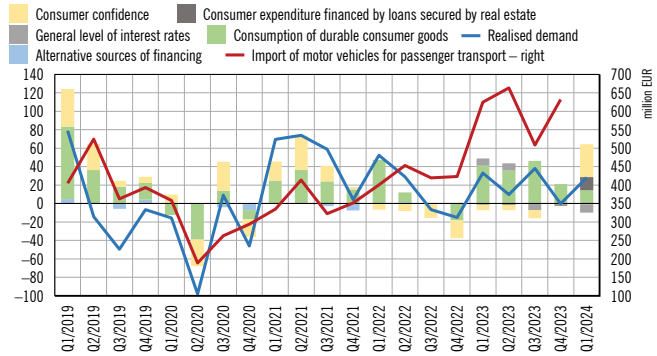
Note: The figure shows the 12-month transaction-based rate of change, which excludes exchange rate, price and other changes.
Source: CNB.

Figure C.2 Growth rates of housing and general-purpose cash loans reached two-digit growth rates



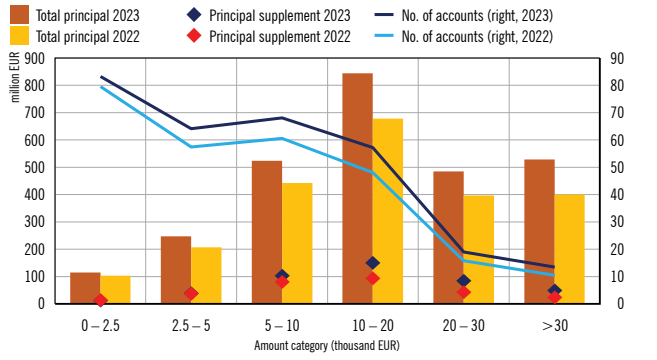
Note: The momentum refers to the transaction-based quarterly rate of change, expressed at an annual level.
Source: CNB.

Figure C.3 Cash loans spurred by consumer optimism and for the purchase of durable goods



Note: The positive values of the series shown on the left y-axis indicate the strengthening of the demand for consumer loans to households from the previous quarter.
Sources: CNB (the euro area bank lending survey – Croatia) and CBS.

Figure C.4 Strong growth of cash loans registered in all amount categories



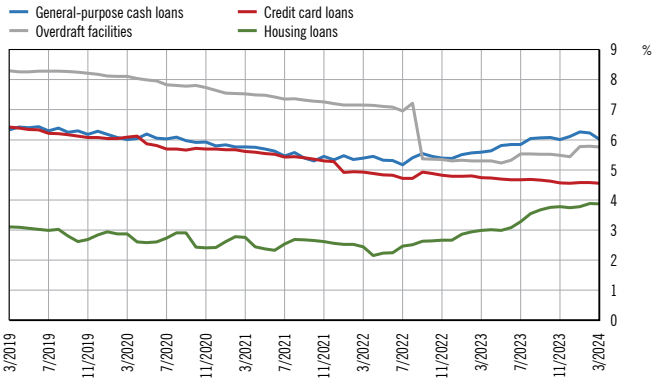
Notes: Loans are presented by the category of the newly-disbursed principal. The supplemented principals refer to newly-disbured loan principals resulting from renewed agreements.
Source: CNB (consumer lending standards).

of loans to households. In some comparable countries, however, such as Lithuania, Latvia and Slovenia, non-housing loans grew considerably as well, while the slowdown in housing loans was visible in almost all euro area countries.

The growth in consumer optimism and in the consumption of consumer goods stand out as the main drivers of growth in general-purpose cash loans. Bank lending survey results (Figure C.3) indicate that banks expect the strengthening of the demand for cash loans to continue. It is evident that apart from financing current consumption, general-purpose cash loans are used to finance the procurement of durable consumer goods, such as cars, the supply of which was limited during the pandemic and in the period thereafter. After the fall in 2022, the annual number of new passenger car registrations exploded in 2023, rising by some 27%. The import of motor vehicles for passenger transport grew as well (some 40%), and so did the total amount of cash loans paid out (some 23%). In addition, it is possible that these loans are used for other purposes such as renovation of real estate or smaller-scale investments in an economic activity.

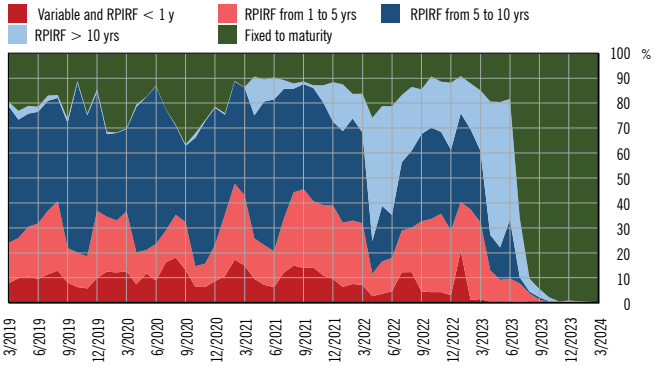
General-purpose cash loans grew strongly in all amount categories. Loans above EUR 30 thousand grew the most in relative terms, by some 30% (Figure C.4). However, the greatest contribution to the total growth of cash loans continued to come from loans in the amounts between EUR 10 and 20 thousand, while the largest number of loan accounts relate to loans below EUR 2500. A share in the growth of general-purpose cash loans is also related to the increasingly more frequent practice of consolidating existing debt by taking out additional debt. In 2023, for slightly less than one-sixth of the total number of newly-approved cash loans prior to the final repayment consumers contracted additional loans with maturity extensions. The share of the new principal of cash loans disbursed in this way rose in the past year, going up from 9.2% in 2021 to 13.2% in 2022 and 16% in 2023.

Figure C.5 Interest rates on new loans to households are gradually increasing



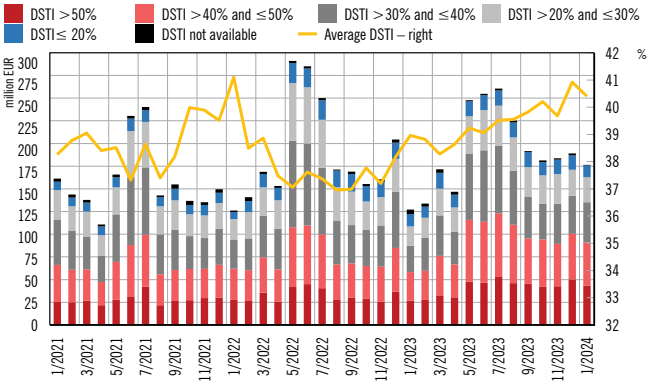
Source: CNB.

Figure C.6 Banks grant new housing loans exclusively at fixed interest rates



Note: IRF relates to the period of initial interest rate fixing.
Source: CNB.

Figure C.7 Interest rate growth accompanied by the increase in DSTI ratios of new housing loans



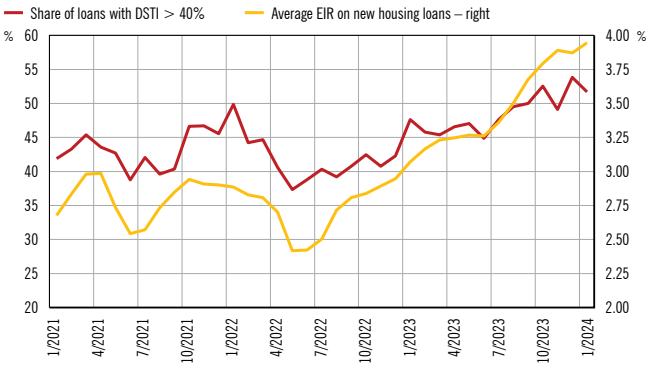
Source: CNB.

Interest rate growth had no substantial impact on lending to households. Interest rates on new housing loans were almost 1.2 p.p. higher in March 2024 than in December 2022, while interest rates on cash loans during this period grew by slightly less than 0.7 p.p. (Figure C.5), which slightly reduced the difference in the prices of these two products. In order to avoid the legal caps applied to housing loans granted at variable interest rates, banks started granting housing loans at fixed interest rates so the average interest rate grew to 3.87%[8] by the end of March 2024. Cash loans already started to be granted at fixed rates, which grew to some 6% by March 2024.

New housing loans were granted on slightly more relaxed lending conditions, reflecting continued growth in the prices of real estate paired with the simultaneous increase in interest rates, which increases their risk profile. The average debt service-to-income ratio (DSTI) for new housing loans thus gradually grew from 38% in the middle of 2022 to 41% at the beginning of 2024 (Figure C.7). At the same time, the share of loans whose DSTI ratios could make them be considered risky (DSTI > 40%), went up from 40% to slightly over 50% (Figure C.8). In addition to the growth of the average repayment burden of new housing loans their maturity increased as well, from some 22 years in the middle of 2022 to some 23.5 years at the beginning of 2024 (Figure C.10), additionally underscoring their riskiness.

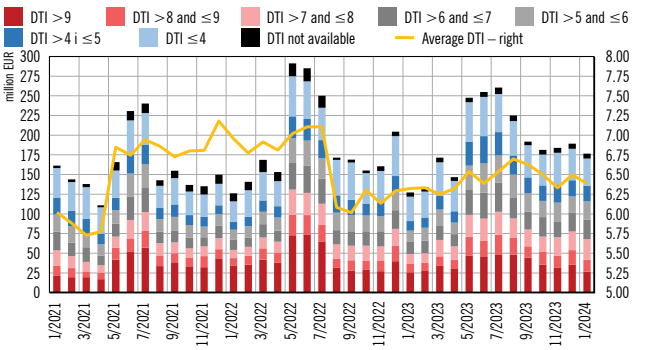
The growth of the average principal, the rise in income and real estate values resulted in stable other housing lending conditions. The debt service to income ratio (DTI), which shows how many annual incomes are required to cover the principal of the loan, remained relatively stable (Figure C.9),

Figure C.8 The rise in interest rates contributes to the growing share of loans with high DSTI ratios



Source: CNB.

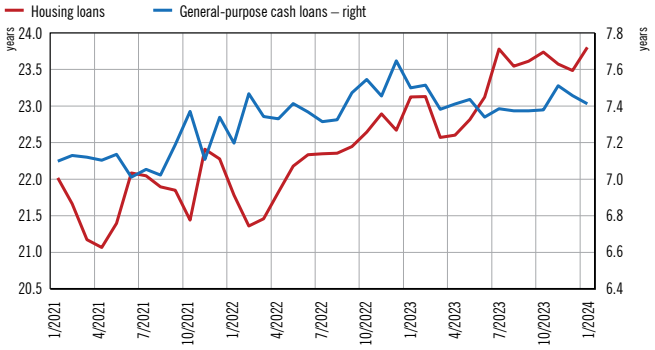
Figure C.9 Stable DTI ratios of new housing loans, on average



Note: the sudden change in the DTI ratio in the second half of 2021 and the first half of 2022 is a consequence of methodological and other adjustments in the system of reporting on consumer lending standards.
Source: CNB.

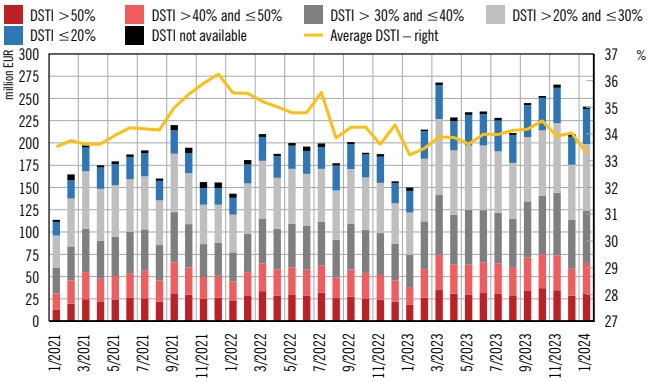
8 The cap on the effective interest rate (EIR) which arises from the provisions of Article 20a of the Consumer Credit Act and Article 17 of the Act on Consumer Housing Loans applies for contracted variable and fixed interest rates on housing loans. The maximum EIR for the first half of 2024 was capped at 7.5% regardless whether the housing loan was contracted with a fixed or variable interest rate. On the other hand, the variable interest rate on housing loans was capped at 3.73%.

Figure C.10 Maturities of new housing loans on the rise



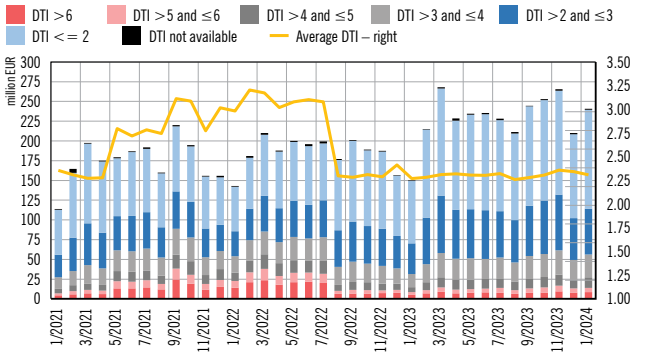
Note: The figure shows the average original maturity of new loans.
Source: CNB.

Figure C.11 DSTI ratios of new cash loans fell slightly in 2023



Source: CNB.

Figure C.12 DTI ratios of new cash loans remained unchanged



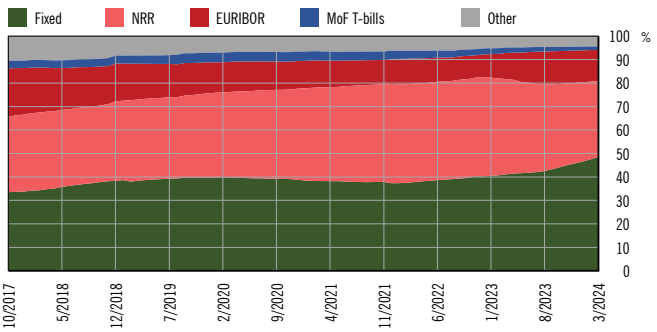
Note: The sudden change in the DTI ratio in the second half of 2021 and the first half of 2022 is a consequence of methodological and other adjustments in the system of reporting on consumer lending standards.
Source: CNB.

because the growth of the average amount of new housing loans followed the increase in income. The LTV ratios also did not change much, except for the temporary increase during the implementation of the government subsidy programme. Moreover, after the completion of the programme, at the end of 2023 and at the beginning of 2024 there was even a slight decline in the LTV ratio (see chapter B.1, Figure B.11).

In contrast to housing loans, new cash loans did not display any very considerable changes in lending conditions. The DSTI ratio of new cash loans even decreased a little (Figure C.11), primarily due to the growth of income, which was strong in comparison to the amount of principal and the slight decline in interest rates at the beginning of 2024. On average, the DSTI ratio ranged between 33% and 34% in 2023, and the share of loans with the DSTI ratio above 40% averaged at 28%. In addition, the DTI ratios remained stable in 2023, at 2.25 (Figure C.12). However, the average monthly income of cash loan users, of some EUR 1,430 in the second half of 2023 amounted to a half of the average income of housing loan users (some EUR 2.950), which paired with a relatively long average maturity of 7.4 years (Figure C.10) contributes to the greater riskiness of these loans.

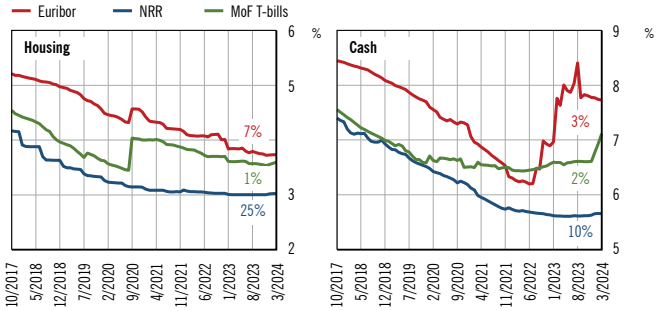
Despite the continued increase in key interest rates during 2023 no very significant interest risk for households materialised. Several factors impacted the subdued transmission of key monetary policy interest rates to interest rates on existing loans to households and contributed to the only limited increase in the costs of loan repayment. Firstly, the share of loans with fixed interest rates totalled 40% at the beginning of 2023. However, since banks started exclusively granting loans with fixed rates, the share of these loans in total loans climbed to 48% by March 2024 (Figure C.13). Further, although the longer remaining maturity of housing loans (14.6 years on average) makes their costs of repayment much more susceptible

Figure C.13 The share of household loans with fixed interest rates increased in 2023



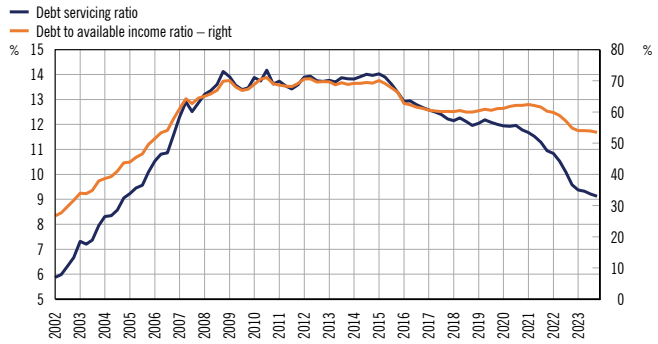
Note: The figure shows the structure of all loans to the household sector by type of interest rate. The figure does not include credit card debt and transaction account overdrafts.
Source: CNB.

Figure C.14 Interest rates on the stock of cash loans linked to the EURIBOR on the rise



Notes: The figure shows average interest rates on loans with variable interest rates which, in addition to the nominal interest rate, also include default rates, where default interest is calculated. The percentages refer to the share of loans with variable interest rates linked to individual benchmarks as at 31 March 2024 in the total stock of loans by instrument. The difference up to 100% refers to loans with the remaining period of interest rate fixation longer than one year.
Source: CNB.

Figure C.15 Debt-to-disposable income ratio stagnates in 2023

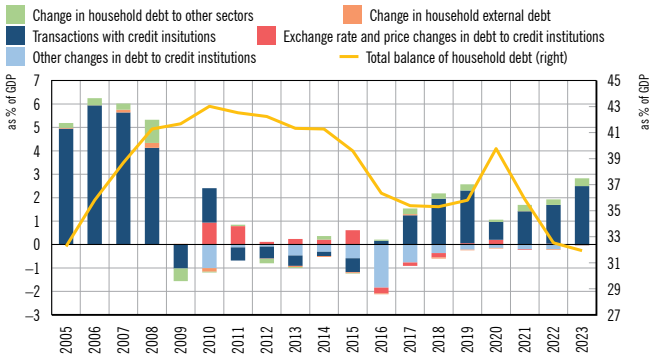


Note: Quarterly disposable income values have been estimated using the Chow-Lin method and a series of employee compensation and gross operating surplus and mixed income as indicators.
Source: CNB.

to changes in interest rates than in the case of cash loans (6.5 years), any growth in interest rates on housing loans was prevented by the relatively low legal cap on variable interest rates on these loans: 3.79% in the first half of 2023 and 3.73% in the second half of 2023. On the other hand, the cap for non-housing loans with variable rates was much higher (8.16% in the first half and 8.48% in the second half of 2023), which enabled considerable growth in interest rates on those loans linked to the EURIBOR (Figure C.14).

The repayment costs for loans with variable interest rates remained unchanged in 2023 for the majority of loans. For housing loans repayment costs fell by an average 0.5%,

Figure C.16 The strong growth in loans of 2023 still moderate compared to historical experiences



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 relativised as a share in GDP.
Source: CNB.

while for cash loans they increased by 1%, with the rise being most considerable for cash loans linked to the EURIBOR and amounting to slightly below 6%. Although, on average, interest rates on loans linked to the NRR are not close to legal caps, the growth in the repayment costs of these loans was prevented by the very low and stable NRR which reflected the costs of bank financing sources, primarily deposits. The interest rates on time deposits during the most part of the year were stable, starting to increase only towards the end of the 2023, which still has not had a significant impact on developments in the NRR. Only if household time deposits rose significantly, with relatively high interest rates, for example, rates exceeding 2.5%, could the NRR growth lead to a slightly higher increase in repayment costs for a share of loans (see Box 4 How does NRR growth affect the loan repayment costs of households?).

The relative indebtedness of the household sector remained moderate in 2023, continuing to mildly decrease. Under the influence of the growth in nominal income and the increase in loan maturity a slight decrease occurred in the aggregate debt service-to-income ratio of the household sector which due to the increase in the average interest rate and high debt growth slowed down considerably from the previous years (Figure C.15). Namely, the debt service-to-income ratio started stagnating in 2023, because the increase in debt caught up with the increase in income. Household debt is lower than in the period before the global financial crisis, when the new real debt (measured by debt transactions relative to GDP) was almost double (Figure C.16). Accordingly, the household debt-to-GDP ratio continued to decline, pointing towards a reduction in the vulnerability of the household sector.

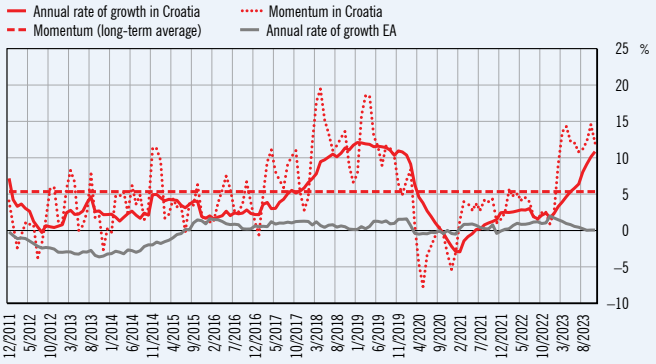
Box 3 Explaining the recent growth in general-purpose cash loans

This analysis assesses the relative influence of loan supply and loan demand shocks on developments in bank lending in order to explain the recent growth in general-purpose cash loans (HCL). The results suggest that the growth in HCL following the corona virus pandemic was first brought about by supply shocks, which vanished with the beginning of the rising cycle in key interest rates, and since then the greatest contribution to HCL growth came from positive demand shocks amid the conditions of increased consumer optimism. However, at the end of 2023 supply shocks gained strength again.

The rise in general-purpose cash loans accelerated strongly in Croatia in 2023, while the growth in interest rates was on average slower and milder than in the euro area. The latest monetary policy tightening cycle aimed at suppressing high inflation considerably slowed down lending to households in the euro area. This deceleration, according to the results of the bank lending survey, was associated not only with stricter lending standards, but also with reduced demand for loans.[1] In contrast however, the growth of total loans to households in Croatia gained strength. The strong acceleration in the growth of general-purpose cash loans led the way, from 2.4% at the end of 2022 to12.6% at the end of March 2024, while the momentum of their growth noticeably surpassed the long term average (Figure 1). Ever since the start of the monetary policy tightening cycle the interest rates on new housing loans[2] in Croatia grew slower than in the euro area, remaining approximately 1 p.p. lower throughout 2023 (Figure 2).

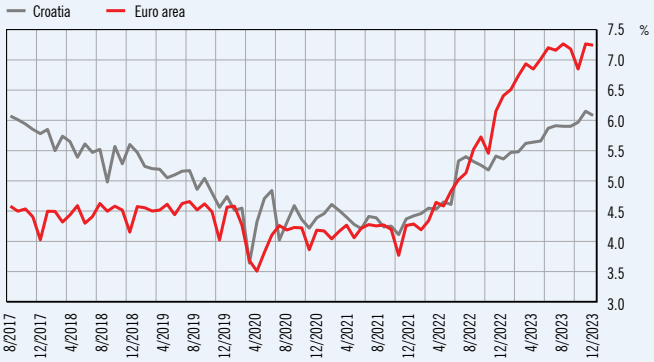
The lending dynamics is under the constant influence of the interaction between the supply and the demand factors, and determining their contributions is key for understanding the causes and risks of credit growth. Changes in lending may be affected by loan demand shocks and loan supply shocks which may work individually or jointly in the same or in opposite directions. The positive loan supply shock increases bank lending activity at reduced lending rates, while the positive demand shock increases both the interest rates and lending activity. Demand shocks may be divided into loan demand shocks defined by exogenous changes in household preferences[3] and shocks affecting the aggregate level of economic activity and consequently household disposable income, which indirectly affect the demand for loans[4]. Thus, for example, when economic developments are favourable, household demand for loans may increase as a result of increased consumer optimism (positive demand shocks). At the same time, banks adjust loan

Figure 1 Momentum and the growth rate of general-purpose cash loans



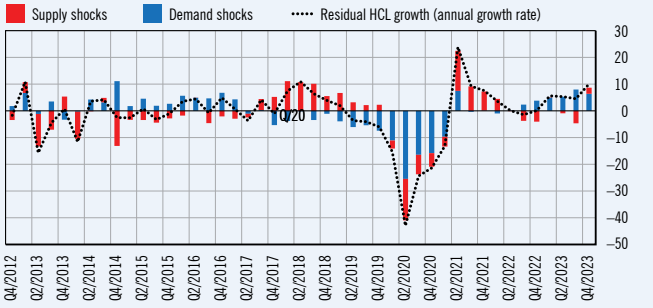
Note: The grey line for the euro area refers to the annual growth rate of non-housing loans.
Sources: CNB and ECB.

Figure 2 Interest rates on non-housing loans in Croatia and the euro area



Source: ECB.

Figure 3 Contributions of shocks to developments in general-purpose cash loans (BVAR model)



Notes: The BVAR model includes the real growth of the disposable income of households, price growth, changes in key interest rates (Wu-Xia shadow rate), the growth of general-purpose cash loans and the change in interest rate differential between HCL and household deposits. The black dotted line (the residual HCL growth) is the difference between the annual HCL growth rate and the baseline projection and the BVAR model variable.
Source: CNB calculations.

1 Lane, P. (2023), The banking channel of monetary policy tightening in the euro area, panel discussion on the topic "Banking Solvency and Monetary Policy", Summer Institute 2023 Macro, Money and Financial Frictions Workshop, Cambridge, Massachusetts, 12 July 2023.

2 The data in the ECB's data warehouse do not include cash loans as a category so for the purpose of comparison non-housing loans are considered a relevant category.

3 These include changes in household expectations regarding future macroeconomic developments, interest rate developments and changes in the access to alternative sources of funding.

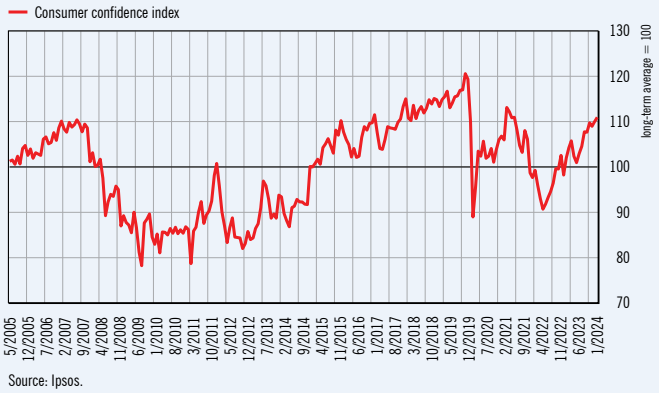
4 This box differentiates among three types of such shocks: aggregate demand shocks, aggregate supply shocks and monetary policy shocks.

supply so when macroeconomic developments are unfavourable, due to lower risk tolerance and the decrease in net wealth of debtors, they may limit loan supply to preserve their portfolio quality. Loan supply shocks may also be a consequence of other factors such as the strong outflow of deposits, loss of credit lines or market access, changes in banking sector competition, etc. (negative supply shocks).

At the beginning of the period under observation (2013-2017), HCLs grew primarily under the influence of positive demand shocks. However, this changed when much stricter conditions for granting housing loans started to be implemented in 2018 and their growth started to be predominantly influenced by positive supply shocks (Figure 3).[5] Namely, in 2018 much stricter conditions for granting housing loans started to be applied for the group of consumers with below-average net salaries. This spurred credit institutions to start relying more heavily on granting HCLs, which continued to enjoy noticeably more lenient criteria for creditworthiness assessment compared to housing. The CNB reacted at the beginning of 2019 by adopting the Recommendation on actions in granting non-housing consumer loans[6] pursuant to which it was recommended, when granting non-housing consumer loans with original maturity equal to or longer than 60 months, to apply the same conditions for assessing creditworthiness as for housing loans.

A pronounced fall in HCLs during the pandemic was a consequence of the strong negative demand shock and, to a lesser degree, negative supply shocks, but the demand recovery after the pandemic was key for the recent growth of this type of loan. The recovery of general-purpose cash loans started simultaneously with the economic recovery in the second half of 2021 and was initially under the influence of positive loan supply shocks. However, with monetary policy tightening in mid-2022 supply shocks vanished as confirmed by the results of the bank lending survey. The strong acceleration in HCL during 2023 was

Figure 4 Consumer confidence index (standardised values)



Source: Ipsos.

a consequence of positive demand shocks, due, among other things, to favourable macroeconomic developments and the situation in the labour market, which buoyed consumer optimism, as corroborated by the consumer confidence index, which in 2023 rose again to above its long-term average (Figure 4). It should be stressed that in the last quarter of 2023, the contribution of supply shocks to the growth of HCLs turned positive again, suggesting the intensification of the supply of general-purpose loans. This type of loan is attractive for banks as it ensures relatively high profit margins. Considering the limitations mentioned earlier, general-purpose loans provide banks with a more flexible approach and better options for generating profits so banks have lately been more prone to advertising them more vigorously.

5 Modelled after Barnett, A., and Thomas, R. (2013), Has weak lending and activity in the United Kingdom been driven by credit supply shocks?, Working Paper No. 482, Bank of England; a structural BVAR model with restrictions on the impulse response function was used for the purpose of assessing the contribution of supply and demand shocks to the growth of HCLs in Croatia:

	Household disposable income	Inflation	New business HCL	Difference between interest rates on HCLs and interest rates on deposits	Key interest rate
Demand shocks					
Loan demand shock	0	0	+	+	0
Aggregate demand shock	+	+	no restrictions	no restrictions	+
Aggregate supply shock	+	–	no restrictions	no restrictions	no restrictions
Monetary policy shock	+	+	no restrictions	no restrictions	–
Supply shocks	0	0	+	–	0

Demand shocks include loan demand shocks, aggregate demand shocks (consumption shocks, investment shocks), aggregate supply shocks (technology shocks, productivity shocks, oil supply shocks and labour supply shocks) and monetary policy shocks. The results of the historical decompositions obtained show the contributions of identified shocks (supply and demand shocks) to the difference of the variable in question (general-purpose cash loans) and its projection from the BVAR model (baseline projection). The analysis is conducted using the transactions of actual new business of general-purpose cash loans and the difference between the interest rate on HCLs and the average interest rate on household deposits (balance-weighted new business).

6 In accordance with the Decision on the additional criteria for the assessment of consumer creditworthiness and on the procedure for the collection of arrears and voluntary foreclosure the highest permitted DSTI ratio for debtors with below-average income has been indirectly limited to a maximum of one-fourth of their net salary

Box 4 How does NRR growth affect the loan repayment costs of households?

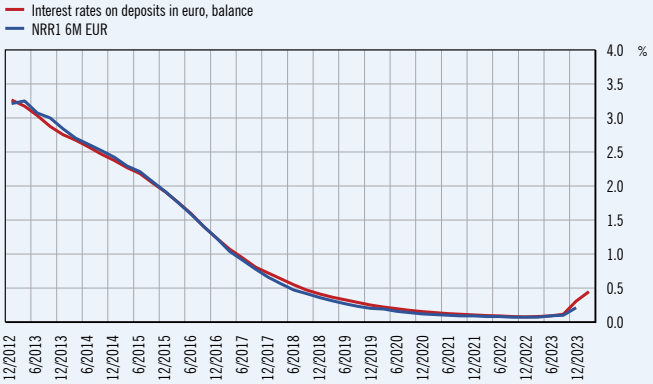
Repayment costs of loans with variable interest rates linked to the national reference rate (NRR) remained stable amid tightening financing conditions. However, the increase in interest rates on deposits combined with the spillover of deposits from transaction accounts to time deposits already raised bank financing costs, which are used to calculate the NRR. In order to assess the possible increase in repayment costs, this box stimulates an increase in the NRR under two scenarios. The baseline scenario reviews the impact of an NRR increase of 70 basis points on repayment costs, the increase in interest rate being limited by law (as of 1 July 2023 the maximum variable interest rate on housing loans is 3.73%). In addition, a simulation was made of the impact of a stronger rise in the NRR, of 150 basis points, withouta legal cap, which could materialise over a longer period if deposit rates remain high and the inflow of deposits to time deposit accounts continues. The results of the sensitivity analysis point to a relatively mild rise in repayment costs under the baseline scenario, while the rise in interest rates of 150 basis points would raise the repayment costs for a third of housing loans by more than 10%.[1]

Thus far the tightening of financing conditions had not brought about any considerable rise in the repayment costs of existing housing loans granted at variable interest rates linked to the NRR. The tightening of financing conditions only affected the repayment costs of loans with variable interest rates linked to the EURIBOR, and then exclusively the share of loans with interest rates below the legal cap on variable interest rates on housing loans (3.73% since mid-2023). On the other hand, the NRR has thus far grown only mildly so, for example, the six-month NRR1, the most broadly used reference parameter (interest rates on approximately 60% of housing loans are linked to the NRR, and among them in more than 90% of loans precisely to the six-month NRR1) increased by only 0.1 p.p. by the end of 2023 from the historic low reached at the beginning of the year.

The growth in deposit rates followed by the transfer of deposits from transaction to time deposit accounts increased the cost of financing for banks, based on which the NRR is calculated. The increase in interest rates on new time deposits, which intensified particularly at the end of 2023, started gradually increasing the average interest rate on total household deposits. The average interest rate on the balances of deposits thus totalled slightly less than 0.5% as at 31 March 2024, up slightly less than 0.4 p.p. from the end of 2022 (Figure 1). Because developments in interest rates on balances of deposits precede developments in NRR, the NRR is bound to increase.

The possible increase in loan repayment costs amid the increase in bank financing costs and then consequently the increase in the NRR was simulated under two scenarios differentiated by the intensity of the growth of this reference parameter[2]. The baseline scenario assumed an NRR growth of 70 basis points from the current interest rate level for each debtor, and built on the assumption that the legal cap for the variable interest rate on housing loans will remain at the current level (3.73%). In addition, a simulation was made of the impact of a stronger increase in the NRR of 150 basis points, with the level of the legal cap also increasing. The baseline scenario could be realised in the shorter term if deposit rates remain at approximately current levels and the gradual spillover of deposits to time deposit accounts continues. The alternative scenario is possible only if the said processes continue over a longer period so that the share of time in total deposits again nears the level from until ten years ago, before deposit rates fell. Such a gradual increase in the NRR would in turn increase the limit of the maximum variable interest rate on housing loans.

Figure 1 Developments in deposit interest rates indicative of developments in the NRR



Source: CNB.

The assessed increase in debt repayment costs arising from the baseline scenario is relatively mild, while a stronger increase in the NRR would lead to a slightly stronger growth in loan repayment costs, precisely relating to loans with longer maturities. Under the scenario of the NRR increasing by 70 b.p. the assessed increase in repayment costs would be very mild. For more than four-fifths of housing loans, that is, some 55 thousand loans, the monthly repayment cost would increase by no more than 5%, that is, EUR 7 on average, while the repayment cost for 99% (slightly less than 110 thousand) of non-housing loans would not go up by more than 5% (EUR 3, on average). Under the scenario of the NRR rising by 150 basis points, the increase in the repayment cost would be less than 5% for approximately four fifths of non-housing (some 85 thousand) loans and for slightly less than one third of housing loans (some 19 thousand) with variable interest rate linked to the NRR. Further, for slightly more than one-third of housing and the remaining one-fifth of non-housing loans the increase in repayment costs would be higher than 5% but lower than 10% (EUR 24), while the increase in

1 For the repayment cost sensitivity analyses of the effects of a considerable increase in the ceiling level see Financial Stability, No. 24, Chapter C, Financial Stability, No. 23, Box 2 and Macroprudential diagnostics, No. 18, Box 1.

2 This box uses data on consumer lending standards to simulate two scenarios of the impact of the increase in interest rates on debt repayment costs for loans with variable interest rates linked to the NRR.

Table 1 The distribution of loans linked to the NRR by class of the increase in repayment costs under simulated scenarios

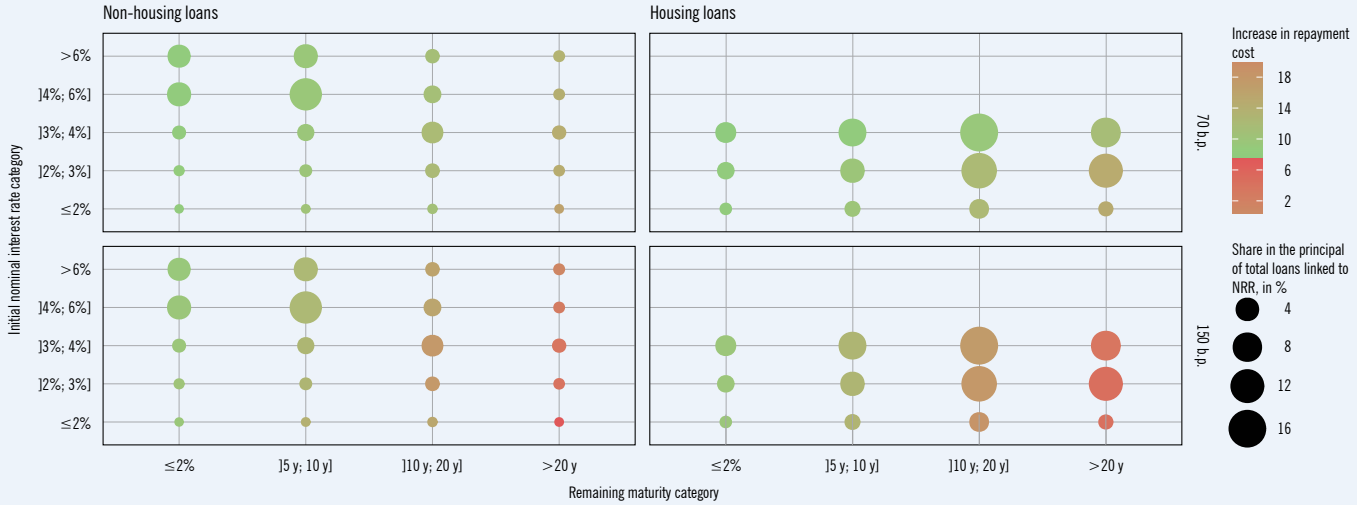
	Increase of 70 basis points						Increase of 150 basis points					
	Share of the loan principal	Number of loan accounts	Share of loan accounts	Remaining maturity (years)	Average monthly instalment (EUR)	Average monthly increase (EUR)	Share of the loan principal	Number of loan accounts	Share of loan accounts	Remaining maturity (years)	Average monthly instalment (EUR)	Average monthly increase (EUR)
Non-housing loans		**110,777**		**7.7**	**194**	**3**		**110,776**		**7.7**	**194**	**7**
1 No increase	0%	138	0%				0%		0%			
2 ≤5%	92%	109,392	99%	6.7	191	3	49%	85,736	77%	4.4	180	4
3]5%; 10%]	8%	1,247	1%	19.3	460	27	40%	23,403	21%	8.9	227	14
4]10%; 20%]							11%	1,637	1%	18.4	473	58
Housing loans		**67,252**		**15.6**	**328**	**9**		**67,186**		**15.6**	**328**	**27**
1 No increase	6%	6,701	10%	12.3	272	0	0%		0%			
2 ≤5%	59%	47,803	71%	12.2	329	7	10%	19,271	29%	4.4	335	9
3]5%; 10%]	35%	12,748	19%	21.9	355	24	33%	24,348	36%	10.6	319	24
4]10%; 20%]							57%	23,567	35%	20.6	332	46

Notes: The calculation includes loans with a variable interest rate or interest rate that will become variable in 2024. Loans categorised into risk category C, loans without a principal, credit cards and overdrafts are excluded. Average remaining maturity has been weighted by the amount of the principal.
Source: CNB calculations.

repayment costs would exceed 10% for slightly more than one-third of housing (EUR 46 on average for slightly less than 24 thousand) loans and for only 1% of non-housing loans (EUR 58).

Irrespective of the scenario in question, the impact of NRR growth on financial stability is very limited. The exposure of debtors to the risk of interest rate change depends on the remaining maturity and the initial interest rate level, with the currently lower interest rate level implying a higher relative increase in the repayment cost for the respective increase in interest rate and at the same time more room for increasing up to the maximum permitted rate, to the extent to which this limit is relevant at a given time (Figure 2). Under the scenario of the NRR rising by 150 basis points, the debt repayment cost would increase the most (by some 16.5% on average) for debtors with housing loans with remaining maturities of longer than 20 years, in this remaining maturity category the initial interest rate level not having a significant impact on the increase in repayment costs. On the other hand, the impact of the interaction of the initial legal interest rate cap is explicitly reviewed under the scenario with the simulated interest rate growth of 70 b.p. The repayment costs for debtors with interest rates at the cap threshold will not increase in the short term, while the repayment costs for debtors with interest rates up to 3% could increase by some 6.5% on average. However, loans with very long remaining maturities (exceeding 20 years) and relatively low current interest rates (below 3%) do not amount to a very significant proportion (slightly less than 6.5% of the principal of loans linked to the NRR whose interest rate will be variable in 2024), which implies that the increase in the NRR can only have a very limited impact on financial stability.

Figure 2 Debtors with loans having longer maturities and loans with low initial interest rate levels are more exposed to the risk of rising repayment costs



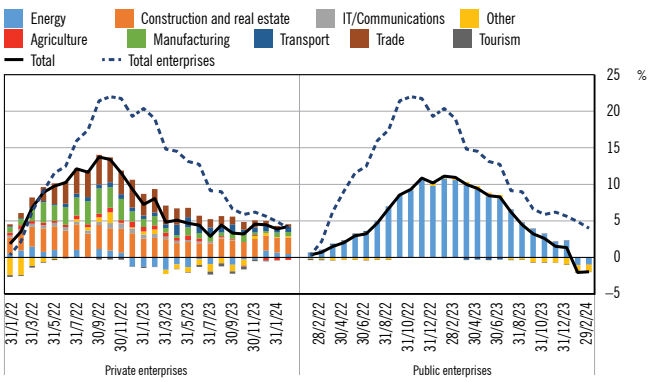
Notes: The figure shows the average relative repayment cost according to remaining maturity category and the classes of the initial interest rate level (rows) in the case of an increase in the interest rate of 70 b.p. (upper section of the table) and of 150 b.p. (lower section of the table) compared to the end of 2023. The calculation includes loans with variable interest rates or interest rates that will become variable in 2024. Loans categorised into risk category C, loans without a principal, credit cards and overdrafts are excluded.
Source: CNB calculations.

C.2 Non-financial corporate sector

The relative indebtedness of non-financial corporations remained stable in 2023 due to the continued credit and economic growth. The rise in transaction-based bank loans to corporates slowed down in 2023, from the high of 22% to 5%, largely under the influence of the slowdown in lending to public sector enterprises (in the energy sector). At the beginning of 2024 this growth slowed down additionally to 2%. In contrast, lending to enterprises in the construction and real estate sector, and to a lesser extent in the manufacturing sector and retail supported credit growth (Figure C.17). Despite these developments and amid the reduction in indebtedness in other EU member states, compared to the EU average, Croatia is no longer below the EU average (Figure C.18.).

In contrast to its level, the structure of corporate debt continued to change with the share of liabilities towards banks additionally reducing in 2023. The rise in corporate revenues, assessed[9] with the help of fiscalised receipts, was close to 14%, that is, almost three times greater than the growth of bank loans. As a consequence, the years-long trend of growth in the importance of financing through liabilities to other creditors and through capital continued (see Box 5 The decrease of bank importance in corporate financing in Croatia).

Figure C.17 Except in construction and real estate, the growth of corporate loans was subdued in most activities

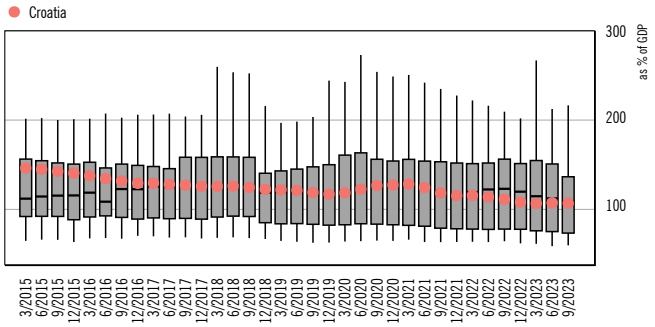


Source: CNB.

The slowdown in corporate lending was also impacted by the tightening in lending standards during the year, while corporate demand for loans mildly recovered. The results of the Survey on lending standards indicate that after the fall in 2023, corporate demand for loans recovered slightly in the first quarter of 2024, with the dominant factors being the rise in

9 The annual data for 2023 obtained from FINA on the operations of non-financial corporations were not available at the time of publication. However, business activity and consequently corporate performance may be assessed by the data on fiscalised receipts and assumptions on margin developments.

Figure C.18 The indebtedness of the non-financial corporations sector in Croatia below the EU average

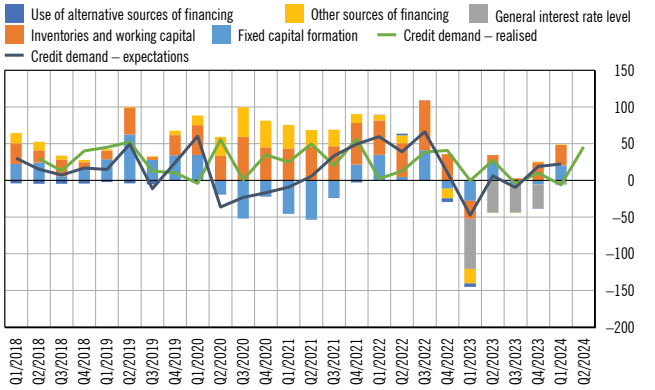


Notes: The figure shows a series of unconsolidated debt-to-GDP ratios. Unconsolidated debt includes liabilities arising from loans, debtors' loans and loans to other corporations. The range in the graph shows the distribution of the unconsolidated debt-to-GDP ratio for EU member states.
Source: Eurostat.

fixed capital investment and the need of corporates for financing inventories and working capital (Figure C.19). In addition, bank expectations regarding credit demand in the second quarter of 2024 suggest continued growth in corporate demand for loans, which might be a result of the increased volume of operations associated with greater demand for consumer goods in the period of stronger economic growth. Although survey findings show that after continued tightening of conditions for lending to corporates in 2023, banks started relaxing them in early 2024 predominantly under the influence of reduced risk perception (Figure C.20), access to finance might remain difficult for small and medium-sized enterprises.

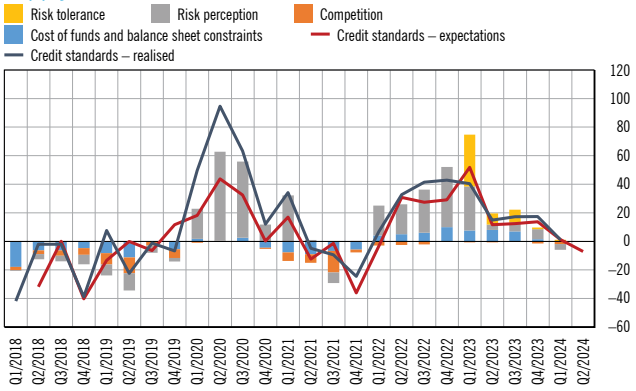
Interest rates on corporate loans continued growing in 2023, spilling over to the debt servicing burden via loans with variable interest rates and at a slightly slower rate via new loans. The increase in rates on newly-granted loans totalled 2.3 p.p.

Figure C.19 The dynamics of the factors of corporate loan demand



Note: Positive values indicate an increase in demand from the previous quarter.
Source: CNB, bank lending survey.

Figure C.20 The dynamics of the factors of corporate loan supply

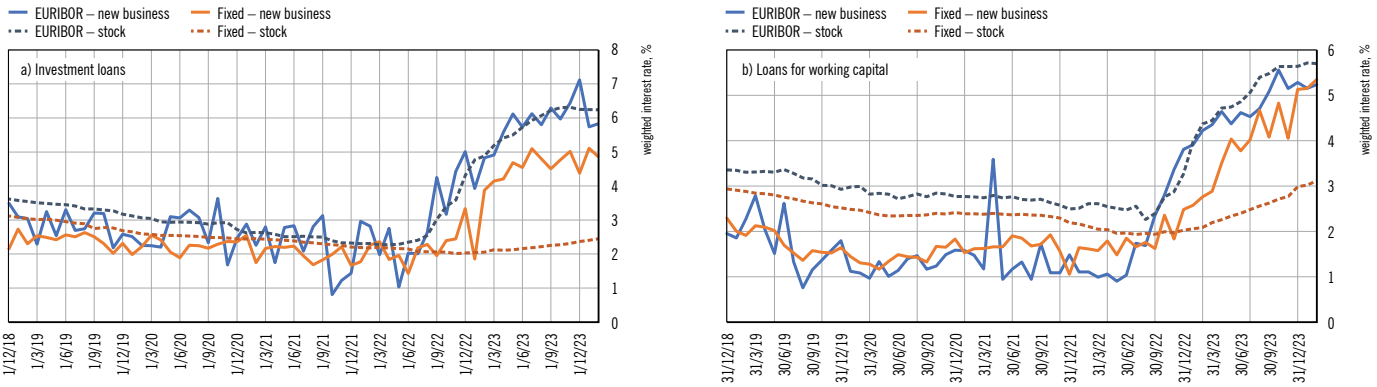


Note: Positive values indicate a tightening in credit standards from the previous quarter.
Source: CNB, bank lending survey.

which was reflected in the increase of the weighted interest rate on the stock of loans with variable interest rates linked to the EURIBOR for investment loans and loans for working capital of slightly more than 2 p.p. in the period from the beginning of 2023 to the end of February 2024. In addition, the expiry of loans with lower rates and the contracting of loans with higher rates caused a rise in the weighted fixed interest rate on the stock of loans, with the fixed rate on investment loans increasing by 0.5 p.p. and on loans for working capital by 1 p.p. (Figure C.21).

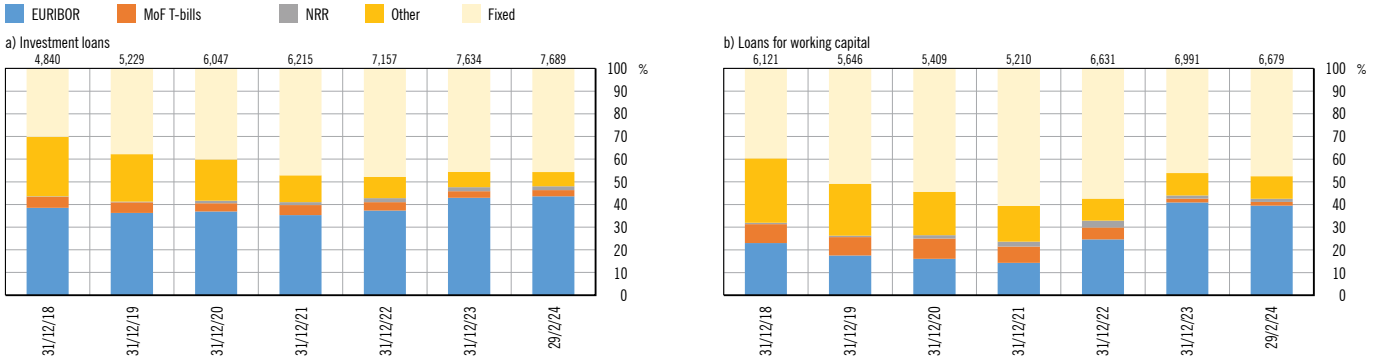
The rise in the share of loans with variable interest rates in 2023 increased the exposure of the non-financial corporate sector to future changes in reference parameters. The share of loans granted with a variable interest rate in 2023 increased slightly, accounting for more than a half of the total stock of corporate loans. The most represented reference parameter for

Figure C.21 The growth of interest rates on the stock of loans with variable interest rates was halted, while for loans with fixed interest rates it increased due to loan rollover at higher rates



Source: CNB.

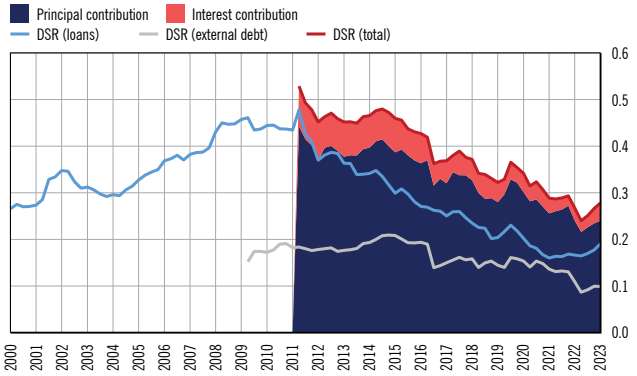
Figure C.22 Slightly less than a half of bank loans to non-financial corporations granted at fixed interest rates



Note: The amounts above the columns refer to the stock of aggregate investment loans of domestic credit institutions to the non-financial corporate sector in million EUR, while the amounts at the bottom of the chart show the stock of EURIBOR-linked loans.
Source: CNB.

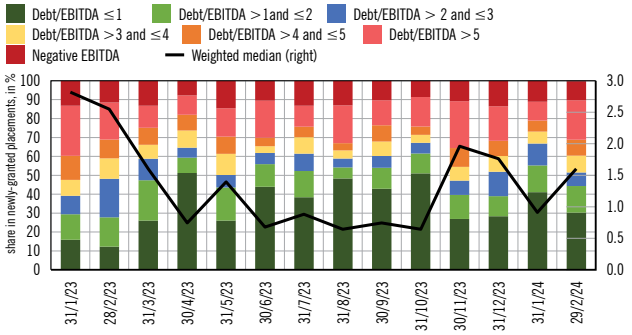
Note: The amounts above the columns refer to the stock of aggregate working capital and other loans of domestic credit institutions to the non-financial corporate sector in million EUR, while the amounts at the bottom of the chart show the stock of EURIBOR-linked loans.
Source: CNB.

Figure C.23 Debt repayment burden increased slightly in 2023 due to the increase in interest expenses



Sources: CNB and CBS.

Figure C.24 In 2023 borrowers' riskiness in newly-granted loans decreases, on average



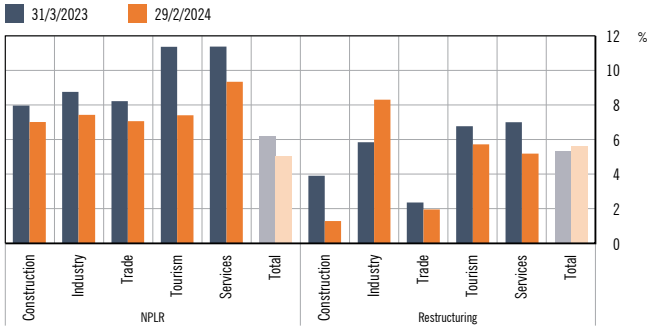
Notes: The figure shows new bank placements in each month since the beginning of 2023. Corporate debt includes the sum of all long-term and short-term liabilities subject to interest payments. The data on corporate debt and EBITDA are obtained from the financial reports for 2022.
Sources: CNB (AnaCredit) and FINA.

loans granted with a variable interest rate is still the EURIBOR (Figure C.22), to which more than 40% of total loans are linked, while a smaller share is linked to Ministry of Finance T-bills and only a negligible share to the NRR. However, despite the still high share of loans with a fixed interest rate, due to the loan turnover of corporate loans being higher than that of household loans, higher interest rates in this sector are relatively quick to spill over to the debt repayment burden, which might be reflected sooner in their ability to service their liabilities.

The growth of interest rates and the slowdown in the gross operating surplus led to a mild increase in the debt repayment burden in 2023. Amid a slower monetary policy transmission to corporate interest rates, as well as the strong economic growth in 2023, the increase in the repayment burden was moderate (Figure C.23). However, the spillover of higher interest rates on the stock of loans will continue in 2024. In addition, the end of 2023 registered an increase in the share in newly-granted loans of enterprises that are financially weaker, according to the debt-to-earnings criterion. From the very beginning of the credit relationship these companies represent more vulnerable debtors and increase the potential for the growth of non-performing loans in the event of the tightening of conditions in the macro environment (Figure C.24).

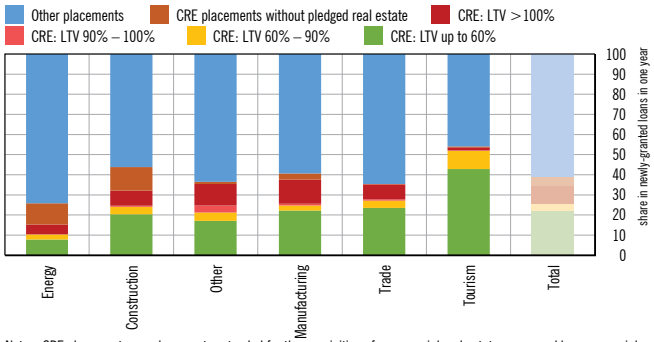
The increase in the debt repayment burden spurred by the sudden growth in interest rates has thus far not caused credit risk to materialise in the non-financial corporate sector. Except in construction where it remained at some 7%, the share of non-performing loans went down in all activities, while loans with forbearance measures have thus far increased only in industry due to the restructuring of individual exposures in the energy sector (Figure C.25). In the event of wider materialisation of the credit risk of non-financial corporations, the recoverability of non-performing receivables will largely depend on the value of collateral in the form of commercial real estate (chapter

Figure C.25 Loans with forberance measures in service activities grew in the past year



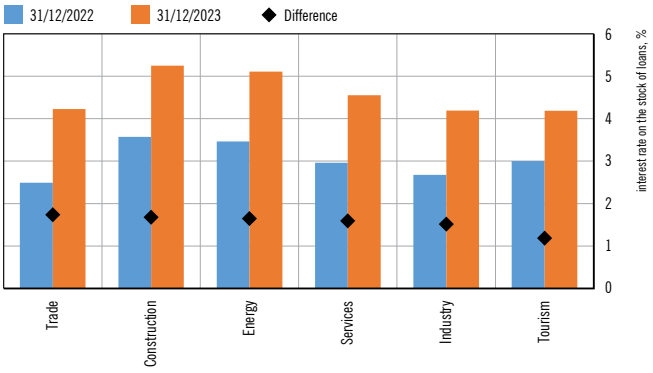
Notes: The NPLR is the share of loans in stage 3, that is, those loans that generated a loss, in total loans The forbearance measures include the following types of changes in the loan agreement: instruments with amended interest rate to below market conditions, instruments with other amended conditions, refinancing – full or partial debt refinancing.
Sources: CNB AnaCredit and CNB (MOST).

Figure C.26 Some 40% of newly-granted corporate placements is accounted for by CRE placements



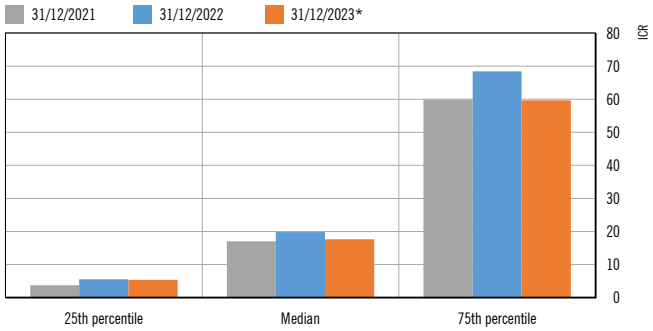
Notes: CRE placements are placements extended for the acquisition of commercial real estate or secured by commercial real estate. The term Tourism represents accommodation and food services activities. Newly-granted placements in the period of 12 months from 1 March 2023 to 29 February 2024.
Source: CNB (AnaCredit).

Figure C.27 Stronger increase in interest rates in construction and energy



Source: CNB.

Figure C.28 Deteriorating business performance might increase the credit risk of individual companies



Note: Interest coverage ratio (ICR) as at 31 December 2023 is calculated based on the assumed income growth of 14% (pursuant to available fiscalised receipts) with stable (EBITDA) margins.
Sources: CNB and FINA.

I.B.2 Commercial real estate market). That is, the loan-to-value ratio, the LTV ratio being measured at the moment the loan is granted, is currently stable with some exposure concentrations with LTV values above 90%, which is considered the increased risk threshold. In the manufacturing industry most loans are secured by commercial real estate, the value of the loan exceeding that of the pledged real estate (Figure C.26), while loans in tourism are most satisfactorily covered by pledged real estate, the highest share of placements having an LTV up to 60%.

A rise in the price of financing increases corporate vulnerability to economic shocks, especially for companies that were initially under a heavier burden. The currently good operating results and robust economic growth in general have enabled easier amortisation of the increase in interest rates. However, there are considerable differences in debt burden exposure among individual activities (Figure C.27). Although overall the interest coverage ratio has remained stable, the differences among companies regarding interest coverage are substantial (Figure C.28). In addition, indicators such as the interest coverage ratio are often embedded in corporate loan agreements. Therefore, the possible deterioration in this indicator of banks' corporate clients could affect the accessibility of loans to corporates that are not able to maintain high business performance results.

C.3 Outlook of the private non-financial sector

The acceleration in household lending despite the restrictive monetary policy has led to risk accumulation among households, although thus far without jeopardising their liquidity. Namely, due to the strong growth in household income, recovered consumer confidence (see chapter A Macroeconomic environment and risk factors) spurred the demand for loans, especially in the segment of cash loans. The rise in maturity and the DSTI ratio of housing loans points to the increase in the risk arising from new lending. These indicators can also not be interpreted as favourable when it is cash loans that are concerned. Although the DSTI ratios of cash loans are slightly lower than those of housing loans, cash loans are approved to consumers with below-average incomes, with a considerable share setting aside a significant portion of their income (> 40%) for loan repayments, which makes them vulnerable should there be any unfavourable or unexpected developments in their income. In contrast, for the time being interest rate risk failed to materialise primarily due to subdued transfer of interest rates on loans to households and strong economic growth which prevented the excessive growth of the overall debt burden. Should the accelerated growth of household loans continue at extended maturities and relaxed lending standards, a possible slowdown in income growth would lead to the increase in the debt burden of households over the upcoming period, which again could strengthen unfavourable effects of the possible materialisation of credit risk on real developments in the economy.

The slowdown in key euro area economies and Croatia's trading partners paired with elevated geopolitical risks led to the increase in the risks for the operation of non-financial corporations, and thus to the potential increase in credit risk. For the time being, good business performance of the non-financial corporate sector reduces the likelihood of a deterioration in the quality of loans to this sector but the slowdown in the economies of key euro area trading partners and the possibility of sudden shocks that might negatively affect global economic growth might jeopardise corporate debt servicing capacity. In addition, continued intensification of corporate interconnectedness through mutual financing might increase the contagion risk in the economy and lead to greater instability should there be an economic shock strong enough to cause a rise in non-performing debt among companies.

Box 5 The decrease of bank importance in corporate financing in Croatia

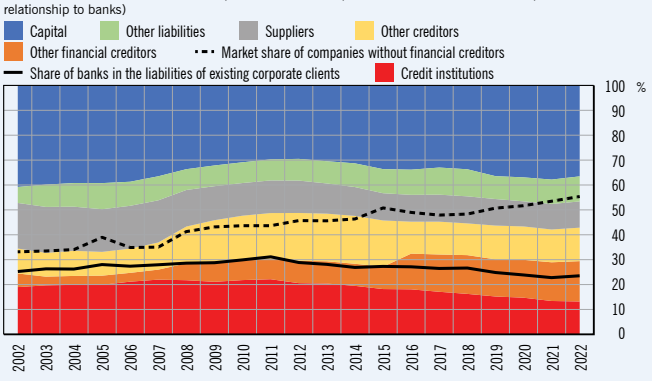
Following the global financial crisis the liabilities structure of non-financial corporations in Croatia has been continuously changing, with the share of liabilities to banks decreasing and the shares of liabilities to companies as well as equity increasing. Bank importance in corporate financing continued to decrease in 2023 and at the beginning of 2024. These changes in the corporate liabilities structure are important for the analysis of the operations of banks, which registered a decrease in their corporate portfolios, leading to a loss of portfolio diversification as well as of market share. In addition, they reduce monetary policy transmission via the corporate sector and may set specific requirements on future macroeconomic policy.

Following the global financial crisis bank importance in corporate financing in Croatia decreased. The corporate financing pattern in Croatia went through two characteristic periods over the last twenty years. The period between 2002 and the recession that followed the global financial crisis was marked by financial deepening, that is the growth in bank financing, paired with the simultaneous reduction in the share of capital in corporate balance sheets. Opposite developments marked the period after 2013, when the share of liabilities towards banks in corporate liabilities started reducing for two reasons: a) the growth in the market share of companies that are not bank clients and b) the fall in the share of bank loans to companies that were banks' existing clients. In this period, the banks' share in corporate balance sheets went down from the initial 22% to some 13% at the end of 2022, with as many as 77% of companies, generating 55% of total income of this sector, not relying on bank lending at all (Figure 1). Simultaneously with the reduction in banks' share, the share of capital in corporate liabilities grew, as did the share of liabilities towards other companies.

The decline in bank corporate lending following the global financial crisis was observed in other EU member states as well, but was more pronounced in Croatia. In the period from 2005 to 2022, there was a general decline in the share of financing through banks in corporate liabilities, although this trend subsided after 2017. As Croatia faced a more pronounced decline in bank lending after 2011, it shifted from being a country with a high share of bank financing in corporate liabilities to being one with a relatively low share. According to current assessments, this trend continued in 2023 (Figure 2).

Figure 1 Bank financing of corporates has been on the decrease since the global financial crisis

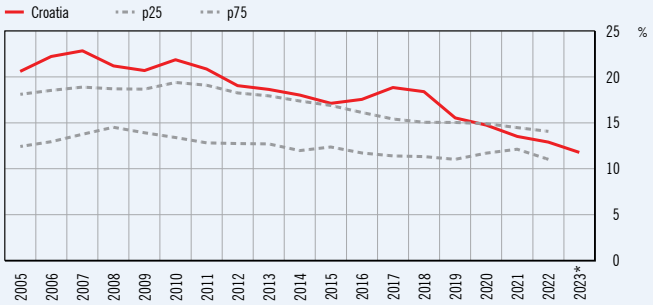
(liabilities structure of non-financial corporations and developments in the market share of corporations without relationship to banks)



Note: Companies that are not bank clients are defined as companies in whose liabilities banks account for less than 5%.
Source: FINA.

Figure 2 The decline in bank corporate lending in Croatia was more intensive than in the EU

(share of liabilities towards banks in the total liabilities of the non-financial corporate sector)



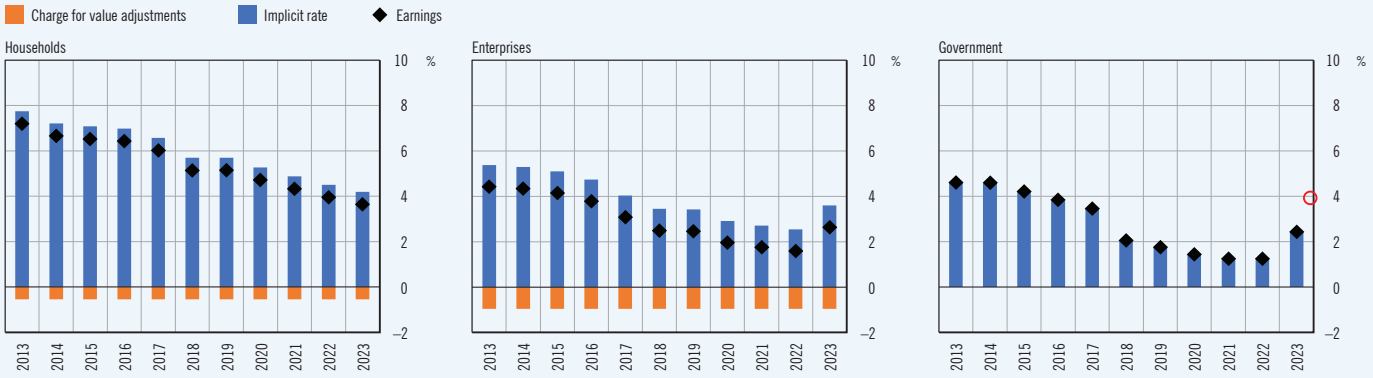
Notes: Presented are data for the following countries: AT, BE, DE, ES, FR, HR, IT, PL, PT and SK. The 2023 indicator for Croatia was approximated by using data on fiscalisation (turnover grew by some 14%) and nominal growth of corporate loans (by some 5%). Gray lines show the 25th and the 75th percentile of distribution for available EU countries.
Sources: FINA and BACH.

On the financing supply side, the developments in interest income and credit risk decrease bank interest in corporate loans, as compared to other portfolios. Although from banks' perspective corporate lending portfolios are productive in the sense of interest income, they are also characterised by high credit risk which effectively reduces bank earnings. In addition, corporate portfolio management, from finding clients to collecting claims, generates considerable administrative expenses. Therefore, from the perspective of banks in Croatia, corporate portfolios, especially when viewed in comparison to household portfolios, are characterised by considerable volatility in earnings, that is, higher risk not accompanied by proportionate earnings. Furthermore, starting in 2022 bank earnings in the government and central bank segments grew considerably (Figure 3).

Changes in the banking system structure, with predominantly small corporate banks exiting the market, also affected the supply of corporate loans. Banking crises of the 1990s, as well as losses during the periods of recession were to the greatest extent linked to then over-indebted companies which led to a more conservative approach in corporate lending and the tightening of lending conditions, especially at times of uncertainty. Banks leaving the market were mostly smaller banks oriented towards local and/or smaller companies. Their exit from the market necessarily led to these companies having to turn to larger, universal and foreign banks for financing. However, these banks were a more logical answer for lending to larger companies with better collateral and documented history, while smaller companies were faced with a gap between their specific needs that required flexibility and the group-

Figure 3 Corporate portfolio is less profitable for banks in Croatia

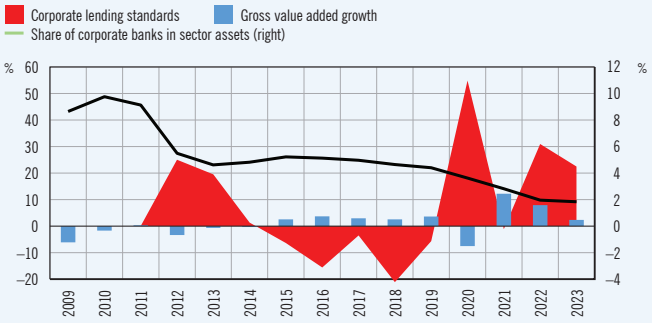
(implicit interest rate and charge for value adjustments by placement to individual sector)



Notes: The red circle at the right refers to the central bank. The implicit rate calculated as interest income / placement amount. The charge for value adjustments is the ratio between the average charge for value adjustments and the average stock of loans in the period 2017-2023.
Source: CNB.

Figure 4 The market share of corporate banks continues to reduce with the tightening of corporate lending standards

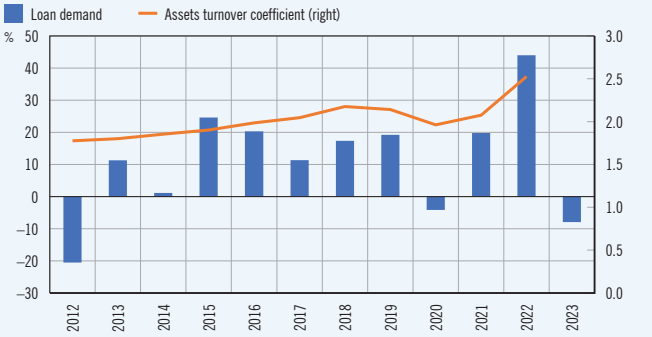
(corporate shares of corporate banks, share of banks tightening corporate financing conditions, real GVA growth)



Note: The positive area indicates the tightening of lending conditions. Lending standards are the averaged four quarters. Corporate banks are banks in which corporates account for more than 40% of their credit portfolios.
Source: CNB i Survey on the access to finance.

Figure 5 Long-term growth in asset turnover reduces the need for bank loans

(total assets turnover coefficient and the share of companies in which loan demand grew)



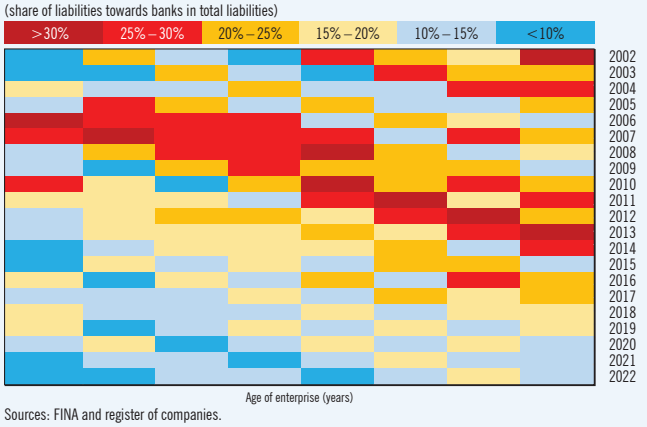
Notes: Developments in assessed demand above 0 indicate demand growth. The annual data represents averaged quarters.
Source: FINA (Survey on the access to finance).

wide procedures of international banks to which these larger banks are obligated to adhere.[1] (Figure 4).

The demand for bank financing was also negatively affected by the increase in the corporate sector asset turnover in Croatia. In the last 20 years and especially in the period after the pandemic, corporate sector asset turnover increased, that is, the asset unit required for a certain level of business activity was considerably reduced. A more efficient use of assets provides for a decreased reliance on bank loans. Broken down by activity, the decrease in bank financing was most pronounced in trade and manufacturing, which belong to the group of activities with the highest increase in asset turnover (Figure 5).

Figure 6 Young companies continue to reduce their reliance on bank loans

(share of liabilities towards banks in total liabilities)



Sources: FINA and register of companies.

1 In the Survey on the access to finance of small and medium-sized enterprises that was conducted in 2021 a half of the interviewees responded that their access to finance makes their operation more difficult only to a certain degree. They stated that they did not use domestic bank loans primarily because they had sufficient own funds (61%) and funds available (23%) and that they were either rejected by a bank or put off by the price (18%).

Young companies, established after the global financial crisis, decreasingly rely on bank lending. Young, newly established companies are usually not bank clients, especially not in their first year. However, after their operations stabilise and their growth strategies are defined, links to banks usually intensify. Companies established before the global financial crisis are characterised by a larger share of bank involvement at the beginning of their operations, which intensifies over the years. However, companies established after the global financial crisis relied less intensively on bank lending in the beginning, which did not change later. The mild decline in banks' share in the liabilities of companies which are their clients paired with the distancing of young companies from banks suggests that the decrease in banks' shares in corporate liabilities will continue (Figure 6).

The experiences of banks' corporate clients from previous crises led to increased caution in financial risk assumption. During the global financial crisis companies faced tighter financing conditions offered by banks (increased interest rates, stricter conditions, etc.) and many over-indebted companies went bankrupt. In addition, shocks during the pandemic, although mitigated through the system of aid offered to companies that included moratoriums on loans, reminded companies of the risks related to leveraged finance. It is therefore possible that many companies continued to work at reducing their dependence on debt financing from banks. Heightened caution is also reflected in the growth of corporate capital, which increased after the recession was over in 2013 despite the fact that interest rates were decreasing until 2022, which should have facilitated debt financing.

Changes in the corporate financing structure change the risk profile of this sector. The growth in liabilities towards other companies and the increase in capital represent, to a degree, the attempt of companies to find the flexibility not provided by bank financing. However, in the event of an increase in interest rates and weaker business results of the corporate sector in general, financing from other companies can easily be interrupted since companies are not specialised in granting loans and collecting receivables, and in the overall monitoring of other companies' operations. In addition, limited liability companies may, more frequently than banks, face operating problems thus interrupting the continued flow of financing. As regards capital, although more capital may, in principle, mean more stability at the level of an individual company, corporate capital positions are not strictly regulated and are historically speaking much more volatile at times of deterioration in the macro environment. Finally, a greater share of capital in liabilities leads to a higher average cost of financing, which generates pressure on companies in the sense of higher required profitability which can in turn lead to greater risk appetite.

The weakening relationship between non-financial corporations and banks also affects the risk profile of banks themselves. Although lending to households and the government might currently seem tempting, the profitability of individual portfolios may change and with the loss of corporate customers comes the loss of particular banking knowledge linked to corporate portfolio management that is hard to reacquire. In the future, as the government's needs for financing change, the monetary policy operational framework changes and the competition from electronic money institutions and other digital platforms in financing household intensifies, banks might find out they need corporate customers to diversify their portfolios. The loss of corporate customers prevents the business diversification of banks and undermines the basis of their future growth.

The developments described may be useful in an assessment of the success of financial deepening in Croatia. The decrease in the share of loans from banks, the growth in intercorporate liabilities and the growth of financing from equity weakens the picture of the development of the financial sector in the last ten years. Survey data suggest that corporate demand for loans is stable but that lending conditions are volatile, that is, much tighter at times of deterioration in the macro environment. This can provide an explanation as to why companies have turned to other solutions, often outside the financial sector. In this sense, the development of the risk capital market outside the financial sector points to the fact that companies and entrepreneurs have outgrown the financial sector, which failed to meet their needs with appropriate instruments.

In conclusion, changes in the financing structure of the corporate sector affect not only companies and banks but also the implementation of economic policies. The weakening of the relationship between companies and banks reduces monetary policy transmission through the corporate sector, and at the same time paired with the strengthening of the link to households may set specific requirements before the macroprudential policy since excessive lending to households paired with relatively relaxed lending conditions may become an important risk source. For this reason, the structure of corporate financing is also important with regard to the implementation of economic policies, especially if it is taken into consideration that corporations as a sector are vulnerable to changes in the environment and play an important role in employment and economic growth.

D Risks to credit institutions' operations

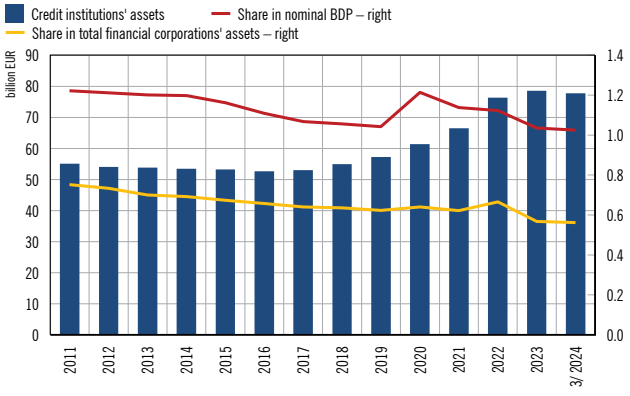
Despite continuing improvements in asset quality and a record profitability in 2023, systemic risks in the banking sector have remained moderate. An increase in the share of placements contracted at a fixed interest rate, in particular in new long-term housing loans, coupled with an enlargement of the assets and liabilities maturity gap, has resulted in the growth of the interest rate risk assumed by banks. In addition, notwithstanding record figures in 2023, resulting mainly from the strong growth of net interest income, profitability has started to come under pressure due to rising financing costs. Finally, although asset quality has improved, the fact that loans have increasingly been reclassified into stage 2 calls for caution in credit risk assessment and requires a more attentive monitoring of portfolio quality trends. It is therefore crucial to manage risks cautiously, especially credit and liquidity risks, and to continue to invest in the improvement of operational efficiency in order to preserve operational stability and maintain competitiveness, both in the domestic market and internationally.

D.1 Changes in the asset structure

The growth of banking sector assets in 2023 was driven by lending to the domestic private non-financial sector, foreign asset growth and rising investments in government bonds (Figure D.1). The growth of foreign assets was a key factor boosting asset growth in the previous period, repo loans with foreign banks playing an important role. Lending to the private non-financial sector, primarily households, also supported this growth trend (Figure D.2). In line with higher yields in this period, banks' investments in government bonds went up to 15.2% of total assets at the end of March 2024, with the result that the already high exposure to central government grew even more, increasing the potential for the transmission of financial stress to banks. This risk is especially pronounced in a period of monetary policy tightening, when falling bond values can cause substantial unrealised losses, limit banks' liquidity by reducing their flexibility in the case of market shocks and, in turn, weigh on lending.

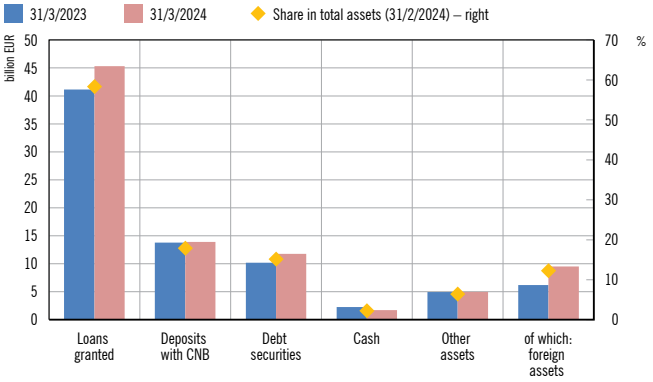
As in the previous several years, credit institutions' exposure to interest rate risk in the non-trading book continued to grow in 2023, contributing considerably to the rise in systemic risks in the banking sector. A scenario under which interest rates grow in parallel by 200 basis points leads to an estimated decrease in the banking sector's total economic value by 7.3% of own funds at the end of 2023 (Figure D.3), which

Figure D.1 Slight increase in banking system assets



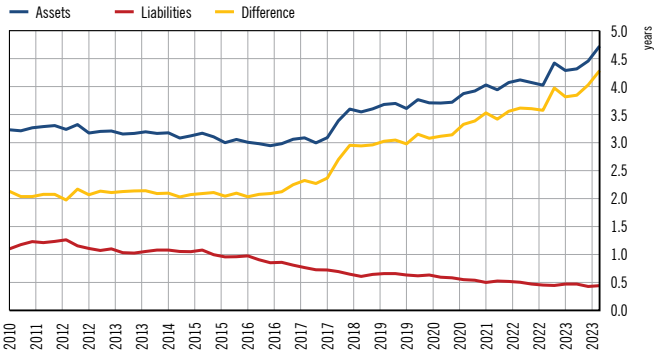
Source: CNB.

Figure D.2 Foreign asset growth and strong lending activity



Source: CNB.

Figure D.4 Average assets and liabilities maturity gap widens



Source: CNB.

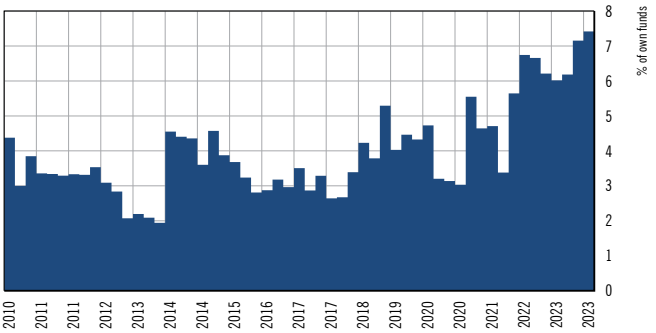
is 3 percentage points more than at the end of 2020. Although such a growth signals an increase in risk, the indicator is still below the supervisory risk threshold of 15%, so that the sector remains relatively resilient in the face of potential economic challenges accompanying interest rate growth. However, the impact on individual banks varies, with changes in the economic value of equity ranging from 0.1% to 12.2%, which implies considerable differences in banks' interest rate risk exposure.

The growth of interest rate risk exposure resulted from a number of long-term trends in banks' balance sheets continuing into the previous year, including an increase in the share of fixed interest rate assets and the large volumes of fixed rate long-term housing loans. As a result, the assets and liabilities maturity gap also increased, up from 2.1 years in mid-2016 to 4.3 years at the end of 2023 (Figure D.4). Despite the availability of financial instruments, such as derivatives, which can protect banks from interest rate risk, domestic banks still use them relatively rarely. At the end of 2023 derivatives accounted for a mere 0.25% of total banking sector assets.

D.2 Financing cost

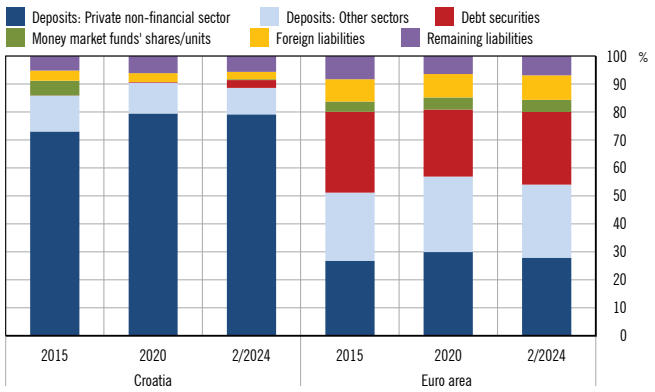
Deposits continued to dominate the Croatian banks' liabilities structure, accounting for almost 90% of all liabilities at the end of March 2024 (Figure D.5). A steady growth in private non-financial sector deposits over the last decade has established them as the primary source of bank financing. Deposit growth slowed down in 2023 from the previous years, reflecting base period effects (strong growth at the end of 2022 driven by the conversion of the kuna to the euro in banks, coupled with outflows in early 2023), but also due to the opportunities created for small investors to participate in central government

Figure D.3 Interest rate risk in the non-trading book on the rise in recent years



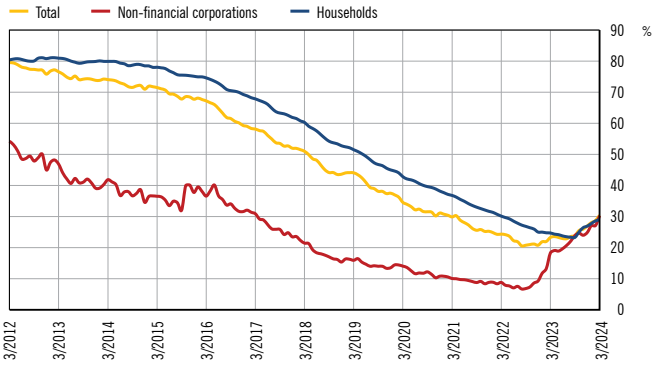
Source: CNB.

Figure D.5 Banking system liabilities rely on private non-financial sector deposits



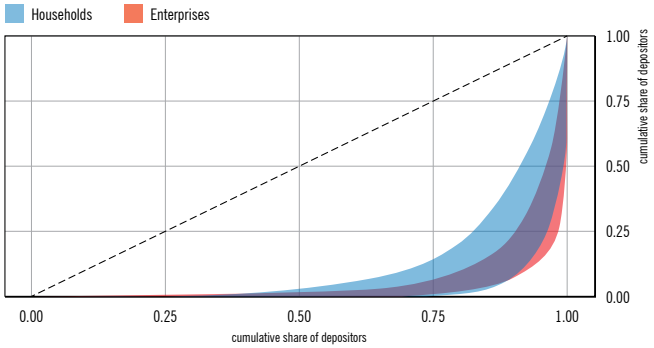
Sources: CNB and ECB.

Figure D.6 Interest rate growth boosted the time deposit share



Source: CNB.

Figure D.7 High concentration more pronounced with some corporate clients



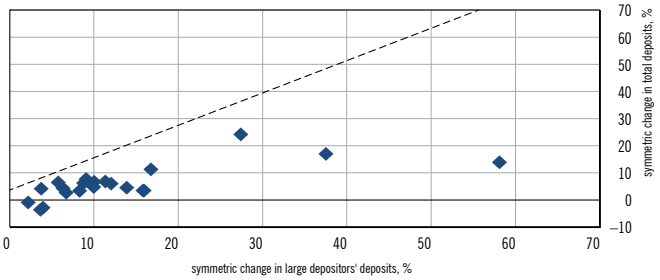
Note: The figure shows the distribution of Lorenz curves across banks. A larger distance of a Lorenz curve from the 45 degree diagonal indicates a greater inequality, that is, a higher Gini coefficient.
Source: CNB.

financing by means of national bonds and treasury bills and their channelling of deposits into this type of assets (see Box 2 Can assets mitigate risks to financial stability associated with household debt?).

The growth in the share of time deposits spills over to increases in bank financing costs, but with a relatively weak effect so far. Due to the gradual and marked growth of interest rates on corporate time deposits, corporate sector liquidity surpluses started to be placed in short-time deposits as early as the beginning of last year. Natural persons allocated funds to time deposits at a considerably slower pace, increasing the allocation not earlier than the last quarter of the previous year, when some clients searched for higher yields at some banks. Although the share of time deposits increased, transaction deposits still account for the largest share (66%) (Figure D.6). Following the transfer of more active clients' deposits to other banks in late 2023, the beginning of 2024 saw a slowdown in new time deposits due to the inactivity of the remaining depositors, which were slower in transferring deposits to banks offering higher rates. Having recognised a potential deposit migration among institutions as a potential risk, banks have been taking precautions by carefully adjusting interest rates and closely monitoring market competition in order to maintain a stable financing base and minimise a possible impact on profitability.

Due to the strong growth of interest rates on time deposits in the second half of 2023, large depositors' deposits rose at a stronger pace, additionally increasing the risk of concentration of funding sources. The largest share of total deposits in domestic banks is held by a small number of clients, with the concentration of corporate deposits exceeding that of household deposits (corporate and household Gini coefficients stand at 0.92 and 0.87 respectively). However, the distribution among banks is non-uniform and natural persons' deposits show more differences in concentration (Figure D.7). Overall, at the end of 2023, depositors in the upper quartile (classified by deposit size) held 95.3% of all deposits and the largest 5%

Figure D.8 Interest rate growth boosted the time deposits share



Note: The dots represent the change in deposits between June and December 2023 in some banks. The symmetric change is calculated according to the following formula:

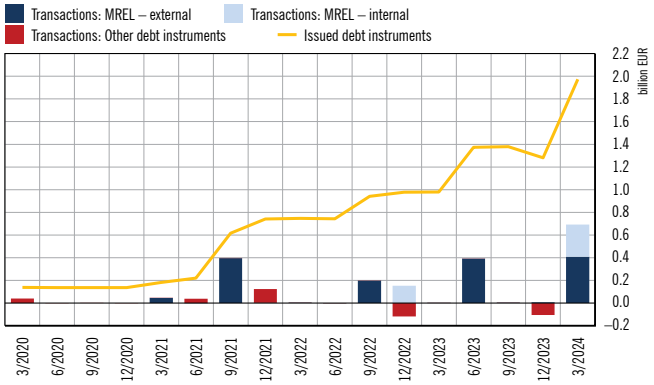
$$\frac{x_t - x_{t-1}}{0.5 \cdot (x_t + x_{t-1})}$$

and measures the change between two periods taking into account the average values at the beginning and end of the observed period.
Source: CNB.

of them held about 69.9% of the total deposit amount. An additional contributing factor was a significant inflow of large depositors' new deposits (owned by 5% of the largest depositors) in the second half of 2023, which exceeded the total change in deposits in almost all banks.

The continuing dominance of deposits in bank liabilities ensures a low bank exposure to volatility risk in international financial markets. Nevertheless, banks' connection with international financial markets increased slightly in 2023. The bulk of market financing growth in 2023 and early 2024 stemmed from the issuance of debt securities by two banks, whose share in total liabilities increased to 2.8% as a result. The new issues were made to comply with the minimum requirement for own funds and eligible liabilities (MREL), accounting for the majority share of the portfolio (Figure D.9). In early 2024, new MREL instruments had an average yield of over 5%, which considerably exceeds (by almost 440 basis points) the average cost of private non-financial sector deposits

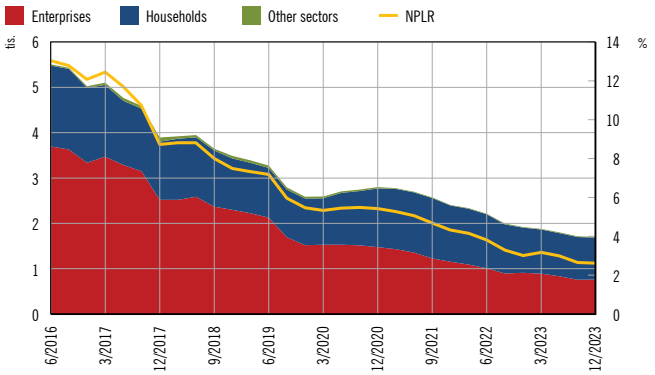
Figure D.9 Increase in debt security investments is mostly related to investments in MREL instruments



Source: CNB.

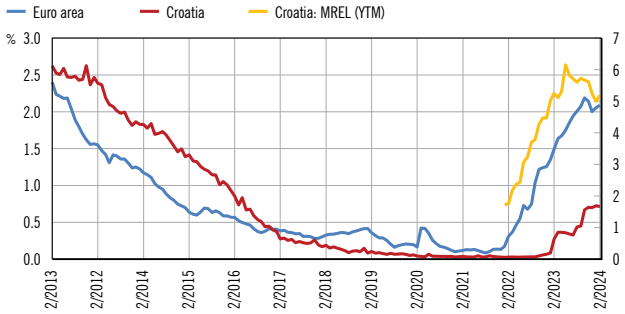
Figure D.11 Non-performing loan ratio continues to fall

(nominal non-performing loans on the left; ratio on the right)



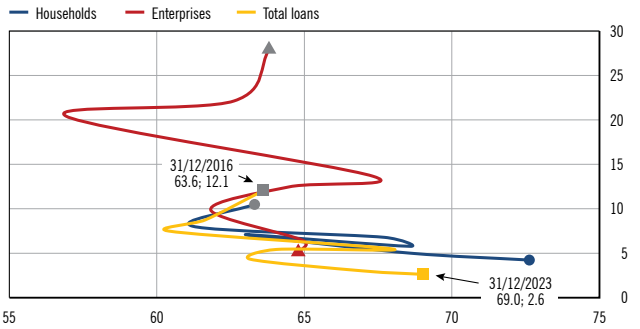
Source: CNB.

Figure D.10 Domestic banking system financing cost stands below the euro area average



Note: The euro area financing cost comprises the cost of private non-financial sector deposits and the cost of issued bonds (according to the ICE BofA Euro Banking Index). Due to a low share of market-based financing, the composite cost of financing of the domestic banking system is estimated as the average cost of private non-financial sector deposits.
Source: CNB.

Figure D.12 Low level of non-performing loans is accompanied by their high coverage



Note: Data refer to the ratio of non-performing loans and their coverage by value adjustments at the end of each year in the 2016 to 2023 period. The starting point (31 December 2016) is marked grey.
Source: CNB.

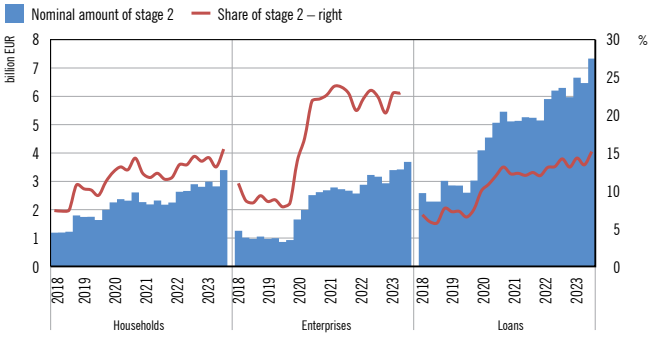
(Figure D.10). The low dependence of banks on market-based financing sources results from their high deposit base and a significant amount of own funds, which make them independent of additional external financing. In addition to being resilient to external financial shocks, domestic banks, thanks to a low share of market-based financing and a high share of relatively cheaper non-maturing deposits, currently enjoy low financing costs relative to the euro area average. While providing stability, high deposit volumes can cause vulnerability if confidence weakens or the behaviour of savers changes. Banks are therefore well advised to carefully manage this risk in order to ensure stability and diversification of financing sources and maintain the continuity of their primary activities.

D.3 Asset quality

Credit institutions' asset quality continued to improve in 2023 (Figure D.11). Notwithstanding challenges in the economic environment, including growing interest rates and high inflation, the non-performing loan ratio (NPLR) fell to a historical low of 2.6% at the end of 2023, with the corporate and household loan ratios down by 1.3 and 0.8 percentage points respectively from the end of 2022. These trends reflect a favourable macroeconomic environment and the so far low contribution of rising interest rates to the lowering of debt repayment capacity. In addition, due to a rise in inflation, non-financial corporations were able to increase their profitability and improve debt servicing capacity, with the improvement of the non-financial sector's asset quality resulting precisely from loans to this sector. Households serviced loans regularly thanks to the strong labour market and the growth of nominal and real wages. The coverage of non-performing loans by value adjustments edged up to 69% at the end of 2023 (Figure D.12). The high coverage by value adjustments and the low non-performing loan ratio make banks stable and resilient to new market turbulences, safe enough to face the challenges of the currently dynamic economic environment.

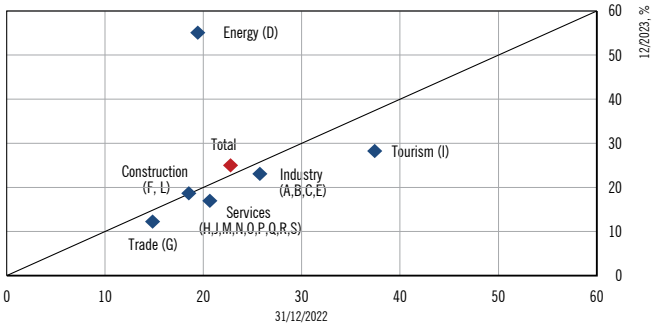
Figure D.13 Increase of the share of stage 2 in the system

(nominal stage 2 loans on the left, share on the right)



Note: Loans in stage 2 (F2) relate to performing loans witnessing a considerable increase in credit risk and loans in stage 3 (F3) relate to non-performing loans witnessing a loss.
Source: CNB.

Figure D.14 Energy activity recorded the largest deterioration in stage 2 corporate loans



Note: The dots above the line denote an increase in stage 2 at the end of 2023 from the end of 2022. The industry sector includes activities A, B, C and E, the energy sector includes activity D, the construction and real estate activities sector includes activities F and L, the trade sector activity G, the tourism sector activity I and services include activities H, J, M, N, O, P, Q, R and S.
Source: CNB.

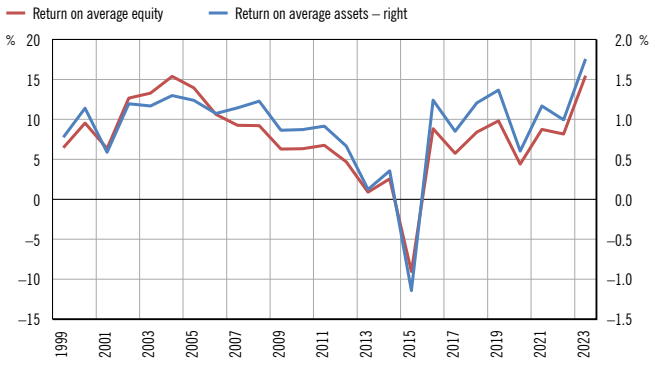
The continuing reclassification of loans into stage 2 indicates that banks expect their credit losses to increase (Figure D.13). The increase in the reclassification of loans into stage 2 in 2023 was especially pronounced in the case of non-financial corporations: the share of these loans to this sector grew from 2.2 percentage points to about one fourth, with the largest contribution coming from the energy sector (Figure D.14). The share of stage 2 household loans increased by 1 percentage point, reaching 15.5% at the end of last year. These trends reflect banks' caution in their assessment of s credit risk, arising from uncertainty about future economic developments. In addition, the expected continued increase in interest rates on consumer loans (with the rise in the legal cap on variable interest rates) and tightened conditions for new financing for the non-financial sector potentially resulting from a major change in the economic environment could weaken the currently high bank asset quality.

D.4 Profitability

Bank profitability hit record highs in 2023, as in the EU, but such profitability levels are unsustainable in the long run (Figure D.15). A high level of short-term liquid assets, which include reserves with the central bank[10], coupled with a rise in deposit rates that was relatively slow compared to that in lending rates, contributed to the growth of net interest income (Figure D.16). Non-interest income had a positive impact on profitability, despite the considerable loss of income from foreign currency operations following Croatia's entry into the euro area. The largest contribution came from net income from fees and commissions, edging up 2.4%, primarily due to a decrease in general expenses on fees and commissions and also to the continuing growth of income from credit cards and payment operations. As a result, the banking sector's profit reached historical highs, with a return on equity of 15.5% and a return on assets of about 2% (Figure D.15).

With interest income growing at a stronger pace than interest expense, the bank net interest margin increased sharply in 2023 and was among the higher margins in the EU (Figure D.17). A moderate spillover of the growth of key interest rates on existing loans and the continuation of stepped-up lending to the private sector considerably boosted bank interest income. Interest expenses grew at a more moderate pace, primarily with regard to financial institutions' derivatives contracts, whereas deposit costs rose more considerably in the case of non-financial corporations' time deposits. Operations with the government and the corporate sector recorded the highest increase in net interest income, with the exception of central government, whereas net interest income generated by retail operations held steady or was lower in some banks (Figure D.18).

Figure D.15 Banks recorded record-high profitability in 2023

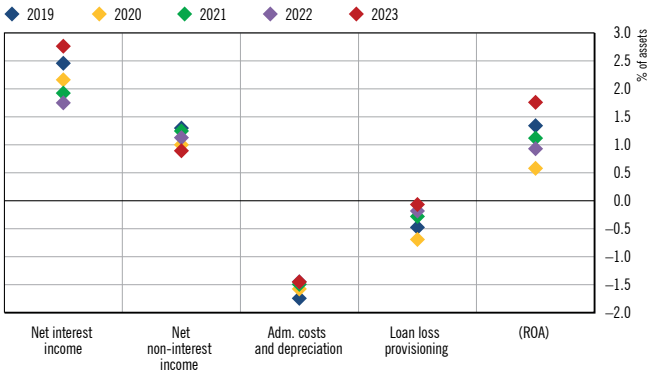


Source: CNB.

10 Total interest income from funds deposited with the central bank in the whole of 2023 amounted to one third of the total profit.

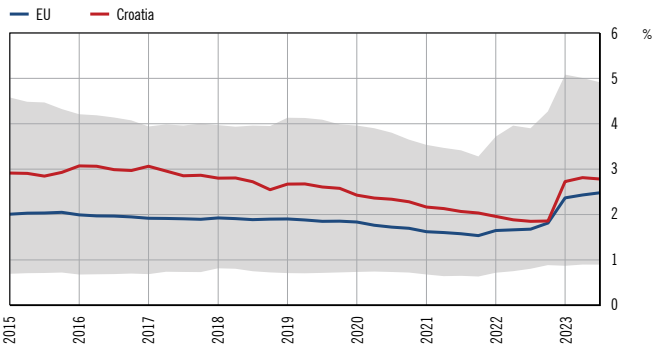
Figure D.16 Increase in net interest income is key to profitability growth

(decomposition of return on assets)



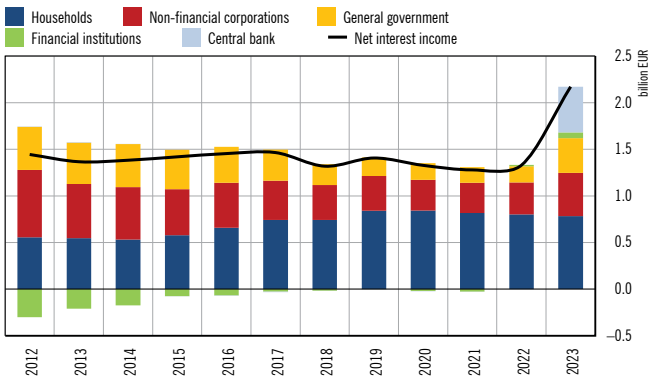
Source: CNB.

Figure D.17 Bank net interest margins in Croatia are currently above EU levels



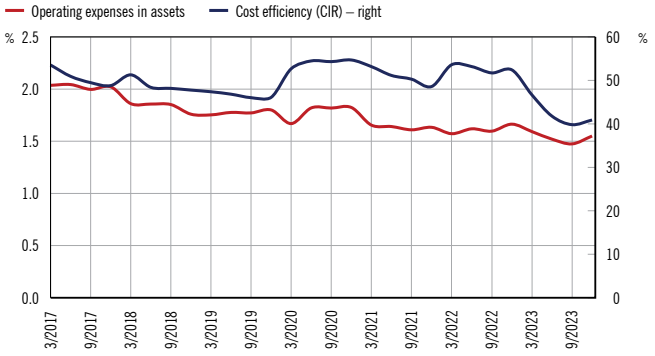
Note: The grey range shows the minimum and maximum levels of the net interest margin for the EU-28 countries.
Sources: ECB (Consolidated Banking Data – CBD2) and CNB.

Figure D.18 Net interest income grew strongly in 2023



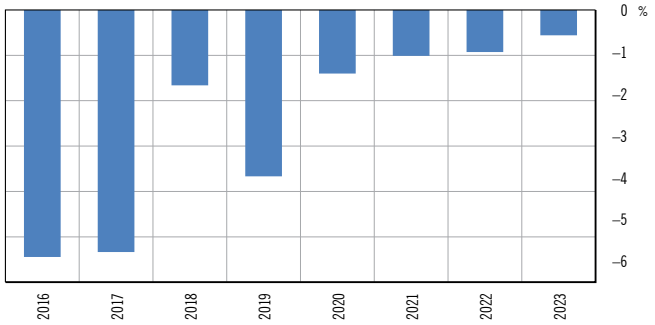
Source: CNB.

Figure D.19 Cost efficiency strongly affected by operating income growth



Note: The CIR is a ratio of operating expenses to net operating income.
Source: CNB.

Figure D.20 Credit risk cost of banks low in recent years



Note: Credit risk cost shows a ratio of new value adjustments for credit risk to the average stock of loans in a period.
Source: CNB.

The volume and sustainability of current bank profitability will in the short-term depend on several factors, such as the economic situation, the dynamics of benchmark interest rate reduction, the growth of competition in deposits with some banks, which could boost financing costs, and the growing cost of liability servicing resulting from interest rate increases. A signal that current profitability was starting to come under pressure was provided by the dynamics of the interest margin, which had decelerated as early as mid-2023 and started to decrease at the end of the year due to the declining difference between average interest rates on bank loans and deposits. Bank profitability should therefore be expected to converge towards average levels in the following period.

Operating expenses grew slightly due to wage increases amid the inflationary environment and additional investments in

digitalisation, but their growth was mitigated by the continued fall in the number of branch offices and employees. Operational efficiency improved in the previous year under the strong influence of a sharp increase in operating income. The cost-to-income ratio decreased to 40.9% as a result, putting the cost efficiency of Croatian banks above the EU average. The average cost dynamics was similar (Figure D.19), with this cost remaining slightly above the EU average, due to differences in the sizes of banking sectors. Expenses on value adjustments for credit risk dropped by 37% from the previous year on the back of the continued asset quality growth and the low cost of risk in the previous years (Figure D.20), while new litigation provisions amounted to EUR 100m.

D.5 Challenges for credit institutions

Like the rest of the economy, the banking sector has also been faced with uncertainties in the macrofinancial environment and the ongoing geopolitical tensions, including the war in Ukraine, Middle East conflicts, deglobalisation and the emergence of trade blocs. Such an environment is conducive to economic shocks that could spill over to banks in the form of mounting risks to stability and/or the higher price of financing sources as well as potential deterioration in asset quality, its corporative segment in particular. In such an environment, banks must focus on the strengthening of resilience and the adjusting of business models in order to be able to manage these risks efficiently.

Technological advancements, while undoubtedly beneficial in terms of the digitalisation of business operations, including a cheaper and more potent distribution network, also increase security risks, such as cyberattacks, financial fraud and other malicious activities. Cybersecurity is becoming an omnipresent problem in the banking sector, given the complex and sophisticated threats accompanying technological advances. Efficient cybersecurity management has become crucial for maintaining business continuity and client trust, while enabling banks to remain competitive in an increasingly challenging environment. The preparations for the banking sector's future should strike a balance between innovations and security in order to enable banks both to provide high-quality services and to protect their clients and operations.

The growth of digitalisation also brings about an increase in competition from digital banks, which cross boundaries with ease. While the increase is still limited in scope, especially in the household sector, given the constantly growing share of IT literate bank clients banks are well advised to keep an eye on competition, now increasingly foreign. A streamlined personal finance management and access to international financial markets with low fees and currently higher deposits rates have led to an outflow of a number of local clients to international digital banks. Banks should respond to this by continuing investments in digitalisation and demonstrating flexibility towards ever more demanding clients.

Banks have been more and more involved with environmental efforts, a responsible role that carries with it some challenges, both physical and transitional ones. Physical risks comprise the direct impacts of extreme weather events and long-term climate changes on banks' operations, their clients and the wider economy. These risks can adversely influence client creditworthiness and cause sudden shifts in asset value, as clearly evident from the increased number of climate events in the last decade (floods, fires, draughts). Transition risks, on the other hand, stem from the limited readiness of clients, enterprises in particular, to bring their operations in line with the requirements of sustainability and climate neutrality, which protect them from energy shocks and enable climate transition. A sluggish or postponed transition of enterprises can result in an increase in direct costs and risks for them, which increases risks for banks as a consequence. Although climate transition pushes up costs in the short run and puts pressure on banks in terms of making the assessment of financing needs in the client transition procedure more difficult, in the long run it helps banks to reduce the risk of non-sustainability of client operations and enables stability and profitability in the future.

II Resilience of credit institutions

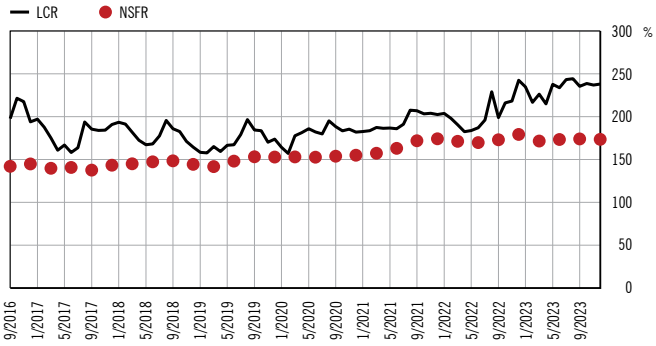
The Croatian banking system remained highly capitalised and liquid in 2023. Its ability to amortise shocks at system level was strengthened by maintaining considerable capital surpluses and liquidity above regulatory requirements. This is also confirmed by the results of the stress test, in which the banking system remains solvent under a hypothetical scenario of unfavourable geopolitical trends, reintensification of inflationary pressures and a decrease in disposable income, mostly on account of low materialisation of interest rate risk and generally robust profitability. Also, the results of the liquidity stress test show that the majority of credit institutions in Croatia are resilient to the stress periods of larger outflows.

A Liquidity

The liquidity position of banks in Croatia remained exceptionally favourable in 2023 and in early 2024 (Figure II.1). Highly liquid assets had increased considerably by the end of 2022 as a result of monetary policy instruments being harmonised before accession to the euro area and held steady at the same level since then. At the end of March 2024, the liquidity coverage ratio (LCR) at system level was a very high 238.1%, with not a single bank being below the regulatory minimum of 100%. The structure of highly liquid assets has not changed, so that reserves with the central bank and central government securities still account for its main components. The LCR also benefited from the decrease in expected net outflows thanks to the migration of deposits from overnight transactions to fixed-term accounts[11]. The high share of cash and reserves with the central bank (about two thirds) reduces banks' exposure to the risks of asset value fluctuations, raising their resilience to risks related to sudden changes in financial markets (Figure II.2). The most recent results of the short-term liquidity stress test additionally confirmed the high ability of credit institutions to manage potential short-term shocks (see chapter Liquidity stress testing of credit institutions).

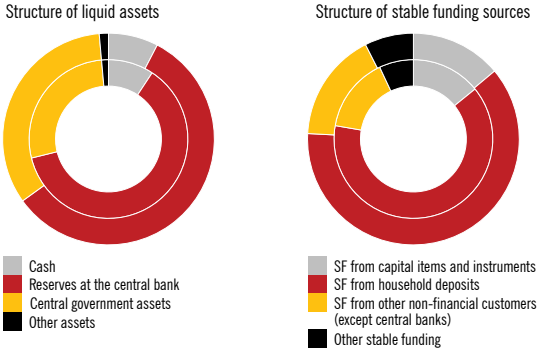
Bank liquidity remained strong even when observed in the medium and long term. At the end of December 2023, the net stable funding ratio (NSFR) stood at 173.4% at system level and all banks met the regulatory minimum of 100%. The available stable funding was mostly accounted for by own funds and private non-financial sector deposits.

Figure II.1 Liquidity coverage ratio and stable funding ratio remained high



Note: LCR means the liquidity coverage ratio, while NSFR means the net stable funding ratio.
Source: CNB.

Figure II.2 Cash and reserves with the central bank are the most significant source of liquidity



Notes: The internal structure shows the values in December 2022, while the outer ring shows the structure in 2023. SF means the sources of funding.
Source: CNB

11 The transfer of funds from overnight deposits to time deposits led to a decline in expected outflows (the denominator of the LCR). Time deposits with a maturity longer than 30 days have an outflow rate of 0%, while overnight deposits, depending on several criteria, have an outflow rate of 5% to 10%.

B Liquidity stress testing of credit institutions

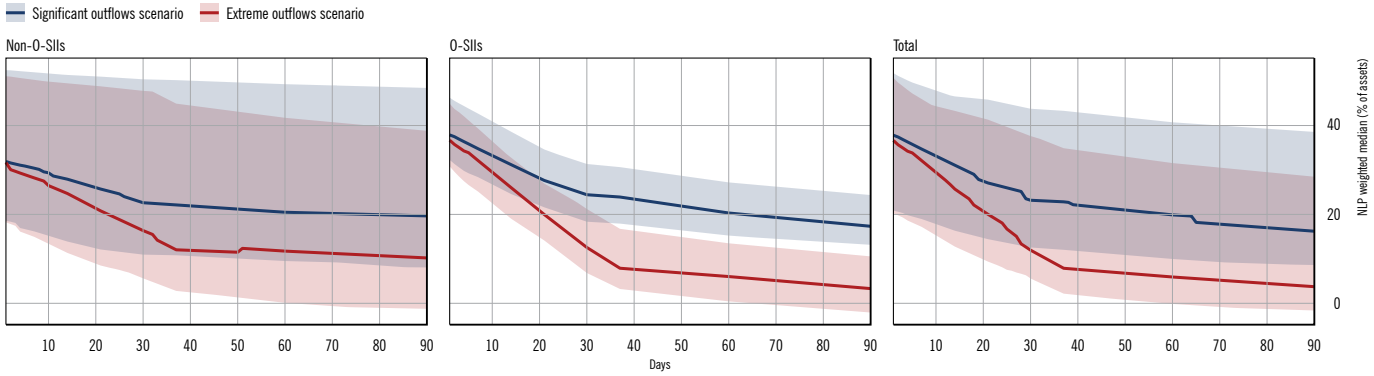
Liquidity stress testing of banks is an assessment of their ability to withstand hypothetical liquidity shocks, which, in addition to a somewhat stronger response in the beginning, last three months continuously; it excludes the situation of a very short and intensified pressure on banks. The analysis examines the effects on bank liquidity of changes in inflows and outflows of funds under two scenarios with different shock levels. The first scenario includes significant shocks, with the assumed outflow in the first month according to the LCR regulatory requirements and with an additional continuation of outflows in a three-month period reaching about 20% of the assets. The second scenario, characterised as an extreme shock, includes an additional outflow of about EUR 8bn in the course of three months up to about 30% of assets. All credit institutions in Croatia cover the expected outflows during the period of three months under the baseline scenario and under the scenario with an increased outflow during the first 30 days. However, four banks do not meet the test conditions during 90 days.

Following a decade marked by high and easily accessible liquidity, liquidity risk became more material due to monetary policy tightening and, in particular, the scaling back of the central banks' balance sheets. Over a long period of high liquidity, potential challenges for banks' operations related to the tightening of the liquidity position were low. However, in the past two years, monetary policy tightening and its effects on financial markets, including the sudden interest rate increase and the rise in (realised and unrealised) market losses, put liquidity risk at the centre of regulators' attention again. Consequently, more attention is devoted to the development of suitable tools and the implementation of liquidity stress tests, which provide an in-depth assessment of a credit institution's ability to face sudden and significant changes in the financial environment, in particular the challenges in the form of delays in cash inflows and large deposit outflows.

The resilience of the Croatian banking system to different liquidity shocks was tested based on a new liquidity stress testing methodology that covers a combination of intensive shocks of inflows and funding sources over a 90-day horizon. The common metrics to assess liquidity is based on the liquidity coverage ratio (LCR), which regulates the minimum degree of coverage of net cash outflows by liquid assets during a 30-day period. Although the above ratio is an exceptionally useful tool for the assessment of current liquidity, it does not take into consideration the timing of cash inflows and outflows within the prescribed time horizon or after its expiry. Liquidity risk can be assessed based on supervisory reports on the maturity ladder, which provide information on expected cash inflows and outflows in different time intervals, within a maturity profile other than a month. In this case, the period of three months was selected as the relevant time horizon since relevant liquidity disturbances should take place within such a period (see Box 6 Liquidity stress testing methodology).

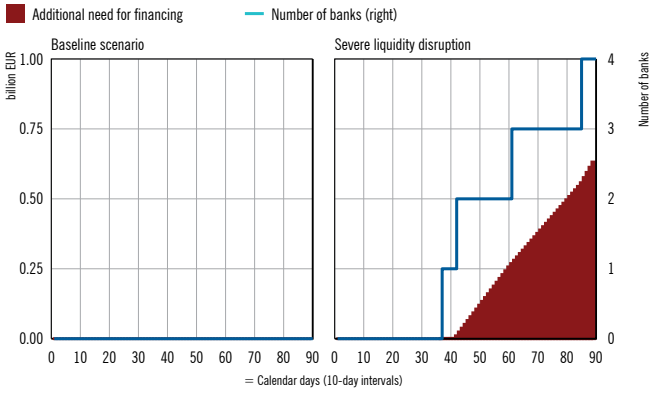
The results of the implemented institutions indicate an exceptionally high level of bank resilience to liquidity disruptions. In the simulated scenario of significant outflows all credit institutions would withstand an increase in net outflows, not only within 30 days, but also within a period of 90 days. In accordance with meeting the regulatory requirement of the LCR, all

Figure II.3 Median of the share of net liquid position (NLP), weighted by banks' assets under the scenario



Notes: On the vertical axis, the chart shows median NLP weighted by total banks' assets, while the shaded areas denote 10 and 90 percentile of value. "O-SIIs" represent other systemically important institutions, while "Non-O-SIIs" denotes all other institutions that are not O-SIIs.
Source: CNB.

Figure II.4 Share of banks at the time of need for additional funding



Source: CNB.

banks successfully cover net outflows up to one month. With the high liquidity of the Croatian banking system, banks can successfully absorb even enhanced outflows in the course of three months (Figure II.3). Although all institutions have sufficient liquid assets to cover simulated extreme outflows within a monthly period, under such a scenario, several banks would face difficulties in covering simulated net outflows in an extended three-month period without seeking additional liquidity.

Although all banks show a high degree of resilience to liquidity disruptions, the results for individual banks urge caution (Figure II.3). The net liquid position of small, systemically less important institutions shows greater stability during the observed period, in particular under the scenarios of extreme outflows. Although their initial share of highly liquid assets in total assets is six percentage points lower than the median, less important institutions demonstrate greater resilience because they are less dependent on unstable deposits. On the other hand, systemically important institutions rely on less stable deposits, in particular from the sectors of corporations and other financial institutions, which makes them more vulnerable to sudden outflows and makes the maintenance of a stable liquid position more difficult.

Four financial institutions are faced with increased needs for funding after the first month of shock (Figure II.4). The combination of a high outflow of funds from credit institutions and limited inflows in a three-month period of liquidity stress causes problems for one fifth of the analysed institutions, increasing their need for additional highly liquid funds to about EUR 620m. With regard to the intensity of the scenario, institutions that do not have sufficient highly liquid assets are forced to seek alternative funding sources in order to bring their net liquidity position to acceptable levels.

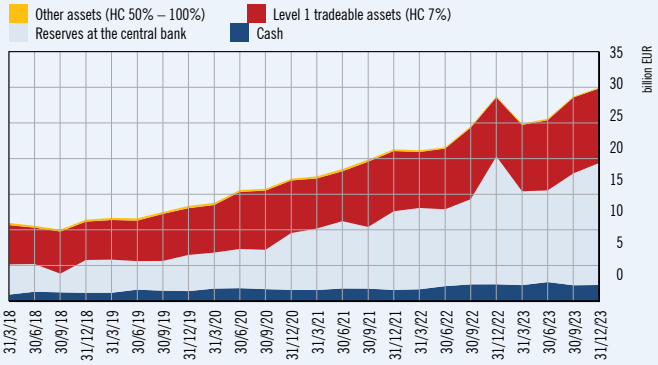
Box 6 Liquidity stress testing methodology

The analysis of credit institutions' resilience to liquidity stress tested the reaction of banks to stress conditions over a three-month horizon. The simulation is carried out independently of changes in monetary and macroprudential policies and under the assumption that the central bank is not going to provide additional support to banks during a stress period, with the exception of renewing the already agreed repo operations. As in the solvency analysis, this analysis also relies on the assumption of a fixed balance sheet, which implies that banks cannot adjust their credit activities or change the liquidity management strategy within the period.

The simulation is based on the maturity ladder (ML) report, which monitors the expected inflows and outflows in different time intervals. The maturity ladder report is included in the standard monthly (for small banks, quarterly) regulatory supervisory reporting and it consist of two main parts: the expected inflows and outflows distributed into time intervals[1] and high-quality liquid assets (HQLA) in the form of cash, deposits with the central bank and traded high-level liquidity assets. The bank reports only the unencumbered assets, i.e. the assets it can freely dispose of and sell without any obstacles. The level of liquid assets is projected according to agreed inflows and outflows and then hypothetical liquidity shocks are simulated, such as deposit withdrawal, the absence of inflows under contractual cash flows or the decline in the value of highly liquid assets related to a rating downgrade or monetising a collateral.

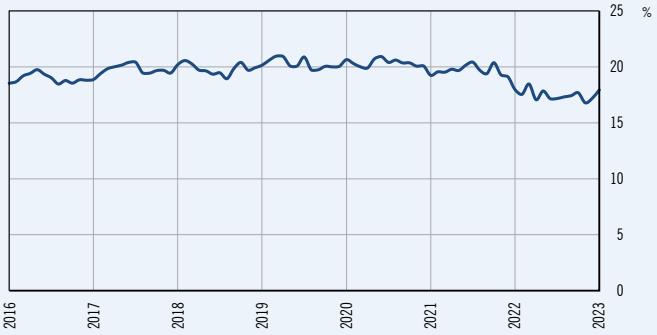
The market value of the individual forms of highly liquid funds is reduced when assessing banks' counterbalancing capacity (CBC) in order to take into consideration the different levels of volatility and liquidity risks, i.e. the ability to liquidate assets without any significant losses. As in the standard for the calculation of the liquidity coverage ratio, highly liquid assets, such as cash and reserves with the central bank, which at the end of 2023 accounted for about one third of total assets, are not subject to a haircut. However, a 7% haircut is applied to level 1 assets, such as government bonds, which reflects the average haircut coefficient for eligible collateral in ECB operations[2]. Other assets are subject to even larger haircuts (from 50% to 100%). However, as they account for a small part of the balance sheets of the Croatian banking system, the total effect of such haircuts is practically negligible (Figure 1).

Figure 1 Composition of highly liquid assets



Note: The liquid assets haircut (HC) is shown in brackets.
Source: CNB.

Figure 2 Average total outflow rate in the LCR template



Source: CNB.

In stress scenarios the inflows of funds to credit institutions are considerably limited or completely suspended, while outflows increase depending on the intensity of the stress scenario. In the significant outflows scenario the factors of the reduction of inflows are used (cap on 75% of outflows[3]) and outflows that are used in the LCR[4] calculation, by which the assumptions of monthly liquidity requirements are replicated. By contrast, under the extreme outflows scenario, twice as large an outflow of stable deposits is assumed, i.e. deposits that are covered by the insurance scheme. The liquid position of banks is estimated on a daily basis, where shocks are concentrated within the first month and gradually weaken towards the end of the testing horizon[5]. Non-linear effects characteristic for typical bank runs, which are usually the most pronounced in the early days, are not considered in this exercise.

1 The ML template contains 21 time intervals and covers the time intervals of overnight maturities to those exceeding five years.

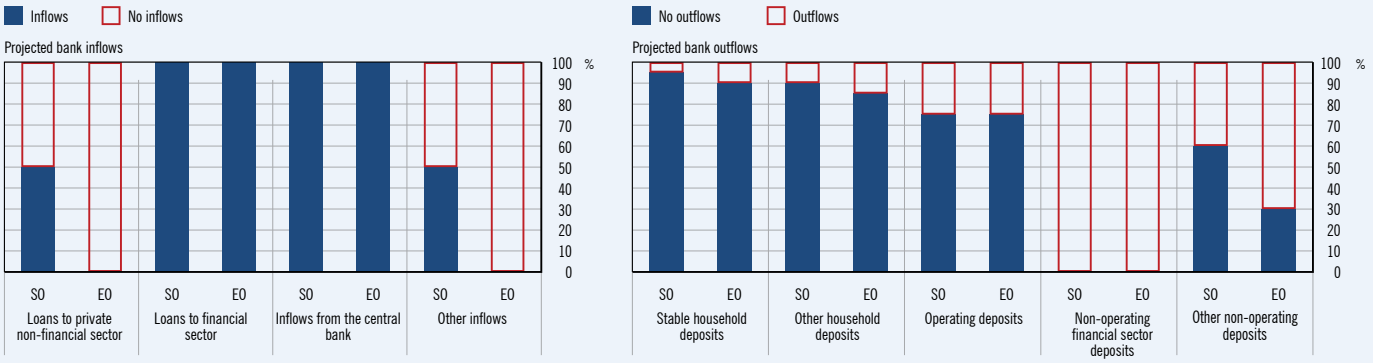
2 The average weight for haircuts of assets that are eligible collateral in ECB operations (https://www.ecb.europa.eu/mopo/coll/assets/html/list-MID.en.html) stood at 7.7% at the end of 2023.

3 In order to prevent banks from relying solely on anticipated inflows to meet their liquidity requirements and to ensure a minimum level of highly liquid assets, the amount of inflows that can offset outflows is capped at 75% of total expected cash outflows.

4 BIS (2013). "Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools". *Basel Committee on Banking Supervision.*

5 The maximum amount of expected deposit outflows with open maturities and overnight deposits is reached on a horizon of one month, while in other deposits, depending on contracted maturity, a gradual outflow is expected in the course of three months.

Figure 3 Projected inflows and outflows under the applied scenarios



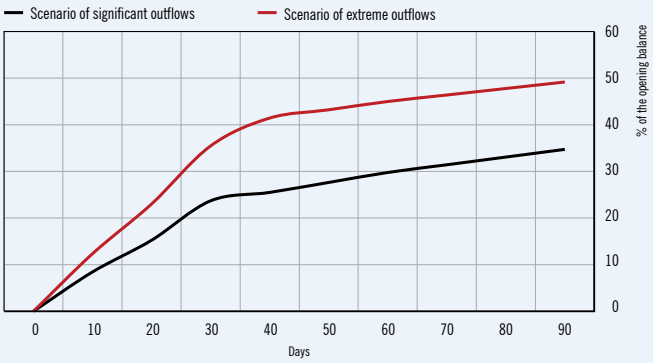
Notes: The assumptions on inflows/outflows are shown relative to the characteristics of inflows/outflows expected according to the maturity ladder, which are based on historical changes during the individual crisis episodes or expert assessment. The abbreviation "SO" stands for the scenario of significant outflows, "EO" stands for the scenario of extreme outflows. Operating deposits are deposits that the bank classifies as necessary for the operation of business entities and are therefore less elastic to liquidity shocks. Non-operating deposits are deposits that are unnecessary for the operation of business entities so that their outflow rates are higher.
Source: CNB.

In accordance with the above assumptions, two scenarios are defined, which differ according to the intensity of the strengthening of outflows and the decline in inflows (Figure 3)[6]:

- **Scenario of significant outflows (SO)**: It assumes inflows and outflows based on parameters used when calculating the liquidity coverage ratio (LCR). The simulation assumes a significant decrease in inflows in the first month of the analysis (50% for the private sector), associated with a temporary backlog in loan repayments and outflows of stable deposits of 5%, and less stable deposits within the range of 10% to 100%. In the remaining two months, monthly outflows of stable deposits of 3% and outflows of less stable deposits of 6.5% are assumed[7]. Here, the total outflows relative to the system balance sheet can be indicated and compared with historical experiences.

- **Scenario of extreme outflows (EO):** This characterises a temporary suspension of all inflows from placements to the private non-financial sector in the first month of the analysis and additionally increased pressure by depositors. In the first month of the shock stable deposits flow out at a rate of 10%, which amounts to an outflow twice as large as in SOs, while operating deposits flow out at a rate of 25%. Also, less stable deposits, if outflow rates for them are not assumed at 100% under the baseline scenario, have higher outflow rates than in SOs. Thus, in other household deposits they flow out at the rate of 15%, while this rate increases to 70% in other non-operating deposits which are considered unnecessary for the operation of business entities. In the next two months of the simulation, an additional 4.5% of stable deposits and 8% of less stable deposits flow out.

Figure 4 Total outflows under the significant and extreme outflow scenarios



Source: CNB.

The simulated scenarios of the outflow of funds used in this stress test include episodes of gradual deposit withdrawal (Figure 4). The rates of deposit withdrawal in historical cases vary by intensity and duration and can accordingly be divided into two main scenarios[8]: (i) cases with gradual withdrawal at low average monthly withdrawal rates during a fairly long period and (ii) cases with fast withdrawal at high average withdrawal rates within a short period. Therefore, it is justified to differentiate between cases that, for example, last up to one month or less and those that last several months. In this simulation we have opted for gradual withdrawal, in which in the first month in accordance with previous experiences we simulate a slightly stronger withdrawal dynamics, which then slows down in the next two months.

As the basis for the baseline scenario – significant outflows (SO), we use assumptions for the LCR regulatory requirement, which prescribes

6 For the purpose of overlapping the LCR and ML templates, the scenarios in this stress test did not cover inflows and outflows with the counterparty "Other".

7 The above assumptions have been taken from the methodologies of other countries denoted in Danielsson, M. and Manfredini, J. (2019): "The Riksbank's method for stress testing banks' liquidity", Staff memo.

8 ECB (2020, November): *Liquidity in resolution: Estimating possible liquidity gaps for specific banks in resolution and in a systemic crisis* [Occasional Paper No. 250].

the liquidity level that should enable banks to manage their liquidity in periods of elevated outflow of funds. With regard to the structure of domestic banks' liabilities, the LCR assumes an average monthly outflow of funds ranging from 18% to 20% (Figure 2), which for the domestic market is considered to be a significant outflow, taking into account isolated historical episodes. When additional outflows during the subsequent two months of simulation are added to the SO scenario, the total outflow in the three-month period reaches about 35%. A stronger extreme outflow (EO) scenario introduces additional pressures on liquidity during the first month, when total simulated outflows reach almost a half of the balance sheet of the banking system.

A comparison of the severity of the simulated scenarios with the recent bank run episodes shows a similarity of intensity to that of the recent Sberbank d.d. episode[9], although in that case outflows took place within a shorter timeframe, of several days, which is not simulated in this exercise. The extreme outflows scenario assumes outflows almost twice as large as those in the significant outflows scenario. Thus simulated, outflows assess the ability of banks to manage liquidity in crisis conditions that are unprecedented in the Croatian banking system, during a three-month period. However, recent global developments, such as the cases of pressures in the USA in March 2023, suggest the possibility of the occurrence of shocks of an intensity even larger than those shown in the simulated scenarios.

The results of the conducted testing of resilience to liquidity disturbances are shown through three indicators:

- **Net liquid position (NLP),** which represents the difference between the currently available liquidity and the expected net outflows until a specific moment in time (t).

$$NLP_t = CBC_{initialy} -$$

$$\sum_{t-1}^{T} [Outflows_{t,after\ the\ shock} - min\,(Inflows_{t,after\ the\ shock}; 0,75 *$$

$$Outflows_{t,after\ the\ shock})], T = 90;$$

- **Share of banks in need of additional funding**, which is determined by the moment in time when the bank's net liquid position becomes negative, i.e. it shows the number of days in which the bank can operate without an additional funding source (the situation when $NLP_{t,i} \leq 0$).

- **The size of the need for additional funding (SNAF) in the total assets** of the system, i.e. how big a part of the system cannot continue with operations without accessing additional funding within a specific time interval.

$$SNAF_t = \sum_{i=} NLP_{t,i} \leq 0$$

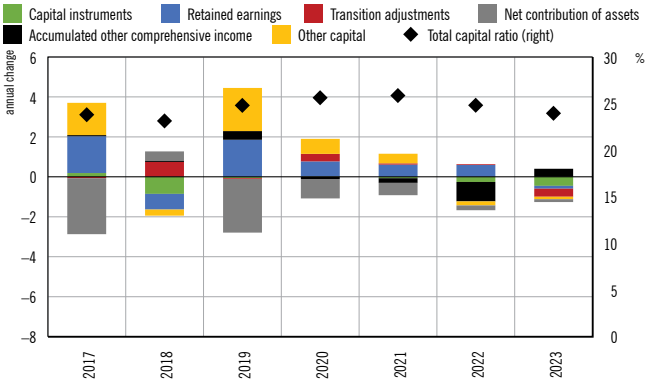
9 Sberbank lost EUR 203m in deposits (18.7% of total deposits) in just two days from the invasion of Ukraine, which led to the bank's illiquidity. The announced amount for the next business day (Monday) would have raised the outflow rate to almost 24% of total deposits.

C Capital position of banks

The strong capital position of banks is reflected in the high rate of total capital, which at the end of 2023 stood at 23.9% at system level. The slight decline from the end of 2022 was the consequence of the parallel decrease in own funds and an increase in the total risk exposure amount. More intensified dividend payouts in 2023 in the amount of about 145% of profit of the preceding year lowered own funds by 3.3 p.p., while the reduction in losses on instruments carried at fair value through other comprehensive income (Figure II.5) acted in the opposite direction. Increased bank lending activity led to the growth in risk-weighted assets despite the fall in the average risk weight from 43.8% to 42.9% due to the channelling of funds towards less risky forms of assets, reducing the total capital ratio by 0.14 p.p. Despite the decrease in the total capital rate, banks still have considerable capital surpluses at their disposal, amounting at system level to about seven percentage points above the total regulatory requirements and additionally enhance the ability to amortise shocks. The high resilience of the banking sector is also confirmed by the results of the conducted stress testing of the banks' capital position (solvency) (D. Solvency testing of credit institutions).

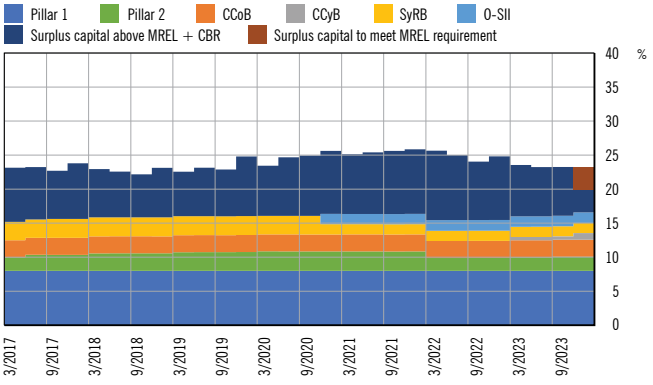
At the end of 2023, banks also met objectives related to the minimum requirement for own funds and eligible liabilities (MREL) (Figure II.6[12]). At the aggregate level, resolution entities maintained their MREL capacities at the levels above the prescribed MREL requirements during the year. The largest part of these requirements was met by means of own funds, and only a smaller part, about one fifth, was accounted for by eligible liabilities. Nevertheless, eligible liabilities are gaining in importance because, in 2023, for the purpose of meeting MREL requirements, three banks issued internal and external MREL instruments in the total value of EUR 550m.

Figure II.5 Dividend payouts and unrealised losses reduced total capital ratio



Source: CNB.

Figure II.6 MREL capacities are higher than prescribed MREL requirements



Source: CNB.

12 For a detailed overview of MREL instruments see Financial Stability No. 24, Box 6 Capital requirements for credit institutions in the prudential and resolution regulatory frameworks.

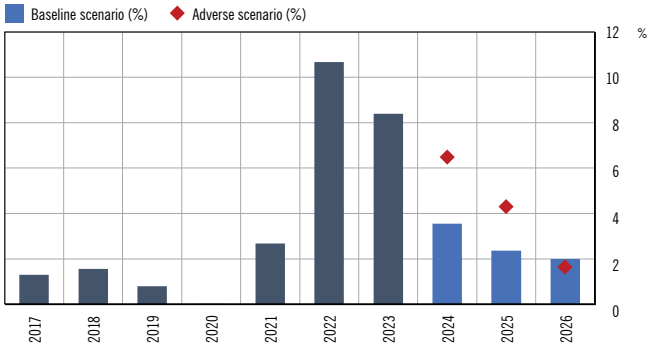
D Solvency testing of credit institutions

The credit institutions stress testing exercise has shown that, given the current level of capitalisation, credit institutions are capable of withstanding the materialisation of risks under the hypothetical scenario. The results contribute to the comprehensive assessment of systemic risk in the financial system and the suitability of macroprudential measures aimed at mitigating such risks. This year's exercise included the announcement of a higher countercyclical capital buffer rate of 1.5% applicable as of 30 June 2024 and the new requirements for other systemically important institutions (see chapter III), meaning that the total capital requirements rate at the end of all three years of the stress testing horizon was 0.9 percentage point up from the rate that applied at the end of 2023. In addition, the time limit for the compliance with MREL requirements, which banks can meet by relying on the existing capital surpluses or by issuing MREL eligible instruments, ended in January 2024. This also tests whether there is sufficient capital to protect them from extremely unfavourable developments.

D.1 Macroeconomic scenarios for stress testing

Stress testing of credit institutions in the period from 2024 to 2026 is carried out based on two different scenarios, that is, the baseline scenario and the adverse scenario. Under the baseline scenario[14] economic activity might intensify further in 2024 under the effect of a robust growth of domestic demand and the continuation of investment activity and continue in the subsequent two years, albeit at a somewhat slower pace. The cumulative real GDP growth in 2024 – 2026 could thus amount to 8.7 p.p. The average annual consumer price inflation rate on the domestic market could slow down considerably as a reflection of the expected downward trend in the inflation of all main components, primarily of core inflation, and gradually return to the long-term target level towards the end of the projection horizon. The growth of residential property prices might slow down noticeably in 2024, but still remain at a relatively high level supported by the strong labour market, although it might slow down additionally in the next two years. With regard to financing conditions, no further monetary policy tightening is foreseen in accordance with the latest deceleration of inflation in the euro area and the signals from the meetings of the

Figure II.7 Developments in consumer price inflation under baseline and adverse scenario



Sources: CBS and the CNB's March 2024 macroeconomic projections for the baseline scenario and the simulation of the macroeconomic model PACMAN for the adverse scenario.

13 Stress testing tests the resilience (solvency) of credit institutions during hypothetical, extremely unfavourable, macroeconomic and financial developments that pose highly unlikely, albeit possible, materialisation of systemic risks deemed relevant for the operation of the banking sector in Croatia. Even though stress testing is not a projection of unfavourable developments expected in the financial sector, it contributes to a timely assessment of systemic risks and stability maintenance.

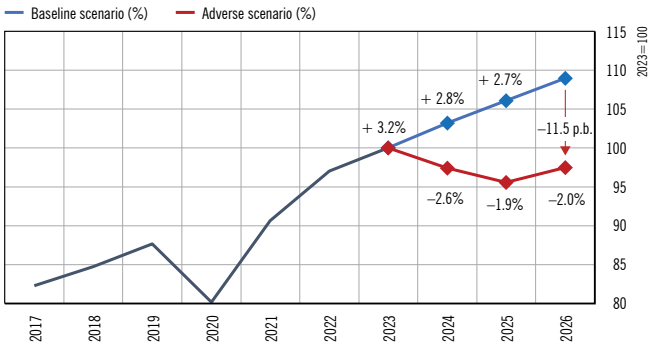
14 Based on the CNB's March 2024 macroeconomic projection.

Table II.1 Main features of the baseline and adverse macroeconomic scenario

	Initial value	Baseline scenario			Adverse scenario		
	2023	2024	2025	2026	2024	2025	2026
International environment							
GDP EA (annual rate of change, %)	0.5	0.6	1.5	1.6	-5.8	-3.0	5.6
EURIBOR 3M, %	3.4	3.4	2.4	2.4	4.5	2.8	2.4
Macroeconomic developments							
GDP (annual rate of change, %)	3.1	3.2	2.8	2.7	-2.6	-1.9	2.0
Personal consumption (annual rate of change, %)	**3.1**	**4.4**	**2.8**	**2.9**	**-1.1**	**-1.9**	**0.6**
Investments (annual rate of change, %)	4.2	2.1	2.6	3.2	-6.6	2.0	0.7
Unemployment rate (%)	6.3	6.0	5.7	5.5	7.9	9.8	6.0
Real estate prices (annual rate of change, %)	12.1	6.7	3.9	3.8	-7.3	-2.6	14.5
Inflation (%)	8.4	3.5	2.4	2.0	6.5	4.3	1.6
Financing conditions							
Yield on government bonds	3.8	3.3	3.3	3.4	7.9	6.3	5.8
Lending rates on new business of households, housing loans	3.3	4.1	4.0	3.9	5.2	5.2	4.6
Lending rates on new business of corporates	4.3	4.9	4.7	4.5	6.1	5.8	5.2
Deposit rates on new business of households, time deposits	1.4	2.2	2.1	2.1	2.7	2.5	2.3
Deposit rates on new business of corporates, time deposits in EUR	2.6	3.1	2.8	2.7	3.8	3.3	2.8

Sources: CBS and CNB, Eurostat, ECB, CNB's March 2024 macroeconomic projections for the baseline scenario and the simulation of the macroeconomic model PACMAN for the adverse scenario.

Figure II.8 Developments in real GDP under baseline and adverse scenario



Sources: CBS and the CNB's March 2024 macroeconomic projections for the baseline scenario and the simulation of the macroeconomic model PACMAN for the adverse scenario.

ECB Governing Council. Moreover, in accordance with the expectations of monetary policy easing in the following year, the EURIBOR is expected to fall by 1 p.p. in 2025.

The adverse scenario is based on a hypothetical assumption of the escalation of geopolitical tensions, disruptions in logistics and shortages in supply chains that increase the prices of raw materials, in particular in the energy and food sectors. A prolonged military conflict in Ukraine and a potential escalation of the conflict in the Middle East could result in an increase in the prices of food and energy and slow down the speed at which inflation is brought back to its two per cent target. Primarily the production sector, as well as other sectors that to a large extent rely on energy, raw materials and food as their own inputs could face increased production costs. Corporates might transfer some of these costs to consumers, which triggers the cycle of price pressures, causing a drop in disposable income of domestic sectors, their purchasing power and aggregate demand. In order to offset losses in purchasing power triggered by higher inflation, households might demand higher wages, which could generate a new cost shock that corporates might partially pass on to consumer prices. Prolonged inflationary pressures and the deceleration of economic activity would have an unfavourable impact on the labour market. Keeping key interest rates at higher levels paired with elevated uncertainty would lead to a stronger volatility in financial markets and a considerable cooling off of activities in the real estate market. In addition, a slowdown in economic activity would weaken the fiscal position, raising doubts concerning the long-term sustainability of public finance and lead to an increase in the risk premium. At the end of the observed period, lower levels of consumer and business confidence and weak economic activity would lead to waning inflation, which could still remain at higher levels relative to the baseline scenario. Table II.1 provides an overview of the developments in the main macroeconomic indicators under the baseline and the adverse scenario.

D.2 Earnings under baseline and adverse scenario

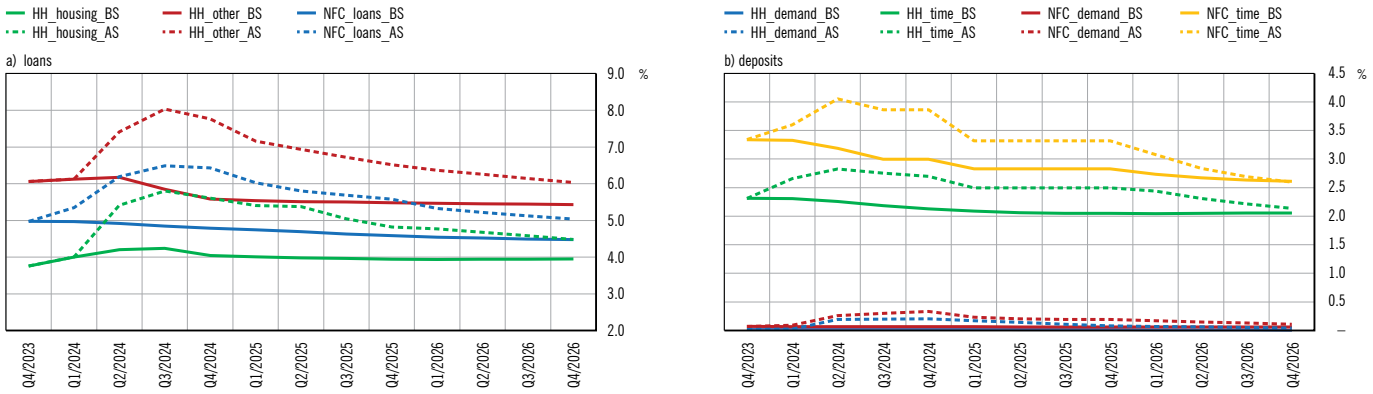
The stress testing exercise involved using satellite models for estimating net income. In order to estimate net operating earnings, corporate and household net interest income is estimated, depending on the model estimate of the movements of interest rates on new household and corporate loans (Figure II.9)[15] and the models of the net income from fees and commissions[16], while for other items of operating income stagnation is assumed at the level from 2023 or the development in accordance with inflation. It is worth noting that the rise in interest rates in 2024 mirrors the lagged pass-through of monetary policy tightening, as well as lower interest rates until the end of the projection horizon under both scenarios.

Following a strong growth of profitability in 2023, in 2024, a gradual decrease in net interest margin is expected, with the unfavourable effect on net interest income. Under the baseline scenario, net interest income is under the pressure of growing deposit costs, while on the side of assets the high share of loans at fixed interest rates decreases net interest income relative to the base year of the scenario. On the other hand, under the adverse scenario, the materialisation of interest-induced credit risk decreases total net interest income in 2024. Additionally, under the adverse scenario, along with the decline in economic activity, net income from commissions and fees also decreases additionally. Under both scenarios, administrative expenses move in accordance with the increase in wage costs, according to the inflation level from the previous year and in accordance with the increase in other administrative expenses by linear progression of the average growth of allocations for IT costs.

The total non-performing loans ratio (NPLR)[17] under the baseline scenario could continue its downward trend and at the end of 2026 drop to 1.9%, from 2.6% at the end of 2023. The rise in the nominal income of households in parallel with the anticipated continued favourable economic developments has alleviated the accumulated effects of elevated inflation and higher interest rates on the debt repayment ability of households. NPLR is projected to decrease for housing and consumer loans within a three-year period from 0.5 and 2 percentage points, respectively. With regard to non-financial corporations, the decrease in NPLR under the baseline scenario of 1.7 p.p. arises from improved business performance (measured by the growth in gross operating surplus) and the strengthening of liquidity, offsetting the negative effect of higher interest rates on debt repayment ability.

Under the hypothetical adverse scenario, the deterioration in loan quality is expected, with the total NPLR potentially reaching 4.9% by the end of 2026. The strong economic contraction in the domestic and foreign markets and persistently high interest rates with the aim of limiting inflationary pressures impact NPLR growth. Simulated NPLR growth in the three-year period is weaker for the household sector (of 0.9

Figure II.9 Projected interest rates on new business



Note: Interest rates on time deposits of corporates include only deposits in euro.
Source: CNB.

15 Interest rates on the new business volume of loans were modelled using the ARDL (autoregressive distributed lag) model so that independent variables, along with the autoregressive component, were all the possible combinations of three variables from the set (K = 6 or 7) of explanatory variables by which the movement is simulated under the baseline and adverse scenarios. The models were aggregated in the posterior model by the Bayesian Averaging of Classical Estimates (BACE) technique, where for each individual model the weight from the obtained model set was used (Sala I. Martin et al., 2004).

16 Fee and commission income was modelled in proportion to the bank assets using the dynamic panel by the generalised method of moments, in which macroeconomic variables were included as explanatory variables. Fee and commission expenses were assessed as a historical fee and commission income.

17 The existing models for forecasting non-performing loans were upgraded (see FSR No. 22, Box 6) so that instead of common averaging of the results of ten selected models with the smallest RMSE value from the set of estimated models, the BACE method (Bayesian Averaging of Classical Estimates, see Sala I. Martin et al., 2004) was employed, aggregating all the estimated models into a single posterior model by applying a method which is an approximation of Bayesian model averaging (BMA).

Figure II. 10 Developments in total NPLR under baseline and adverse scenario

Source: CNB.

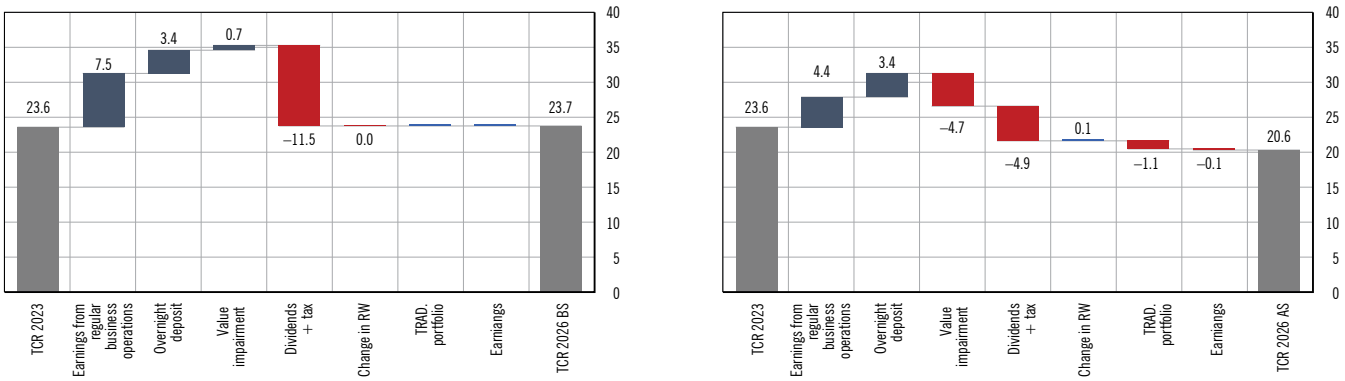
or 2 percentage points for housing and cash loans, respectively), and slightly stronger for the non-financial corporate sector (7 percentage points). This is the result of a historical pattern, where the first impact of negative economic developments hit the corporate sector, which then for some time spilled over to the household sector through the labour market and the increase in unemployment. Within the household sector, a fast and strong increase in non-performing loans was first manifested in consumer loans and only later, and at a slower pace, in housing loans.

Apart from the impact of non-performing exposures, the adverse scenario also projects additional costs of impairments and provisions for exposures that have not yet become non-performing, equal to the expected credit loss (Stage 2 of credit risk) in accordance with IFRS 9. The increase in value impairments for expected credit loss (Stage 2) is most pronounced immediately in the first year of the adverse scenario, witnessing the strongest deterioration in economic developments and the most pronounced growth in interest rates. Furthermore, the growth in value impairments and provisions for new non-performing exposures (Stage 3) is the strongest in the second year of the adverse scenario, while a slight improvement is recorded in the third year, as is immediately evident in the corporate sector.

D.3 Assessment of banking system stability

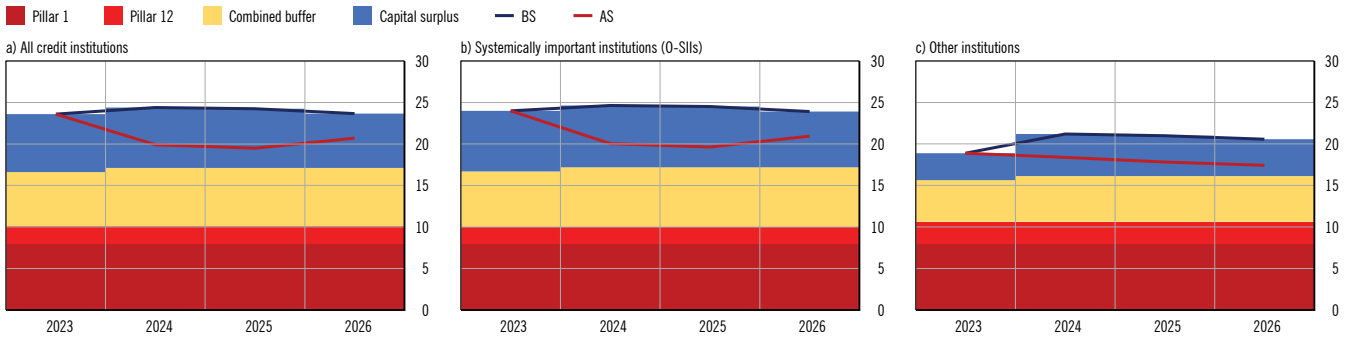
Under the baseline scenario, the capital ratio increases marginally from 23.6% at the end of 2023 to 23.7% at the end of 2026. The reason for this is that amid conditions in which relatively

Figure II.11 Decomposition of the change in the capital ratio under baseline and adverse scenario, from the end of 2023 to 2026



Notes: TCR 2026. BS denotes total capital ratio under the baseline scenario and TCR 2026 AS denotes the adverse scenario. In the adverse scenario, deviation from the baseline scenario is observed.
Source: CNB.

Figure II.12 Capital ratio under baseline and adverse scenario with respect to minimum prudential capital requirements



Notes: Pillar 1 – minimum capital requirements; Pillar 2 – own funds requirements appropriate to overall system average; the combined buffer consists of SRB – systemic risk buffer; CCoB – capital conservation buffer; O-SII buffer – the capital buffer for other systemically important institutions; CCyB – countercyclical capital buffer; TCRBS – total capital ratio under the baseline scenario; TCRAS – total capital ratio under the adverse scenario. Capital surplus is defined as the balance between the total capital ratio of a credit institution and the sum total of the minimum legally prescribed capital requirements for that credit institution, i.e. as the TCR – (Pillar 1 + Pillar 2 + CCoB + SRB + O-SII buffer + CCyB).
Source: CNB.

high profit and capital surpluses are generated, a significant share of the profit is paid to owners. Both scenarios assume that credit institutions, after they have paid the announced profit for 2023, in the projected three-year period, if they have generated profit in the current year, pay taxes and make dividend payments amounting to 80% of the profit generated in the previous calendar yea1[18], which means that only a part of their earnings will be included in capital. In a situation when a bank dips into capital buffers, the assumed amount of dividend payment is limited[19] in accordance with regulations.

Under the adverse scenario, the capital ratio of credit institutions declines initially in the first two years of the analysed period, and then recovers, reaching 20.7% at the end of 2026. This dynamics mainly reflects the increase in credit risk caused by slower economic growth, high inflation and deterioration in the labour market, which leads to the decrease in net operating earnings due to the lower debt repayment capacity of banks' clients. The differences in the estimated solvency between the adverse and the baseline scenario arise due to additional impairments amid credit risk materialisation under the adverse scenario. Furthermore, the growth in the yield on government bonds under the adverse scenario leads to a decline in their market value, which has a negative effect on capital, although this effect is moderate as compared to the 2022 – 2023 period due to the increase in the share of instruments in held-to-maturity portfolios that are not carried at their fair value. Indirect negative effects of interbank contagion are also present, resulting from the common exposures of all credit institutions to those banks that do not meet supervisory capital requirements. When the adverse is compared with the baseline scenario, smaller dividend payouts and lower taxes brought about by lower profits under the adverse scenario, make an additional positive contribution to the total capital ratio of credit institutions at the end of the period.

The stress test results suggest a heterogeneity across institutions (Figure II.12). When viewed at the level of systemically important credit institutions and smaller institutions, the banking system achieved relatively good results even under the adverse scenario because the accumulated capital surpluses efficiently absorbed the unfavourable effect of macroeconomic developments. In contrast to the stress testing results in previous years, in this test small credit institutions also set off from considerably stronger capital positions, which proved to be sufficient to absorb the effects of several years of unfavourable economic developments, so that on the whole test horizon they did not encroach on their combined capital buffer. Nevertheless, the results of the simulations made for individual banks suggest that seven credit institutions would dip into capital buffers in the case of unfavourable macroeconomic conditions. Additionally, the results show that all banks would have sufficient capital to meet the supervisory capital requirement, total SREP capital ratio (TSCR), at the end of the observed horizon. This confirms that in recent years marked by high profitability, they have strengthened their capital position, also benefiting from macroprudential measures directed at increasing banks' capital.

This year's stress test results are better than the previous year's results, partly due to improvements in the performance of banks, and also owing to changes in the risk profile. The rise in interest rates continues to provide credit institutions with the opportunity for high profitability levels. Historically low levels of non-performing loans and the high levels of coverage have a positive impact on developments in loan quality. Although in 2023 credit institutions increased their exposure to

18 The announced ratio of dividend payments, or the planned share of bank earnings in 2023, which banks plan to pay to shareholders through dividends at system level, amounts to 80%. The actual payment plan was used for the 2023 estimate, and the 2023 average was used as the assumption for payments with all banks generating profit in other years.

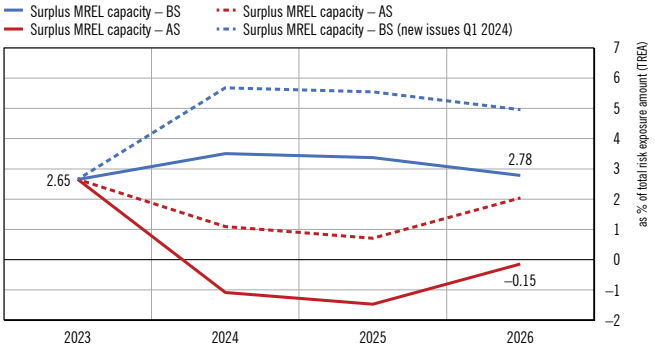
19 Article 141 of Directive CRD IV prescribes that institutions that fail to meet their combined buffer requirement must calculate the maximum distributable amount (MDA) according to the defined regulatory formula. This calculation serves for the purpose that, in the case of capital buffers being dipped into, capital or dividend payments would be limited in order to preserve the stability of the financial system and achieve the appropriate level of provisions.

debt securities, most of them were classified in held-to-maturity portfolios, without any direct impact on capital. Banks do this because it enables stability and predictability due to the measurement of prices at amortised cost, instead of fair value. They also avoid market risks related to price changes, thus keeping a more conservative approach to risk management, ensuring a higher degree of certainty and reducing the pressure on capital requirements. Although these changes seem to increase the system security, banks might also incur potential losses if these financial instruments are to be sold. Therefore, it is crucial for credit institutions to maintain caution and develop strategies for efficient risk management to ensure sustainable growth and stability even in unpredictable market conditions.

The banking system also meets the final MREL[20] requirements under the adverse scenario, but does not meet the combined capital buffer. As regards the amount of capital and the eligible instruments that the banks had at the end of 2023, with an autonomous capital increase in the simulated scenarios, it is shown that the banking system under the baseline scenario meets the final MREL target and a combined capital buffer requirement which banks are also obligated to maintain. By contrast, although under the adverse scenario all institutions continue to meet the final MREL requirement across the stress horizon, four institutions also do not meet the combined capital buffer (Figure II.13).

However, when new issues of eligible liabilities from the first quarter of 2024 are added to the total MREL capacity, the banking system in stress conditions also meets the combined buffer above the MREL requirement. Namely, in the first quarter of 2024, two of the four mentioned institutions issued new MREL eligible instruments by which they increased their MREL capacity and thus freed part of the capital to meet the combined buffer requirement. If those issues are added to the total MREL capacity that banks had at the end of 2023, the banking system under the adverse scenario meets both the MREL requirement and the combined capital buffer (dotted lines in Figure II.13). At the level of individual institutions until the end of the test horizon and beyond, two institutions still do not meet the combined buffer requirement. It is worth noting that if a bank meets the MREL requirement, but fails to meet the combined buffer requirement, restrictions on distributions

Figure II.13 Surplus MREL capacity with respect to own funds



Note: Surplus MREL capacity means own funds and eligible liabilities that exceed the MREL and combined buffer requirements.
Source: CNB.

are not automatic, as is the case of a breach of the combined buffer requirement combined with the total SREP requirement, but instead, are based on the assessment of the resolution authority in consultation with the supervisory authority.

The solvency test has shown that the banking system is capable of withstanding unforeseen hypothetical shocks, confirming the importance of a proactive risk management and maintaining adequate capital buffers. High capitalisation of banks is a key factor in protecting the system and enabling it to overcome rare, but possible crisis situations caused by the deepening and prolongation of the negative effects of the parallel decline in economic activity and presence of inflationary pressures as well as of tightened global financial conditions. Capital buffers play a key role, and their build-up has additionally increased the resilience of the banking system in recent years and created additional room for monetary policy manoeuvring in times of crisis, in order to alleviate the potential negative effect on credit activity. In addition, any capital surplus that the banks voluntarily maintain above legal requirements provides them with additional stability and the capacity to adjust in crisis situations. Further maintenance of the high levels of capitalisation will be crucial for preserving the stability and resilience of the banking system in the future.

20 Minimum requirement for own funds and eligible liabilities.

III Macroprudential policy implementation

The total exposure of the financial system of the Republic of Croatia to systemic risks edged down amid favourable macroeconomic developments and historically high bank profitability. A robust economic growth and an increase in household and corporate income reduce the vulnerabilities of these sectors in a mature phase of the financial cycle, although the expected continuation of the transmission of tightened monetary policy to financing conditions in the mid-term may lead to an increase in the loan servicing burden and a rise in the credit risk for banks. However, the main sources of risk to financial stability come from the external environment and for the most part relate to heightened geopolitical tensions and subdued economic growth in the euro area.

In such an environment, the macroprudential policy of the Croatian National Bank remained focused on preserving the resilience of the banking sector. Capital-based macroprudential measures help preserve bank stability and provide the manoeuvring space needed by the Croatian National Bank in the case of risk materialisation or sudden shock.

A Capital buffers

Capital buffers increase banking sector resilience to sudden shocks and unfavourable financial or macroeconomic scenarios and they are the backbone of the macroprudential policy of the Croatian National Bank. The CNB actively applies all four buffers targeting structural and cyclical systemic risks, avoiding their overlapping and taking into account the interaction with supervisory and resolution requirements. The level of capital buffers reflects the level and the expected movement of the financial system's exposure to systemic risks with the aim of increasing banks' capacity to cover potential losses in the case of materialisation of such risks.

In the previous year, the combined capital buffer increased for all banks by between 0.75 p.p. and 1.5 p.p. and at the end of June 2024 stands between 5.5% and 8% of total risk exposure amount, depending on the systemic importance of a bank. It consists of the capital conservation buffer, whose rate of 2.5% is prescribed by European regulation and is applied in all EU states, the countercyclical buffer of 1.5%, the systemic risk buffer of 1.5% and the buffer for other systemically important credit institutions ranging between 0.25% and 2.5% (Figure III.1). The increase in the combined buffer was largely the consequence of the entry into force of a higher countercyclical buffer rate due to the accumulation of risks associated with the strong private sector lending and the momentum in the residential real estate market. At system level, the requirement for other systemically important banks also increased, taking into account the changes in their market position, the intention being to better align the buffer level with the systemic role of each bank.

Figure III.1 Capital buffers applied on 30 June 2024

Capital conservation **2.50%**	Systemic risk **1.50%**
Countercyclical **1.50%**	O-SIIs **0.25% – 2.50%**

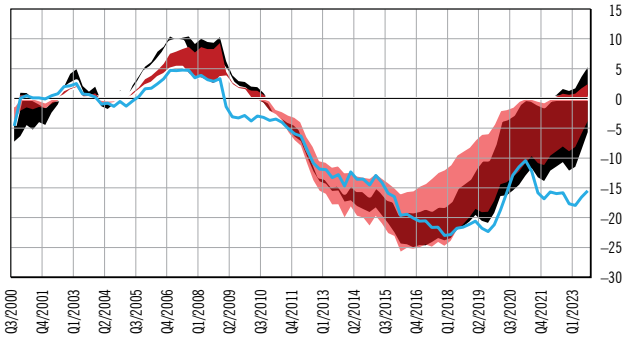
Abbreviations: O-SIIs – other systemically important credit institutions.
Source: CNB.

A.1 Countercyclical capital buffer

The financial cycle is in the mature phase of expansion marked by increased levels of cyclical vulnerabilities. Lending to the private sector is still strong, so that the total annual growth of loans to the private non-financial sector based on transactions was 8% in March 2024. This is the consequence of strong lending to households, where, due to growth in employment and wages paired with a stable growth in housing loans at the annual rate of change of about 10%, the acceleration of general-purpose cash loans to consumers continued, reaching the rate of 13% at the end of March 2024. Conversely, lending to non-financial corporations remained subdued, partially also as a consequence of a sizeable upward trend of interest rates on corporate loans. A significant contribution to the build-up in cyclical risks also originated from the residential real estate market, whose prices continued to rise sharply in 2023, with signs of temporary stabilisation in the middle of the year, despite a continued decrease in activity that has been going on for two years already.

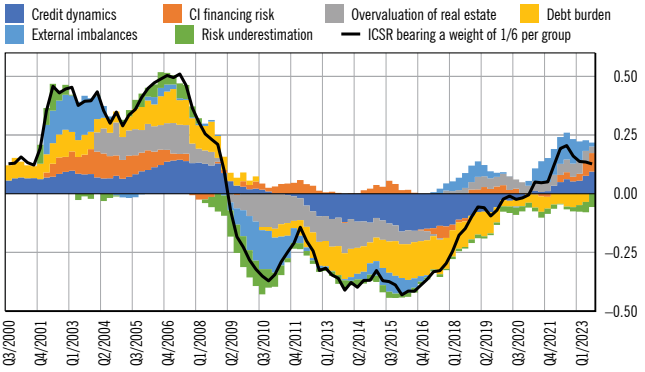
Elevated indicators of cyclical systemic risk show that the countercyclical capital buffer rate of 1.5% remains appropriate for preserving banking system resilience to a possible

Figure III.2 Credit gap



Notes: The panel shows the Basel gap (blue curve) and the range of 12 credit gap indicators which have better signalling properties for the Republic of Croatia than the Basel gap. Red shaded areas indicate the range of absolute gaps, while black shaded areas refer to relative gaps.
Source: CNB.

Figure III.3 Indicator of cyclical systemic risk (ICSR)



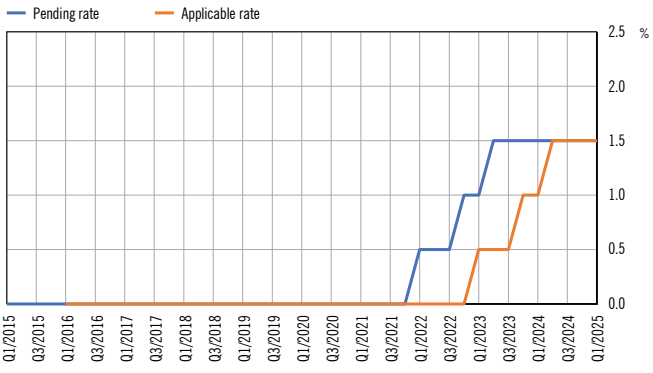
Note: ICSR with equal weight of 1/6 by groups of indicators.
Source: CNB.

cyclical risk materialisation or sudden shocks. Amid the strong growth in banking lending and the acceleration in the growth of residential real estate prices, supported by the latest round of the government housing loan subsidy, in June 2023 the CNB decided to increase the countercyclical capital buffer rate from 1% to 1.5% to be applied as of 30 June 2024.

Specific credit gap indicators for the Republic of Croatia and the composite indicator of the cyclical system risk remained elevated throughout 2023. The credit gap continued to close, which was due not only to the growth in lending but also and mostly to the continued decline in the trend value of the credit-to-GDP ratio, which, in 2023, continued falling more sharply than the credit-to-GDP ratio. Despite the strong growth in loans, the credit-to-GDP ratio continued to edge down due to a relatively faster growth of GDP, which can be associated with elevated inflation, which tends to have an immediate effect on GDP and a lagged effect on the stock of loans. As a result, some credit gap indicators for the Republic of Croatia[21] are in positive territory and continue to grow (Figure III.2). Keeping the cyclical risk composite index[22] at an elevated level also suggests a mature phase of the financial cycle. Following a strong growth in 2022, in 2023, the composite index somewhat decreased, but still remained elevated, suggesting the need to maintain the countercyclical buffer rate above 1%. Bank lending and developments in the residential real estate market still mostly impact the dynamics and level of this index (Figure III.3).

With its gradual build-up of countercyclical capital buffer in accordance with the development of cyclical risks, the CNB increased the share of the variable capital requirement in the combined buffer (Figure III.4). This has created additional room for macroprudential policy action in the case of a clear and strong materialisation of systemic risks, when the countercyclical buffer can be immediately decreased or deactivated and in this way, if necessary, support the continuity of banks' lending activity. The CNB also took account of the good capital position and high profitability of banks (see chapter II Resilience of credit institutions), which at the aggregate level maintain considerable capital surpluses, so that meeting new capital requirements did not have a negative impact on the supply of bank lending. The CNB will continue to adjust in good time

Figure III.4 Countercyclical buffer rates



Source: CNB.

21 Specific credit gap indicators for the Republic of Croatia include 12 indicators: six absolute and six relative gaps, calculated using different definitions of credit and different smoothing parameters. For more information, see the CNB's publication Macroprudential Diagnostics No. 16 and Škrinjarić and Bukovšak (2022): New Indicators of Credit Gap in Croatia: Improving the Calibration of the Countercyclical Capital Buffer, CNB Working Papers I-69, June.

22 The composite index comprises a wide range of indicators related to excessive credit growth, divided into six risk categories as recommended by the ESRB, which have been assigned equal weights. For more information, see the CNB's publication Macroprudential Diagnostics No. 16 and in Škrinjarić, T (2022): Introduction of the composite indicator of cyclical systemic risk in Croatia: possibilities and limitations, CNB Working Papers I-70, July. It concerns those that use the standardised approach to capital requirements assessment.

the countercyclical buffer rate to the evolution of cyclical risks in the context of domestic and global financial and economic developments.

A.2 Coverage of structural systemic risks

The exposure of the financial system to structural systemic risk remained at a moderately elevated level. In 2023 and in the first half of 2024, the CNB continued to apply a systemic risk buffer at the rate of 1.5%. A significant share of systemic risks to the domestic financial system and the economy, which due to its size and openness is highly susceptible to the spillover of external effects, arises from the international environment. Of the domestic structural vulnerabilities, the high exposure of the banking sector to the government and the imbalances in the labour market reflected in the very low rates of labour force participation and highly unfavourable demographic trends that limit the potential for economic growth continue to stand out. On the other hand, the public debt level is constantly declining, keeping the related sovereign risks at a moderate level (see chapter A.1).

At the end of 2023, the CNB confirmed the existing other systemically important credit institutions and increased their prescribed capital buffers at system level. The regular review of the systemic importance of credit institutions from the last quarter of 2023 confirmed the previously identified seven other systemically important (O-SII) credit institutions. These capital buffer rates for 2024 are adjusted so as to take into account changes in their market position and to better align the buffers to the systemic importance of each institution. The adjustment resulted in an increase in total buffers at system level and an increase in the range of the set rates. The buffer rate for the largest O-SII was thus increased from 2% to 2.5% nearing the highest permissible rate of 3%, while the buffer rate for the smallest O-SII, as identified by expert assessment, was slightly reduced, from 0.5% to 0.25%. In addition, for one O-SII the buffer rate was increased as a reflection of its greater systemic importance after the merger with another credit institution (Table III.1).

Table III.1 Other systemically important institutions

O-SII	Systemic importance score as at 31 Dec. 2022	CCyB rate as of 1 Jan. 2024 (%)
Zagrebačka banka d.d., Zagreb	3079	**2.5↑**
Privredna banka Zagreb d.d., Zagreb	2298	2.0
Erste&Steiermärkische Bank d.d., Rijeka	1846	2.0
Raiffeisenbank Austria d.d., Zagreb	929	1.5
OTP banka Hrvatska d.d., Split	733	1.5
Hrvatska poštanska banka d.d., Zagreb	479	**1.0↑**
Addiko Bank d.d., Zagreb	198	**0.25↓**

Notes: The abbreviation CCyB stands for the capital buffer for O-SIIs. CCyB rates in bold were different from the rates in 2023. The arrows indicate the direction of the change.
Source: CNB.

B Coverage of risks associated with the real estate market

In order to mitigate risks associated with the real estate market, the CNB applies macroprudential policy measures aimed at increasing banks' resilience and indirect measures to increase the resilience of housing loan users. In order for capital requirements related to credit institutions' exposure[23] to the real estate market adequately to reflect potential risks, the CNB applies more stringent measures that relate to risk weights for banks' exposures to residential and commercial real estate. Accordingly, a decision[24] in force in Croatia lays down a definition of residential property more stringent than that in the harmonised EU legislation, to which a preferential risk weight of 35% can be applied; it only covers property owned by a natural person who owns a maximum of two residential real properties, occupied or let for residential purposes. Otherwise, the standard weight for exposures to households of 75% is applied. Instead of the risk weight of 50%, the CNB has prescribed a higher risk weight of 100% for exposures fully and completely secured by mortgages on commercial immovable property. Risk weights are reviewed once a year in light of the incurred and expected losses on these exposures, alsotaking into account the real estate market trends and other financial and economic developments[25]. After the review conducted in mid-2023, it was concluded that risks associated with the real estate market are still elevated, but that in the forthcoming one-year period no significant increase in losses from these exposures is expected, so the applicable stricter risk weights were considered appropriate and can continue to be applied.

In addition, from 2018, the CNB prescribes the implicit debt service to income (DSTI) ratio for housing consumer loans, as set out in the Foreclosure Act and the Decision on the additional criteria for the assessment of consumer creditworthiness. The Decision prescribes that when assessing consumers' creditworthiness credit institutions should take into account minimum living costs that cannot be lower than the amount defined by legislation regulating the amount of salary exempt from seizure. The interaction of this Decision and the Foreclosure Act set an indirect limit on the debt service to income ratio, which for debtors with a below average income stands at 25%, and for other debtors increases in parallel with a rise in their income[26]. The CNB regularly monitors and analyses data on household lending standards (see chapter C.1), but has so far not introduced any explicit borrower-based measures. In addition to the existing capital-based measures and the implicit DSTI ratio, and taking into account a relatively low bank exposure to housing loans and the limited range of such measures, due to the fact that a large share of sales and purchases of residential property is not financed by bank loans, the CNB so far has not deemed it necessary to apply any direct measures directed at consumer housing lending conditions.

23 It concerns those that use the standardised approach to capital requirements assessment.

24 Prescribed by the Decision implementing the part of Regulation (EU) No 575/2013 pertaining to the valuation of assets and off-balance sheet items and the calculation of own funds and capital requirements (Official Gazette 107/2023).

25 The provisions regulating the basic and preferential treatment in allocating risk weights to these exposures are contained in Articles 124, 125 and 126 of Regulation (EU) No 575/2013.

26 See Macroprudential Diagnostics No. 8, Box 1.

C Implementation of macroprudential policy in other European Economic Area countries

European Economic Area (EEA) countries mostly continued to strengthen the resilience of their financial systems in the second half of 2023 and in the first quarter of 2024. In accordance with ECB and ESRB recommendations, in the absence of materialisation of accumulated systemic risks, the regulators used banks' good business results to additionally strengthen the capacity of banks to withstand potential losses.

A number of countries[27] apply the positive neutral countercyclical buffer rate approach for the purpose of creating a buffer against sudden shocks in any phase of the financial cycle. With the aim of gradually reaching the positive neutral rate, the following countries have raised the level of the countercyclical buffer: Estonia from 1% to 1.5% as of December 2023, Slovenia from 0.5% to 1% as of January 2025, Latvia from 0.5% to 1% as of June 2025, Ireland from 1% to 1.5% as of June 2024, Cyprus from 0.5% to 1% as of June 2024 and the Netherlands from 1% to 2% to be applied as of the end of May 2024. By contrast, the Czech Republic lowered the countercyclical buffer rate from 2.5% to 1.75% applied as of 1 April 2024, which according to the central bank's assessment is the appropriate rate considering the risk level.

The countercyclical buffer rate was also raised by the countries that calibrate the level of this requirement exclusively based on the development of cyclical risks. Romania raised the rate from 0.5% to 1% as of the end of October 2023, in accordance with the proactive policy of the build-up of this buffer due to the accumulation of cyclical risks to financial stability. With the aim of strengthening banks' resilience to unexpected losses amid conditions of increased financing costs, Belgium reactivated the countercyclical buffer at a rate of 0.5% applied as of April 2024 and announced it would be increased to 1% as of October 2024. At the same time, Belgium decided to lower the sectoral systemic risk buffer rate for exposures secured by real estate from the currently applied 9% to 6%, as of 1 April 2024. The easing of the measure was motivated by the high compliance of new mortgage loans with supervisory expectations relating to lending terms and the concurrent downturn in the real estate market cycle.

The rate of the sectoral systemic risk buffer most frequently used to cover risks associated with the real estate market was adjusted by a few other countries. Due to the abating cycle in the residential real estate market, Slovenia reduced the sectoral systemic risk buffer rate for exposures to natural persons secured by residential real estate property from 1% to 0.5% to be applied from the beginning of 2025. By contrast, due to the continued growth of risks associated with the residential real estate market, amid conditions of increased interest rates and the high share of variable interest rates, Portugal has announced the introduction of this instrument at a 4% rate in early October 2024, which credit institutions using the IRB approach will have to apply to exposures to consumers secured by residential real estate in Portugal. Finally, France has introduced the sectoral buffer at a rate of 3% for systematically important credit institutions on exposures to highly-indebted large non-financial corporations. The measure has been applied since 1 August 2023, when it replaced the previous measure pursuant to Article 458 of the Capital Requirements Regulation, which covered the same vulnerabilities.

Due to risks associated with the real estate market, EEA members continued to apply even stricter risk weights. At the end of September 2023, Sweden introduced a minimum average risk weight for bank exposures to non-financial corporations secured by real estate in the amount of 35% and 25% for commercial and residential real estate in Sweden, respectively, for all banks applying the IRB approach. The measure was adopted to replace the previously applicable Pillar 2 supervisory measure which covered the same risks, as it was estimated that the risks in question are systemic risks to financial stability,

27 Nine EEA countries apply the strategy of positive neutral countercyclical buffer rates: Czech Republic, Netherlands, Sweden, Ireland, Estonia, Latvia, Lithuania, Cyprus and Slovenia

making a macroprudential measure more appropriate. For the third time in a row, Sweden extended the application of stricter risk weights to the portfolio of retail exposures to obligors residing in Sweden secured by real estate. Norway extended the application of the floors for average risk weights applied to exposures secured by residential (20%) and commercial (35%) and real estate in Norway by banks using the IRB approach in calculating capital requirements for credit risk.

In the case of borrower-based measures one recent adjustment was recorded, while no new measures were introduced. As of 1 January 2024, the Czech Republic deactivated the upper threshold of the total debt to income ratio (DTI) for loans to consumers secured by residential real estate, after the cap on the debt service to income (DSTI) of consumers was deactivated in mid-2023. The deactivation of these measures is justified by the assessment that in the downward stage of the cycle in the real estate market and amid a considerable slowdown in the making of housing loans and a decrease in the relative indebtedness of households there is no longer the need for such measures. Nevertheless, the current cap on the ratio of the loan amount to the collateral value (LTV) was kept due to the high overvaluation of real estate and the risk of a stronger correction of their prices.

Abbreviations and symbols

Abbreviations

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

Two-letter country codes

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

Symbols

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

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