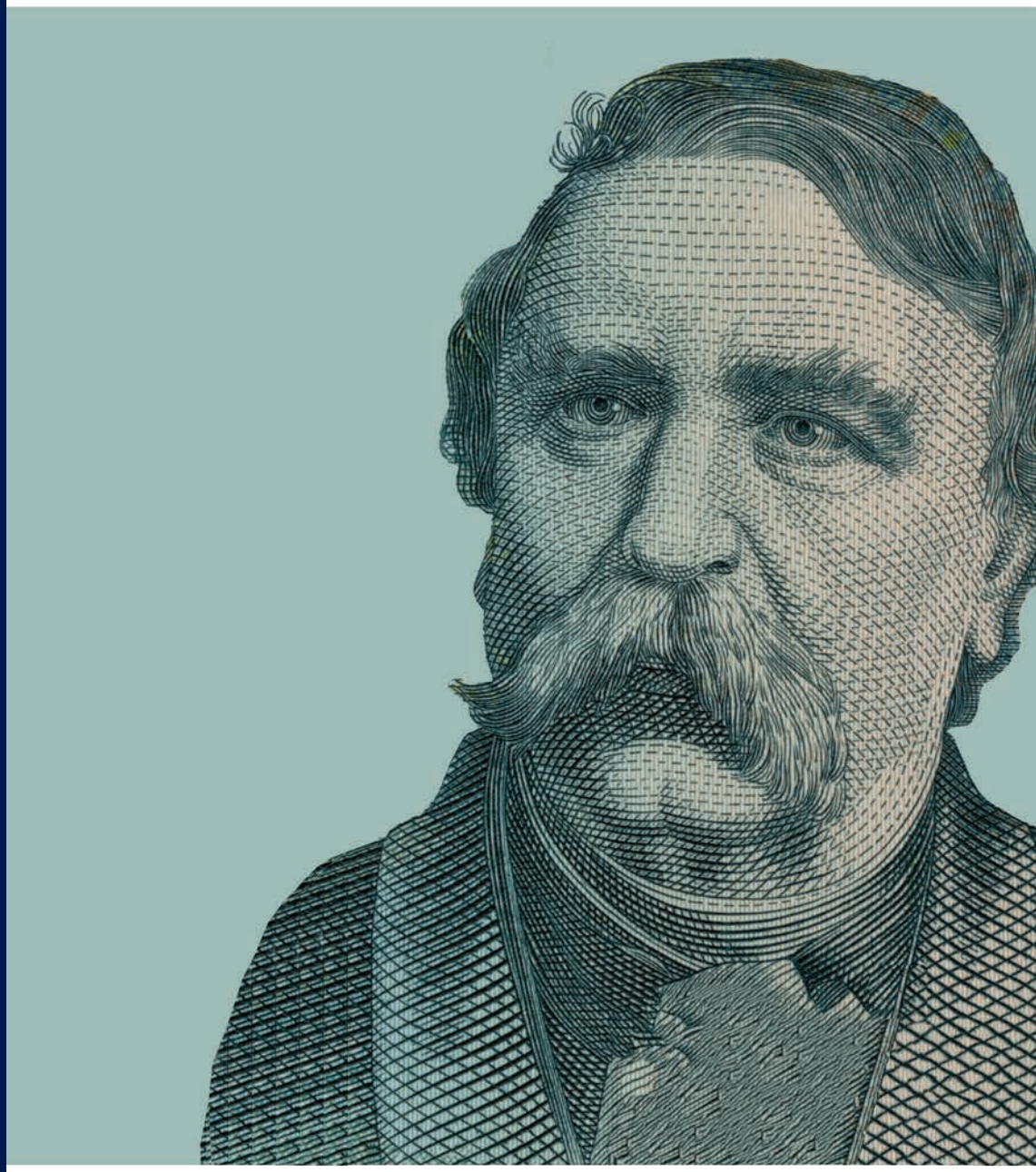
FINANCIAL STABILITY REPORT



2023
MAY

'...a nation is strong where property and independence are guarded by free hands.'

Ferenc Deák

FINANCIAL STABILITY REPORT

2023

MAY

Published by the Magyar Nemzeti Bank

Publisher in charge: Eszter Hergár

H-1013 Budapest, Krisztina körút 55.

www.mnb.hu

ISSN 2064-8863 (print)

ISSN 2064-9452 (on-line)

Financial stability is a state in which the financial system, including key financial markets and financial institutions, is capable of withstanding economic shocks and can fulfil its key functions smoothly, i.e. intermediating financial resources, managing financial risks and processing payment transactions.

The Magyar Nemzeti Bank's fundamental interest and joint responsibility with other government institutions is to maintain and promote the stability of the domestic financial system. The role of the Magyar Nemzeti Bank in the maintenance of financial stability is defined by the Central Bank Act.

Without prejudice to its primary objective – to achieve and maintain price stability –, the MNB shall support the maintenance of the stability of the financial intermediary system, the enhancement of its resilience, its sustainable contribution to economic growth; furthermore, the MNB shall support the economic policy of the government using the instruments at its disposal.

The MNB shall establish the macro-prudential policy for the stability of the entire system of financial intermediation, with the objective to enhance the resilience of the system of financial intermediation and to ensure its sustainable contribution to economic growth. To that end and within the limits specified in the Central Bank Act, the MNB shall explore the business and economic risks threatening the system of financial intermediation as a whole, promote the prevention of the development of systemic risks and the reduction or elimination of the evolved systemic risks; furthermore, in the event of disturbances to the credit market it shall contribute to the balanced implementation of the function of the system of intermediation in financing the economy through stimulating lending and by restraining lending it in the event of excessive credit outflow.

The primary objective of the Financial Stability Report is to inform stakeholders about the topical issues related to financial stability, and thereby raise the risk awareness of those concerned as well as maintain and strengthen confidence in the financial system. Accordingly, it is the Magyar Nemzeti Bank's intention to ensure the availability of the information needed for financial decisions, and thereby make a contribution to increasing the stability of the financial system as a whole.

The analyses in this Report were prepared by the Financial System Analysis Directorate, with the contribution of the Prudential and Consumer Protection Supervision of Money Market Institutions Executive Directorate, the Monetary Policy, Financial Market and Macrofinance Analysis Executive Directorate, and the Monetary Policy Instruments and Foreign Reserve Management Executive Directorate, under the general direction of Ádám BANAI, Executive Director for Monetary Policy Instruments, Financial Stability and Foreign Reserve Management.

The Report was approved for publication by Barnabás VIRÁG, Deputy Governor.

The Report incorporates the Financial Stability Council's valuable comments and suggestions following its meetings on 4th April and 16th May 2023, and those of the Monetary Council following its meeting on 25th April 2023.

This Report is based on information in the period to 30st April 2023. Since data frequency is divergent through the analyses, the analysis horizons may also alter.

Table of contents

List of boxes

Executive Summary

The Hungarian banking system remains stable in the face of recent bank crises, inflation risks and the uncertainty caused by the prolonged Russian-Ukrainian war. Lending to the private sector has increased, while overall demand has weakened in line with regional trends. Banks' lending capacity is adequate and their capital and liquidity situation is robust. The real estate market showed a substantial decline in 2022, which will also be gradually reflected in real estate values. Nevertheless, the financial stability risks of these developments are limited in the domestic banking system. The share of non-performing loans is low, but looking ahead banks are also prepared for a possible increase in defaults by loan loss provisioning.

Given the high inflationary environment worldwide and the uncertainty caused by the prolonged Russian-Ukrainian war, the banking system was surrounded by risks from the international environment in the last one and a half year. During the spring of 2023, the turbulence caused by the US bank failures and the forced merger of major Swiss banks had a short-term negative impact on investor sentiment both in Europe and overseas. Emerging markets faced widespread, although temporary risk aversion. Nonetheless, banking regulation in Europe, and within it in Hungary, is much stricter than in the US and can therefore prevent problems similar to the case of Silicon Valley Bank.

The liquidity reserves of the banking system are stable at high levels, with the banking system's operational liquidity reserves amounting to nearly HUF 18,000 billion, equivalent to around 63 per cent of deposits. While the structure of banks' liquid asset has changed significantly in line with the restructuring of monetary policy instruments. The sector's liquidity position remains robust. Based on the liquidity stress test, even in the event of a significant shock, the sector would meet the regulatory requirements. The banking system continues to operate with a stable, balanced funding structure.

The average interest rate of term deposits follows the change in interbank interest rates more slowly than usual, especially in the household segment. While in the case of corporations there is a clear shift from sight deposits to term deposits, no such shift is visible in terms of household deposits. The redistribution of household savings can be observed between deposits, government securities and investment funds. At the same time, the appropriate level of interest rate transmission is extremely important from the point of view of keeping bank deposits.

Bank lending to the private sector continued to grow in 2022, albeit at a slowing pace, with corporate sector's loans outstanding expanding by 14 per cent and household lending by 6 per cent. The stock of bank loans to micro, small and medium-sized enterprises increased by 13 per cent, with the contribution of government loan programmes. Although the ratio of FX loans in corporate loan issuance increased, the majority of borrowers were companies with revenues from exports and therefore borrowed in FX with natural collateral. According to banks' perception, demand for loans is generally shifting away from long-term and HUF loans towards short-term and foreign currency loans. Corporate lending conditions have tightened, driven mainly by cyclical factors, while the capital and liquidity situation does not justify a reduction in lending. Banks' overall lending capacity is strong.

The volume of loan contracts with households declined in 2022 H2. New housing loan disbursement has fallen by one half, in line with the trends in other countries in the region. With tighter lending conditions and smaller average contract sizes, the loan-to-income and loan-to-value financial stress on new clients has decreased. From the point of view of indebtedness, two groups deserve special attention: on the one hand, those debtors of prenatal baby support loans and Home Purchase Subsidy Scheme for Families (HPS) claimants who do not meet the conditions of state subsidies, and on the other hand, those who took out market loans in addition to subsidized loans. Overall, due to the increased economic uncertainty, the strict monetary environment and the resulting drop in demand, both corporate and household loans may show single-digit growth in 2023, and state loan programs may play an increasing role in the development of lending processes.

Activity in the domestic housing market has fallen sharply, as a result of weakening demand, owing to the wait-and-see approach due to the uncertain economic prospects, the significant price increases in recent years and the tighter monetary conditions. The number of sales fell by 36 per cent in the fourth quarter versus end-2021. In 2022 H2, average house prices decreased even in nominal terms, and thus the overvaluation of house prices relative to fundamentals has eased. The financial stability risks of overvaluation are mitigated by the fact that the median LTV ratio of mortgages issued since 2016 is only around 50 per cent.

Although there are no longer significant volumes of new development projects in the domestic commercial real estate market, with the exception of the industrial-logistics segment, the strong development activity in recent years is expected to result in significant completions, while rental demand in most segments is below pre-pandemic levels. As a result, vacancy rates are rising, while the increase in expected yields on real estate investments is tending to reduce property values. The ratio of the banking system's exposure to project loans backed by commercial real estate to own funds and to total assets is also at roughly one half of the level of the ratio seen in 2011–2012, reflecting banks' lower sensitivity to the real estate market and stronger resilience to shocks.

After the narrowing of the general payment moratorium to vulnerable debtors in October 2021, the non-performing loan ratio shifted from its historical low, reaching 3.9 per cent for the corporate sector and 4.4 per cent for the household segment at the end of 2022. In the corporate segment, outstanding loans past due over 90 days rose doubled, but still account for only 1.2 per cent of the corporate loan portfolio. Thus, on the whole, phasing out the general moratorium did not lead to a significant build-up of non-performing loans, and our preliminary data suggest that the same applies to phasing out the targeted moratorium at the end of 2022. Households' repayment capacity has been supported by the continued application of debt cap rules ensuring prudent indebtedness since early 2015 on the one hand and a stable labour market on the other. Loan loss provisioning increased in both the household and corporate loan portfolios at a faster pace than the expansion of the loan portfolio, resulting in a slight increase in the loan loss provision coverage ratio by the end of 2022. The rise in loan loss provisions indicates that the banking system is preparing for a possible future increase in defaults.

The 2022 after-tax profit of the credit institutions sector was 5 per cent below the previous year. The decrease was mainly due to the profit and loss impact of the recognition of higher loan loss provisioning and the extra profit tax, as well as the impact of the interest rate cap, but this was almost fully offset by the outstanding interest income. The sector's return on equity fell from 10 per cent to 9 per cent, while the return on assets fell from 0.9 per cent to 0.7 per cent.

The consolidated capital adequacy ratio of the banking system was 18.2 per cent at the end of 2022, after declining by 1.5 percentage point from the all-time high at end-2021, which was due to the dividend payout restriction. The credit institution sector's free capital above the overall capital requirement exceeds HUF 1,500 billion. The capital position of institutions is adequate, even with unaudited results and capital requirements applicable from July 2023, and the leverage ratio is above 4 per cent for almost all banks and above 6 per cent for four fifths of them.

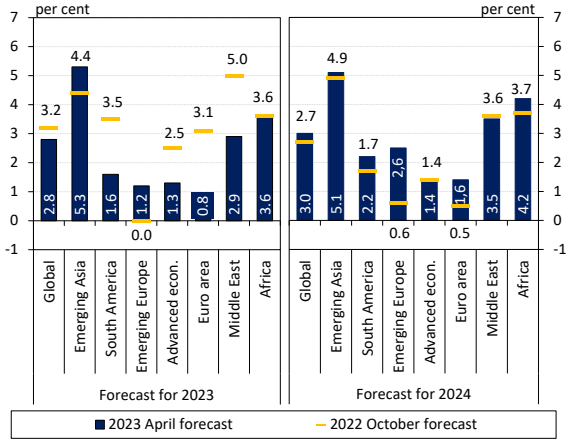
Based on the results of the solvency stress test, the capital position of the sector is robust even in the event of significant stress. In the stress scenario, significant credit risk losses may be realised in the vulnerable external environment, and these are only partially compensated by the continuously improving profitability developments in the higher interest rate environment. At the same time, taking into account the already approved capital increases, there would be no capital shortages at the end of the stress test horizon, but the level of the bank's capital buffers would decrease significantly as a result of the stress.

1. External environment: cyclical risks on the rise, while risks materialise at individual banks

Overall, the financial stability risks stemming from the international environment did not diminish in the past period. Despite many positive developments, downside risks to the global growth outlook for 2023 increased, mainly due to high inflation worldwide and the uncertainty caused by the prolonged Russian-Ukrainian war. In early 2023, most of the major central banks continued to tighten their interest rate conditions to curb inflation. In the spring of 2023, the temporary turbulence caused by US bank failures and the forced merger of major Swiss banks had a negative impact on the financial markets and investor sentiment, which also altered the expected interest rate paths of the Fed and the ECB. In the wake of the bank failures, recession fears continued to intensify in the USA, while widespread risk aversion hit the emerging markets, but the latter proved to be temporary.

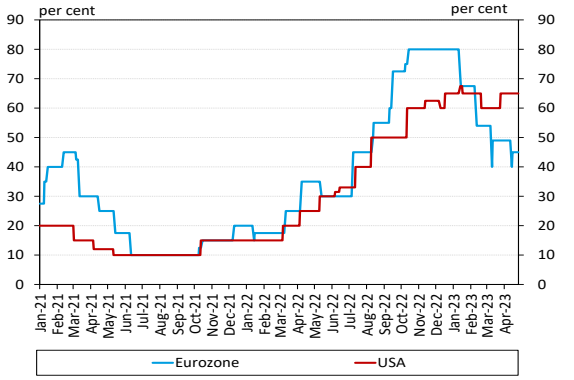
The consequences of a more uncertain growth outlook, a higher interest rate environment and financial market turbulence in the wake of the US bank failures hit the euro area banking system in a prepared state. The European banking system operates profitably and with significant liquid reserves, even in the face of mounting cyclical and individual bank risks. Rising interest rates and tighter lending conditions are reducing housing market activity across Europe and therefore affecting the value of mortgage collateral, but for the time being there is no sign of a significant increase in banks' non-performing loans and risk costs. The rising interest income was partly diverted from the sector by European governments in the form of taxes, windfall taxes and contributions, but profitability indicators were nevertheless still able to improve in 2022.

Chart 1: IMF forecasts for real GDP growth



Note: "Emerging Europe" includes Ukraine and Russia, which reduces the average for the region. Source: IMF

Chart 2: Recession expectations

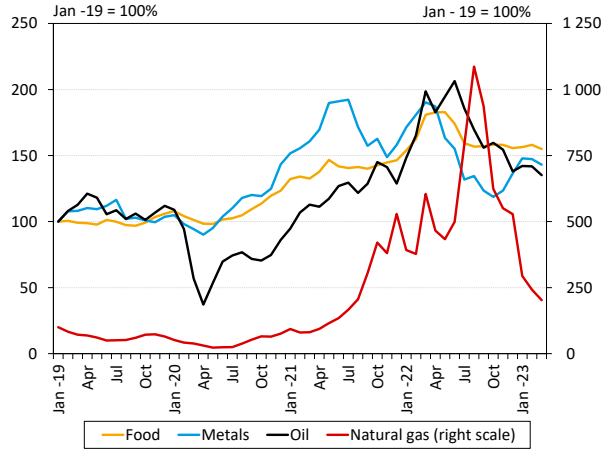


Source: Bloomberg

1.1. Growth outlook for 2023 remains fragile due to high inflation and the protracted war

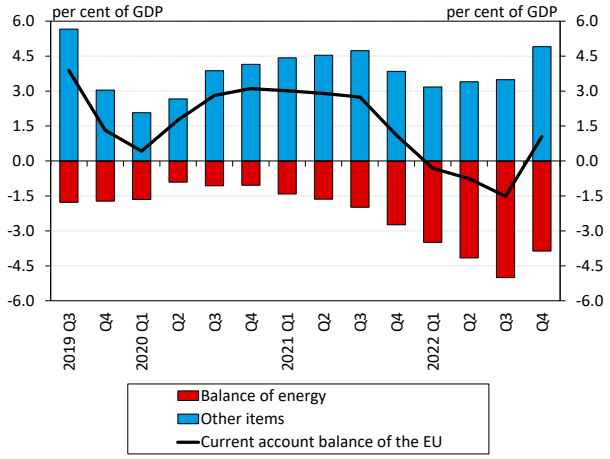
The global growth outlook has been revised downwards for this year, mainly due to the high inflation worldwide and the uncertainty caused by the prolonged Russian-Ukrainian war. In both January and April, the International Monetary Fund (IMF) lowered its forecast for global real GDP growth in 2023: while growth was still projected at 3.2 per cent in the October 2022 forecast, the latest forecast anticipates only a rate of 2.8 per cent (*Chart 1). In* addition to unfavourable factors (high inflation, persistent geopolitical tensions, bank failures), several positive developments have been seen in recent months: energy and commodity prices have fallen, supply chain frictions have eased and the Chinese economy has restarted after the lifting of lockdowns. Consequently, economic growth may improve in some of the regions surveyed by the IMF (emerging Asia and emerging Europe), but in most regions the outlook has deteriorated considerably. In 2023, the major emerging economies in Asia (China and India) may account for around 40 per cent of the expected growth in the global economy, while developed countries are expected to grow only moderately (around 1 to 1.5 per cent). Despite several months of improvement, the US economy

Chart 3: World market price trends for energy, metals and food



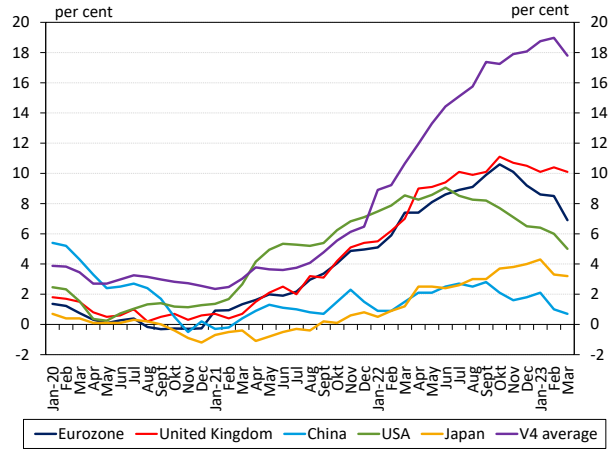
Note: Natural gas denotes the Dutch TTF gas price. Source: Bloomberg, World Bank

Chart 4: Current account and energy balance developments in the European Union



Source: Eurostat

Chart 5: Inflation trends by country and region



Note: The V4 average is the unweighted average for Hungary, Slovakia, Czechia and Poland. Source: OECD, ONS

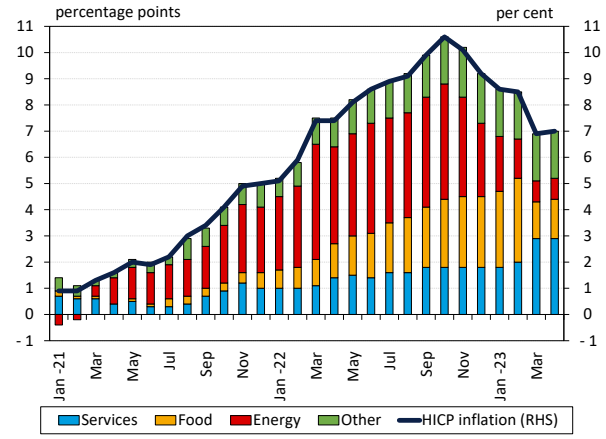
faces again rising risks of recession after the US bank failures in March, reflecting the fragility of growth prospects (*Chart 2*). However, the likelihood of a recession in the euro area has diminished substantially in recent months, mainly due to the decline in energy supply risks. The financial market turbulence following the bank failures subsided within a few weeks, and the risk aversion affecting emerging markets eased.

The European energy supply crisis caused less real economic, fiscal and financial stability damage than initially feared. In 2022, European gas prices surged to extreme levels due to uncertainty about Russian gas supplies (*Chart 3*). By the end of 2022, the vast majority of European economies became independent of Russian gas supplies. The reduction in supply uncertainty is reflected in lower world market price of energy, which has had a positive impact on the EU's current account (*Chart 4*). The EU's energy balance bottomed out in 2022 Q3, but in 2022 Q4 the EU's current account balance to GDP turned into a surplus of 1 per cent, due to the combined improvement in the energy balance and other items. Moderating energy costs have positive effects on all sectors of the economy and play an important role in reducing inflation.

Inflation rose to highs unseen for decades around the world, but in many regions it may have already peaked. The moderation in energy prices is reflected in the inflation developments, with the average rate of price increase already starting to fall in most advanced economies, but this is occurring with a delay in the Visegrad countries (*Chart 5*). A breakdown of euro area inflation by components shows that food prices and services prices, rather than energy prices, have been the main drivers of inflation in recent months (*Chart 6*). The current level of inflation remains above what central banks deem tolerable, and therefore the top priority is still to curb the pace of price increases. Inflation in the Visegrad countries is higher than the rate of price rises in developed countries, reflected also in the higher extents of interest rate increases by their central banks in 2021 and 2022.

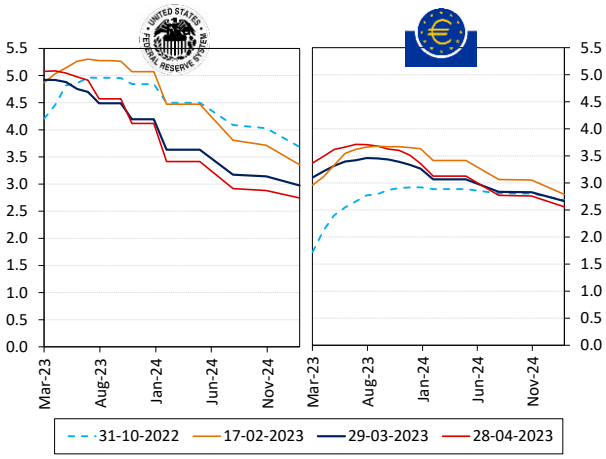
Developed central banks responded to high inflation with monetary tightening, but the US bank failures substantially altered interest rate paths. In early 2023, globally major central banks implemented stronger monetary tightening compared to market expectations. However, the US bank failures in mid-March 2023 and the resulting turbulence in financial markets then led to a significant shift in interest rate expectations (*Chart 7*). In response to the bank failures, the Fed's monetary policy instruments

Chart 6: Inflation trends by components in the euro area



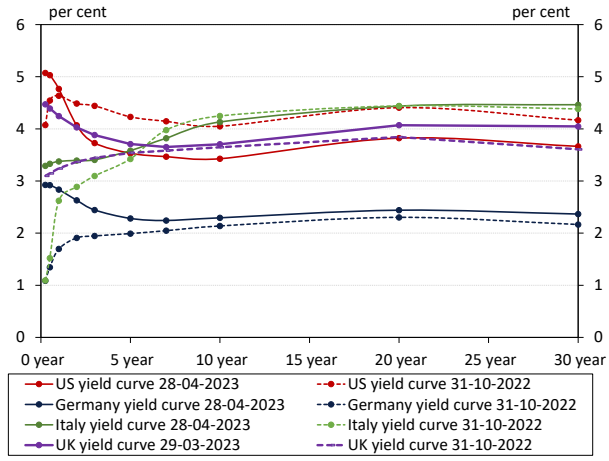
Source: Eurostat

Chart 7: Expected interest rate paths of the central banks of developed countries on the basis of market pricing



Note: Expected interest rate paths on the basis of interest rate swaps in the case of the Fed and on the basis of EONIA forward yields in the case of the ECB. Source: Bloomberg

Chart 8: Development of government bond yield curves in developed countries



Note: Maturities shown on yield curves: 3M, 6M, 1Y, 2Y, 3Y, 5Y, 7Y, 10Y, 20Y, 30Y. Source: Bloomberg

were also changed in several respects. First, since mid-March, the Fed has been providing daily USD liquidity to its central bank counterparts via its USD swap facility, instead of the previous weekly frequency (thus reducing liquidity pressures in the financial markets), and second, a new liquidity facility (Bank Term Funding Program) was introduced to address the risk of increased deposit outflows. Under the programme, the Fed considers securities eligible as collateral at face value. Following the Fed's 25-basis point hike in early May, its communication no longer featured any reference to further rate hikes. The European Central Bank (ECB) also raised its key policy rate by 25 basis points in May, reflecting a reduction in the size of the increases. The ECB will decide on interest rates in a data-driven manner, depending on incoming data, but market expectations suggest that the ECB's interest rate hike cycle is not finished yet.

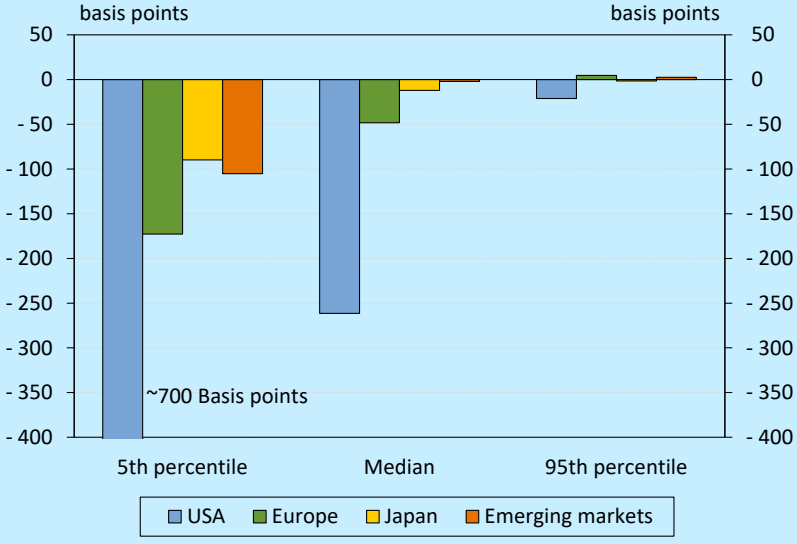
Interest rate hikes have only shaped the short end of the yield curves to a substantial degree. US government bond yields have risen sharply over the past year and a half, driven mainly by the Fed's interest rate hikes. Some banks accumulated significant holdings of long-term securities during the period of low interest rates. At the same time, the US bank failures in March highlighted that a rising interest rate environment could have financial stability implications if liquidity risks, and interest rate risk are not properly managed. Since our last report, investor expectations have changed significantly, leading to a rise in near-term risk-free yields and a decline in long-term yields in the USA (*Chart 8*). Government bond yields in the EU's largest economies and the UK have risen significantly for maturities of less than 5 years, but there has been no major shift in long-term yields over the past six months. The treatment, i.e. write-down of Credit Suisse's AT1 bonds, which differed from the general loss-absorption practice, triggered widespread concerns about the subordinated bank debt markets, leading to higher yields on these bonds in Europe. The index tracking the AT1 bond market in developed countries fell by nearly 9 per cent in the week before the merger of UBS and Credit Suisse and by another 6 per cent on 20 March. The US bank failures and loss of confidence in Credit Suisse brought renewed attention to the risks in the banking sector (see Box 1).

BOX 1: KEY FACTORS LEADING TO THE FAILURE OF SILICON VALLEY BANK AND THE ACQUISITION OF CREDIT SUISSE

The collapse of two medium-sized banks (Silicon Valley Bank and Signature Bank) hit the headlines in the USA between 10 and 12 March. The suspension of the activities of these two banks represents the second and third largest bank failures in US history. In addition to a global decline in bank share prices, shortly afterwards negative news emerged about the operations of Credit Suisse, Switzerland's second largest bank and a major international player. Following the Swiss central bank's failed liquidity bailout, on 19 March 2023 a decision was taken, with the involvement of the Swiss supervisory authority, that UBS Bank (Switzerland's largest bank) would buy Credit Suisse at well below the last stock market price, thus rescuing the institution from bankruptcy.

Silicon Valley Bank (SVB) was a regional credit institution that built its business model primarily on the Silicon Valley's start-up ecosystem. Fast-growing start-up companies placed significant deposits with the bank, at which this growing liquidity was largely tied up in long-term securities. The bank's business model entailed significant – and inadequately managed – interest rate and maturity risk, exacerbated by the fact that most of its short-term deposits exceeded the USD 250,000 limit guaranteed by US federal deposit insurance. According to Jiang (2023),[1] it was the latter factor that made the bank really vulnerable: while about one tenth of US banks were in a worse position than SVB in terms of capital position and "hidden" losses suffered on the revaluation of the held-to-maturity government bond portfolio, SVB fell into the riskiest 1 per cent in terms of the proportion of deposits not guaranteed by deposit insurance. In the first half of March, these risks materialised: due to the withdrawal of deposits, SVB was forced to sell securities it had originally planned to hold to maturity at a loss, and thus its liquidity risks turned into a solvency problem. The mounting risks and rapid spread of news about the capital position in social media accelerated the outflow of deposits, which the bank was no longer able to manage. Similar developments occurred in the case of Signature Bank, which was also active in the cryptocurrency market.

Estimated impact to CET1 Ratio from Unrealized Gains and Losses on Held-to-Maturity Securities



Source: IMF Global Financial Stability Report

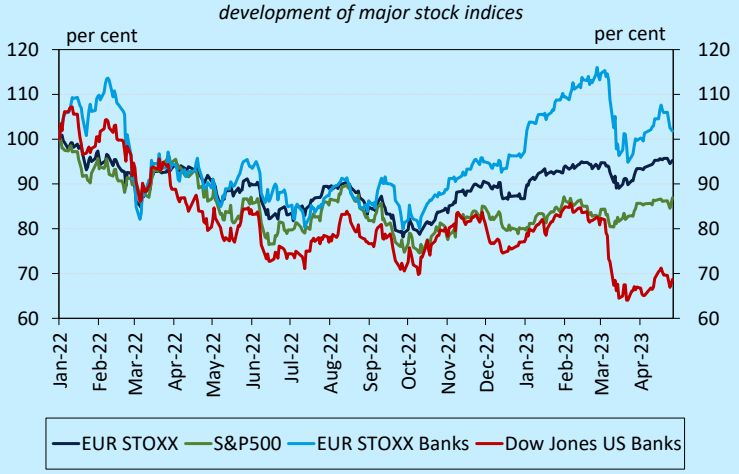
According to IMF Global Financial Stability Report,[2] the potential losses for banks from unrealised interest rate risk may be much higher in the USA than in Europe and emerging markets. In particular, the difference is significant for the riskiest institutions (in the USA, for these institutions, the realisation of losses would have a much larger adverse impact on the banks' top-quality CET1 capital), but the difference is also significant at the median value. The different regulatory environment also contributes strongly to this. In Europe, under Pillar II regulation, banks hold capital add-ons for several key risks, including the interest rate risk of the bank's trading book exposures, which must be met independently of macroprudential capital buffers. By contrast, in the USA, a capital add-on requirement similar to Pillar II capital – calculated on the basis of stress-testing exercise – must be met in overlap with the capital conservation buffer requirement, i.e. only the larger of the two must be met, in a non-additive manner.[3] The complexity

[1] Jiang, E. X., Matvos, G., Piskorski, T., Seru, A. (2023): Monetary Tightening and U.S. Bank Fragility in 2023: Mark-to-Market Losses and Uninsured Depositor Runs? NBER Working Paper No. 31048, National Bureau of Economic Research.
[2] IMF (2023): Global Financial Stability Report, 2023. April. International Monetary Fund.
[3] Oliver Wyman (2023): The EU Banking Regulatory Framework and its Impact on Banks and the Economy. Reference Study.

of US banking regulation is further increased by the different requirements for smaller and larger, internationally active institutions. For example, the liquidity coverage ratio (LCR) requirement that has applied to all banks in the EU since 2015 has only applied to banks with a balance sheet total of over USD 250 billion in the USA since 2018.

Where the proportion of federally insured deposits was low, the outflow of deposits was faster. In the case of SVB and Signature Bank, a 25-per cent outflow of deposits was observed in a single day, and due to the rapid regulatory intervention, it is not known where the withdrawal of deposits would have stopped without this. In the case of SVB, there was a significant chance that most deposits would be withdrawn from the bank. First Republic Bank was the third American credit institution to find itself in trouble, as its customers withdrew about USD 100 billion over three months, equivalent to 41 per cent of its deposits. Although the bank was profitable overall even in 2023 Q1, the bank's share price fell sharply due to the deposit outflows, and at the beginning of May, J.P. Morgan acquired the credit institution. Credit Suisse also faced a very significant outflow of funds, as its deposit portfolio fell 40 per cent in 2022 and a further 29 per cent in 2023 Q1.

Changes in the valuation of European and US banks compared to the development of major stock indices



Note: 03-01-2022=100%.
Source: Yahoo Finance, Marketwatch

The failure of US regional banks has changed the picture of the impact of changes in the interest rate environment on the banking system. While the rise in interest rates was previously seen by the markets as a fundamentally positive development that boosted banks' profits, these isolated events have drawn attention to the fact that the effect can be damaging for some institutions. The change in market sentiment has also been reflected in bank valuations at the global level: while bank shares in Europe have outperformed other sectors since the beginning of 2022, the relative position in their valuations deteriorated significantly following the US bank failures.

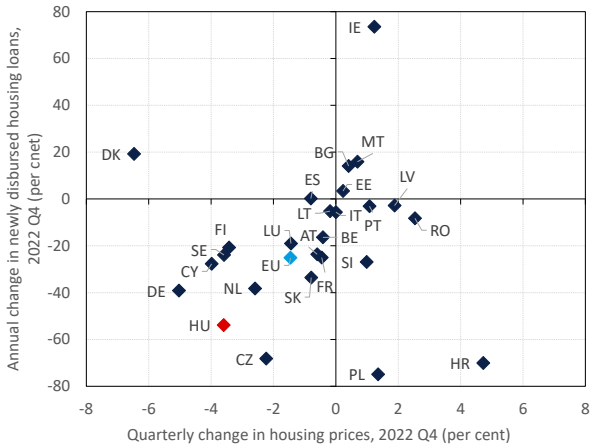
The international contagion effect was most severe for Credit Suisse (CS), a large Swiss bank that was already struggling with problems. Plagued by a series of scandals (loss-making business lines for several quarters, bad investment decisions, breaches of money laundering rules, strategic restructuring, frequent changes in management), it had already suffered strong outflows in the final quarter of 2022 and as a result of the US bank failures, its share price fell by almost 10 per cent on 13 March, while its CDS spread rose to a historic high of 1,082 basis points on 16 March. At the same time, CS's key indicators suggested stable operations prior to the series of events. Its share price fell sharply again on 15 March and was already down 30 per cent at 3 p.m. The new fall was compounded by the fact that an official at the bank's largest owner (*Saudi National Bank*) stated that it could not provide more capital to the institution due to regulatory constraints. On the morning of 16 March, Credit Suisse announced a CHF 50 billion loan from the Swiss National Bank to strengthen liquidity and investor confidence.

In the interests of clearing up the uncertainty surrounding the bank, the Swiss authorities considered a merger with UBS, Switzerland's largest bank, to be desirable. This was announced on 19 March. Credit Suisse's valuation had already fallen to one third of its level from the beginning of the year. UBS bought Credit Suisse for CHF 3 billion, absorbing CHF 5.4 billion of the bank's losses. However, the merger of the two banks may be accompanied by lawsuits because the claim of Credit Suisse AT1 bondholders (CHF 16 billion) has been declared null and void by the Swiss authorities. Although the terms of the Credit Suisse AT1 bonds allowed for the write-off of the bonds if the bank received state aid in the absence of which it would be unable to operate, this procedure deviated from the normal loss-absorption order and therefore set a negative precedent. The effects were immediately reflected in the yields and values of the EUR 250 billion European AT1 bond market, despite the European Central Bank (ECB), the European Banking Authority (EBA), the Single Resolution Board (SRB) and the Bank of England (BoE) all distancing themselves from the practice. In March,

international banking supervisory and regulatory authorities pledged to examine whether liquidity coverage requirements needed to be revised in the light of the recent financial turmoil. The collapse of US banks highlighted the dramatic speed at which clients are able to withdraw deposits in the digital age, and banks need to develop resilience and modernise their emergency scenarios. The failure of US banks also drew attention to the importance of examining the relationship between the rising interest rate environment and financial stability, which may even have a lasting impact on the sector.

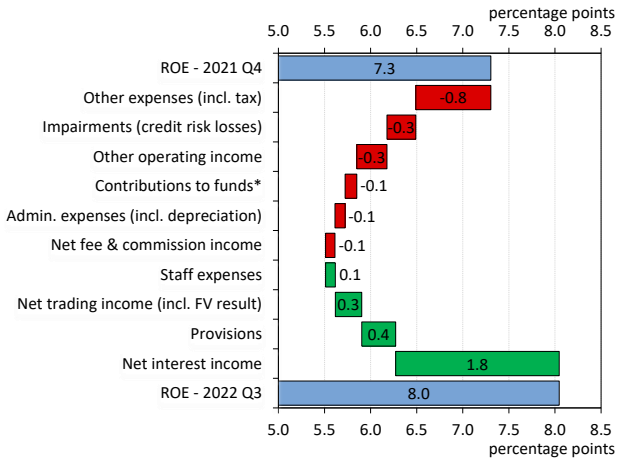
As additional individual institutional risks came to the fore with international risk aversion intensifying, the parent banks of Hungarian banks typically suffered average declines in share prices and saw modest increases in their CDS spreads. Along with Commerzbank, UniCredit and Raiffeisen are in the headlines mainly because of their Russian exposures.

Chart 9: Quarterly change in housing prices and annual change in the disbursement of new housing loans in the EU



Source: ECB, Eurostat, MNB

Chart 10: Contribution of changes in certain profitability components to the annual change in average ROE in the EU banking system

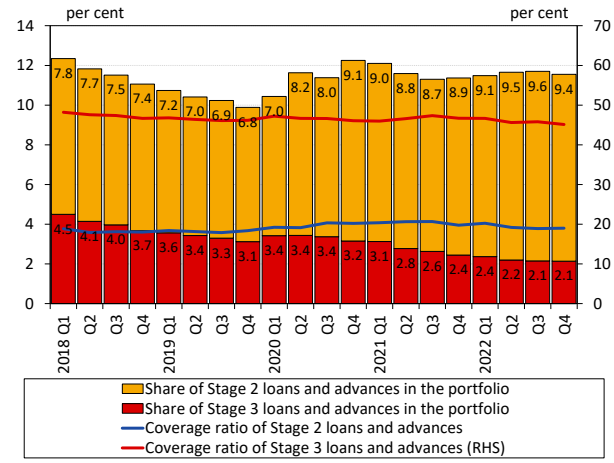


Note: *Contributions to deposit guarantee schemes and resolution funds. Source: EBA

1.2. EU banking system shows improving profitability and substantial liquid reserves, amidst rising real estate market risks

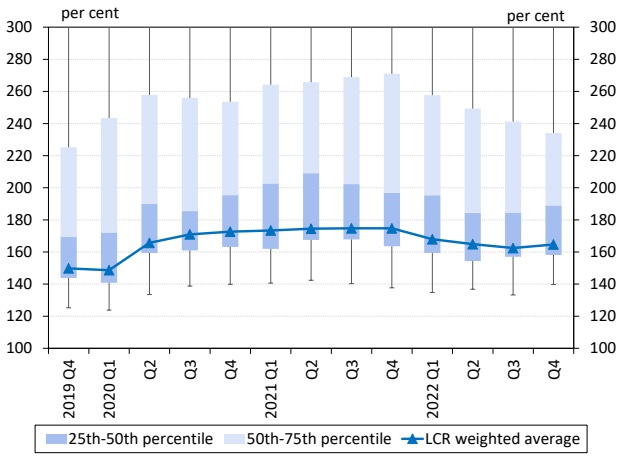
The volume of newly disbursed mortgages fell significantly in the EU, and house prices have already started to decline in half of the Member States. Rising interest rates have made the access to credit more expensive across Europe, with the average interest rate on newly disbursed mortgages in the euro area rising to 2.8 per cent by 2022 Q4, from an all-time low of 1.3 per cent one year earlier. Also related to the higher interest rates, new housing loan issuance dropped sharply in 2022 Q4, with 25 per cent fewer new mortgages disbursed in the EU compared to the same prior-year period (*Chart 9*). The sharp rise in residential real estate prices in past years, falling borrowing and eroding demand due to the uncertain economic outlook contributed to a decline in housing market transactions in more and more Member States in 2022, which can be interpreted as the first sign of a reversal in the real estate market cycle. The long upward trend in house prices remained in place in all Member States in 2022 Q2, but house prices declined in nominal terms in six countries in the third quarter and in fifteen countries in the fourth quarter. Compared to the peak in 2022 Q2, by the end of last year house prices had fallen the most in Denmark (-10 per cent), Sweden (-7 per cent) and Germany (-6 per cent). The decline in house prices reduces the overvaluation of residential real estate, but may also lead to an increase in bank credit risks via the depreciation of residential mortgage collateral. Cyclical risks are also having a more pronounced impact on the commercial real estate market. In most EU Member States, the commercial real estate market is characterised by a high share of floating-rate financing, where rising interest rates not only affect real estate values negatively through an increase in the

Chart 11: Evolution of the proportion of loans classified as risky and their coverage by impairment in the EU banking system



Source: EBA

Chart 12: Development of the distribution of the LCR in the EU banking system



Note: Error bars indicate the 5th and 95th percentiles. Source: EBA

discount rate, but also make debt servicing more difficult, which can lead to an increase in non-performing loans. In the case of commercial real estate funds, it may be problematic that while their assets are illiquid, fund investors may withdraw their money at short notice, which can lead to liquidity problems and forced sales.[4]

Interest income has had a positive impact, while higher public charges have had an adverse impact on the profitability of the EU banking system. The weighted average annualised ROE of the EU banking system rose from 7.3 per cent in 2021 Q4 to 8.0 per cent in 2022 Q4 (*Chart 10*). The largest contributor to the year-on-year increase in ROE (1.8 percentage point) was the increase in net interest income. However, the rising level of other expenses substantially reduced ROE, by 0.8 percentage points on an annual basis, which was also driven by the increase in the tax burden on banks (see Box 2).

The loan loss provision coverage ratio in the European banking system's loan portfolio declined in year-on-year terms, with the rate of non-performing loans remaining low. In line with the trend from recent years, the share of Stage 3 (non-performing) loans in the EU banking system as a whole fell from 2.4 per cent at the end of 2021 to 2.1 per cent in 2022 Q4, while the share of Stage 2 loans rose from 8.9 per cent to 9.4 per cent (*Chart 11*). In 2022 Q4, the loan loss provision coverage ratio for loans classified as Stage 2 and Stage 3 decreased to 3.8 per cent and 45.1 per cent respectively, down from 4.0 per cent and 46.7 per cent one year earlier, and therefore these indicators do not reflect an increasing perception of credit risk in banks' behaviour.

Monetary tightening and US bank failures hit the EU banking system, having substantial liquid reserves. The weighted average liquidity coverage ratio (LCR) of EU banks fell to 165 per cent by 2022 Q4 from a peak of 175 per cent at the end of 2021 (*Chart 12*). The change was mainly driven by an increase in gross outflows as a share of total assets. The weighted average LCR ratios of the largest internationally active European banks exceed those of the US banks in the same group by around 30 percentage points. Under the ECB's third targeted longer-term refinancing operation (TLTRO-3), the majority of the repayments of funding to banks are due in 2023, which could lead to a further decline in the LCR via a reduction in high-quality liquid assets (HQLA). However, the monetary easing measures introduced at the outbreak of the pandemic led to a significant increase in banks' LCR ratios

in 2020, meaning that the current level of liquid buffers can still be considered high.

BOX 2: FINANCIAL STABILITY EFFECTS OF BANK LEVIES BASED ON INTERNATIONAL EXPERIENCE

After the 2007–2008 global financial crisis, the taxation of banks became a widely used tool to strengthen financial sector stability and improve public finances. Due to the severe financial imbalances caused by excessive risk-taking by banks (debtor and bank bailouts) and the extreme public finance burden this has entailed, it has become accepted that financial institutions should contribute to government spending to restore banking operations. Taxation of the financial sector is therefore an instrument, complementary to indirect banking regulation, designed to offset the negative externalities of risk-taking in the financial sector. There have been many examples of bank taxes in recent years, with 17 EU Member States currently applying some form of bank tax.

In international practice, several forms of bank taxation have emerged, and their financial stability effects depend strongly on the specific characteristics of the banking system and the way the tax is levied. There are three different solutions in relation to the basis of the tax. The first is a financial stability contribution (FSC) targeting all or part of the bank balance sheet, the second is a financial activities tax (FAT) focusing on bank profits, and the third is a financial transaction tax (FTT) focusing on some financial transactions. In addition to choosing the base for bank taxes, the rate of the tax, the subjects of the tax, its duration and the purpose for which it is to be used also play an important role. Bank taxes can contribute to the expected costs of bank bailouts, reduce the vulnerabilities of financial markets and contribute to strengthening macroeconomic balance. At the same time, taxes can impair banks' ability to accumulate capital by constraining bank profitability, weaken their lending capacity, have adverse effects on the efficiency of financial intermediation, result in more expensive services, erode the international competitiveness of the banking system and lead to undesired structural changes.

Extra profit and solidarity taxes in force and planned in the EU

Country	Year of implementation	Tax base at introduction	Tax rate	Planned scope
Czechia	2022	Above 120% of average after-tax profit for the years 2018-2021	60%	2022-2025
Hungary	2022	Net interest income for the previous year plus commission and fee income	2022:10%, 2023: 8%	2022-2023
Spain	2022	Net interest and fee income exceeding €800 million	4.8%	2022-2024
Lithuania	2023	Net interest income exceeding 150% of average net interest income in 2018-2021	60%	2023-2024

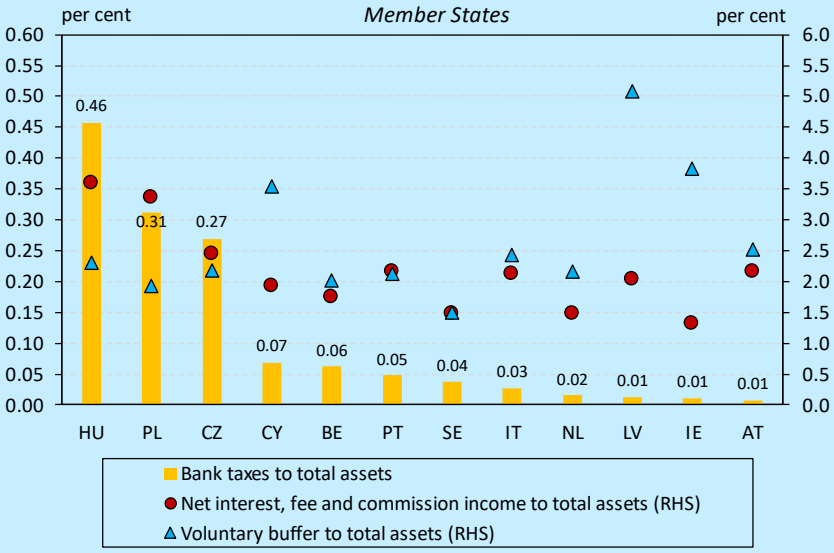
Note: In April 2023, the Government changed the base of the Hungarian extra profit tax to the adjusted profit before tax, which change affects the tax payment of the banks due in the second half of 2023. In addition to the tax base, the tax rates have also been modified. Source: ECB SDW, own collection

The spike in bank profitability seen in the current rising interest rate environment may have a material impact on the calibration of bank taxes. The Covid-19 pandemic, followed by the Russian-Ukrainian war, has confronted the global economy with unprecedented complex economic challenges, an adverse macroeconomic outlook and, as a result, rapidly rising inflation and a radically changing interest rate environment. As a result, many banking systems have seen significant short-term profit improvements, mainly due to high volumes of rapidly repricing liquid assets and interest margin expansion due to slow interest rate transmission on the deposit side, which has led to massive profits for some credit institutions. Several governments consider these profits above the normal (average) profit as extra profit (windfall profit) and have imposed or plan to impose an extra tax on such. Taxes of this kind have been introduced in Czechia, Hungary and Spain since 2022 to divert extra profits from banks, and is planned in Lithuania from 2023.

[4] Daly, P., Dekker, L., O'Sullivan, S., Ryan, E., & Wedow, M. (2023): The growing role of investment funds in euro area real estate markets: risks and policy considerations. Macroprudential Bulletin.

Among the EU Member States that levy a bank tax, three Visegrad countries – Hungary, Poland, and Czechia – have the highest taxation of banks as a proportion of total assets in addition to corporate tax, resolution fund contributions and supervisory fees. The financial stability effects of bank taxes can best be captured through the size of the tax relative to profitability and the size of the free capital buffers. The profitability and capital position of banks provides considerable room for manoeuvre for taxation in the short term without significantly jeopardising banks' solvency and lending capacity in most of the countries surveyed. Over the medium term, however, banks' profitability and capital position may deteriorate substantially, primarily due to a fall in lending, deterioration in the quality of the loan portfolio, the depreciation of financial assets or other non-tax burden-sharing measures (such as the interest rate cap in Hungary or the Polish repayment relief), which could amplify the adverse effects of bank taxes.

Bank taxes, net income and free capital buffers in selected EU Member States



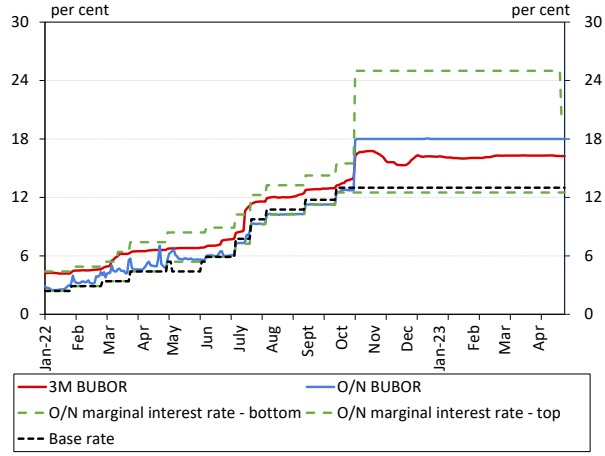
Note: Based on 2022 Q3 data, except the Hungarian data which is available for 2022 Q4.
Source: ECB SDW, MNB, own collection

2. Market and bank liquidity: favourable financing structure and ample liquid asset portfolio

The steadily high level of short yields serves the MNB's objective of curbing inflation, while long yields have declined substantially, in line with the improving overall investment sentiment. The liquidity reserves of the banking system have continued to grow moderately from a high level since the start of the year. Since end-October 2022, the level of liquidity has been shaped by the liquidity-providing effect of interest rates paid on central bank instruments and of a decline in retail bank deposits and their reallocation to other assets in a mutually offsetting manner. The high interest rate environment is leading to substantial changes in the banks' funding structure and requires active liquidity management by domestic banks. Despite significant changes in funding conditions, the banking system continues to operate with a stable, balanced funding structure, which, together with ample liquidity, ensures adequate shock resilience and lending capacity.

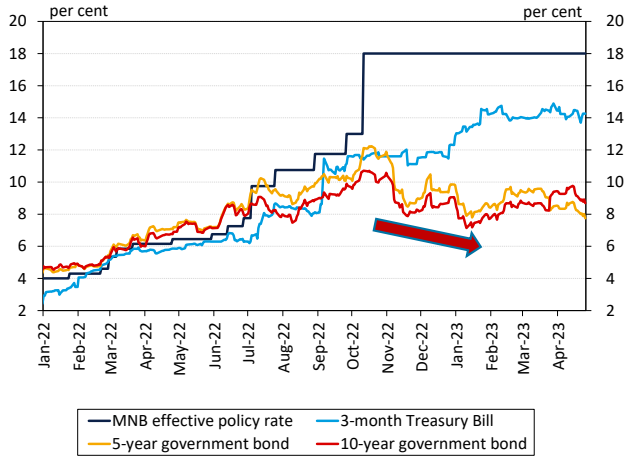
2.1. While short yields are high, long yields fell

Chart 13: Short-term yields and base rate developments



Source: Government Debt Management Agency, MNB

Chart 14: Evolution of the MNB's effective interest rate and government bond yields

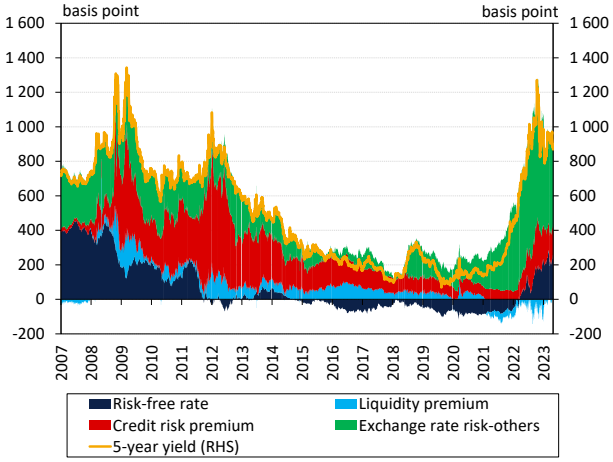


Source: Bloomberg

Short-term interest rates reflect the central bank's determined moves to curb inflation. As a result of the MNB's instruments introduced last autumn to tie up interbank forint liquidity on a long-term basis – the restructured mandatory reserve system, the one-week discount bond and the long-term deposit tender – and the overnight deposit quick tender introduced to ensure financial market stability, short yields have risen broadly and significantly since October 2022. In the interbank unsecured money market, the HUFONIA stood at 18 per cent and the 3-month BUBOR at 16.2 per cent at the end of April 2023 (*Chart 13*). In the view of the Monetary Council, it is necessary to maintain the base rate at the current level of 13 per cent for a longer period, to ensure the anchoring of inflation expectations and the achievement of the inflation target in a sustainable manner. In setting the conditions for the overnight instruments introduced in mid-October, the MNB will continue to take into account lasting changes in risk perception.

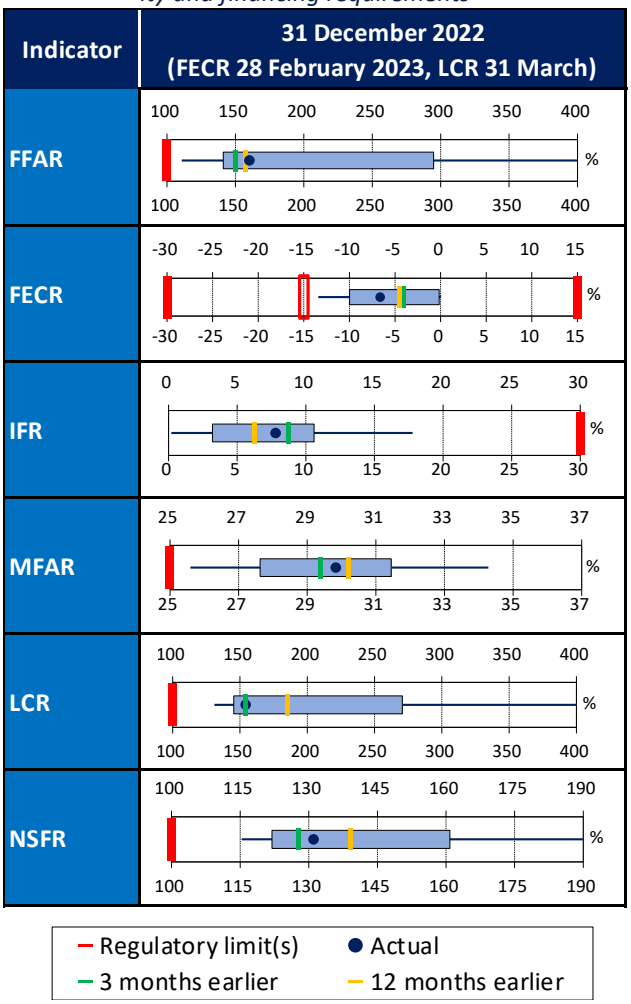
Long interest rates fell substantially in response to the measures taken by the MNB and improving investor sentiment. In October, adverse changes in the growth and inflation outlook and the strengthening of global risk aversion, in parallel with the turbulence in the foreign exchange market, pushed domestic long government bond yields to a 10-year record high. To address the tensions, the MNB introduced market stabilisation measures in mid-October, which had a positive impact on both the forint and government bond markets. Maintaining market stability is key to achieving price stability, and restoring foreign exchange market stability was able to support demand for government bonds. In the weeks following the MNB's measures, 5-year and 10-year government bond yields fell by around 250 basis points and were at 7.7 per cent and 8.7 per cent,

Chart 15: Breakdown of the 5-year forint government bond yield



Source: Refinitiv, MNB

Chart 16: Compliance of the banking sector with liquidity and financing requirements



Note: FFAR - Foreign exchange Funding Adequacy Ratio, FECR - Foreign Exchange Coverage Ratio, IFR - Interbank Funding Ratio, MFAR - Mortgage Funding Adequacy Ratio, LCR - Liquidity Coverage Ratio, NSFR – Net Stable Funding Ratio. The edges of the blue rectangle denote the lower and upper quartiles of the distribution, while the ends of the dark blue line show the 10th and 90th percentiles of the distribution. For LCR, excluding mortgage banks and home savings funds. The FECR has been operating with an asymmetrical limit since 9 December 2021, with

respectively, by the end of April 2022. In addition, Hungarian spreads over German and Polish 10-year yields also declined by 240 basis points and 70 basis points, respectively. Long yields remained stable in March, amidst escalating investor uncertainty due to the turbulence at US and Swiss banks (*Chart 14*).

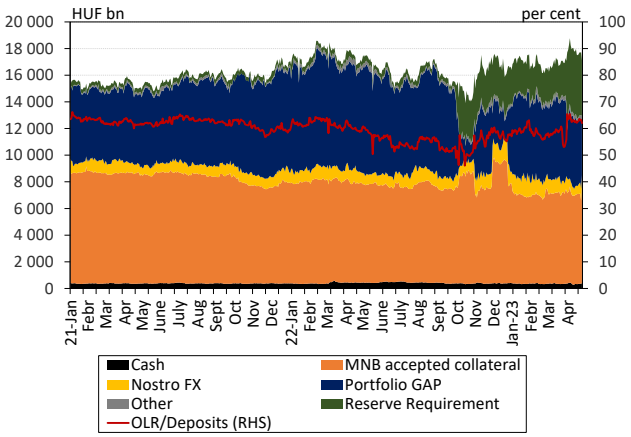
Several factors played a role in the evolution of Hungarian long-term yields. On the one hand, risk-free yields rose because of interest rate hikes by advanced central banks, and on the other hand, the domestic credit and exchange rate risk premium also jumped, primarily in connection with the outbreak of the Russian-Ukrainian war and the ensuing energy crisis (*Chart 15*). In order to manage the situation, the MNB took extraordinary measures in October, which successfully stabilised the domestic financial markets. Thus, primarily because of the reduction in the component that captures exchange rate risk and other market frictions, the yield on the 5-year government bond has fallen by around 400 basis points since its peak in October.

2.2. Funding and liquidity position provides strong shock resilience

Banks' liquidity and funding position is stable, and the level and structure of funding is adequate, even in the face of substantial changes in the monetary instruments. The liquidity coverage ratio (LCR) requirement, which ensures short-term liquidity, changed levels as a result of the restructuring of the monetary instruments and banks' adjustment, falling from an average of 173 per cent in 2022 Q3 to an average of 135 per cent in 2022 Q4, and remaining well above the regulatory expectation of 100 per cent (see Box 3 for more details).[5] However, no substantial change in the actual liquidity position has been seen, with the available buffers remaining significant and stable (*Chart 16*). Banks comply with the expected EU-wide net stable funding ratio (NSFR) of 100 per cent, which requires long-term stable funding, with minor fluctuations, at an average level of around 130 per cent at the systemic level. The banking system's on-balance-sheet FX liabilities surplus increased, mainly due to an increase in client FX deposits, but remained well below the regulatory limit of the foreign exchange coverage ratio (FECR). Banks are also consistently outperforming the expected level of the foreign exchange funding adequacy ratio (FFAR) by an average of around 60 percentage points. Sector-wide reliance on financial corporate funding, which is considered riskier, remained low in 2022 H2 and was well below the ceiling allowed by the interbank funding ratio (IFR) regulation. Banks meet the

greater leeway for balances with FX liability surplus. For MFAR, from 1 July 2021, green mortgage bond-based funds are eligible for a preferential weighting (150 per cent), and from 1 July 2022, foreign currency mortgage bond-based funds can also be taken into account in the calculation of the indicator. Source: MNB

Chart 17: Decomposition and development of banks' operational liquidity reserves



Note: The portfolio gap denotes the contractual net flows of treasury operations within 30 days from the date of data reporting with the following content: interbank loans and deposits, MNB deposits, repos, securities other than own issued, deposits over HUF 5 billion, derivatives. Classified into the "other" category: ECB eligible collateral, cash flows from own securities. Source: MNB

Table 1: Main parameters of the liquidity stress test

Assets		
Item	**Degree**	**Currencies affected**
Exchange rate shock on derivatives	15 per cent	FX
Interest rate shock on interest rate sensitive items	300 basis points	HUF
Calls in household lines of credit	20 per cent	HUF/FX
Calls in corporate lines of credit	30 per cent	HUF/FX

Liabilities		
Item	**Degree**	**Currencies affected**
Withdrawals in household deposits	10 per cent	HUF/FX
Withdrawals in corporate deposits	15 per cent	HUF/FX
Withdrawals in debt from owners	30 per cent	HUF/FX

Source: MNB

mortgage funding adequacy ratio (MFAR) requirement with adequate buffers.

Liquidity reserves in the banking system are ample and have risen slightly since the start of the year. The banking system's operational liquidity reserves (OLR) is substantial, amounting to an average of HUF 17,850 billion in April 2023, which corresponds to 63 per cent of the private sector's deposit holdings (*Chart 17*). The level of the banking system's operational liquidity reserves have risen slightly since the beginning of the year, and its volatility has decreased compared to the final quarter of last year. Since October 2022, the level of the operational liquidity reserves have been shaped mainly by the liquidity-providing effect of the interest paid on central bank instruments and a slight increase in the loan-to-deposit ratio, which mutually offset each other. The decrease in OLR volatility is mainly due to banks' gradual adjustment of liquidity management to the new elements of the central bank's set of instruments (overnight quick tender, long deposit) that were introduced in October 2022. In the meantime, the banking system's liquid assets held at the central bank have increased by around 20 per cent since October 2022 and totaled around HUF 12,000 billion in April 2022. In line with its announcement, the Monetary Council tightened the impact of the reserve requirement on interbank liquidity by raising the reserve requirement ratio and adjusting its interest rate from 1 April. Pursuant to this decision in January, the reserve requirement ratio increased to 10 per cent and pursuant to the Council's decision in February a staggered interest rate regime for the reserve account was introduced from the beginning of April, which would encourage an increase in the share of liquidity tied up permanently, further strengthening monetary transmission.

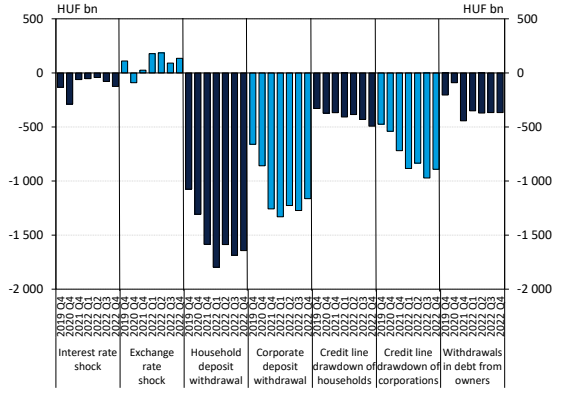
2.3. Sector-wide liquidity surplus provides sufficient coverage for a severe stress scenario

The sensitivity of bank LCR indicators to the liquidity shocks assumed in the stress test did not change significantly in 2022 H2.[6] Of the shocks (*Table 1*), the relative weight of the potential impact of deposit withdrawals remains the most significant factor. In the hypothetical stress scenario used in our stress test exercise,

[5] Non-consolidated value calculated by aggregating individual institutional data, excluding building societies and mortgage banks.

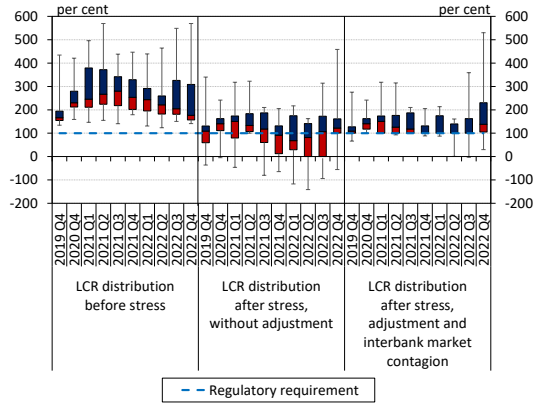
[6] The liquidity stress test examines the impact of a hypothetical, simultaneous occurrence of financial market turmoil, an exchange rate shock, deposit withdrawals, credit line drawdowns and withdrawal of owners' funds with possible interbank contagion effects. For a detailed description of the methodology, see Box 9 of the MNB's May 2016 Financial Stability Report. With regard to the spring 2020 changes to the monetary policy framework, in our calculations, we still take into account the measures that remain effective and relevant during our liquidity stress test, thus including the eligibility of the free stock of large corporation loans and bonds after reduction with an adequate haircut as liquid assets.

Chart 18: Aggregate impact of stress components



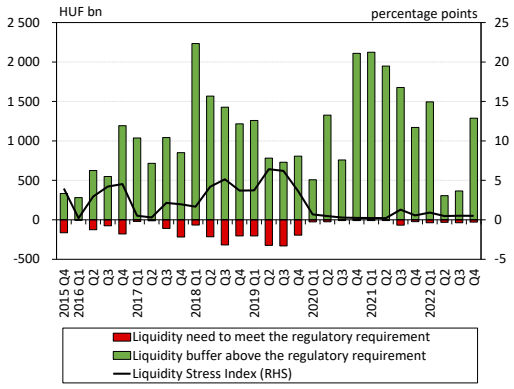
Note: The columns show the change (in HUF billion) in the LCR's liquid assets at the banking sector level as a result of a given shock, adjusted for the change in net outflows. For calculating the impact of each shock, we applied the assumption that the given shock occurs individually. Therefore, the sum of the impacts of the shocks does not necessarily reflect the combined impact of the shocks. Source: MNB

Chart 19: Distribution of the LCR before and after stress, based on the number of banks



Note: Boxplot of the distribution between the 10th and 90th percentiles. Source: MNB

Chart 20: Liquidity Stress Index



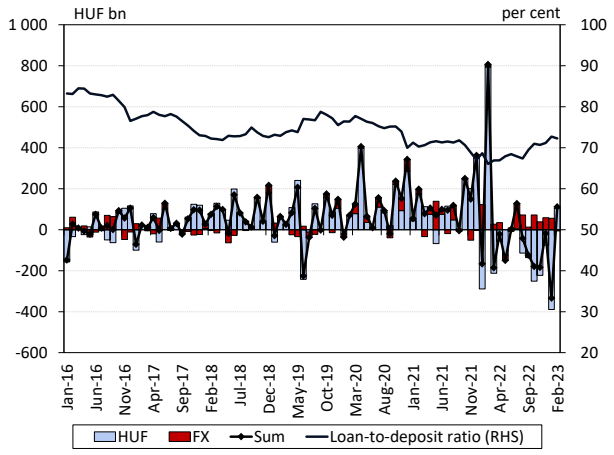
Note: The indicator is the sum of the liquidity shortfalls in percentage points (but maximum 100 percentage points) compared to the 100-per cent regulatory limit of the LCR, weighted by the balance sheet total in the stress scenario. The higher the value of the indicator, the greater the liquidity risk. Based on data for the nine largest institutions up to 2018 Q1 and for the whole credit sector thereafter. Source: MNB

deposits amounting to nearly HUF 3,000 billion are withdrawn collectively by the corporate and household sectors in 2022 Q3 and Q4, equivalent to 11 per cent of deposits at the end of the year. Among the credit line drawdown shocks, both the corporate and the household shocks increased somewhat (*Chart 18*). The exchange rate depreciation of the banking system's derivatives holdings, the liquidity impact of the interest rate shock and the role of a shock caused by the withdrawal of owners' funds would continue to have a relatively moderate impact compared to other items.

According to the liquidity stress test, the sector would meet the regulatory requirements even in the case of a major shock. After a gradual, steady decline, the median LCR ratio of banks reached 221 per cent in 2022 Q2 and 177 per cent by the end of the year. The sector-level aggregate LCR indicator also showed a similar decline, reaching 154 per cent by the end of the year. The difference between the two ratios is due to the fact that there is still considerable heterogeneity in LCR compliance between institutions. However, the decline in the LCR indicator occurred while the liquid assets included in the indicator's numerator increased. Moreover, with a significant increase in liquid assets, banks' adaptation pressure decreases in the fourth quarter in the event of a stress scenario (*Chart 19*). Three quarters of the sector-level distribution meets regulatory requirements without significant adaptation. In our estimation, taking into account banks' ability to adapt, which assumes an active role of the interbank market and extensive use of central bank liquidity facilities, only two small institutions would face compliance problems even in a severe liquidity stress.

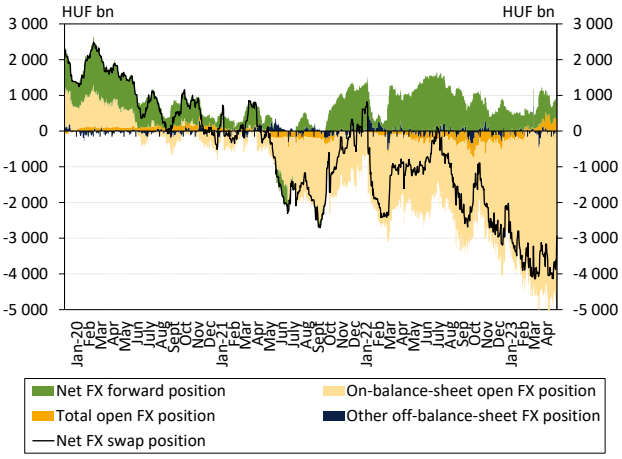
The Liquidity Stress Index[7] still implies a low level of risk. Following a temporary moderation, the sector-wide liquidity surplus rose significantly again by the end of the year, while the liquidity needs of banks in deficit did not increase as a result of the stress. The banks' liquidity surplus estimated in the stress scenario temporarily declined to between HUF 300–400 billion in mid-2022, but by the end of the year it had risen back to levels near those observed in previous quarters, to reach nearly HUF 1,300 billion. The liquidity needs of banks with insufficient liquidity in the stress scenario amounted to less than HUF 30 billion (*Chart 20*). The Liquidity Stress Index thus remains close to its theoretical minimum and still implies a low level of risk.

Chart 21: Monthly transaction change in household deposits with banks and evolution of the loan-to-deposit ratio



Source: MNB

Chart 22: Changes in the banking sector's FX swap position and in other components of the total FX position



Note: Excluding data from the banking system, EXIM, MFB and KELER. Net FX swap position = (On-balance-sheet open FX position - Total open FX position) + Net FX forward position + Other off-balance-sheet FX position. Source: MNB

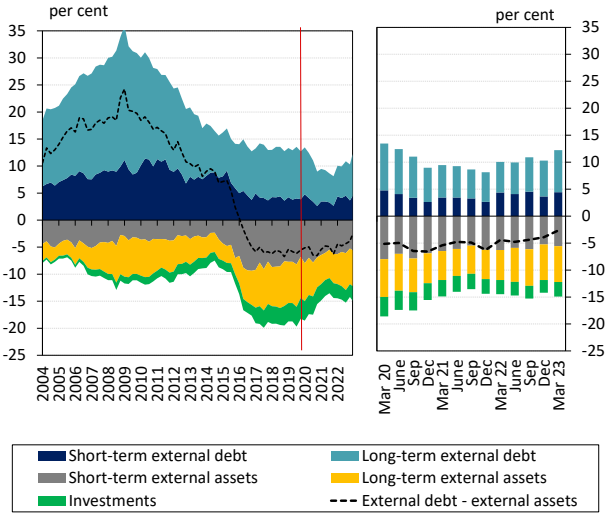
2.4. Changes in deposits and high interest rates are the main drivers of banks' funding situation

The loan-to-deposit ratio has risen since August 2022, driven by a decline in household deposits. Household deposits have fallen by HUF 767 billion on a transaction basis since August 2022, and this decrease played a key role in the 4.5-percentage point increase in the banking system's loan-to-deposit ratio over the same period (*Chart 21*). Looking at the transactions of household deposits by currency, HUF deposits decreased by HUF 1,080 billion, while foreign currency deposits increased by HUF 300 billion over the period under review. Low deposit rates in the household sector also contribute to the flow of deposits into other assets and restructuring in terms of currency, while falling real wages lead to a general decline in household savings (see more in the chapter 9 of the report). The decrease in retail deposit do not threaten banks' funding position, as the loan-to-deposit ratio, which captures funding risks, remains low at 72 per cent at end-February 2023, but continued deposit outflows could lead to a deteriorating profitability and capital position through the need to raise deposit rates.

FX lending, which falls short of the growth in FX deposits, causes an increase in the banking sector's on-balance-sheet FX liability surplus. The growth dynamics of foreign currency assets are below the growth in foreign currency deposits, and this continuously opens the banking sector's on-balance-sheet FX position, which has already reflected an FX liability surplus since 2020 (*Chart 22)*. The growth of foreign exchange savings in the banking system has been supported by an increase in FX deposits by corporates, households and non-bank financial institutions since autumn 2022. From 22 November 2022, the government introduced a deposit interest cap for domestic non-bank financial institutions and retail clients depositing at least HUF 20 million. Most of the decline in the forint deposits of investment funds, which make up the majority of the institutions concerned, was transferred to foreign currency deposits and foreign government securities. The banking sector covers the on-balance-sheet open position with off-balance-sheet FX sales (forint purchases) on the FX swap market. Nevertheless, the growing swap market exposure leads to an increase in market, counterparty and liquidity risks related to the derivative transactions, although according to

[7] The Liquidity Stress Index, which was prepared to capture the heterogeneity across institutions, aggregates (weighting by the size of bank) the post-stress liquidity shortfalls compared to the regulatory limit calculated at the level of the individual banks, expressed in percentage points. This allows us to draw conclusions with regard to the extent of a potential stress situation within the banking sector.

Chart 23: External assets and liabilities of the banking system in proportion to total assets



Note: Credit institutions sector, together with data from EXIM, MFB and KELER. According to original maturity. Source: MNB

March 2023 data, the banking sector's gross forint obtaining swaps accounted for only 13 per cent of the banking sector's balance sheet total on average, which is still not excessive. The on-balance-sheet open position is limited by macroprudential rules. FECR regulation reduces the risk of the evolution of an excessive on-balance-sheet open FX position, limiting its ratio to the balance sheet total at a level of 30 per cent in the case of an FX liability surplus.

The external funds of the banking sector are growing in line with the high interest rate environment. Compared to September 2022, the ratio of foreign liabilities to total assets increased from 10.9 per cent to 12.2 per cent by the end of March 2023 (*Chart 23*). Behind the proportional increase in the balance sheet total, total external debt rose by HUF 1,159 billion, driven by both funding and profitability considerations. Despite the increase in total external debt, the proportional level of their balance sheet total is less than half compared to the values seen in the 2008 crisis, and overall, the funding and liquidity risks in the banking system remained manageable due to high liquidity and the balance of foreign liabilities and assets.

BOX 3: LIQUIDITY ASPECTS OF CHANGING THE MONETARY TOOLKIT

In order to efficiently manage the significant liquidity surplus built up during the successful crisis management of the past years and to maintain the efficiency of monetary transmission, the Monetary Council decided to partially restructure and expand the set of money market instruments. A key factor in addressing the financial effects of the pandemic was the substantial amount of long-term funds provided to economic agents by the MNB, which resulted in a major expansion in the MNB's balance sheet and the banking sector's excess liquidity. However, with the evolution of the economic and financial environment, in order to preserve the efficiency of monetary transmission, it became necessary to review and amend the MNB's money market instruments. The changes have an impact on banks' liquidity and financing reserves, as well as their liability-side structure, affect the compliance with various liquidity and funding requirements, and thus – indirectly – the lending capacities of banks. Financial stability considerations were also taken into account to a maximum extent in the MNB's decision.

In consideration of the increased money market volatility, in order to efficiently tie up the banking sector's excess liquidity and to strengthen monetary transmission, the MNB made decisions on regular discount bond auctions, the introduction of a new liquidity absorbing long-term deposit facility as well as the tightening of the minimum reserve system:

1. In October 2022, the MNB introduced a variable-rate **deposit** facility, which can be announced with long maturity that may even reach 6 months. The aim of the facility is to tie up liquidity for a longer term and to extend the average maturity of the sterilisation portfolio. The yield suppression effect has been reduced in the shortest maturities, thereby strengthening monetary transmission. Since its introduction, the instrument has been tendered by the MNB on a case-by-case basis for 1- or 2-month maturities in competitive price tenders. The reference rate for the floating rate instrument was the one-week deposit rate in the first tenders, and thereafter the central bank base rate, above which the MNB compensates the liquidity premium with a premium based on bank bids.
2. The MNB decided to conduct on a regular basis its previously ad-hoc **discount bond** auctions that facilitate banks' balance sheet adjustment at the end of quarters. Due to the regular announcement, these auctions further

strengthen monetary transmission by reaching a wider investor base. From December 2022, the MNB has announced the central bank discount bond on a weekly basis, with a maturity of one week.

3. The MNB supports long-term liquidity tie-up by tightening the **reserve requirement regime** by decree. The central bank raised the reserve requirement in two steps. From October 2022, the reserve requirement ratio was increased from 1 per cent to 5 per cent, and an additional maximum optional rate of 5 per cent per percentage point was introduced. For the minimum 5 per cent rate, the MNB required daily compliance, while the optional rate above this could still be met on a monthly average by credit institutions subject to reserve requirements, which gave them sufficient flexibility to deal with liquidity shocks. From April 2023, the MNB raised the minimum reserve ratio to 10 per cent to further tighten short-term liquidity, above which an additional optional rate of 5 per cent continues to help banks manage liquidity. In addition, the MNB has introduced a staggered interest rate on the reserve account from April 2023, which will encourage an increase in the proportion of liquidity tied up for the long term.

With the amendments, the set of instruments is able to completely cover the relevant time horizon of liquidity management and tie-up, from the shortest maturities to as long as half-year periods. Among the liquidity-absorbing instruments, the most significant in terms of volume was the increase in the reserve requirement ratio: the amount to be deposited in the reserve requirement rose from around HUF 400 billion, the previous rate of 1 per cent, to nearly HUF 4,000 billion on a daily basis from April 2023, and to over HUF 4,400 billion on a monthly average. Until April 2023, banks tied up an average of more than HUF 2,400 billion of liquidity in the long deposit facility, and then deposited HUF 616 billion in the first April tender following the increase in the reserve requirement ratio, even amidst tighter liquidity. Through regular central bank discount bond auctions, the MNB tied up an average of more than HUF 850 billion in liquidity until April 2023. The liquidity-absorbing measures have permanently strengthened monetary transmission, thereby helping the central bank to achieve its price stability objective.

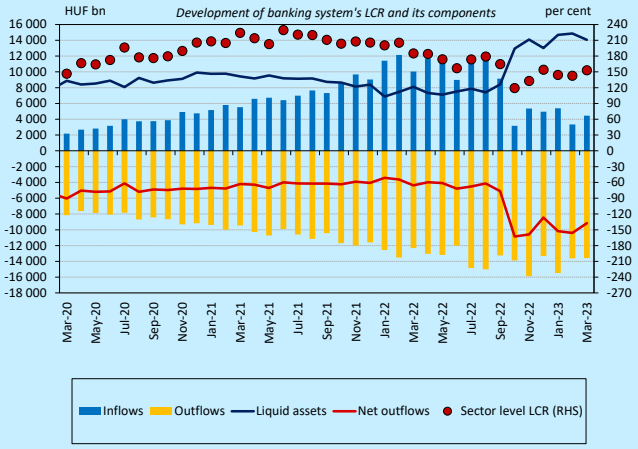
Due to the restructuring of the reserve requirement regime, the MNB revised the liquidity and funding requirements: the reserve requirement as a whole is considered a liquid asset in the LCR and does not require the provision of stable funding in the NSFR. According to the EU regulation requiring LCR adequacy, within the scope of national discretion, the MNB is allowed to determine whether the minimum reserves are considered liquid assets, depending on whether these amounts are accessible by the bank at any time in a stress period. In 2014, the MNB decided that institutions are allowed to indicate only the deviation from the lowest optional minimum reserve level, i.e. only the excessive reserve, as liquid asset (a surplus increases the liquid assets, whereas falling short of the required level reduces them).[8] In the case of the NSFR, the MNB required the accumulation of stable funds corresponding to 50 per cent of the minimum reserves upon the entry into force of the regulation. Had the supervisory requirements remained unchanged, raising the reserve ratio would have resulted in a decline in liquid assets and inflows, generating a major LCR effect and thus significant compulsion to comply at certain institutions. In the case of the NSFR, increasing the reserve ratio would have generated a much smaller impact and thus a lower need to comply. Nevertheless, based on past years' experiences it can be established that in the case of the domestic minimum reserve the condition of usability in a stress period is fulfilled. Although under-provisioning entails pecuniary sanctions, the reserves can actually be used. In addition, in the case of a liquidity shock banks may request the MNB to exempt them from fulfilling the reserve requirement completely or partially. Sector-level easing is also not without precedent; in 2020, after the outbreak of the pandemic, the MNB granted general exemption from fulfilling the reserve requirement. Therefore, due to the usability of the minimum reserves in a stress period, within its supervisory competence, the MNB decided that from now on minimum reserves in whole will be considered liquid assets in the LCR and will not require the provision of stable funds in the NSFR.[9]

[8] Some changes to it were made during the restructuring of templates. After that, under-provisioning did not reduce the liquid assets directly, but affected the indicator by increasing the outflows.

[9] This requirement was announced by the MNB in the form of interpretation questions and answers on its website: https://www.mnb.hu/letoltes/3-2022-likvitas-kotelezo-tartalek-stresszhelyzet-lcr.pdf, https://www.mnb.hu/letoltes/4-2022-likviditas-forrasellatottsag-kotelezeo-tartalek.pdf

As for the other announced instruments that serve the long-term tying up of liquidity, more moderate impacts were expected in the case of both the LCR and longer-term financing regulatory constraints. The *central bank discount bond* is considered a liquid asset, and therefore does not in itself reduce LCR levels, but the adaptation to it or liquidity reallocation is largely at the expense of the 1-week MNB deposits considered as inflows, leading to a change in the ratio of the items that make up the LCR, reflected as a technical, internal effect in the indicator. The *long-term deposit* can only be taken into account as an inflow in the LCR when the maturity of the deposit becomes shorter than 1 month (if it was longer at the time of deposit), which may entail a decline in the LCR level compared to using the 1-week deposit. Indirectly, even before shortening to within 1 month, the long-term deposit may appear as a factor that increases the LCR due to its acceptance as collateral by the MNB. However, in terms of the actual LCR effect, what matters is the extent to which banks make use of new instruments and how they adapt to other elements of liquidity. Long instruments also have an impact on longer maturities; therefore, in addition to the LCR, the restructuring of the set of instruments may also have an impact on compliance with the NSFR or, where appropriate, typically indirectly, with other MNB funding regulations introduced within national competence.

In the six months between October 2022 and March 2023, following the restructuring of the set of instruments, the banking system's LCR declined, and its structure changed, but the sector's liquidity position remained robust. Banks have an operational liquidity reserve (OLR) of around HUF 16,000–18,000 billion, supplemented currently by a reserve requirement and the liquidity reserves are accounting for around 60 per cent of deposits, and the trend is improving. However, due to the impacts and adaptations described above, there have also been changes in the level and internal structure of the LCR indicator. The level of liquid assets fluctuated mainly as a consequence of the restructuring of the reserve requirements regime, while for inflows the adaptation at the expense of 1-week deposits resulted in a change in level, and then developments related to long deposits (shortening of 2-month deposits, announcement of the 29-day central bank deposit) caused fluctuations. This has resulted in a lower than before October 2022 banking system[10] LCR level of 140–150 per cent and an overall liquid asset surplus of around HUF 4,500 billion, which may be further increased by the announced changes to the reserve requirements regime from April 2023. In recent months, the LCR has been close to this new level, with a slight improvement. Overall, despite the lower average LCR level, the liquidity position of the banking system remains robust, with current changes being driven by the changes in the monetary policy instruments.



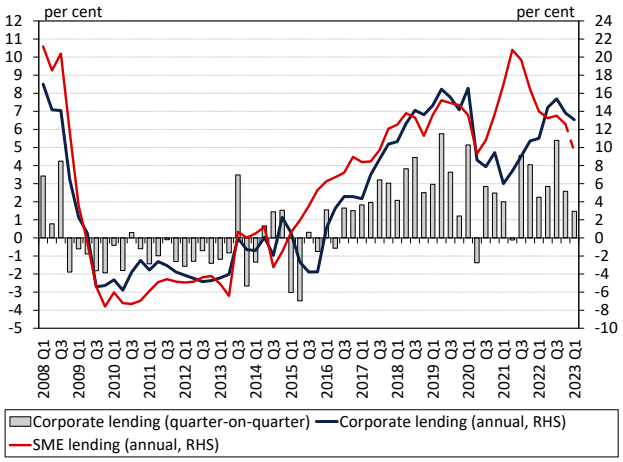
Note: Aggregated data of solo banks excluding building societies and mortgage banks. Source: MNB

[10] Sector average calculated on individual bank data and excluding specialised institutions, building societies and mortgage banks.

3. Corporate lending: banks' lending capacity is adequate

In 2022, total corporate loans outstanding increased by 14 per cent, as a result of disbursements and repayments. Large individual transactions contributed substantially to the expansion in corporate loans outstanding, while the annual growth rate of SME loans stood at 13 per cent at the end of the year, following a gradual slowdown. Foreign currency loan disbursements increased significantly throughout the year, but the majority of borrowers were companies with export revenues. The Lending Survey shows that banks have tightened corporate lending conditions overall, motivated primarily by cyclical factors. According to the majority of credit institutions, the capital and liquidity position is adequate and does not justify a reduction in lending, and banks' overall lending capacity is at a high level. Respondents also recognised a shift in demand for loans, with 62 per cent and 11 per cent noticing weaker demand for long-term and HUF loans, while 37 per cent and 61 per cent indicated stronger demand for short-term and foreign currency loans. The elevated economic uncertainty, tighter monetary conditions and the resulting slowdown in demand could push the expansion of loans outstanding into the single-digit range by the end of 2023.

Chart 24: Growth of the total corporate and SME loan portfolio of the credit institution sector



Note: Transaction based, prior to 2015 Q4, data for SMEs are estimated based on banking system data. In order to generate the growth rate, between March 2022 and August 2022, payments to Sberbank are also taken into account. Growth rate of SMEs in the first quarter of 2023 based on preliminary data. Source: MNB

3.1. Large transactions boosted growth in corporate loans outstanding

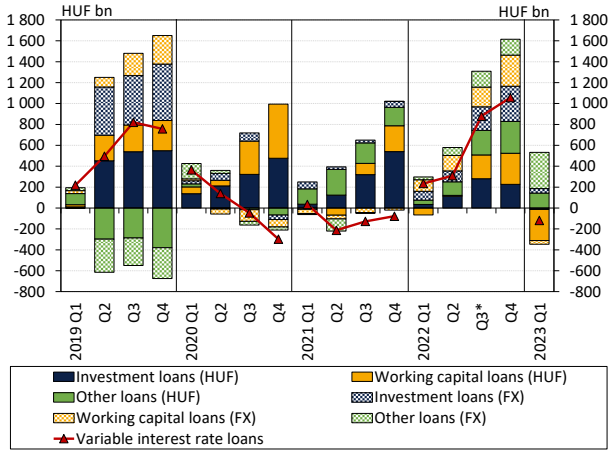
In 2022, the corporate loan portfolio expanded at a double-digit rate. Between December 2021 and December 2022, non-financial corporations' bank loans outstanding rose by 14 per cent on a transaction basis (*Chart 24*), with growth slowing to 13 per cent by the end of 2023 Q1. Within this, the SME portfolio and large companies' loans outstanding expanded by 13 per cent and around 19 per cent, respectively, in 2022. Although loans outstanding have expanded significantly in recent years, the rate of increase has not exceeded nominal GDP growth. Accordingly, the level of corporate loans outstanding as a share of GDP has not changed significantly: it stood at 18 per cent at the end of December, slightly above the 15-per cent average for the Visegrad countries, but 14 percentage points below the average for the euro area.

Portfolio expansion was also balanced in terms of currency and loan purpose. Corporate loans outstanding rose considerably in 2022, expanding by HUF 1,616 billion.[11] With the exception of the information and communication sector, loans outstanding in all sectors increased during the period under review, with the largest increases seen in the financial and insurance activities sector,[12] mainly due to large individual transactions, manufacturing, trade and repair of motor vehicles. Expansion of investment and

[11] The sector reclassification of Sberbank's portfolio is not filtered out from the data of 2022 Q3.

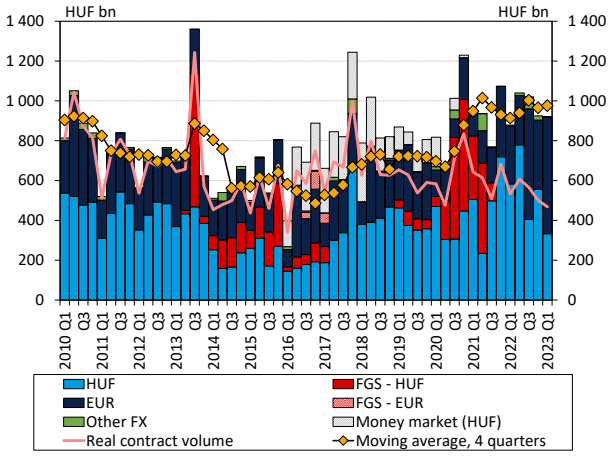
[12] Within the sector of non-financial corporations, the financial services subsector mostly comprises holding companies. In this sector, there have been a number of individual large corporate lending transactions in recent months associated with the financing of the country's energy needs.

Chart 25: Transactional expansion in corporate loans outstanding by loan purpose, denomination and interest rate



Note: Cumulative transaction data within a year adjusted for exchange rate effects and filtered from other stock changes. The sector reclassification of Sberbank's portfolio is not filtered out from transaction data of 2022 Q3. Source: MNB

Chart 26: New corporate loans in the credit institutions sector



Note: The GDP deflator was used to calculate the real value of the new contract volume (2010 = 100 per cent). Source: MNB

working capital loans by loan purpose was similar (*Chart 25*). The composition by interest rate and by denomination was also relatively balanced and exhibited a considerably different structure compared to previous years. Whereas in 2020 and 2021 an overall decline in variable-rate loans outstanding was observed, these loans increased by HUF 1,057 billion in 2022. In parallel with the periodic tightening of subsidised programmes and rising forint interest rates, foreign currency loans also increased significantly, rising by HUF 786 billion. By company size, a similar shift can be observed, with large corporate loans contributing to the annual expansion at a rate not seen since the outbreak of the pandemic.

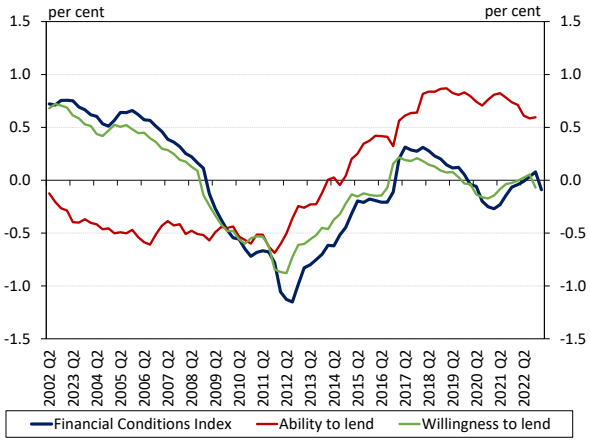
The volume of new contracts was high throughout 2022. The new contract volume was 4 per cent higher in 2022 than in 2021. New loan disbursements in the second half of the year totalled nearly HUF 1,950 billion, up 6 per cent on the same period of 2021 (*Chart 26*). Half of the new contracts were related to large companies in 2022 H2, resulting in a year-on-year increase of 36 per cent in new contracts in this segment. In parallel with the tightening of subsidised loan programmes, the share of market-based loans[13] in new loan issuance increased significantly, reaching 78 per cent in 2022 H2, just below the pre-coronavirus level of 85–90 per cent and well above the level of roughly 40–50 per cent seen in the months following the outbreak of the pandemic in Hungary. With the rising operating costs of companies and the decline in investment demand, the share of short-term loans increased significantly from 13 per cent to 38 per cent in a year. The total volume of loan disbursements in 2023 Q1 was high, partly due to large deals, but in the SME segment, which better captures the underlying developments, the volume of new loan issuance was already 18 per cent lower than in the same period of the previous year. Parallel to the rise of the Baross Gábor Loan Programme and the new Széchenyi Card Programme, the share of market loans decreased again in the first quarter.

3.2. Banks' lending capacity remains high

The banking system had a near-neutral impact on real economic expansion through its lending activity. The Financial Conditions Index is close to zero (*Chart 27*), i.e. the impact of the banking system on the real economy is neutral, in line with the cyclical position, neither underfinancing nor overfinancing the economy. Lending capacity has

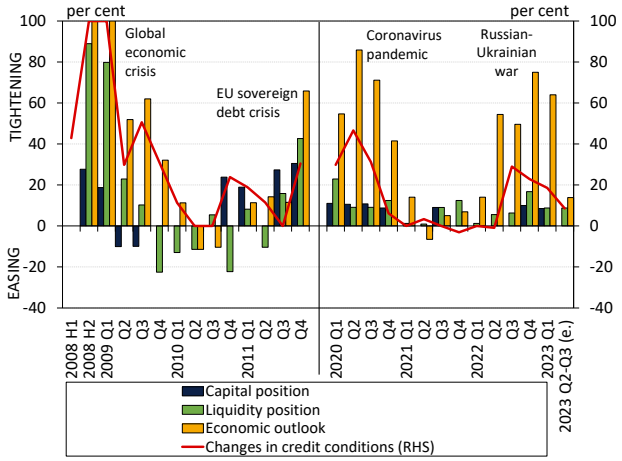
[13] When calculating the share of market-based loans, within credit institutions' contracts excluding the Hungarian Development Bank and Eximbank we examine the ratio of non-overdraft loans classified into the 'normal market' category in banks' data reporting.

Chart 27: Evolution of the Financial Conditions Index



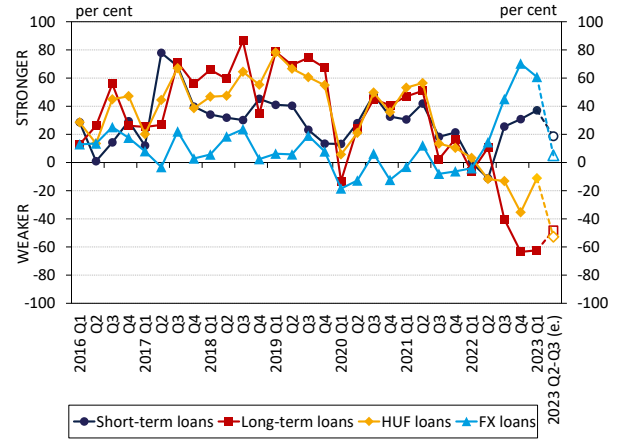
Note: Positive values represent a larger contribution to economic growth compared to the cyclical position of the economy, while negative values represent a smaller contribution. Detailed methodology: Hosszú, Zs. (2016): The impact of credit supply shocks and a new FCI based on a FAVAR approach, MNB Working Papers 2016/1, Magyar Nemzeti Bank. Source: MNB estimate

Chart 28: Changes in credit conditions and factors contributing to the changes in the corporate segment



Note: Net ratio is the difference between tightening and easing banks weighted by market share. Source: MNB, based on banks' responses

Chart 29: Changes in corporate loan demand



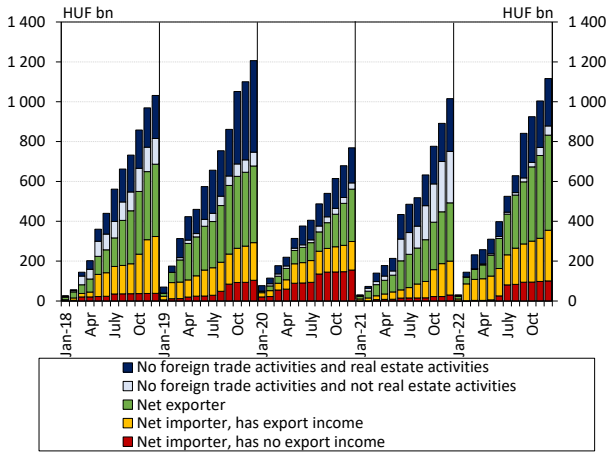
Note: Net percentage balance of respondent banks indicating stronger/weaker demands, weighted by market share. Source: MNB, based on banks' responses

deteriorated in recent quarters, but remains at historically high levels, well above those seen in the 2007–2008 crisis. The willingness to lend factor remained essentially unchanged at zero, close to equilibrium at the end of 2022 Q4.

The tightening of credit conditions is justified by the deterioration in cyclical components and the increase in client risks. Based on the MNB's Lending Survey, for both 2020 and 2022, banks tightened their conditions of access to loans mainly due to deteriorating cyclical components, i.e. the worsening economic outlook and increasing industry-specific risks (*Chart 28*). In 2023 Q1, only a net 9 per cent of the banks considered the liquidity position to be a factor pointing towards tightening with a net 9 per cent also indicating the capital position as such, and looking ahead, an even smaller number indicated this. This suggests that the increasingly uncertain macroeconomic environment has hit the banking system in an adequate liquidity and capital position, and accordingly these factors do not represent an obstacle to lending. By contrast, following the onset of the 2008 economic crisis, in addition to the cyclical components, a net 28 per cent of banks also identified the deterioration in bank capital and almost 90 per cent identified the worsening liquidity position as factors inducing tightening.

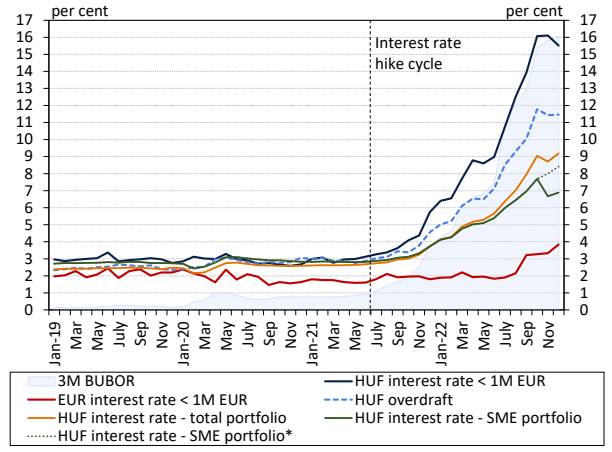
Demand for long-term loans and HUF loans has fallen. Whereas in the first three quarters of 2022, a narrow range of responding credit institutions experienced an upturn in demand for corporate loans, in 2022 Q4 and 2023 Q1, around 10 per cent already experienced weaker demand. The change in demand in the first quarter shows significant differences by product type (*Chart 29*). Broken down by company size, a net 11 per cent and 25 per cent of banks reported a decline in demand for loans to large and medium-sized companies, and small and micro companies, respectively. In line with the changes in the interest rate environment, a net 11 per cent of banks experienced decreasing demand for HUF loans, while a net 61 per cent experienced increasing demand for foreign currency loans. As a result of declining corporate investment activity and mounting liquidity needs, a net 62 per cent of banks reported fading demand for long-term investment loans and net 37 per cent reported rising demand for short-term working capital loans. Looking ahead to 2023 Q2 and Q3, 18 per cent of the institutions expect a further decline in demand, while maintaining the dual trends in terms of currency and maturity.

Chart 30: Cumulative foreign currency loan contracts within a year by foreign trade activity of the corporate borrowers



Note: Exchange rate adjusted values. Source: NTCA, MNB

Chart 31: Interest rates on the outstanding corporate loan portfolio and on new loans



Note: Volume weighted interest rates. Loans with variable interest rate or with up to 1-year initial rate fixation. For the 3-month BUBOR, monthly averages are shown. HUF interest rate – SME portfolio*: average interest rate on SME portfolio without interest rate cap. Source: MNB

Table 2: Subsidised loan programmes in 2023

	KAVOSZ – Széchenyi Card Programme MAX+			EXIM – Baross Gábor Reindustrialisation Loan Programme				
Typical target group	Micro and small businesses (due to the highet margin and the state guarantee)			Larger SMEs and large companies				
Credit purpose	Max. loan amount	Interest payable (HUF)	Max. term	Budget	Max. loan amount	Interest payable (HUF)*	Interest payable (euro)*	Max. term
Overdraft	HUF 300 million	5 per cent	3 year	–	–	–	–	–
Working capital loan	HUF 250 million	5 per cent	3 year	HUF 600 billion	HUF 4 billion	6 per cent	3.5 per cent	3 year
Investment loan	HUF 500 million	5 per cent	10 year	HUF 400 billion	HUF 6 billion	6 per cent	3.5 per cent	10 year
"Green" investment loan	HUF 500 million	5 per cent	10 year			5 per cent	3 per cent	10 year
Leasing	HUF 200 million	5 per cent	7 year		HUF 6 billion	6 per cent	3.5 per cent	5 year

Note: *In the case of the Eximbank Investment Loan Plus and Working Capital Loan Plus, the fixed interest rate is 6.0-12.0 per cent and 3.5-8.0 per cent for HUF loans and EUR loans, respectively. Source: MNB

3.3. Subdued portfolio growth expected in an uncertain environment

Foreign currency loans were typically taken out by companies with natural collateral in 2022. The foreign currency loan contract volume in 2022 was 10 per cent higher than in the previous year on an exchange rate-adjusted basis but was 7 per cent lower than before the coronavirus crisis in 2019 (*Chart 30*). The increasing issuance of foreign currency loans is a risk if it is caused by the difference between forint and foreign currency interest rates, and if these loans are requested by companies with no foreign currency revenues. Based on the available data, however, the majority of companies taking out foreign currency loans in 2022 have export revenues and thus have natural foreign currency collateral. Companies without natural collateral borrowed a total of HUF 385 billion in 2022, which is 30 per cent lower than the previous year. The share of companies with natural coverage within the new foreign currency loan contracts even increased compared to recent years, from 46 per cent to 66 per cent as a share of the volume. In addition, the share of the real estate sector is about 21 per cent; although the companies in this sector do not have export income, their revenues (rental fees) are typically denominated in euros, due to the nature of the market.[14]

Lending rates have continued to rise, but the impact is being cushioned by subsidised loans. The average interest rate on low-amount (less than one million euros) HUF loans with variable interest rates within a year rose by nearly 10 percentage points in 2022 to 16 per cent at the end of December (*Chart 31*). This was mainly driven by a 12-percentage point annual increase in the 3-month BUBOR, while the spread over this fell to a historic low of close to 0 percentage point. However, the cost of funding for banks is influenced by a number of factors in addition to the BUBOR, including deposit rates, and therefore according to our estimate, the spread over the effective cost of funding remains positive. Interest rates on euro loans continued to show only a small year-on-year increase of 2 percentage points, increasing the spread between forint interest rates and the average interest rates on euro loans to 12 percentage points. However, the effective cost of credit for companies may be significantly lower than these

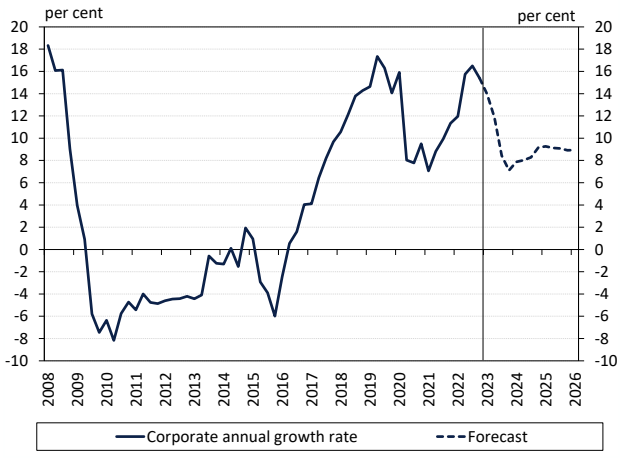
[14] However, in some cases this is only an apparent collateral if the tenant does not have foreign currency revenue from which currency-based rent could be paid without exchange rate risk. A summary of the exchange rate risk related to commercial real estate project loans can be found in Box 1 of the November 2018 Financial Stability Report.

average interest rates: subsidised loan programmes were available to eligible companies in 2022 at an effective client interest rate of 2.5–5.5 per cent, which rose to only 5–6 per cent in 2023. As for loans already outstanding, based on data at the end of 2022, the interest rate cap prevents interest rates from rising for around HUF 1,000 billion of loans in the SME loan portfolio. The average interest rate on the total SME loan portfolio was 6.9 per cent at the end of 2022, which is 1.5 percentage points lower than it would have been without the interest rate cap.

Government loan programmes provide substantial support for corporate loan disbursements, but their impact on the real economy may be limited by several factors. The Baross Gábor Loan Programme and the Széchenyi Card Programme are available to companies at very favourable, single-digit interest rates (*Table 2*). However, the impact of pricing significantly below the risk-free yield is complex: in addition to the positive effect on companies' ability to access funds, it can also hamper the reorganisation of the economy, as it can contribute to the survival of firms that are unviable in the longer term without public support,[15] while also weighing on the budget for years. In addition, the use of subsidised loan programmes for liquidity purposes creates arbitrage opportunities for companies, so that some of the loans disbursed finance non-real economy activities. The Baross Gábor Loan Programme, amounting to HUF 1000 billion, and the loans of the Széchenyi Card Programme can cover the majority of renewal needs of SME loans in 2023. Among the outstanding bank loans of SMEs at the end of 2022, loans maturing in 2023 have an outstanding principal amount of around HUF 1,120 billion. Of this amount, approximately HUF 660 billion is the outstanding principal of loans with bullet/balloon repayment, i.e. a higher principal repayment can be expected at maturity, making loan renewals more likely.

More subdued growth in corporate loans outstanding may be seen in the coming years. In view of the slower economic growth compared to the previous years and the strict monetary conditions, the expansion of corporate loans outstanding is expected to decelerate. Companies' high liquid asset holdings may also reduce their willingness to borrow. Increased inflation, however, may keep companies' working capital borrowing needs high, and the Széchenyi Card and Eximbank's loan programmes may also help to sustain the expansion of the loan portfolio. Owing

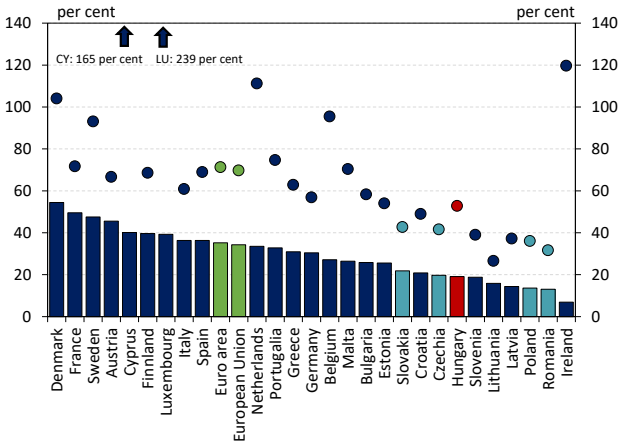
Chart 32: Forecast for the corporate loan portfolio



Note: Transaction-based annual growth rate based on data from the financial intermediary system. Source: MNB

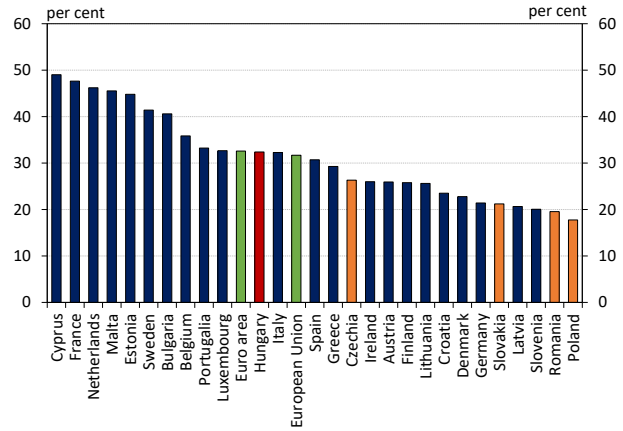
[15] The financing risks of unviable companies are discussed in more detail in Chapter 4 of the Transition Report of the European Bank for Reconstruction and Development. Available at: https://www.ebrd.com/publications/transition-report-202223

Chart 33: Total and bank credit-to-GDP of companies in the countries of the European Union



Note: End-2021 data. The entire corporate loan portfolio includes loans from credit institutions, financial enterprises, households, public finances, loans from abroad and other sectors. Consolidated data, i.e. it does not include loans between domestic companies. Source: Eurostat, ECB

Chart 34: Corporate funds, bonds and deposits in proportion to GDP in the countries of the European Union



Note: End-2021 data. Source: Eurostat, ECB

to the changed real economy situation, however, demand for investment loans may taper off significantly in the future. On the whole, in this uncertain environment the growth rate of corporate loans outstanding may decelerate into single-digit territory by end-2023 (*Chart 32*).

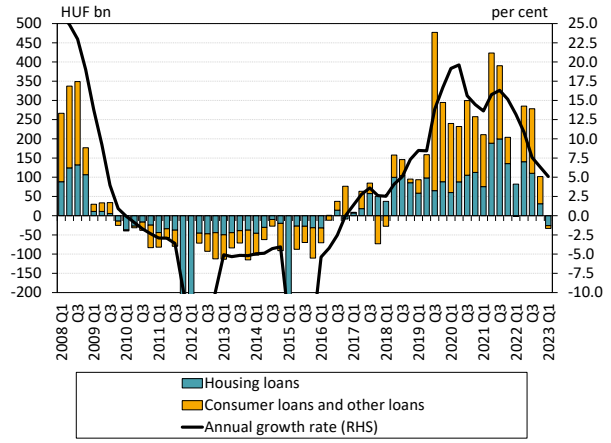
The corporate loan portfolio taken together with loans from abroad can be considered high in regional comparison. In comparison to the European Union, the value of Hungarian corporate loans in proportion to GDP was low, ranking twenty-first at the end of 2021, 14 percentage points below the average value of the European Union (*Chart 33*). However, it is typical of Hungarian companies that a relatively large proportion of their financing is realised from foreign loans. If we also include loans from financial companies, other sectors, and from abroad in the corporate loan portfolio, in a regional comparison, the Hungarian corporate loan portfolio is already the highest at the end of 2021, reaching 53 per cent of GDP in proportion. The expansion of foreign loans is not substantially higher than that of domestic loans: at the end of 2022, domestic loans increased by 15 per cent and foreign loans by 16 per cent. The expansion of foreign loans in recent years was entirely related to foreign currency loans, and thus the share of forint loans within the segment decreased from 23 per cent to 13 per cent.

The stock of corporate liquid assets in Hungary has grown significantly in recent years. The value of liquid assets as a share of GDP reached 20 per cent in 2013, in line with the regional average, and exceeded 32 per cent by the end of 2021. This was in line with the EU average and ranked 11th highest in the EU countries (*Chart 34*). It is remarkable that the rise in the Hungarian indicator accelerated significantly in 2020 and 2021. The expansion of liquid assets during this period may have been largely driven by measures to support corporate debt servicing and financing that were introduced after the emergence of the coronavirus, such as the credit moratorium or the announcement of large subsidised loan and guarantee schemes.

4. Household lending: falling loan disbursement, moderate client risks

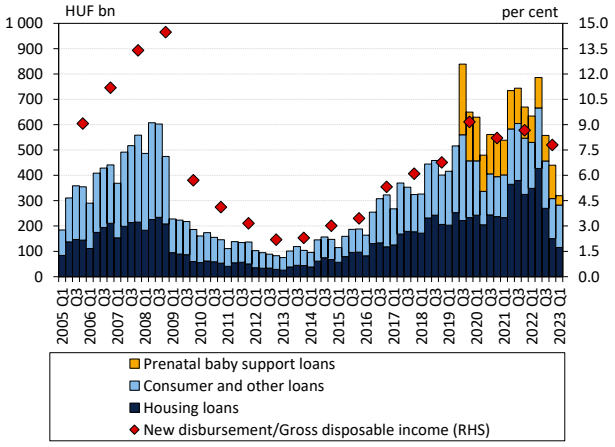
Household loans outstanding grew by 6 per cent in 2022 as the balance of disbursements and repayments, showing a much lower rate of increase than seen in recent years. In parallel with the uncertain growth outlook and tighter monetary conditions, new household loan disbursement also declined in 2022 H2, accompanied by a sharp fall in housing transactions. In the fourth quarter, housing loan disbursement was down to one half of the level from a year earlier, but this decline is not exceptional at the regional level. In line with tightening bank lending standards and declining average contract amounts, the loan-to-income and loan-to-value ratios of new clients decreased. In the retail loan market, average lending rates rose, within which market-based housing loans showed a smaller increase and state-subsidised housing loans showed a larger increase. The debt burden of clients taking out both subsidised loans and market-based loans can be significant, and the interest subsidy that must be repaid if the borrowers fail to satisfy the loans' childbirth-related conditions may pose an additional risk.

Chart 35: Household loan transactions of credit institution



Note: Including repayments flowing to Sberbank between March 2022 and August 2022. The acquisition of Sberbank's portfolio by the MKB is not eliminated from the 2022 Q3 transaction data. Source: MNB

Chart 36: New household loans in the credit institution sector



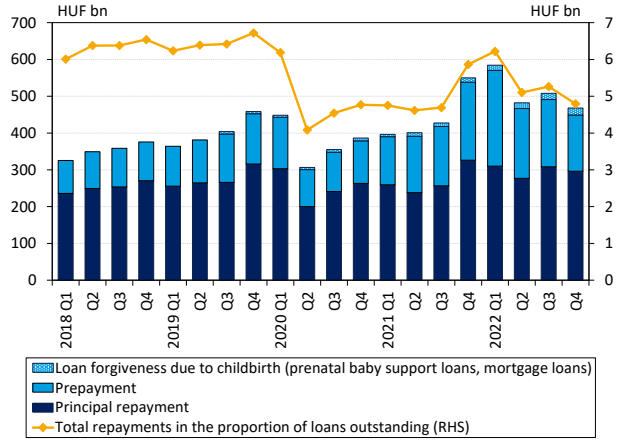
Note: Without FGS loans and early repayment scheme. The disbursement/income figure shows the sum of the annual nominal loan disbursement as a ratio of the household sector's total annual disposable income. Source: HCSO, MNB

4.1. Significant decline in new lending

The growth rate of household loans outstanding decelerated substantially in 2022. In 2022, household loan disbursements exceeded repayments by HUF 746 billion, less than in 2018–2021, raising the loans outstanding to nearly HUF 10,000 billion. Rising prepayment activity in the first half of the year and falling lending in the fourth quarter in response to the rising inflation and tight monetary conditions led to a more subdued stock expansion than in previous years. The annual change in household loans outstanding slowed to 6 per cent by the end of 2022 from 15 per cent one year earlier (*Chart 35*). Housing loans and prenatal baby support loans accounted for the largest share of the year-on-year increase in the loan portfolio, with the latter product accounting for one fifth of the total household loans outstanding at the end of the year. The slowdown in lending growth continued at the start of 2023, with the annual growth rate of households' bank loans outstanding at only 5.1 per cent in the first quarter, as a result of the HUF 33 billion decrease in the outstanding loan stock.

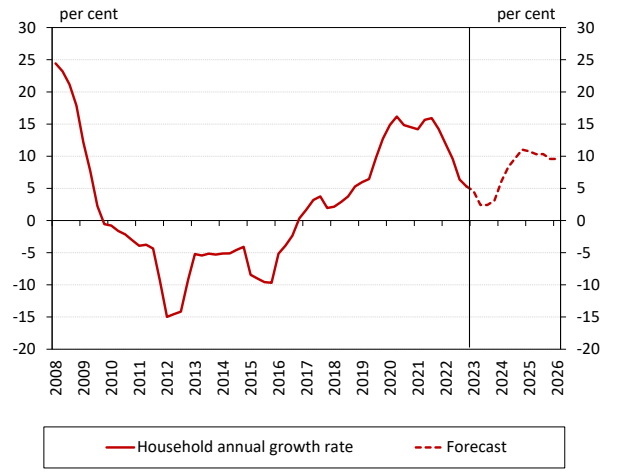
By the end of 2022, the volume of new lending had fallen significantly. In 2022, banks signed loan contracts worth around HUF 2,400 billion with retail clients, down 10 per cent on the 2021 figure. In 2022, the volume of lending in the fourth quarter was already 34 per cent less than a year earlier. The largest decline was registered in housing loans, which fell by 54 per cent. The high base caused by the FGS Green Home Programme, as well as the weaker loan demand linked to the declining number of housing market transactions due to the uncertain economic environment and tighter monetary conditions,

Chart 37: Prepayments within household loans outstanding



Note: Prior to July 2019, we do not have data on debt write-offs for childbirth. The debt write-off does not include the amount of the grant for the early repayment of home improvement loans. Source: MNB

Chart 38: Household lending forecast



Note: Transaction-based annual growth rate based on data from the financial intermediary system. Source: MNB

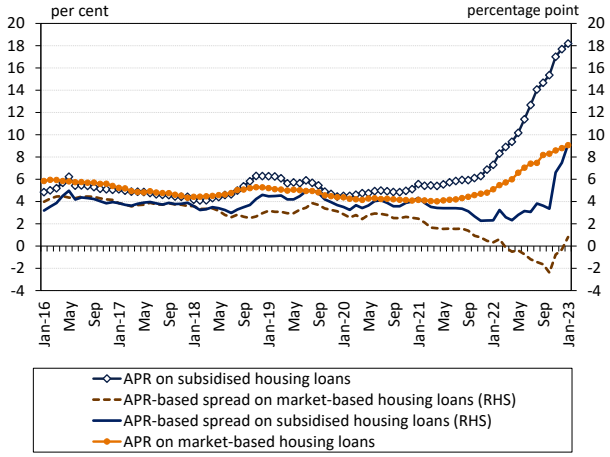
played a major role in this. Rising lending rates have also had an impact on regional housing loan markets, as discussed in more detail in Box 4. Within consumer loans in the fourth quarter, only the contracting of prenatal baby support loans exceeded the volume of the same period of the previous year, by around 7 per cent, which was also affected by demand brought forward due to the originally announced closure of the programme in December (*Chart 36*). However, in 2023 Q1, the HUF 37 billion disbursement of prenatal baby support loans was already below the level seen in 2022 Q1, and the disbursement of housing loans showed a 67-per cent drop compared to the same period of the previous year. As a result of the uncertain economic environment and tighter monetary conditions, the volume of retail loan disbursements in 2023 Q1 fell by one half in a year-on-year comparison.

In 2022, the repayment activity of retail clients increased. As of November 2021, only 5 per cent of household loans outstanding entered the payment moratorium in a tightened form, bringing the volume of principal repayments to a higher level. The government transfers allocated at the beginning of 2022 represented significant, one-off income for households, part of which was used to prepay existing loans, mainly hire purchase and other consumer loans, thus doubling the volume of prepayments in 2022 Q1 compared to the same period of the previous year (*Chart 37*). In 2022, the higher level of early repayments was maintained, mainly due to the "pricing out" of floating-rate securities loans as a result of the rising interest rate environment. Loan debt relief for children born[16] reduced household loans outstanding by HUF 66 billion in 2022.

Household loans outstanding are expected to rise slightly in 2023. The total financial intermediary system, i.e. credit institutions and financial corporations, expanded their retail loans outstanding by 5 per cent in 2022. Based on the responses to the Lending Survey, almost all banks surveyed reported a decline in loan demand for housing and consumer loans in 2022 Q4. In 2023 H1, we forecast a contraction in household loans outstanding due to falling loan demand in the context of tight monetary conditions and an uncertain economic

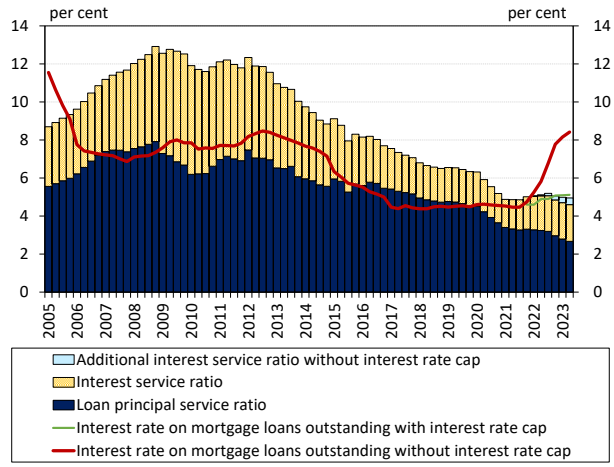
[16] As of 1 July 2019, in the case of mortgages taken out before the birth of children, borrowers can apply for a partial write-off of the principal amount on the birth of a second and subsequent children, or in the case of a prenatal baby support loan, they can apply for a partial write-off in the case of the arrival of the second and a full write-off in the case of the arrival of a third new child. Between January 2018 and June 2019, for the arrival of the third and each additional new child, it was possible to apply for a partial write-off of the mortgage principal, but we do not have data on the extent of this. The debt write-off due to the birth of children does not include the amount of the grant for the early repayment of home improvement loans.

Chart 39: APR and spread on new housing loans



Note: Averages weighed by contractual amount. Calculation excludes FGS GHP. The spreads were calculated on the basis of relevant BIRS data observed in the same period according to interest periods. Subsidised loans cover the subsidised HPS constructions, the subsidised bridging loans and the subsidised housing loans. Source: MNB

Chart 40: Debt-service of the households as a ratio of their sectoral disposable income and interest rate on mortgage loans outstanding with and without the interest rate cap



Note: Calculated with an interest forward path as of 19 April. Interest repayment burdens and principal repayments are calculated as a proportion of the disposable income of the household segment. The excess repayment burden without the interest rate cap was calculated ceteris paribus, i.e. only the interest rate on mortgages was changed compared to the scenario with the interest rate cap, everything else was assumed unchanged. The interest rate time series on the outstanding mortgage loan portfolio is a volume-weighted average interest rate, which is calculated from 2020 Q1 onwards on the basis of micro-data from the Credit Registry. Source: MNB

environment, which could result in annual loan dynamics slowing to around 2 per cent. However, from the second half of the year, as the economy returns to growth and previously deferred demand returns, lending dynamics may gradually strengthen. This is in line with the answers to the Lending Survey, as for 2023 Q2 and Q3, more than one quarter of surveyed banks also expect an increase in credit demand. Lending may grow at around 11 per cent in 2024 (*Chart 38*), supported by renewed higher demand for prenatal baby support loans, which will be phased out at the end of 2024.

4.2. Clients' credit risk remains low

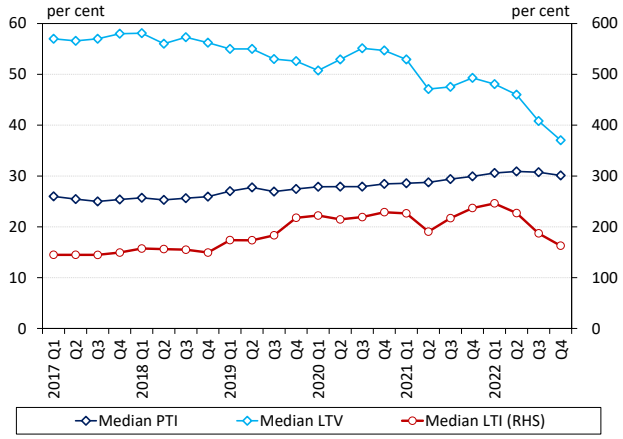
Subsidised housing loans are beneficial for clients and banks, but they represent a growing burden on the budget. In the increased interest rate environment, a particular increase is visible in the total annual percentage rate (APR) of subsidised housing loans, mainly those related to the Home Purchase Subsidy Scheme for Families (HPS) *(Chart 39).* The fixed 3-per cent client interest rate protects clients from interest rate rises on these products, but it is an increasing burden on the budget that covers the difference between client and bank lending interest rate, i.e. the interest subsidy to banks.[17] If we compare the APR to interbank yields, we can see that subsidised products are offered at a significant spread – 9 percentage points in January. Compared to the average interest rate on deposits, which also influences the cost of funding, there is a 15-percentage point spread on subsidised products, as interest rate transmission is much less prevalent in deposits than in loans. At the same time, this could help to set lower interest rates on market-based loans through cross-pricing, thus supporting the maintenance of bank loan supply.

At the sectoral level, the interest rate cap has only a modest impact on the ratio of debt servicing burdens-to-income of households. Since the start of the programme, the interest rate cap has provided more than HUF 100 billion in gains to households in the form of lower instalments by June 2023[18]. At the contract level, this means that by mid-2023 the median instalment would increase by one and a half times, from HUF 41,000 to HUF 63,000 for the loans concerned. Although in the

[17] For more information on pricing discrepancies, see: Dancsik Bálint – Marosi Anna – Szabó Beáta: Túl drága az olcsó hitel – a családi otthonteremtési kedvezmény támogatott hitelkamatainak vizsgálata (Cheap loans are too expensive: an examination of interest rates on subsidised housing loans). Közgazdasági Szemle (Economic Review), Vol. 69, December 2022 (pp 1493–1506)

[18] With government decrees 175 and 176/2023 (V.12.), the government extended the interest rate cap measures for households and SMEs until December 31, 2023.

Chart 41: Indebtedness indicators of new housing loans



Note: PTI: payment-to-income ratio. LTV: loan-to-value ratio. Loan-to-income ratio (LTI): the amount of loans taken out by the debtor, as a ratio of the debtor's annual income. In the case of Median LTV, the data is an estimate. In the case of LTI, we took into consideration if additional housing loans have been taken out at the same time by the debtor, and/or if (s)he has taken up prenatal baby support loan or personal loan(s) maximum 180 days prior to taking out the housing loan(s). Source: MNB

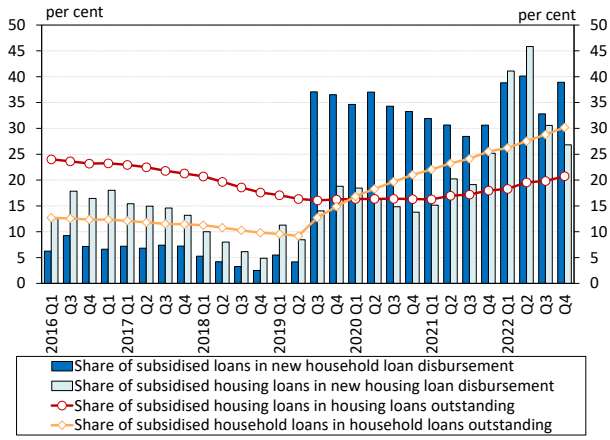
absence of the interest rate cap, the interest rate on the outstanding mortgage loan portfolio would be higher, approaching 8 per cent by the end of 2022 (*Chart 40*), this would not materially increase the (interest) repayment burden on total household loans outstanding as a share of disposable income. There are several reasons for this: on the one hand, only around 14 per cent of total household loans outstanding were subject to the interest rate cap at the end of 2022. On the other hand, repayments on loans subject to the interest rate cap are still not suspended, and the majority of consumer and overdraft loans, which account for 40 per cent of household loans outstanding, have inherently higher interest rates. In the MNB's view, the interest rate cap measure in its current form has several adverse macroeconomic effects, as reported in the November 2022 Financial Stability Report.[19]

Client indebtedness indicators decreased for new housing loan borrowers. The decline in loan disbursement is not only reflected in a drop in the number of contracts, but is also associated with lower average loan size: the average loan amount for housing loan contracts fell from a peak of HUF 15 million in April 2022, partly reflecting the impact of the FGS Green Home Programme, to HUF 10 million by January 2023. However, 16 per cent of clients do not only take out a single housing loan, but supplement it with another housing loan or other loan. For clients taking out at least one housing loan – considering the prenatal baby support and personal loan(s) taken out before their housing loan – the average loan amount fell from HUF 19 million in 2022 Q2 to HUF 14 million by the end of 2022. Accordingly, the relative indebtedness of new housing loan clients is also declining: clients taking out new housing loans were typically indebted up to 160 per cent of their annual income at the end of 2022, compared to 250 per cent at the beginning of 2022 *(Chart).*[20] The median loan-to-value (LTV) ratio also showed a significant decline in 2022, reaching only 37 per cent at the end of the year. This means that debtors are becoming less indebted in proportion to the value of the collateral, which further mitigates the financial stability risks in the event of a house price correction. The payment-to-income ratio nevertheless showed an insignificant decrease in the last few quarters, as the decrease in

[19] Financial Stability Report, November 2022, Box 2.

[20] The Austrian central bank compares nine Central, Eastern and Southeastern European economies' households' indebtedness and vulnerability based on 5 indicators and concludes that Hungary has a lower-than-average share of overindebted households. Enzinger et al. (2022): Financial vulnerabilities and debt at risk of CESEE borrowers: a cross-country analysis https://www.oenb.at/dam/jcr:0ffc38ec-3c25-4191-ad1f-a90b29b81228/03_FSR_44_Financial-vulnerabilities.pdf

Chart 42: Share of subsidised loans in the household segment



Note: Subsidised household loans cover prenatal baby support loans and subsidised housing loans. In case of subsidised housing loans, the FGS GHP scheme is also included. Source: MNB

Table 3: Number of clients with subsidised loans at the end of 2022

Number of clients (thousands)	Prenatal baby support loan	HPS-loan	Other subsidised housing loan	Combinations including more than two types of loans	
Prenatal baby support loan	217.2			Prenatal baby support loan + market based housing loan + HPS	25.3
HPS-loan	33.1	46.5			
Other subsidised housing loan	5.0	3.5	88.1	Prenatal baby support loan + market based housing loan + other subsidised housing	1.8
Market-based housing loan	72.3	23.5	15.1		
Personal loan	28.0	9.7	14.5	Prenatal baby support loan + market based housing loan + personal loan	8.5
Home equity loan	4.8	1.5	5.6		
Number of clients having that particular loan type	**414.8**	**165.1**	**148.9**	**Number of clients having subsidised loan types**	**635.8**

Note: The client has at least one loan of the given loan type as a debtor or co-debtor. Other subsidised housing loans cover home renovation loans, loans under the FGS GHP scheme (which are not HPS loans) and other subsidised housing loans. Source: MNB

contractual amounts has been counteracted by an increase in interest rates.

4.3. Failure to comply with the conditions of subsidised loans may pose an increasing risk

A significant proportion of household loans are associated with state interest subsidies. HPS loans and prenatal baby support loans have all contributed to the rise of the ratio of subsidised loans within both new loan disbursements and loans outstanding in the household segment *(Chart 42).* These subsidised loans are an attractive alternative for clients with children or planning to have children in a rising interest rate environment, due to their low client interest rates.[21] There is a risk, however, that if the childbirth condition is not fulfilled within the timeframe set by the regulation,[22] the clients will have to repay the interest subsidy they have received in one sum.[23] The amount of this is increasing, due to the rising interest rates: while for a HUF 10 million prenatal baby support loan taken out in July 2019 the repayable interest subsidy would be HUF 1.7 million, for a loan taken out in January 2023 the repayable interest subsidy would be HUF 7.2 million after five years (assuming the transaction interest rate at the time of taking out the loan remains unchanged).[24] Additionally, these products play a significant role in the housing market as well,[25] and thus their non-performance could lead to price correction as a result of the sale of collaterals.

The majority of the clients with subsidised loans have several debts. At the end of 2022, 635,000 clients had a subsidised loan product – prenatal baby support loan, HPS loan, or other subsidised housing loan – as a debtor or as a co-debtor *(Table **3**)*. In the case of 45 per cent of these clients, the subsidised loan has been supplemented by other loan product(s). Out of the almost 415,000 prenatal baby support loan clients for instance, 197,000

[21] In the case of a prenatal baby support loan, the client does not pay any interest during the interest subsidy period, and in the case of loans linked to HPS, the interest rate payable by the client is 3 per cent.

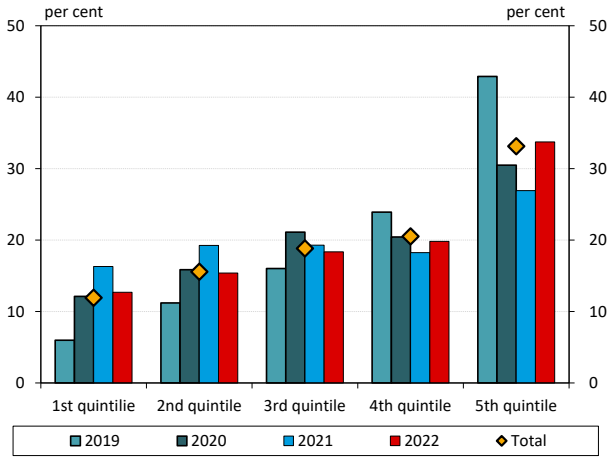
[22] Or the couple violates the terms in other ways, such as deciding to divorce in the case of a prenatal baby support loan.

[23] The difference between the transaction interest rate set by the banks and the client interest rate is reimbursed to the banks by the state in the form of an interest subsidy. If the childbirth (or adoption) condition of the loan is not fulfilled, the interest rate on the prenatal baby support loan will be adjusted to 130 per cent of the then average yield of the ÁKK plus 4 percentage points and the interest subsidy will be terminated. HPS loans become market-based and their interest rate subsidies are abolished. The interest subsidy must be repaid in both cases. In the case of the HPS, the HPS subsidy must also be repaid, with a 5 per cent "penalty rate".

[24] Subsidised loans typically have a five-year interest period, meaning that they are repriced every five years.

[25] As a result of the introduction of the prenatal baby support loan, the ratio of loan transactions has increased in small settlements with low price to square meter ratio. The reason behind this may be the fact, that the maximum amount of the loan could cover the purchase of the property.

Chart 43: Distribution of prenatal baby support loan debtors based on income quintiles



Note: 2022 data is based on income thresholds of 2021. Source: MNB

clients had one or several other loan(s) at the end of 2022, which can result in a significant total debt burden, as the prenatal baby support loan itself has a high maximum amount (HUF 10 million). Clients having both prenatal baby support loan and market-based housing loan had a typical total debt outstanding of HUF 18 million, while clients who also have an HPS loan beside these products, typically had total debt outstanding of HUF 29 million at end-2022.

However, the majority of the prenatal baby support loans are already permanently interest-free. For half of the borrowers with a prenatal baby support loan, the loan has already become permanently interest-free because at least one child was born or adopted after the loan was disbursed. This significantly reduces the repayment risks for this product. So far, only a small proportion of contracts, around 1 per cent, could have been converted into subsidy, but our questionnaire survey suggests[26] that this could eventually be the case for up to 15 per cent of borrowers, based on the number of children born and planned. Two per cent of respondents said they do not have or plan to have children – in which case the loan becomes market-based and the interest subsidy must be repaid – but this is further narrowed by those who cannot have children for health reasons.[27] In the case of prenatal baby support loans, the overall risk of repayment of the interest subsidy for clients may thus be moderate, and is further reduced by the fact that the majority of borrowers are from the upper income segments *(Chart 43).*

BOX 4: LENDING DYNAMICS IN AN INTERNATIONAL COMPARISON

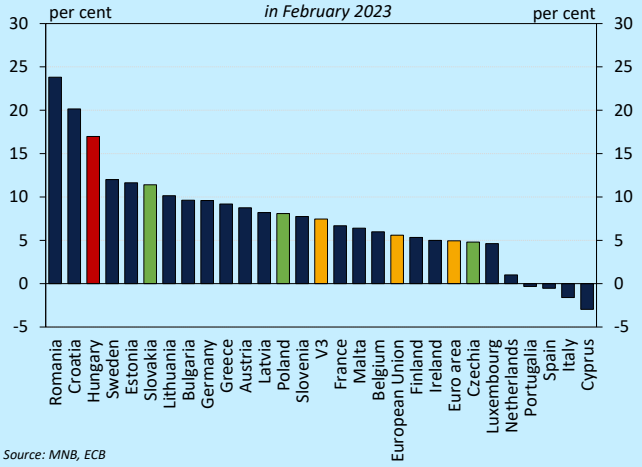
Hungarian lending trends in the retail and corporate segments do not differ from those observed in the European Union. In 2022, inflation and a parallel tightening of monetary conditions, together with uncertain growth prospects, led to a decline in credit outflows and an increase in prepayments. As a combined result of these factors, the loans outstanding of the credit institutions sector, excluding the impact of large one-off transactions, grew at a slower pace during 2022 and the trend is expected to continue in 2023. In many countries, the slowdown in the credit market is also reflected in a decline in credit demand perceived by banks and tighter lending conditions.

[26] In June 2022, the Magyar Nemzeti Bank – repeating its May 2020 survey – conducted a questionnaire survey among prenatal baby support loan debtors with the cooperation of commercial banks. The survey aimed to identify loan purposes, plans for having children and possible future repayment difficulties. A total of 6,348 people completed the survey, representing 4.1 per cent of all debtors. The results are representative by the quarter of borrowing and by the type of settlement.

[27] However, we do not take into account possible divorces, in which case the interest subsidy will also be terminated and will have to be repaid.

The slowdown in corporate credit dynamics is widespread across the European Union. In February 2023, growth in corporate loans outstanding slowed down in all but three EU countries, bringing the annual corporate credit growth in the European Union to 6 per cent in February 2023. By contrast, due to the impact of large one-off transactions, domestic loans outstanding increased by 17 per cent in year-on-year terms, significantly above the average growth rates of both the EU and Visegrad countries. However, the loans outstanding of micro, small and medium-sized enterprises, which are more in line with the underlying processes, are already showing a sharper slowdown in Hungary: In mid-2021, the annual growth rate of SME loans outstanding was 21 per cent, but at the end of 2022 it was only 13 per cent.

Annual growth rate of corporate loan portfolio in EU Member States in February 2023

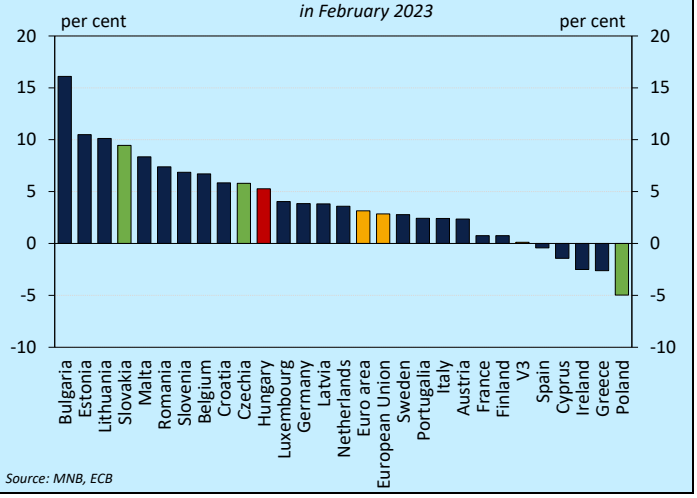


Source: MNB, ECB

The slowdown in the credit market is also a consequence of the tightening of credit conditions offered by banks, in addition to weaker demand. The euro area, Hungary and most countries in the region saw a gradual tightening of corporate credit conditions in 2022. The tightening is mainly a response to the deterioration of the economic environment, while banks' lending capacity (liquidity and capital position) remains stable. Corporate lending rates rose in all countries. In 2022, in line with the extent of monetary tightening, Hungarian corporate lending rates increased the most in the region, with the average interest rate on loans in local currency with floating interest rates over the year rising by 13 percentage points, while in Poland and Czechia it increased by 5 percentage points and in Slovakia and the euro area by 2 percentage points. However, the actual increase in Hungarian corporate interest rates was significantly lower, as a considerable share of companies obtained financing through subsidised loan programmes instead of market-based loans. The tightening of monetary conditions and deterioration in the macroeconomic environment led to a decline in demand for investment loans in both the euro area and Hungary, while demand for short-term liquidity loans typically increased in the region, in line with the increased financing needs associated with companies' higher operating costs.

The slowdown in household lending dynamics continued in almost all EU Member States in early 2023. In February 2023, growth in household loans outstanding fell in all but two EU Member States compared to the end of 2022, bringing the annual growth rate in the European Union to 3 per cent in February 2023. Thus, the 5-per cent increase in domestic household loans outstanding continued to exceed the EU average, but compared to the regional countries, it is higher only than in Poland.

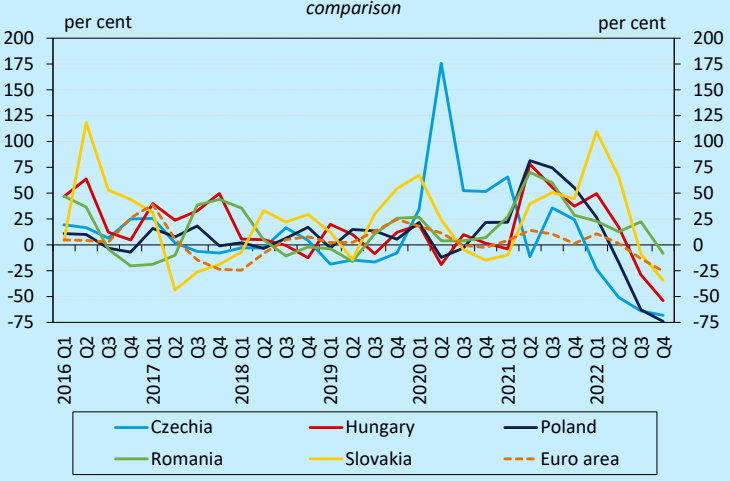
Annual growth rate of household loan portfolio in EU Member States in February 2023



Source: MNB, ECB

Uncertain economic environment and tighter monetary conditions have dampened demand for housing loans. In February 2023, the volume of new housing loan contracts in Hungary was 68 per cent lower than in the same period of the previous year. A similar decline was observed in the Visegrad countries: New housing loans fell by 53 per cent in Czechia, 67 per cent in Slovakia and 64 per cent in Poland. The volume of new housing loans in the euro area fell by 39 per cent. The increased interest rate environment is spilling over into household lending rates in more and more countries, but typically with a lag: the average 3-month smoothed interest rate on newly extended housing loans in Hungary stood at 10 per cent at the end of 2022, after a 6-percentage point annual increase, while in the region, the smoothed rate on housing loans in Poland and in Czechia was 9 per cent and 5 per cent, respectively. In the euro area, the rise has been more subdued, and thus housing loans were available in Slovakia at below 3 per cent at the end of 2022 Q4.

Annual change in new housing loan contracts in an international comparison



Source: MNB, ECB

Banks reported tighter lending standards and declining credit demand at the end of 2022. The fall in demand for housing loans was felt by almost all domestic banks surveyed and was also widely felt by European banks (a net 74 per cent of them). Banks also reported a slowdown in demand for consumer loans in Hungary and the EU in the fourth quarter. In both Hungary and in the euro area, the responding institutions tightened household lending conditions in the fourth quarter. In most countries, banks cited deterioration in the economic outlook and the liquidity and capital position as factors contributing to tightening, while in Hungary, deterioration in the economic outlook is the main driver. In 2023 Q1, domestic banks left housing loan conditions unchanged and do not intend to change them looking forward. In the first quarter, banks saw a decline in demand for housing loans and a pick-up in demand for consumer loans, but looking ahead, demand is expected to increase in both segments.

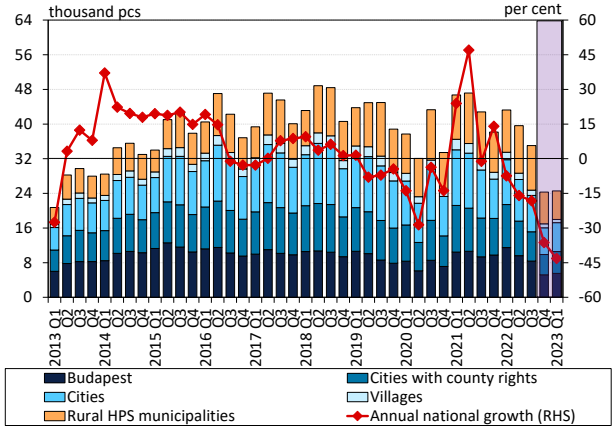
A general slowdown in the credit markets is apparent, which is a natural phenomenon at a time when the economic outlook is deteriorating. Thus, domestic data and conditions are in line with regional trends.

5. Real estate markets: declining real estate market activity, with moderate risks for banks

From the second half of 2022, domestic housing market activity declined significantly, with the number of transactions falling by 43 per cent year-on-year in the first quarter of 2023. The decline in housing market demand has been driven by tightening monetary conditions, a wait-and-see approach due to the uncertain economic outlook and a price level that has risen significantly in recent years. In 2022 Q3 and Q4, housing prices have already declined slightly in nominal terms, and their overvaluation relative to fundamentals also eased in the second half of the year. The financial stability risks of housing market overvaluation are mitigated by the fact that the median LTV ratio of mortgages issued since 2016 is only around 50 per cent.

Although significant volumes of new developments in the domestic commercial real estate market are no longer being started with the exception of the industrial-logistics segment, the buoyant development activity in recent years is expected to result in significant completion volumes, while rental demand in most segments is below the pre-pandemic levels. Consequently, vacancy rates are expected to rise in the short to medium term, while the increase in expected yields on real estate investments in 2022 points towards a decline in property values. The ratio of the banking system's exposure to project loans backed by commercial real estate to own funds and the balance sheet total is also roughly half of the ratio seen in 2011–2012, reflecting banks' lower sensitivity to the real estate market and stronger resilience to shocks.

Chart 44: Housing market transactions by settlement type



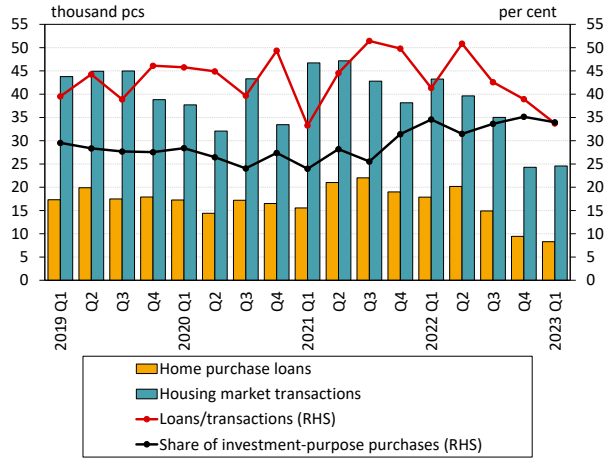
Note: Taking into account only 50 and 100 per cent acquisitions of ownership by private persons. 2021 Q3 until 2022 Q3 NTCA levy database data adjusted on the basis of the estimation of the level of processing by settlement type. The last two quarters highlighted in purple are based on real estate agents' transactions and estimated market shares. According to our estimate, in March 2023, real estate agents' transactions amounted to 12.4 per cent of the national market turnover and 15.0 per cent of the sales in Budapest. Source: NTCA, MNB, housing agents' database

5.1. Overvaluation eased as the number of transactions fell

The number of housing market transactions dropped to an extremely low level by the end of 2022. Since October 2022, there have been fewer than 10,000 housing transactions per month nationally, with the number of sales falling to levels not seen since 2013. For 2022 as a whole, the national number of sales was around 142,000, which represents a 19-per cent decline compared to 2021, but also a 3-per cent decline compared to 2020, which was hit by severe restrictions due to the pandemic. Compared to 2022 Q1, the number of transactions fell by 43 per cent nationwide, dropping by 52 per cent in Budapest, 49 per cent in cities with county rights and 36 per cent in other rural towns, while the number of transactions in settlements eligible for rural HPS declined by 32 per cent *(Chart 44).* With such a decline in housing market activity, properties collateralising mortgages will also sell more slowly or at lower prices, which could increase banks' loss given default.

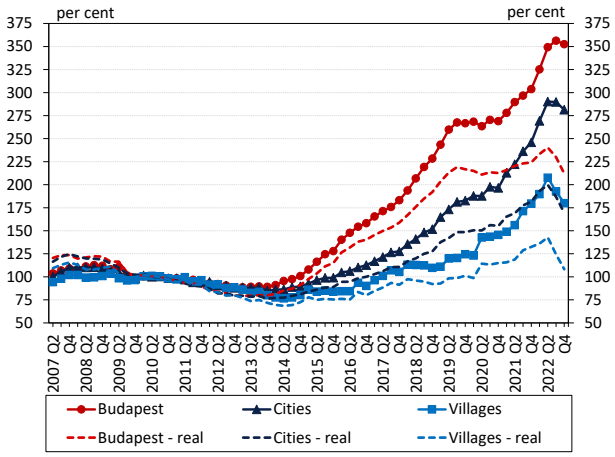
In addition to the decline in lending, the uncertain economic outlook and high price levels have also contributed to the contraction in demand. In 2023 Q1, the number of loans taken out for housing purposes decreased from 18,000 to 8,000 compared to the same prior-year period, reducing the housing market loan-to-transaction ratio from 41 per cent to 34 per cent *(Chart 45).* The decline in

Chart 45: Number of home purchase loans and housing market transactions, and share of buyers with investment purposes



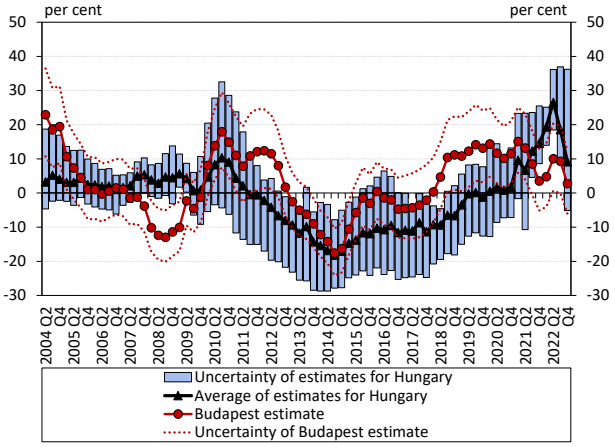
Source: NTCA, MNB, Duna House

Chart 46: Nominal and real MNB house price index by settlement type (2010 = 100 per cent)



Note: Real price index deflated by consumer price index. Source: MNB

Chart 47: Deviation of house prices from the level justified by estimated fundamentals, nationwide and in Budapest



Note: For detailed methodology, see the May 2023 Housing Market Report of the MNB. Source: MNB

purchases on credit was probably mainly due to the rise in lending rates. At the same time, the number of housing market transactions decreased more than the number of loan contracts – from 43,000 to 25,000 – during the period under review, suggesting that the market participation of buyers purchasing purely from own funds also decreased. The main reasons for this may have been the high price level, the uncertainty about the general economic outlook and a wait-and-see attitude towards buying. At the same time, the number of those buying with investment purposes fell less than those buying on loan, thus accounting for a ratio of 34 per cent, which was basically unchanged versus the same prior-year period.

A mild decline was already registered in housing prices in 2022 H2. According to the MNB's house price index, housing prices fell by 4 per cent in nominal terms on national average in 2022 Q4, after a moderate, 2-per cent decrease in the third quarter. Consequently, the annual nominal growth rate of house prices slowed significantly, dropping from 29 per cent in the second quarter to 11 per cent by the end of the year. Nominal annual house price dynamics slowed to 16 per cent in Budapest and to 14 per cent in cities, while housing prices in villages stagnated on an annual basis in 2022 Q4 (*Chart 46*). In the high inflationary environment, housing prices declined by 10 per cent nationally in real terms in the fourth quarter and by 5 per cent in the capital. Based on our preliminary data, house prices may have risen by 4 per cent at the national level and fallen by 1 per cent in Budapest in 2023 Q1, with annual nominal house price dynamics continuing to decelerate, reaching 6 per cent nationwide and 7 per cent in Budapest.

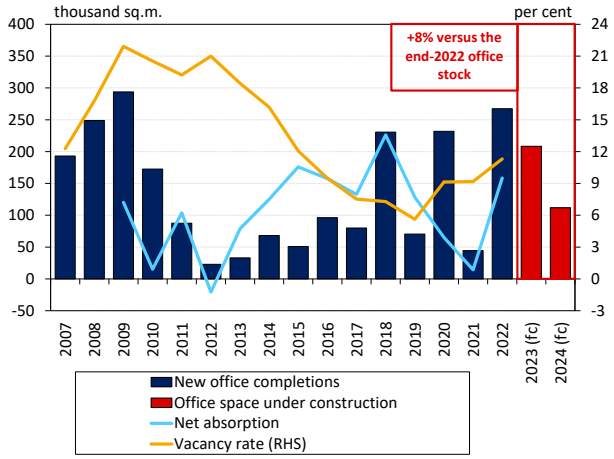
Housing market overvaluation eased in 2022 H2. As a result of the slightly lower nominal house prices and falling real house prices due to rising inflation, as well as the favourable macroeconomic fundamentals, such as the stable labour market, overvaluation in the housing market eased in 2022 Q3 and Q4. At the national level, the overvaluation of house prices relative to economic fundamentals fell from 27 per cent in the second quarter to 9 per cent in the fourth quarter, and from 10 per cent to 3 per cent in Budapest over the same period *(Chart 47).* From the perspective of the stability of the banking system, it is favourable that the imbalance eased as a result stable fundamentals and only a moderate fall in nominal house prices, rather than via a substantial decline in nominal house prices, as the latter would increase the loss given default on bank mortgages by depreciating bank collateral. The financial stability risk of a possible depreciation of collateral is mitigated by the fact that the median LTV of mortgages disbursed

Table 4: Main features of the Hungarian commercial real estate market at the end of 2022

	Office	Industrial-logistics	Retail (shopping centre)	Hotel
Vacancy rate	11.3%	3.8%	8.1%	39.4%
Change in vacancy rate versus end-2019 (percentage points)	+5.7	+1.9	+5.1	+30.4
Change in demand versus pre-COVID level	-36%	+64%	-	-21%
New supply under construction as a percentage of existing stock	+8%	+15%	0%	+8%
Change in average offered rent versus end-2019	+8%	+12%	-	-
Change in investment yield versus end-2019	+75 bp	-75 bp	+100 bp	-

Note: Based on end-2022 data. Factors pointing to a decline or increase in the value of properties are with red and green background, respectively. In the case of hotels, the vacancy rate (100 per cent – room occupancy) and its change refer to hotels in Budapest in the January–December 2022 period. The change in demand compared to pre-pandemic level is the comparison of total (gross) rental demand in 2022 and 2019. Source: CBRE, Cushman & Wakefield, HCSO, MNB

Chart 48: Development activity and vacancy rate in the Budapest office market



Note: Based on end-2022 data. Source: Budapest Research Forum, Cushman & Wakefield

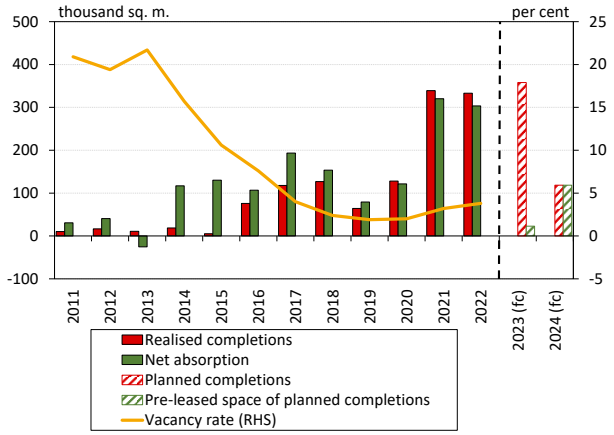
since 2016 has mostly been between 50 and 60 per cent, falling to 37 per cent by 2022 Q4. The loan portfolio which is vulnerable due to housing market overvaluation is discussed in detail in Box 5.

5.2. Mounting but differing risks in the commercial real estate market, by segment

In 2022, rising investor yields pointed to a downward trend in property values. Among the commercial property segments, rental demand activity remained buoyant in the industrial-logistics market in 2022, with demand 64 per cent higher than in 2019, the year before the coronavirus pandemic *(Table 4).* The large industrial investments currently in progress in Hungary play a significant role in this high demand. However, in 2022, demand in the office market was more than one third lower than in 2019, while the number of hotel guest nights was one fifth lower. Significant development volumes are under construction in all segments except retail. With the completions, vacancy rates may also increase, in the office market over the short term already, and in the industrial-logistics segment rather over a time horizon of more than one year. In 2022, the volume of commercial real estate transactions fell by 28 per cent on an annual basis, while in the second half of the year, the yield expected by investors rose in all segments, a factor pointing towards a depreciation of properties.[28] However, despite the rise in yields, the prime yield on the industrial logistics market in and around Budapest is still 75 basis points lower than at the end of 2019.

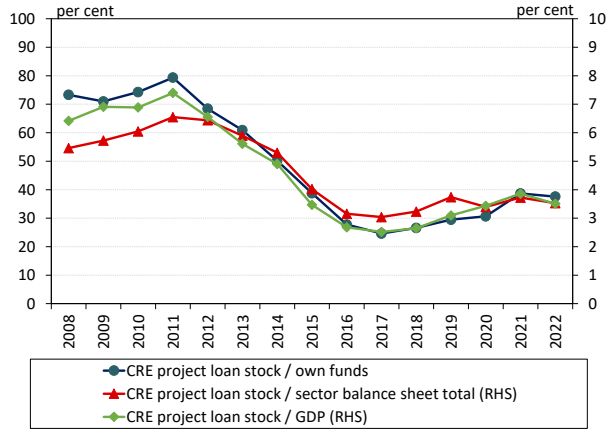
Office development activity in Budapest is declining, but with expected completion volumes, the vacancy rate is expected to rise in 2023. A record volume of new office space (267,000 square metres, equivalent to 7 per cent of the 2021 year-end stock) was completed in Budapest in 2022, with a higher level only seen in 2009 *(Chart 48).* Net market absorption, a measure of the change in office stock in use, was also high in 2022, driven by the completion of several owner-occupied office buildings, but even with the high level of this indicator, the vacancy rate increased. In Budapest, 320,000 square metres of office space was under construction at the end of 2022 (8 per cent of the total stock), of which more than 200,000 square metres is expected to be completed in 2023. 22 per cent of office space under construction had a pre-lease agreement at the end of the year, representing a significant decline from levels of over 35 per cent in recent years. In addition, there has been a decline in office development activity, with no significant volume of new developments in recent quarters. Based on the volume of developments in progress

Chart 49: New completions, net absorption and vacancy rate in the industrial-logistics market of Budapest and environs



Note: Based on end-2022 data. Source: Budapest Research Forum, Cushman & Wakefield

Chart 50: The significance of commercial real estate project loans in the banking system



Note: Credit institutions sector excluding affiliates, based on non-consolidated data, increased by the real estate Bond Funding for Growth Scheme (BGS) portfolio. Source: MNB

and the level of demand, the vacancy rate is expected to rise further in 2023. Pointing to this direction too, the prevalence of remote work could mean cost reduction potential for tenants, and thus represents an upward risk in the vacancy rate.

The industrial-logistics segment is characterised by buoyant development activity and high demand. The 333,000 square metres of new space completed in 2022 in the industrial-logistics market in and around Budapest was 2 per cent lower than the historic high in new supply registered in 2021 *(Chart 49).* Despite the high completion volumes, the vacancy rate remained low, at 4 per cent at the end of the year, due to buoyant demand. Significant new supply (358,000 square metres, 15 per cent of the stock) is expected also in 2023, with a pre-lease rate of only 6 per cent at the end of 2022. However, the large industrial investments underway in Hungary – with a strong weight in vehicle and related electrical equipment manufacturing, which account for 93 per cent of the large investments announced between January 2022 and March 2023 in terms of total investment volume – are generating significant demand for industrial-logistics developments. This is likely to absorb the new supply entering the market in the short term.

The increase in project loan risks may have a moderate impact on financial stability. Including loans disbursed to finance housing estates, credit institutions' project loans outstanding collateralised with commercial real estate doubled in the past five years, reaching the 2010–2011 level in nominal terms. As the eurozone interest rate environment rises, the interest rate risk of the commercial real estate project loan portfolio increases, as 81 per cent of the portfolio is denominated in foreign currencies, predominantly in euros, and 86 per cent of this is at floating rates. In the case of HUF project loans, the share of floating-rate loans is 31 per cent, or 7 per cent of total project loans. Since mid-2021, with the tightening of monetary conditions, interest rates on these loans have risen the most, and two thirds of them are linked to residential development projects and hotels. However, considering the shock-absorbing capacity of the institutions, their real estate market exposure is much lower than at the onset of the economic crisis in 2008. The ratio of the commercial real estate-backed project loan portfolio of credit

[28] With regard to the office markets in the Central and Eastern European region and Western Europe, we have analysed the potential extent of depreciation based on the development of prime yields and supply rents, the details of which are presented in the MNB Commercial Real Estate Market Report April 2023.

institutions to own funds, taking into account the institutions' exposure to the real estate market through corporate bonds issued under the Bond Funding for Growth Scheme (BGS), was 38 per cent at the end of 2022, compared to 79 per cent and 68 per cent respectively in 2011–2012 *(Chart 50).* The exposure of the banking system, both as a share of the balance sheet total and as a share of GDP, has risen slightly in recent years, but the current, 3.5-per cent levels of these indicators are significantly below the levels of around 6 per cent and 7 per cent seen during the 2008 crisis, respectively. Overall, the riskiness of real estate loans in the credit institutions sector is on the rise in both the retail and corporate segments. The most exposed and vulnerable portfolios are discussed in Box 5.

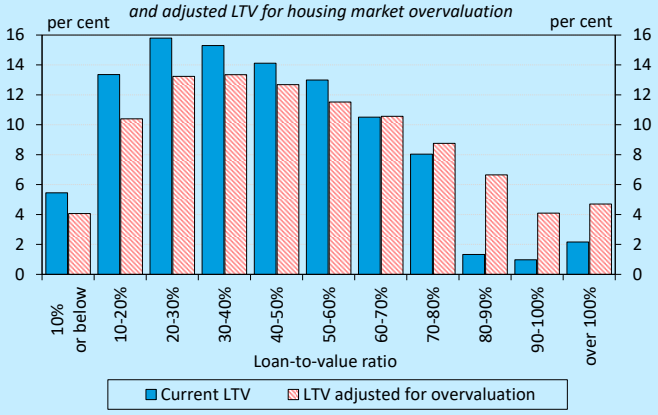
BOX 5: RISKS ARISING FROM CREDIT INSTITUTIONS' EXPOSURES TO THE REAL ESTATE MARKET IN THE EVENT OF A POSSIBLE MARKET CORRECTION

Real estate market developments are closely linked to bank lending and have an impact on the balance sheet and profitability of the banking system. A significant recovery was seen in the current real estate market cycle: Compared to 2013, the number of transactions in the housing market increased by 63 per cent to 173,000 by 2021, while the investment turnover of the domestic commercial real estate market increased by 252 per cent to EUR 1.25 billion. Although the real estate market exposure of domestic credit institutions is currently lower than during the global financial crisis, both in terms of regulatory capital and the balance sheet total, the stock of real estate loans has increased substantially in nominal terms, expanding by 80 per cent compared to 2016 Q4. In 2022, a significant drop was observed in activity on the domestic real estate market, especially in the second half of the year. The number of transactions in the housing market fell by 27 per cent in year-on-year terms, while the volume of commercial real estate investment fell by 53 per cent. Reduced market activity makes it more difficult to sell properties and may reduce their value. According to previous research, rising house prices and imbalances in the housing market are leading to an increase in the level of banking risk in Hungary.[29] In this Box, we thus examine the real estate exposures of the Hungarian credit institutions sector by segment, to see where risky loans can be identified in light of real estate market trends.

[29] Ádám Banai and Nikolett Vágó (2018): The effect of house prices on bank risk: empirical evidence from Hungary, NBP Working Paper No. 289. Available at: https://static.nbp.pl/publikacje/materialy-i-studia/289_en.pdf

The impact of a possible house price correction on banks would be limited, due to the low loan-to-value ratios. In areas with the highest housing market overvaluation, a potential housing price correction could also increase the credit risk of bank exposures in those areas. Moreover, if a house price correction is associated with a high debt-to-collateral ratio among borrowers, it reduces the chances of a loss-free closure of the loan transaction through the sale of collateral in the event of a default. For these reasons, we analysed the retail mortgage loan portfolio according to the housing market overvaluation of the district where the collateral is located and the current loan-to-value ratio (LTV). Only 4.4 per cent of the outstanding mortgage loan portfolio has a current LTV above 80 per cent. Within this, only in the case of 1.5 per cent of the stock is the collateral residential property located in an area where house price overvaluation may have exceeded 20 per cent in 2022. We estimate that, with a full correction of housing market overvaluation, 15.4 per cent of the mortgage stock would be above 80 per cent LTV and only 4.7 per cent above 100 per cent LTV. This is in line with research showing that, due to a decline in lending with high LTV, the loss given default (LGD) of newly disbursed mortgages in Hungary has improved significantly since 2009.[30]

Distribution of the mortgage loan portfolio according to the current and adjusted LTV for housing market overvaluation



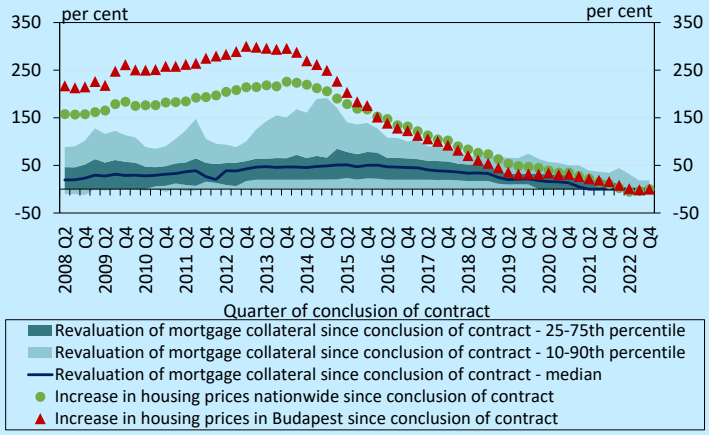
Note: December 2022 stock. The overvaluation was calculated based on the percentage deviation of the house price-to-income ratio from its long-term average. Housing prices for 2022 are calculated based on the first three quarter. Source: MNB

Distribution of the mortgage loan portfolio in 2022 Q4 according to the estimated housing market overvaluation of the collateral and the current loan-to-value ratio

%		Estimated housing market overvaluation					
		undervalued	0% - +10%	10% - 20%	20% - 30%	above +30%	Total
Current LTV ratio	30% or below	1.9	4.4	12.5	12.8	3.1	**34.6**
	30-50%	1.9	3.9	10.2	10.6	2.8	**29.4**
	50-70%	1.5	3.1	7.9	8.7	2.3	**23.5**
	70-80%	0.4	0.9	2.7	3.3	0.7	**8.1**
	80% or above	0.4	0.5	2.0	1.1	0.4	**4.4**
	Total	**6.1**	**12.9**	**35.2**	**36.6**	**9.3**	**100.0**

Note: The overvaluation was calculated based on the percentage deviation of the house price-to-income ratio from its long-term average. Loans with a current LTV ratio above 150 per cent are excluded. Source: MNB

Revaluation of mortgage collateral and the rate of increase in house prices between the date of conclusion of the contract and 2022 Q4



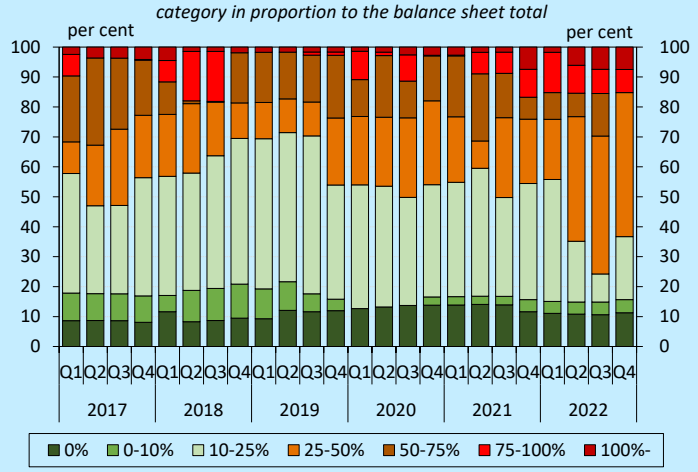
Note: Based on the outstanding mortgage loan portfolio at the end of December 2022. The housing price increase is based on the MNB housing price index. Source: MNB

Residential property collateral has been conservatively valued by banks, which significantly mitigates the risks stemming from a downturn in the housing market. Financial institutions have gradually increased the value of the residential mortgage collateral underlying the mortgages on their balance sheets in response to the appreciation of housing market prices. However, the revaluation of collateral has been conservative: even for mortgages contracted in early 2016, the median appreciation was only 50 per cent until 2022 Q3, and for 90 per cent of collateral, the total appreciation was 128 per cent or less compared to the value at the time of contracting. By comparison, since 2016 Q1, house prices have risen by 153 per cent on average nationally and by 151 per cent in Budapest. The conservative recording of collateral values also reduces the banking system's vulnerability to a potential downturn in the housing market.

[30] Bálint Várgedő (2022): A magyar lakossági jelzáloghitelek egy sztochasztikus nemteljesítéskori veszteség modellje (A stochastic loss given default model of Hungarian residential mortgages), MNB Occasional Papers, No 146, November 2022. Available at: https://www.mnb.hu/letoltes/mnb-tanulma-ny-hun-146-vegleges.pdf

The stock of project loans as a share of the balance sheet total is substantially lower than the post-2008 crisis level, while the share of banks with higher project loan exposure increased somewhat after 2020. As a result of portfolio cleaning activity and the institutions' improving capital position, the share of institutions in the credit sector with a ratio of project loan exposure backed by commercial real estate to regulatory capital of higher than 75 per cent had declined by the end of 2018. However, the share increased again from 2020 onwards, with these institutions accounting for 15 per cent of the sectoral balance sheet total at the end of 2022, and the share of institutions with a project loan-to-regulatory capital ratio of 25–50 per cent also increased last year.

Distribution of credit institutions' project loan stock/regulatory capital by category in proportion to the balance sheet total



Note: Non-consolidated data of the credit institution sector without branches. Source: MNB

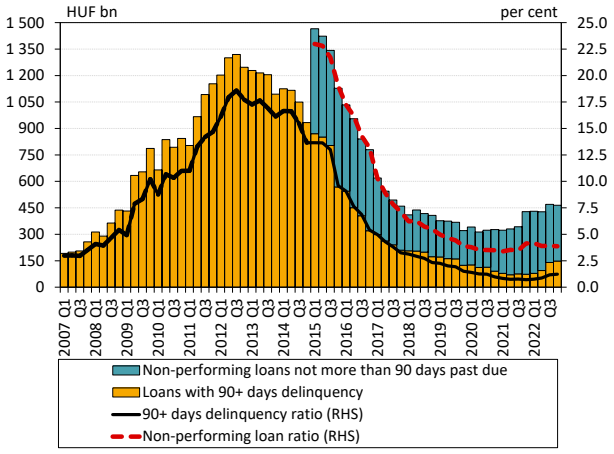
The vast majority of commercial real estate exposures are concentrated in a relatively small number of large transactions, while the largest exposures are associated with properties with favourable market characteristics. At the end of 2022, credit institutions' commercial real estate-backed project loan portfolio, which includes residential development projects, was comprised of around 1,300 projects. In terms of number of transactions, the 260 transactions with the largest amount, which account for 20 per cent of the portfolio, represent 82 per cent of the project loan stock, and 97 per cent of the exposures are linked to one half of the transactions, meaning that the majority of the portfolio is concentrated in a relatively small number of large transactions. The average exposure of project loan transactions at the sector level is around HUF 2 billion, and HUF 14 billion in the top decile, which accounts for 64 per cent of the project loan portfolio. Therefore, if the profitability of projects linked to only a few large exposures were to deteriorate as a result of the uncertain economic environment, this would also have a significant impact on the capital position of institutions with high exposure to regulatory capital ratio. However, in line with the rise in real estate exposure, since 2020 institutions have tightened their lending criteria for commercial real estate, and most of the largest project loans are used to finance properties that have favourable characteristics in terms of market demand. These characteristics are central location, good accessibility, completion of the building within a few years, green building certification (BREEAM, LEED, DGNB in most cases) or favourable energy efficiency.

6. Portfolio quality: ratio of non-performing loans is low, loan loss coverage increased

The non-performing loan ratio (NPL ratio) has moved away from its historical low after the phase-out of the general payment moratorium in October 2021, mainly due to those who remained in the moratorium. In 2022, the NPL ratio in the retail segment stagnated between 4.2 per cent and 4.4 per cent, while in the corporate sector it was 3.9 per cent at the end of the year, following a steadily downtrend. Accordingly, the banking sector's NPL ratio for the private sector exceeds the EU average by 1.7 percentage points. In the corporate segment, loans past due over 90 days doubled during 2022, but still account for only 1.2 per cent of the corporate loan portfolio. In the household segment, the rate rose by 0.3 percentage points to 1.5 per cent. Thus, overall, the phase-out of the general moratorium has not led to a significant build-up of overdue stock, supported – in addition to a stable labour market – by government measures to curb the rise in repayments due to the increased interest rate environment. However, the uncertain economic outlook poses an upward risk to the non-performing loan ratio.

In both the corporate and household segments, loan loss provisions expanded at a faster rate than the growth in loans outstanding, reflecting banks' forward-looking preparation for potential losses. Loan loss provisions for corporate and household loans increased by 32 per cent and 26 per cent, respectively, last year. By the end of 2022, the loan loss coverage ratio had also increased, but only moderately, as it rose by 0.1 percentage point to 3.4 per cent in the corporate segment and by 0.8 percentage point to 4.9 per cent in the household segment. Loan loss coverage in the credit sector as a whole is high by European standards as well.

Chart 51: Ratio of non-performing corporate loans of the credit institution sector



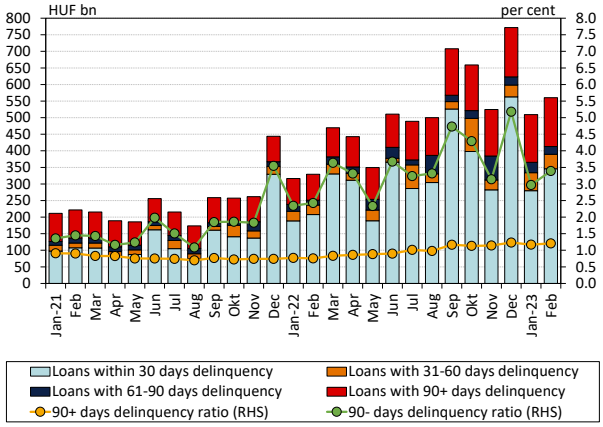
Note: The definition of non-performing loans changed in 2015. From then on, in addition to loans over 90 days past due, loans less than 90 days past due where non-payment is likely are also classified as non-performing. Calculated by clients until 2010 and by contracts from 2010. Source: MNB

6.1. Volume of non-performing loans rose at the same pace as the loan stock

The share of non-performing corporate loans declined slightly, but the share of the loan portfolio over 90 days past due within the portfolio increased. The stock of corporate bank loans over 90 days past due amounted to HUF 148 billion at the end of December, thus doubling in one year (*Chart 51*). In parallel with this, the loan portfolio not over 90 days past due but classified as non-performing declined by HUF 39 billion to HUF 316 billion. The ratio of non-performing loans (NPLs) over 90 days past due increased from 17 per cent to 32 per cent, approaching the pre-moratorium level of around 40 per cent. Overall, non-performing loans outstanding increased by HUF 36 billion, while the NPL ratio decreased by 0.3 percentage point to 3.9 per cent by the end of 2022, due to a larger increase in the loan stock (denominator effect).

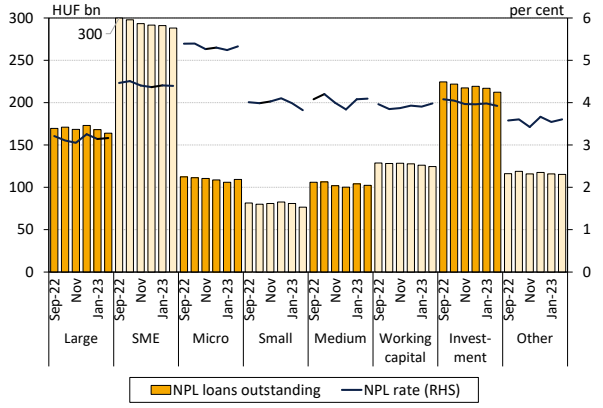
In early 2023, the NPL ratio of corporate loans outstanding continued to decline and short delinquencies also did not increase after the termination of the moratorium. In December 2022, the final, fourth phase of the moratorium, which was introduced following the outbreak of the Covid-19 pandemic and involved 1 per cent of corporate loans, was closed. Nevertheless, the stock overdue by less than 90 days fell at the beginning of the year, but this is partly due to seasonality within the

Chart 52: Delinquent corporate loans of the credit institution sector by duration of delinquency



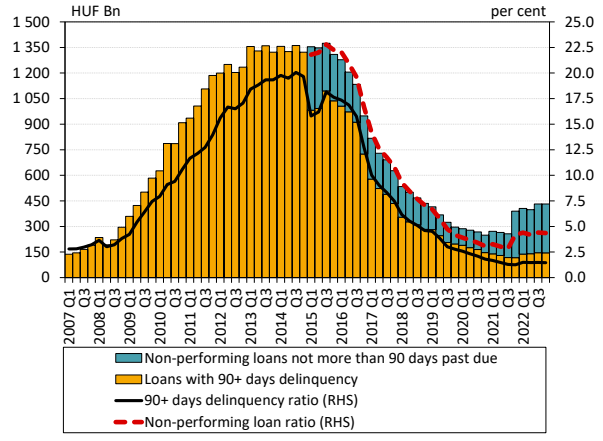
Source: MNB

Chart 53: Non-performing corporate loan ratio by company size and product type



Source: MNB

Chart 54: Ratio of non-performing household loans of the credit institution sector



Note: The definition of non-performing loans changed in 2015. From then on, in addition to loans over 90 days past due, loans less than 90 days past due where non-payment is likely are also classified as non-performing. Calculated by clients until 2010 and by contracts from 2010. Source: MNB

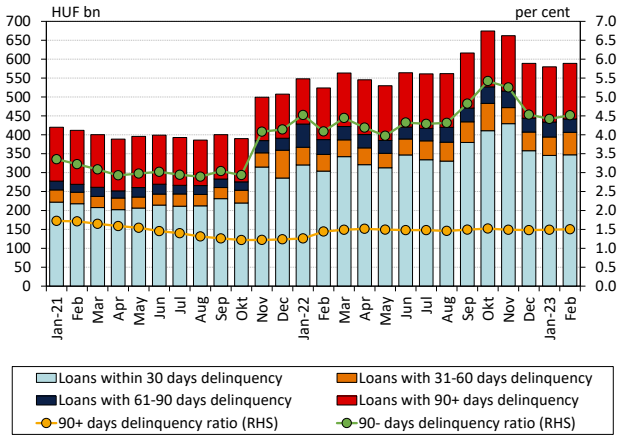
year.[31] The stock overdue within 90 days increased by a total of HUF 46 billion between December 2021 and February 2023. Its ratio rose to 3.5 per cent after the general moratorium was phased out, after fluctuating significantly during 2022, and reached 3.4 per cent in February 2023 *(Chart 52).* However, a large, 86 per cent share of the loan portfolio maximum 90 days past due is still recorded by banks as performing. The portfolio over 90 days past due remained unchanged in the first two months of the year. The NPL ratio of the overall corporate loan portfolio continued to decline in early 2023, amounting to 3.7 per cent at the end of February.

The NPL ratio in the large corporate segment fell sharply, but it rose moderately in the SME segment. By company size, the NPL ratio of the large corporate portfolio declined significantly by 1 percentage point to 3.2 per cent between December 2021 and February 2023, in line with the stronger expansion in loans outstanding (*Chart 53*). At the same time, there was a slight increase of 0.2 percentage points for the SME segment, bringing the share of non-performing SME loans to 4.4 per cent at the end of February 2023. Within this, micro-enterprise loans had the highest NPL ratio of 5.3 per cent. By loan purpose, the NPL ratio decreased in all segments in 2022. However, in the first two months of 2023, there was a mild increase in working capital loans and a decrease in investment and other loans.

The NPL ratio of the household sector has fluctuated between 4.2 per cent and 4.4 per cent since the general moratorium was phased out. The non-performing loans outstanding of households increased by HUF 42 billion to HUF 432 billion in 2022. Within this, the portfolio not past due over 90 days but non-performing increased by HUF 14 billion, and thus still accounts for two thirds of the non-performing portfolio (*Chart 54*). The loan portfolio over 90 days past due increased by HUF 28 billion during the year. The household NPL ratio rose from a historical low of 2.8 per cent after the moratorium was narrowed at the end of October 2021 to 4.2 per cent by the end of the year and 4.4 per cent at the end of 2022. The volume of restructured loans in the household sector fell by one half during the year, explained by the preferential treatment

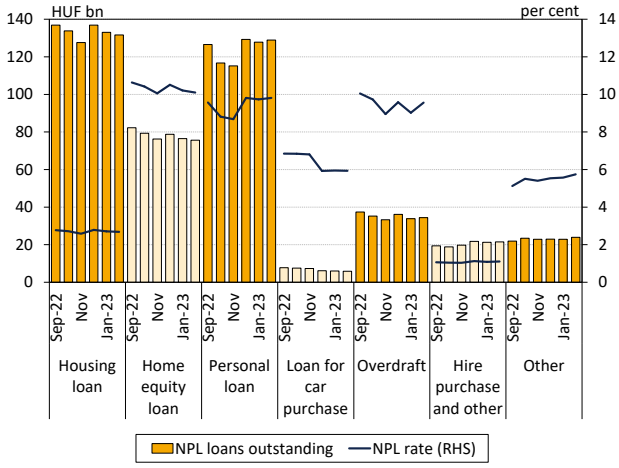
[31] Seasonality is caused (not exclusively, but recurrently) by a technical effect, as the fees and charges associated with financing are charged quarterly, which are often settled by companies within the month, but not when repayments are due.

Chart 55: Delinquent household loans of the credit institution sector by duration of delinquency



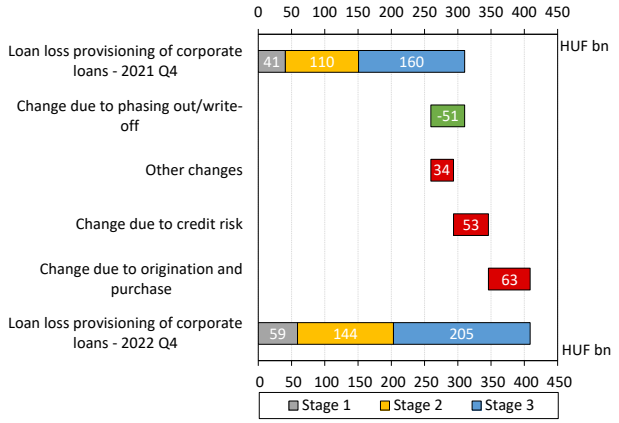
Source: MNB

Chart 56: Ratio of non-performing household loans by product type



Source: MNB

Chart 57: Loan loss provisioning of corporate loan portfolio



Note: Credit institution sector. Source: MNB

of clients quitting the moratorium following a 6-month monitoring period.[32]

The household loan portfolio in short delinquency has not changed significantly since the moratorium was terminated. The portfolio of household loans less than 90 days overdue – 86 per cent of which are still classified as performing – increased by HUF 51 billion between December 2021 and February 2023 (*Chart 55*). This increase was attributable to loans with up to one month of past due but still classified as performing. From September 2022 onwards, there was an increase in the loan portfolio with a short payment delay of 30 days, but this trend reversed in December. Overall, the phase-out of the general moratorium and the targeted moratorium has not led to any substantial increase in delinquencies, but the government's interest rate cap measures have also contributed to this.

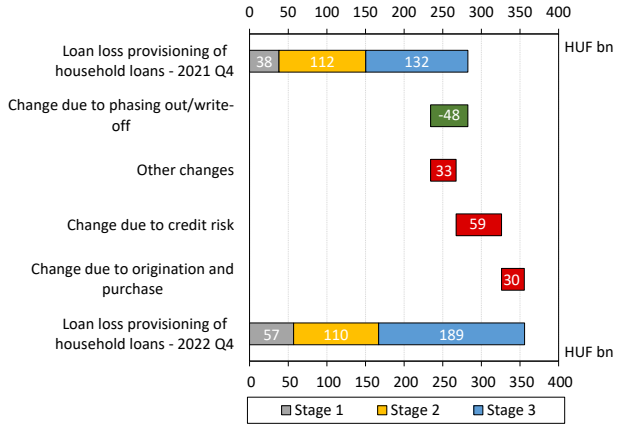
The NPL ratio of mortgage loans fell, while the NPL ratio of unsecured loans rose. For housing loans, the share of non-performing loans decreased slightly to 2.7 per cent at the end of February 2023. The NPL rate for home equity loans dropped to 10.1 per cent, but remains the highest by product type (*Chart 56*). In the non-housing purpose loan portfolio, the NPL ratio increased for all product types except vehicle purchase loans, with the largest increases recorded in personal loans and overdrafts. The NPL ratio of the total household loan portfolio fell slightly in early 2023, reaching 4.3 per cent at the end of February.

6.2. Loan loss coverage increased

Loan loss provisions expanded faster than loans outstanding. Loan loss provisions for corporate loans increased by 32 per cent to HUF 409 billion (*Chart 57*) and rose by 26 per cent to HUF 356 billion for household loans in 2022 (*Chart 58*). This was driven both by the increase in loan loss provisions recognised at origination due to the expansion of the loans outstanding and by the increase in credit risk, which was only partly offset by derecognitions and write-offs. In the corporate segment, loan loss provisioning increased in all three Stage categories, with Stage 1 by 45 per cent, Stage 2 by 31 per cent and Stage 3 by 29 per cent. In the household segment, the increase occurred in Stage 1 and Stage 3 stocks, at 50 per cent and 43 per cent, respectively. Loan loss provisions may

[32] A restructured classification can be terminated after the 6-month monitoring period if the client has not been delinquent for more than 30 days during this period and the amount of arrears does not exceed EUR 100 and there are no circumstances that would trigger a restructuring in themselves. Source: MNB Executive circular

Chart 58: Loan loss provisioning of household loan portfolio



Note: Credit institution sector. Source: MNB

Table 5: Loan loss coverage in the corporate segment

	Stage 1	Stage 2	Stage 3
Large corporation	0.6%	3.9%	49.6%
SME	0.7%	5.4%	44.6%
Micro	0.8%	6.5%	40.6%
Small	0.7%	3.8%	38.1%
Medium	0.7%	5.9%	54.8%
Working capital loan	0.5%	3.0%	52.3%
Investment loan	0.8%	5.6%	43.4%
Other loan	0.8%	5.5%	46.2%
Project loan	0.9%	9.9%	41.0%
Loan secured by commercial real estate	0.8%	6.1%	47.4%
Credit institution sector in total	**0.7%**	**4.9%**	**46.5%**

Note: End-December 2022 data. Red shading means coverage below the average, blue shading means coverage above the average. Source: MNB

Table 6: Loan loss coverage in the household segment

	Stage 1	Stage 2	Stage 3
Housing loan	0.4%	5.0%	34.9%
Home equity loan	0.7%	6.7%	39.7%
Personal loan	3.1%	18.3%	69.1%
Vehicle loan	0.5%	5.7%	91.4%
Overdraft	2.4%	13.1%	61.9%
Hire purchase and other consumer loans	1.2%	6.9%	56.4%
Other loans	0.7%	4.7%	40.8%
Credit institution sector in total	**1.0%**	**8.1%**	**51.6%**

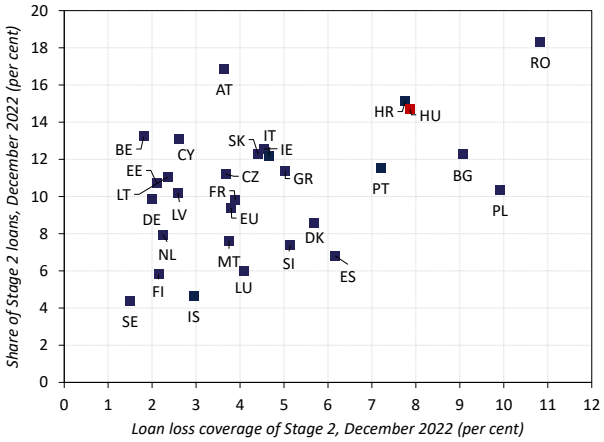
Note: End-December 2022 data. Red shading means coverage below the average, blue shading means coverage above the average. Source: MNB

continue to rise in 2023, in line with a further increase in credit risk: based on banks' expectations the creditworthiness of clients may deteriorate due to inflationary pressures and uncertainty in the economic environment.

Loan loss coverage for corporate loans increased slightly. Loan loss coverage for corporate loans rose 0.1 percentage point over the year to 3.4 per cent at the end of 2022. Within this, the average coverage of Stage 1 loans ended the year at 0.7 per cent after an increase of 0.1 percentage points, Stage 2 loans at 4.9 per cent after a decrease of 0.7 percentage points, and Stage 3 loans at 46.5 per cent after an increase of 4.6 percentage points. There is no significant heterogeneity in the loan loss coverage of Stage 1 loans by company size and loan purpose. However, for Stage 2 loans, the average coverage ratio is lower for small and large company loans and for working capital loans, and significantly higher for project loans (*Table 5*). In the case of Stage 3 loans, the coverage of the medium-sized company loans and working capital loans portfolio is significantly higher than the average for the whole population. With the exception of medium-sized companies and project loans, impairment coverage in all segments according to company size and loan purpose showed a slight increase in 2022.

Loan loss coverage of the total household loan portfolio increased. Loan loss coverage of the household sector's loan portfolio increased by 0.8 percentage points to 4.9 per cent in 2022. The average coverage of Stage 1, Stage 2 and Stage 3 loans rose by 0.3 percentage point to 1 per cent, 0.7 percentage point to 8.1 per cent and 3.8 percentage points to 51.6 per cent, respectively, over this period. The loan loss provision coverage of mortgage-backed and unsecured loans differed significantly in all loan loss categories in December 2022. Housing loans and personal loans clearly reflect this difference: loan loss coverage for personal loans is nearly 3 percentage points higher in Stage 1, 13 percentage points higher in Stage 2 and 34 percentage points higher in Stage 3 (*Table 6*). The significantly higher-than-average coverage of the portfolio is typical for overdrafts and Stage 3 vehicle purchase loans. In the case of personal, hire and purchase and other loans, the largest rise in coverage occurred in 2022 for these loans, with increases observed in all three Stage categories. Housing and home equity loans were characterised by stagnation and a slight decrease.

Chart 59: Loans classified as Stage 2 and their loan loss coverage in an international comparison



Note: EBA data are based on a sample consisting of 162 banks. Based on non-consolidated data. Hungarian data is based on three banks.
Source: EBA

Loan loss coverage of domestic banks' loan portfolio is high by European standards. In relation to the appearance of the uncertain economic environment in credit risk and its impact on loan loss provisioning, it is also worth examining the EU comparison of the loan loss coverage of the riskier Stage 2 loans. In 2022 Q4, both the share and the coverage of Stage 2 loans at Hungarian banks were high by international standards (*Chart 59*). The share of Stage 2 loans outstanding in Hungary was 5.3 percentage points above the EU average and 3.4 percentage points above the Visegrad countries' average, while the loan loss coverage was 4.1 percentage points above the EU average and 1.9 percentage points above the Visegrad countries' average.[33] The European Banking Authority's (EBA) sample of 162 banks in Europe, including three Hungarian banks, also shows that the banking sector's NPL ratio for the private sector exceeds the EU average by 1.7 percentage points in Hungary. Overall, portfolio quality is therefore slightly below average and loan loss coverage is appropriate by European standards.

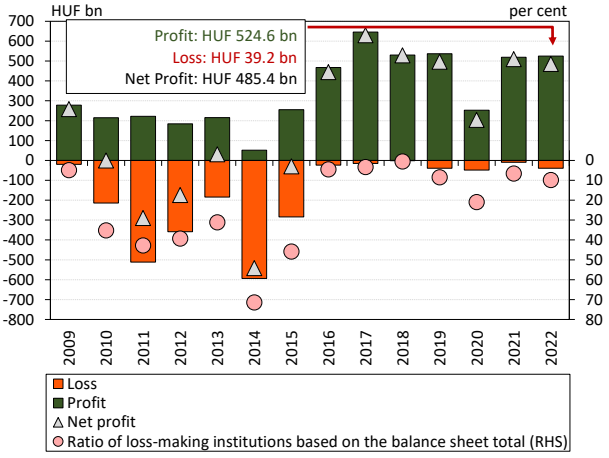
[33] It is important to note that the differences in coverage across countries may be explained to a great degree by composition effects, such as the differences between the shares of the household and corporate sectors.

7. Profitability and capital position: extraordinary items offset by interest income and strong capital position

In 2022, the credit institution sector recorded an after-tax profit of HUF 485 billion according to non-consolidated data, down 5 per cent on the previous year's result. The consolidated profit, which also includes the profits of domestic and foreign subsidiaries, amounted to HUF 824 billion. The decline in after-tax profit is mostly explained by the recognition of loan loss provisions and the extra profit tax as well as the impact of the interest rate cap measures; the profit-reducing effect of these items was primarily offset by the outstanding interest income. The sector's return on equity (ROE) fell from 10 per cent at the end of 2021 to 9 per cent, while the return on assets (ROA) declined from 0.9 per cent to 0.7 per cent. Although the level of profitability has not changed significantly compared to the previous year, the increase in expected returns has resulted in 55 per cent of institutions' profits being below the cost of equity.

The consolidated capital adequacy ratio of the banking sector amounted to 18.2 per cent at the end of 2022, after a decline of 1.5 percentage points from the all-time high at the end of 2021, which was due to the dividend payout restriction, while the CET1 ratio reached 16.1 per cent. The increase in the total risk exposure amount in 2022 was mainly driven by credit risk exposure amount, including exposures to corporates, central governments and central banks. The increase in own funds was driven by the retained earnings of previous years and the rise in CET1 capital. The credit institution sector's free capital above the overall capital requirement amounted to HUF 1,528 billion (4.2 per cent on a TREA basis). The capital position of the institutions was still satisfactory, even with unaudited profit and capital requirements applicable from July 2023, and the leverage ratio is above 4 per cent for almost all banks and above 6 per cent for four fifths of them.

Chart 60: After-tax profit and loss of the credit institution sector



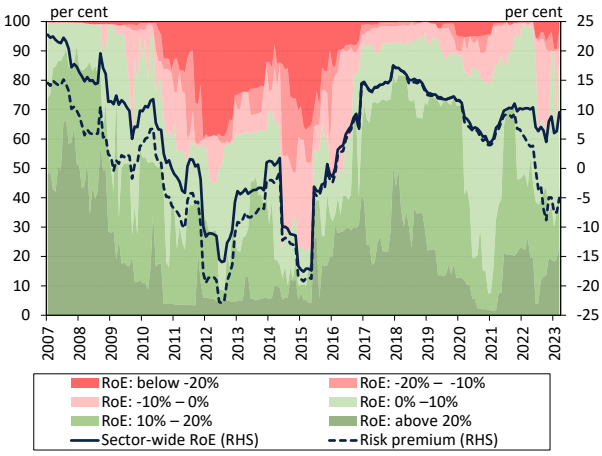
Note: At the end of 2022, the ratio of loss-making institutions in terms of total assets was 3.9 per cent based on consolidated data. Source: MNB

7.1. Impact of negative items was offset by interest income increase

The after-tax profit of the credit institution sector only declined by a moderate degree in 2022. In 2022, the credit institution sector recorded an after-tax profit of HUF 485 billion according to non-consolidated data, down by HUF 24 billion (5 per cent) on the previous year's profit (*Chart 60*). The number of institutions with a negative profit at the individual level is modest, with a share by balance sheet total not exceeding 10 per cent of the sector, and these institutions only recorded losses totalling HUF 39 billion. The consolidated profit, which includes the profits of domestic and foreign subsidiaries as well, amounted to HUF 824 billion, which was HUF 26 billion (3 per cent) higher than in 2021. In the same period, the profit of financial enterprises declined by HUF 32 billion to HUF 118 billion.

The return on equity (ROE) has fallen below the risk-free rate of return at the sector level and, for some banks, is below the cost of equity. With a lower nominal profit and expanding equity, the 12-month rolling ROE dropped from 10 per cent at the end of 2021 to 9 per cent in 2022. However, due to sharply rising short interest rates, the

Chart 61: Distribution of 12-month rolling after-tax return on equity of credit institutions weighted by the balance sheet total



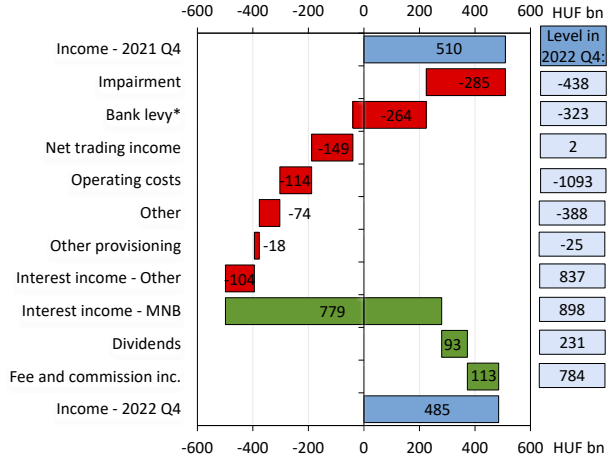
Note: Monthly time series based on non-consolidated data. The yield premium is the difference between the 12-month rolling ROE and the yield on the one-year Discount Treasury Bill. Backward-looking yield for the ROE, forward-looking yield for the Discount Treasury Bill. Source: MNB

Table 7: Distribution of banks by return on equity (ROE) and cost of equity (COE) at end-2022

		COE (2022)						
		< 6%	6-8%	8-10%	10-12%	12-14%	14% <	Total
ROE (2022)	< 6%	7.8	0.7	0.0	3.4	3.7	26.8	**42.3**
	6-8%	0.0	0.3	0.0	0.0	0.0	2.3	**2.6**
	8-10%	0.0	0.0	0.0	0.0	17.5	0.0	**17.5**
	10-12%	0.0	0.0	0.0	0.0	0.0	0.7	**0.7**
	12-14%	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
	14% <	0.3	8.7	0.6	1.7	12.5	13.2	**36.8**
	Total	**8.1**	**9.6**	**0.6**	**5.1**	**33.7**	**43.0**	**100.0**

Note: Weighted by balance sheet total. Source: MNB Bank Sentiment Survey

Chart 62: Annual changes in the after-tax income components of the credit institution sector

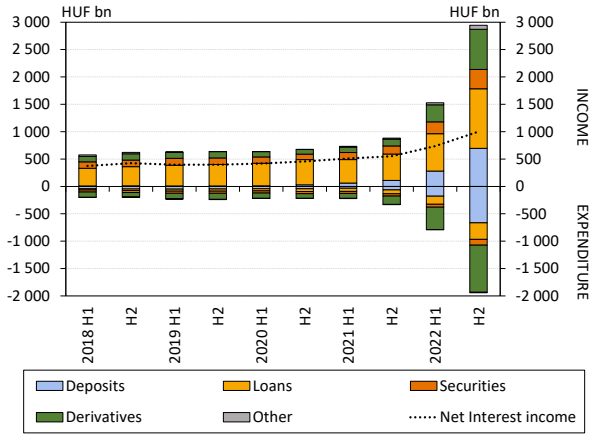


Note: Nominal values of income components at the end of 2022 are shown on the right-hand side. Interest income – MNB does not include interest income on derivative transactions with the MNB. *Bank levy includes the combined change in the 'normal' bank levy and the extra profit tax. Source: MNB

premium of ROE above the risk-free rate of return was already consistently in the negative range in 2022 H2 (*Chart 61*). As a result, the profitability of banks was well below the cost of equity for nearly one third of the sector on a balance sheet total basis (*Table 7*). However, it is worth noting that the trend in profitability in 2022 was not uniform, with a sharp deterioration in the first three quarters and a strong improvement in the fourth quarter. Intra-year fluctuations in profitability were largely influenced by government measures and the way they were treated in accounting, while changes in the policy interest rate also had a significant impact. While the majority of institutions accounted for the extra profit tax in the second quarter, the impact of the interest rate cap measures mainly affected the Q3 and Q4 profits, and the policy interest rate, which rose throughout the year, also peaked in the fourth quarter. This explains the fact that, while the income distribution of institutions showed only a slight shift towards lower income categories over the year as a whole, the fourth quarter showed a strong improvement. Based on 12-month rolling after-tax ROE data, the share of profitable credit institutions increased by nearly 24 percentage points to 90 per cent in the fourth quarter compared to the third quarter, which was still below the 94 per cent share registered at the end of 2021.

The moderate decline in after-tax profit was the result of changes in opposite directions. Among the items that reduced profit, loan loss provisioning reduced profit by HUF 285 billion more in 2022 than in 2021 (*Chart 62*). Impairment charges for domestic banks' exposures to Russia and Ukraine played a significant role in this increase, even though almost one third of the HUF 166 billion impairment for these exposures by end-September 2022 was reversed in the fourth quarter. Another major group of profit-reducing items were taxes on the banking sector, within which the accounting of the extra profit tax had a negative impact of HUF 227 billion on profit, while the increase in the bank levy, in force since 2010, meant an additional HUF 37 billion in expenditure compared to 2021. We estimate that the interest rate cap measures, which partly reduced interest income and partly reduced other income, caused a total loss of HUF 196 billion for the credit institutions sector in 2022, more than half of which was accounted for in the fourth quarter. The impact of the increase in the transaction fee, which amounted to nearly HUF 54 billion compared to 2021, is also included in the change in other income, but part of this increase was passed on and therefore also boosted fee and commission income. The contribution of net trading income to the profit was HUF 149

Chart 63: Changes in components of 6-month interest income in the credit institution sector



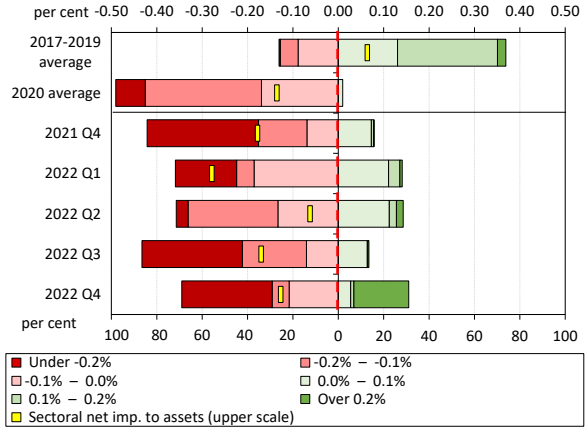
Note: Based on non-consolidated data. Source: MNB

Table *8: Changes in the portfolio of debt securities at fair value through other comprehensive income (FVOCI) and the impact of their revaluation in total equity*

(HUF billion)	End of 2021	End of 2022	Annual change
Debt securities (AC)	10 519	11 797	1 278
Debt securities (FVOCI)	**2 834**	**2 964**	**130**
Capital	1 426	1 986	560
Accumulated other comprehensive income	-88	-243	-156
- fair value changes of debt securities	*-44*	*-144*	*-100*
- cash flow hedges reserve	*-58*	*-113*	*-54*
Retained earnings	2 632	2 575	-56
Profit for the financial year	508	485	-24
Other capital and reserves	1 094	1 442	348
Total equity	**5 572**	**6 245**	**673**

Note: Based on non-consolidated data. AC: measured at amortised cost, FVOCI: measured at fair value through other comprehensive income. Source: MNB

Chart 64: Distribution of credit institutions by net impairment to assets ratio



Note: Total-asset-weighted distribution. Green categories represent net reversal of impairment, while red categories represent net recognition of impairment. Source: MNB

billion lower compared to the previous year, while the increase in operating costs at the sector level was HUF 114 billion higher than in 2021. This latter effect on profit is explained in equal parts by the annual increase in personnel expenses on the one hand, and in administrative costs and depreciation on the other hand.

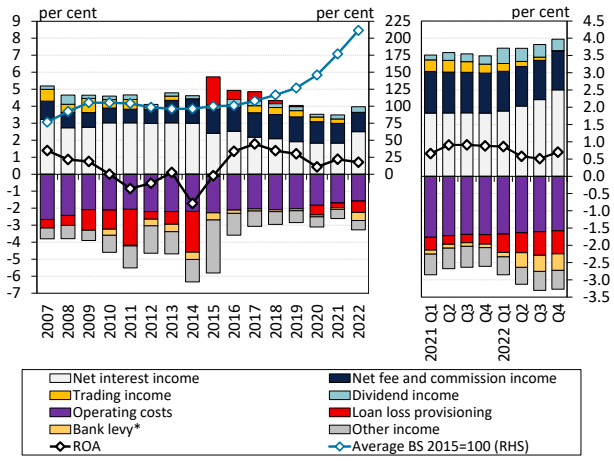
The impact of the negative items was mainly compensated by the surge in interest income. In 2022, the most significant item improving the profit was the HUF 675 billion increase in net interest income, which consisted of a HUF 779 billion increase in net interest income on on-balance-sheet items with the MNB and a HUF 104 billion decrease in net interest income with other sectors. The expansion in interest income was the result of the balance of the increase in net interest income of loans, securities and deposits as well as of the rising interest expense of derivative transactions (*Chart 63*). Interest income on loans increased the most, rising by HUF 859 billion, with around one half of this resulting from the increase in the average interest rate on corporate and household loans that are not subject to the interest rate cap or that are newly disbursed.[34] Interest income on asset-side deposits exceeded the 2021 figure by HUF 807 billion, which was primarily attributable to the historically high interest rates on central bank deposits. In 2022, however, interest expenditures on liability-side deposits also increased significantly, by around HUF 750 billion compared to the previous year, of which around HUF 300 billion is due to repricing of corporate and household deposits.[35]

The rising interest rate environment reduced the sector's equity moderately via a revaluation of debt securities. Most of the debt securities on the banking sector's balance sheet are fixed-rate, and thus their net present value is declining in the rising interest rate environment (Box 6). Depending on the accounting classification of the security, this repricing effect may be reflected in the profit/loss or in capital as well, if the security is measured at fair value. Although the vast majority of the debt securities portfolio is valued at amortised cost, which is not affected by repricing, a significant portion of almost HUF 3,000 billion at end-2022 belonged to the category of fair value through other comprehensive income (FVOCI), the repricing of which

[34] The remainder stems mainly from the rising interest income on the faster repricing interbank HUF loan portfolio and, to a lesser extent, from the interest income on foreign interbank loans, which are mostly denominated in foreign currency.

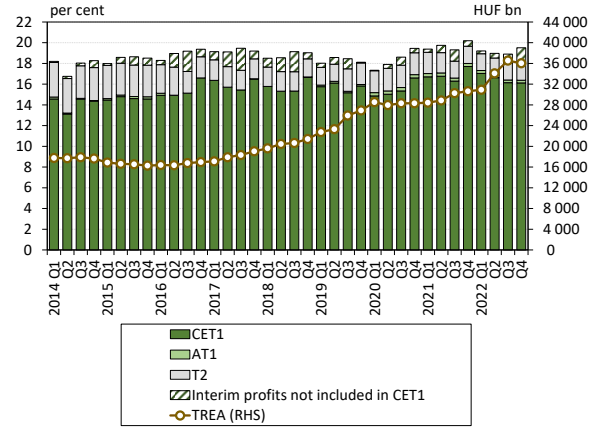
[35] The remainder stems mainly from the rising interest expenditure on the faster repricing interbank HUF deposit portfolio and, to a lesser extent, from the interest expenditure on foreign interbank liabilities, which are mostly denominated in foreign currency.

Chart 65: Changes in 12-month rolling income components relative to total assets in the credit institution sector



Note: Based on non-consolidated data. *Bank levy denotes the sum of „normal" bank levy and extra profit tax. Source: MNB

Chart 66: Consolidated capital adequacy and total risk exposure amount of the banking sector



Source: MNB

reduced the capital of the banking sector by HUF 100 billion in 2022 (Table *8*).

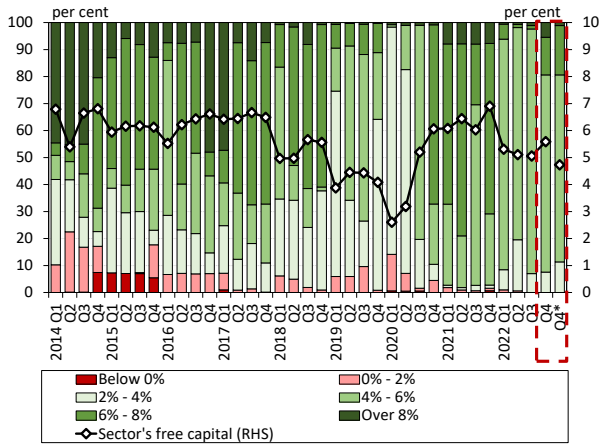
A significant part of the reversal of impairment charges in the fourth quarter related to exposures to Russia and Ukraine. In 2022 Q4, the share of institutions recognising loan loss provisions by balance sheet total fell by 18 percentage points to 69 per cent in one quarter, mainly due to the reversal of almost one third of the impairment charges for Russian and Ukrainian exposures recognised up to September (*Chart 64*). However, despite the significant reversal, the net loan loss provisioning for the fourth quarter amounted to 0.13 per cent as a share of total assets, which is about the same as the average for the quarters in 2020, which was affected by the pandemic.

In 2022, interest income to total assets improved significantly, even in spite of the remarkable balance sheet dynamics. The 12-month rolling return on assets (ROA) amounted to 0.9 per cent in December 2021, before falling to 0.7 per cent by the end of 2022 (*Chart 65*). As in the case of the nominal items, the decline in the indicator was driven by the recognition of loan loss provisions and the extra profit tax. These items reduced the value of the indicator by 39 basis points and 38 basis points, respectively, which was offset by a 67-basis point increase in interest income. The year-on-year change in interest income is also outstanding on an asset-based approach, that was realised in parallel with an annual increase of almost 20 per cent in the average sector-wide total assets. The 12-month rolling indicator of operating expenses to total assets declined by 11 basis points to a historical low of below 1.6 per cent.

7.2. Capital position of the sector remains adequate

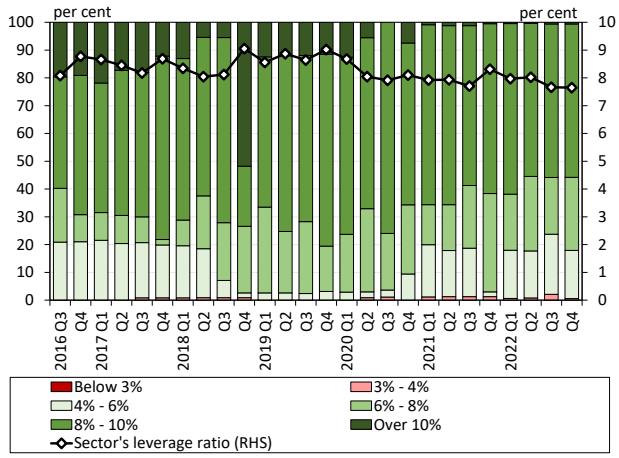
Despite a decline in the capital adequacy ratio, the banking sector's capital adequacy implies strong shock-absorbing capacity. The sector's consolidated capital adequacy ratio (CAR) declined in the first three quarters of 2022 and then rose slightly in the fourth quarter to 18.2 per cent, representing a 1.5-percentage points decline from the record high at the end of 2021, which was due to dividend payout restrictions (*Chart 66*). The CET1 ratio amounted to 16.1 per cent. For lack of auditing, the profit that cannot yet be included in the profit/loss may potentially improve the value of the CAR by roughly 1.3 percentage points, but in light of banks' dividend disbursement plans, this profit will not completely strengthen the sector's capital position. In 2022, own funds increased by 9 per cent and the total risk exposure amount (TREA) by

Chart 67: Distribution of banks by level of free capital over the overall capital requirement weighted by TREA



Note: Free capital includes total interim or year-end profits as well. Q4* with a combined buffer requirement applicable from July 2023. The categories indicate the level of own funds above the overall capital requirement as a ratio of the total risk exposure amount. Source: MNB

Chart 68: Distribution of total exposure measure based on institutions' leverage ratio



Note: Based on the fully phased-in definition of the Tier 1 capital. The categories indicate the level of the leverage ratio, i.e. of the ratio of the T1 capital to the total exposure amount used for the calculation of the indicator. For 2020 Q3, numerical data and data on an exposure basis are only available for 75 per cent and 84 per cent of banks, respectively. Source: MNB

18 per cent. 84 per cent of the increase in TREA was related to credit risk exposure amounts, notably to corporates and to central governments and central banks. The increase in own funds at the sector level is mostly explained by the rise in the previous years' retained earnings and CET1 capital, and within that the increase in fully paid equity instruments. The increase in both TREA and own funds was significantly affected by the depreciation of the forint seen in the past year.

Capital adequacy remains sound, but the burdens of government measures and rising credit risks could erode banks' capital positions. The free capital of the credit institutions sector was 4.2 per cent as a share of TREA, after an annual decline of 2.1 percentage points, amounting to HUF 1,528 billion in nominal terms at the end of 2022 (*Chart 67*). The availability of the 50-per cent capital conservation buffer (CCoB), which allowed for a temporary increase in free capital, ceased at the end of 2022, meaning that the full buffer requirement must be met in 2023. Calculating with the total unaudited profit and the level of capital requirements applicable from July 2023, with the reintroduction of the capital buffer for other systemically important institutions (O-SII) and the capital conservation buffer (CCoB), at 50 per cent and 100 per cent, respectively, and the introduction of the countercyclical capital buffer (CCyB) of 0.5 per cent in July 2023, on a TREA basis 89 per cent of the banking system would have a free buffer exceeding 4 per cent.[36] The 0.5-per cent CCyB rate, which will be effective from 1 July 2023, and the minimum requirement for own funds and eligible liabilities (MREL), which will be applicable from 1 January 2024, will impose a significant fund-raising need on institutions under adjustment pressure in 2023.[37] Looking ahead, developments in the capital position could be worsened by additional potential government measures that may lead to further losses, as well as additional loan loss provisioning, due to a further potential increase in credit risks.

The leverage requirement is met by all institutions in the sector, with a significant buffer at the sector level. From June 2021, meeting the 3-per cent leverage requirement also became mandatory for banks. The sector's leverage ratio (LR) fell slightly by 0.7 percentage points in 2022 to reach 7.7 per cent at the end of the year *(Chart 68).* The decline in the ratio is explained by the relatively higher

[36] At the end of 2022, one small bank did not comply with the effective overall capital requirement, but would comply with it on a total profit basis.

[37] See sections 9.1. and 9.2. of the Macroprudential Report 2022 for more detail about the calculation of the MREL requirement and the scale of the necessary adjustment.

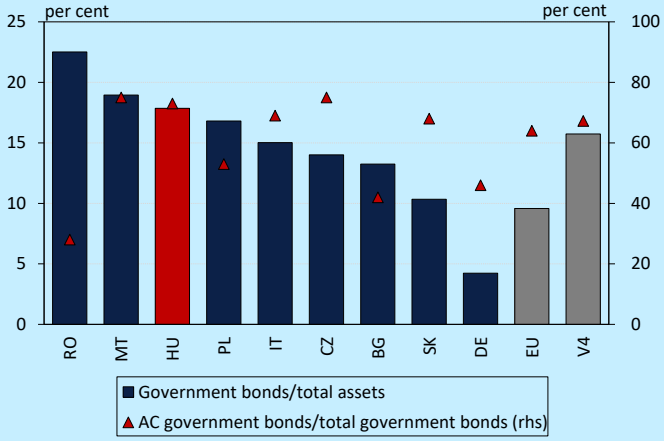
increase in the total exposure amount (denominator) compared to the increase in the T1 capital (numerator), representing annual growth of 14 per cent and 5 per cent, respectively. Despite the decline, all institutions in the sector meet the leverage requirement and 82 per cent of institutions exceed the 6-per cent level on an exposure basis. Thanks to a positive shift in the fourth quarter for institutions with a lower LR of between 3 per cent and 5 per cent, only a single credit institution failed to reach the 4-per cent level at the end of 2022.

BOX 6: NON-REALISED INTEREST RATE RISKS IN THE BANK BALANCE SHEET

In the operation of credit institutions, it is inherent that the assets and liabilities side of the balance sheet respond to changes in the interest rate environment at different speeds and to different degrees, i.e. banks' operations are exposed to interest rate risk. Interest rate risk arises partly from the different maturity structure of items on the assets and liabilities side, as banks typically finance themselves with shorter maturities (which need to be renewed or replaced when necessary) compared to the maturities of the assets they provide to the rest of the economy. The impact of the rise in the interest rate environment can be viewed from both an accounting perspective and an economic perspective. From an accounting perspective, it is possible to examine how a given shift in the yield curve affects some of the banks' profit and loss items, in particular net interest income and trading income,[38] and bank's capital via the revaluation of assets at fair value through other comprehensive income. The accounting effects are largely influenced by the way in which banks record their individual assets in their books: for example, in the case of fixed-rate assets recognised at amortised cost, there is normally no revaluation effect even in the event of a change in the interest rate environment, but it is reflected in net interest income, spread over time.

Securities held by banks play an important role in the context of interest rate risk. The Hungarian banking system's government securities holdings amount to around HUF 10,000 billion in book value, representing 17 per cent of the banking system's total assets. By European standards, the Hungarian banking system's sovereign exposure is significant, but it is not outstanding in the region, and the share of government securities on the balance sheet has been declining steadily since 2017. In Hungary, 80 per cent of government securities are carried at amortised cost (AC). International data collected by the EBA[39] show that the share of government securities carried at fair value (FV) is about 10 percentage points lower in Hungary than the EU average. In the event of a shock caused by an interest rate hike, only government securities valued at fair value cause an immediate loss to banks, and holding the securities to maturity causes their value to converge to their face

Government bonds as a proportion of total assets of the banking system and the proportion of government bonds valued at amortised cost



Note: Data on the accounting classification are not complete banking system data. Source: ECB, EBA

[38] Findings on the impact of different interest rate shock scenarios on banks' profit depending on the accounting classification were also discussed in Box 10 of the MNB's Financial Stability Report of May 2020, which showed a positive effect on profit over a two-year horizon in the case of a parallel positive interest rate shock.

[39] Non-complete banking system data on major banks.

value, and thus results in a change in bank profitability over the remaining maturity that is opposite to the initial loss.

In economic terms, however, securities carried at amortised cost may also decrease in value. This may be the case if the assets are sold prematurely[40] – as was the case with Silicon Valley Bank (see Box 1). The interest rate risk of securities increases with their duration. The extent of duration mainly plays a role in the calculation of the economic values of equity (EVE), which is taken into account by the MNB when calculating both regulatory limits and Pillar 2 capital requirements, irrespective of the accounting policies applied by the bank. In addition, banks can reduce the impact on bank profitability and capital over the desired time horizon via the active management of government securities portfolios, including by entering into interest rate swaps. The average duration of the securities portfolio carried at amortised cost was around 3.5 years at the end of 2022, representing a significant decrease compared to two years earlier (4.3 years).

Banks manage the interest rate risk on their balance sheet either for individual positions (micro hedges) or for larger positions resulting from the risk structure of the balance sheet (portfolio hedges). The extent to which risks are managed and the proportion of hedged positions may vary across institutions, depending on, inter alia, business policy, risk appetite and liquidity position. The most common way to manage risk is to use interest rate swaps, which were supported by the MNB in several of its previous programmes through swaps with the MNB made available to banks. In addition, the MNB has also helped banks manage interest rate risk through its collateralised loan transactions and refinancing loan programmes.

Banking practices modelling the behaviour of demand deposits, which account for the vast majority of the deposit stock, are not uniform, making it difficult to produce consistent sector-level estimates. It is important to stress that the rise in the interest rate environment "devalues" not only individual assets, but also fixed or quasi-fixed rate funds. While the former constitute a hidden loss, the latter constitute a hidden gain for the bank. In the context of a forward-looking assessment of interest rate risk, it is therefore crucial to understand the assumptions about the bank and client pricing and behaviour regarding these liabilities, especially deposits with banks. The regulation provides some considerations that affect the modelling framework and results. Examples include setting a maximum[41] *core* stock ratio or a maximum estimated maturity per customer segment. Forecasting the interest rate of the stock, and therefore the observed interest rate transmission, is further complicated by the fact that its value is highly dependent on other, less exact factors (e.g. financial awareness of clients, availability of alternative investments), in addition to reference rates and bank liquidity.

Another key factor for deposits is how susceptible they are to rapid outflows in a liquidity stress situation. The volatility of bank deposits depends on a number of measurable factors that can be used to identify risks in the bank deposit portfolio. In turbulent times, with declining confidence, a concentrated deposit portfolio can pose a risk. A good example of this is the case of SVB, whose deposit portfolio was highly concentrated in start-ups, while almost the entire deposit portfolio was above the deposit insurance limit. By contrast, in the Hungarian banking system, the share of large deposits[42] that increase concentration within total deposits is below 25 per cent for the vast majority of large domestic banks, and the share of deposits protected by deposit insurance is also much higher (61 per cent on average) than in the case of the failed US bank.

[40] It also has an impact on the banks' liquidity situation, in the event that such securities are used as collateral, since they can typically be debited up to their market value. In the event of a secured loan, the profitability effect is not realized.

[41] Even in a highly volatile interest rate environment, a stock with a low probability of repricing and a near zero interest rate elasticity.

[42] The 50 largest deposits and deposits representing at least 2 per cent of own funds.

Banks' risk appetite with regard to interest rate risk is also kept conservative by regulation and is hedged with an appropriate level of capital requirements, updated annually. The methodology for calculating the capital requirement is reviewed annually by the MNB in response to changes in both the macro and the external regulatory environment. Both the European and Hungarian interest rate risk regulation has recently become increasingly important. In 2022, to address interest rate risk in the banking book, the European Banking Authority (EBA) prepared two Regulatory Technical Standards (RTS) and revised the relevant Guidelines.[43] The regulatory documents have been approved by the EBA's decision-making bodies and are expected to enter into force in mid-2023. Domestic regulation (see MNB ICAAP-ILAAP-BMA methodological manual; interest rate risk reporting) follows and in many respects complements, and sometimes precedes, European developments. The so-called "outlier" test, which measures the sensitivity of banking book interest rate risk to the EBA's expectations, using a common methodology for banks, as a ratio of T1 capital, is examined every quarter. None of the banks in Hungary was in breach of the international limit at the end of 2022.

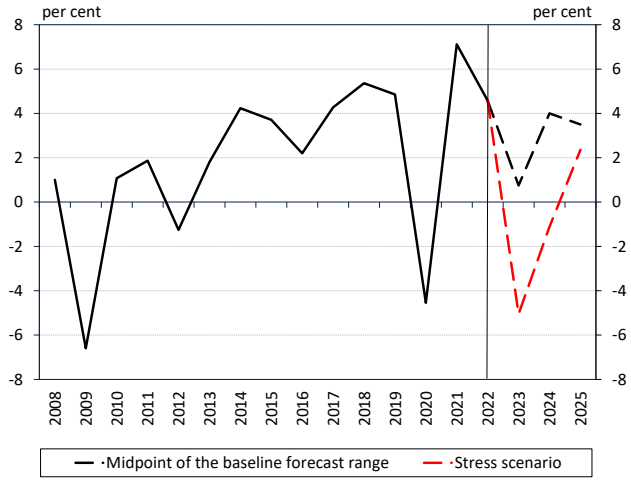
[43] See RTS on SOT (supervisory outlier test for EVE and NII); RTS on STA (standard method for calculating the sensitivity of economic value of equity (EVE) and net interest income (NII)); GL in IRRBB and CSRBB (guidelines on the treatment of interest rate risk for banking book (IRRBB) and credit spread risk in the banking book (CSRBB)).

8. Solvency stress tests: increased risks, but high shock resilience

The prolonged Russian-Ukrainian war and the European energy crisis, as well as the spillover of uncertainty in international financial markets, continue to pose substantial downside growth risks to the operating environment of the Hungarian banking sector. Consequently, in our stress test of the domestic banking sector's resilience to shocks, we assume a comprehensive scenario in which domestic economic growth is substantially lower than the baseline, external demand is reduced due to global supply problems and prolonged geopolitical tensions, and the risk aversion of the domestic private sector is considerably intensified due to the prevailing uncertainty.

These international macroeconomic uncertainties and the high interest rate environment are the main drivers of the solvency stress test results. In the stress scenario, there is a substantial excess need for loan loss provisioning, reflecting not only macroeconomic risk sensitivity, but also specific individual sensitivities to energy costs and the risk-mitigating effect of the interest rate cap. The other income components are strongly influenced by the repricing of interest-bearing assets over the two-year horizon in both scenarios, resulting in a total deterioration of banks' income generating capacity of nearly HUF 400 billion in the stress scenario before loan loss provisions. The shocks result in a significant reduction in the sector's after-tax profit in the first year, which is only partly offset by steadily improving profitability developments until the end of the second year. Therefore, even taking into account the capital increases already approved, there is no capital shortage at the end of the stress test horizon, but the level of bank capital buffers is substantially reduced by the stress.

Chart 69: Annual GDP growth rate in the scenarios

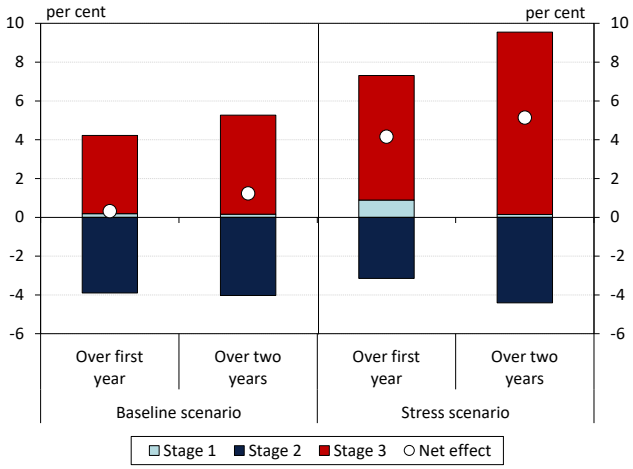


Source: MNB

8.1. Substantial losses from credit risk may materialise in a vulnerable external environment

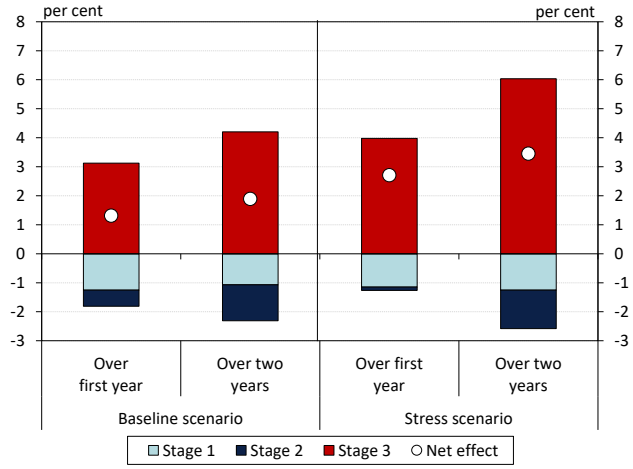
The risk narrative of the stress test is primarily determined by uncertainties in the international environment. The baseline scenario for the stress test is the forecast of the March 2023 Inflation Report of the MNB, and the results of our calculations are based on the development of the midpoint of the forecast range. The key factors in both the baseline forecast and the stress scenario are the prolonged Russian-Ukrainian war, the volatility in international markets coupled with increased risk aversion and the downside risks surrounding global economic growth. The negative global growth outlook in the stress scenario also holds back the domestic recovery process (*Chart 69*). Domestic economic growth is substantially lower compared to the baseline, driven by disruptions in supply chains and damages to production capacities. In addition, the external inflation environment is higher than expected, which steadily passes through into domestic prices. The uncertain environment increases risk avoidance in the private sector, with businesses postponing planned investments and domestic export momentum slowing in line with the deterioration in external demand. Furthermore, in the stress scenario, companies start downsizing, leading to a substantial

Chart 70: Cumulative loan loss provision rate for the corporate loan portfolio



Note: Net generated loan loss provisions in proportion to the gross carrying amount of the corporate loan portfolio, grouped by end-of-period Stages. Source: MNB

Chart 71: Cumulative loan loss provision rate for the household loan portfolio



Note: Net generated loan loss provisions in proportion to the gross carrying amount of the household loan portfolio, grouped by end-of-period Stages. Source: MNB

increase in the unemployment rate. Wage dynamics decelerate and disposable income falls, and by building up precautionary reserves, households save a larger share of their income and thus reduce their consumption to a greater extent. As a result, domestic GDP growth in cumulative terms falls short of the first and second years of the baseline forecast by 6 per cent and 10 per cent, respectively, accompanied by a major exchange rate depreciation in the stress scenario, and thus different interest rate conditions between the scenarios.

Risks arising in the stress scenario result in a significant excess of loan loss provisions, in which the individual vulnerability of clients also plays a role. In addition to the sensitivity to risk arising from macro events, the sensitivity of corporate clients to energy price changes[44] and the risk-mitigating effects of the interest rate cap have been factored in this time again, the latter also for the SME clients concerned. However, the interest rate cap carries an implicit risk after the phase-out of the measure. To reflect this, a Stage 2 classification[45] was applied to clients facing a significant increase in repayments after the scheme is phased out. Overall, the need for loan loss provisioning is lower than what was published in the November 2022 Financial Stability Report, primarily due to the narrowing of the gap between the baseline and stress scenarios concerning the macroeconomic outlook. On the whole, in the stress scenario, total additional loan loss provisioning reaches around 5 per cent of the aggregate gross book value in the case of the corporate portfolio (*Chart 70*) and 3–4 per cent in the case of the household portfolio (*Chart 71*).

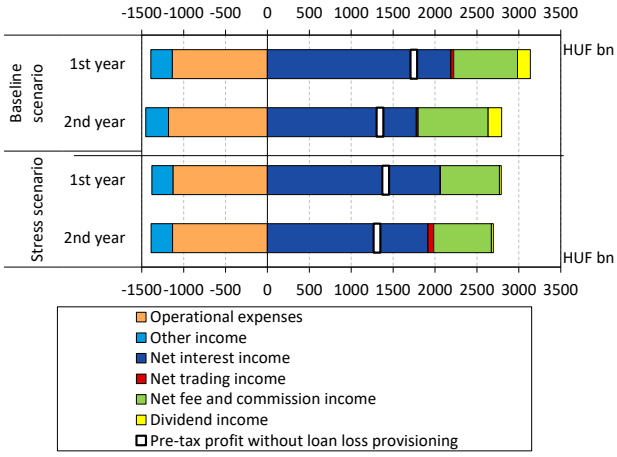
8.2. The sector's capital adequacy remains robust even in the event of a major stress

The economic shock in the high yield environment slightly reduces sectoral profitability before credit risk losses. In our baseline scenario, we anticipate the normalisation of the current high yield environment, while in the stress scenario, interest rates decline from even higher levels after an initial shock. In line with this, net interest income also decreases in both scenarios, even though we forecast the phase-out of the interest rate cap by the end of 2023. Cumulative net interest income in the stress scenario is essentially the same as the baseline.

[44] For details, see Box 9.1 of the November 2022 MNB Financial Stability Report.

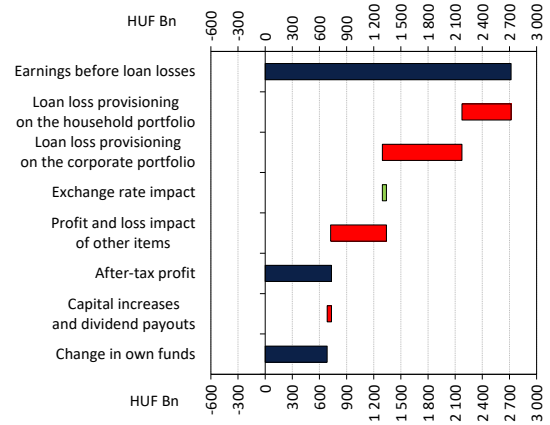
[45] Under IFRS 9, we therefore considered a significant increase in the repayment burden after the expiry of the programme as a significant increase in credit risk (SICR).

Chart 72: Developments in earnings items before loan losses



Source: MNB

Chart 73: Changes in certain profit and loss items and own funds of the banking sector in stress scenario

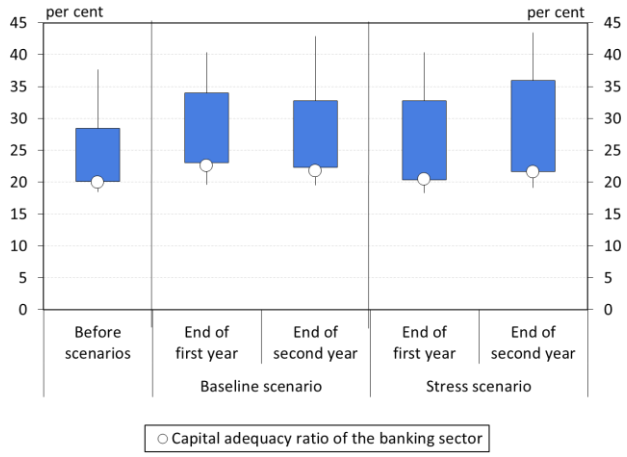


Note: Values cumulated over 2 years. The profit and loss effect of other items consists of the following elements: NDIF, IPF and Resolution Fund fees, bank tax, extra profit tax, capital increase needs of foreign subsidiaries and bank groups' tax expense. The level of dividend payments is influenced by the profit and capital adequacy as well.
Source: MNB

Interest income on securities and central bank assets is significantly higher in the stress scenario, taking into account the current conditions of holdings subject to reserve requirements. At the same time, these additional revenues are fully offset by higher interest expenses on deposits and other liabilities. Moreover, there is no significant difference between the two scenarios in terms of net interest income on household and corporate loans. This is because the revenue-raising effect of higher interest rates in the stress scenario is offset by the loss of revenue due to the increase in non-performing loans. With low economic growth, household and corporate financial transactions are likely to remain at moderate levels, and net fee and commission income remains unchanged in the baseline and even declines in the stress scenario. We assume that the dividend income realised by banks also decreases significantly in the stress scenario, while most of the other items slightly improve the profit in the stress scenario. Overall, the profit on loans net of loan loss provisions in the stress scenario falls short of the baseline estimate by HUF 371 billion over two years (*Chart 72*).

A significantly lower capital accumulation can be achieved in the stress scenario. Loan loss provisioning, as well as other items which include corporate income tax, the regular bank levy and the extra profit tax, reduce the sector's after-tax profit by more than HUF 2,000 billion forints over a two-year horizon, according to the stress scenario. Shocks prevail at the beginning of the scenarios, and initial losses are only partially offset by slowly improving results. As a result, the sector is loss-making in the first year of the stress scenario, but banks also realise nearly 60 per cent lower after-tax profits over the two years compared to the baseline. Overall, the sector would be able to accumulate about half as much capital over the two years of the stress scenario as in the baseline (*Chart 73*).

Chart 74: Distribution of the capital adequacy ratio based on the number of banks



Note: Vertical line: 10–90 per cent range; rectangle: 25–75 per cent range. The banking sector average is weighted by the total risk exposure. Source: MNB

Table 9: Stress test results at various capital requirements

	8-per cent capital requirement		Overall capital requirement*	
	Baseline scenario 2024 Q4	Stress scenario 2024 Q4	Baseline scenario 2024 Q4	Stress scenario 2024 Q4
Capital need of banks (HUF bn)	0.0	0.0	0.0	0.0
Average capital need of banks** (percentage points)	0.0	0.0	0.0	0.0
Capital buffer of banks above requirement (HUF bn)	3 946	3 456	1 772	1 522
Average capital buffer of banks** (percentage points)	13.8	13.6	6.2	6.0

Note: *Capital requirements projected for the given quarter. ** TREA-weighted average. Source: MNB

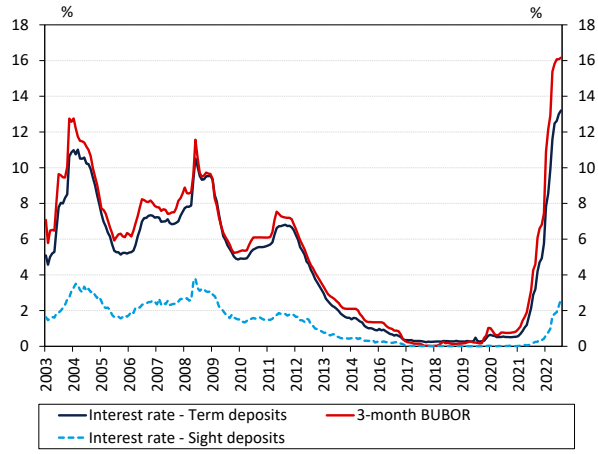
Banks would maintain their lending capacity even in the event of a severe stress. The sectoral capital adequacy ratio of 18 per cent at the end of 2022, including the full interim result, would increase to above 20 per cent in both the baseline and the stress scenario, with the stress scenario only slightly below the baseline. What plays a role in this, on the one hand, is the lower loan dynamics of the dynamic balance sheet assumption and the consequently lower total risk exposure amount (TREA) (*Chart 74*). On the other hand, the development of profitability and capital adequacy would in certain cases require changes to dividend payment plans to enable banks to meet their overall capital requirement (OCR) in the stress scenario. Overall, however, there is no capital shortage for any institution at the end of the first and second year of the stress scenario, but the level of buffers falls substantially even with a decreasing TREA (*Table 9*).

9. Special topic: The strength and speed of deposit interest rate transmission in a regional comparison

Retail and corporate deposits account for nearly 40 per cent of the banking system's balance sheet total, and their structure, interest rates and stability are key to the functioning of the banking system. The stock of retail and corporate deposits on the balance sheet of credit institutions amounted to HUF 28,000 billion at the end of 2022, representing almost 40 per cent of the HUF 73,000 billion – unconsolidated – balance sheet total. Bank deposits are the backbone of the banking system's funding, and therefore changes in their volume and structure directly affect the funding risk and liquidity position of institutions, and indirectly affect the profitability and capital position. In a changing interest rate environment, the pace and extent to which bank deposits on the liabilities side of the balance sheet track changes in financial market interest rates, driven by the central bank's interest rate decisions, is of key importance.

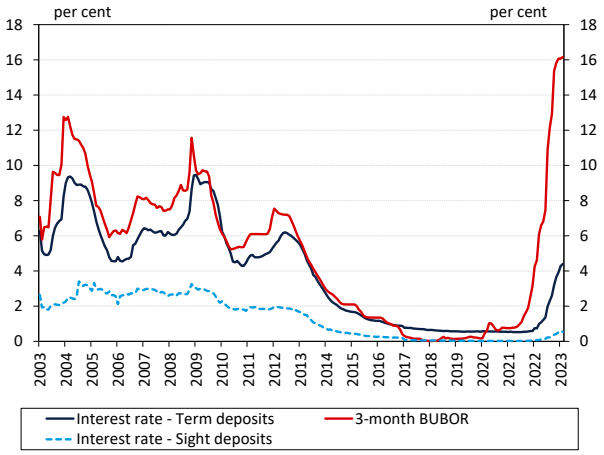
The slow repricing of client deposits since the start of the interest rate hike cycle increases banks' profitability and capital accumulation capacity in the short run, but in the longer run it also increases the risk of the decrease of deposits. While the 3-month interbank rate rose by 15.2 percentage points between June 2021 and February 2023, the average interest rate paid by banks on retail and corporate deposits increased by just over 3.6 percentage points (*Chart 75* and *Chart 76*).[46] The high interest rate environment and the slow and limited repricing of client deposits require banking actors to keep liquidity and funding risks under constant monitoring, and the central role of deposits in bank funding and liquidity is further underlined by recent international bank failures.

Chart 75: Average annualised interest rate of companies' forint deposits and changes in the monthly average level of the 3-month BUBOR



Source: MNB

Chart 76: Average annualised interest rate of households' forint deposits and changes in the monthly average level of the 3-month BUBOR



Source: MNB

[46] Deposit portfolio includes total demand and term deposits.

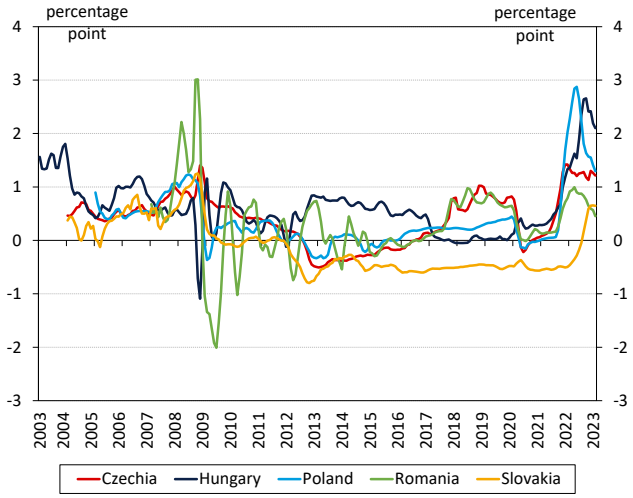
9.1. Analysis of domestic deposit interest rate transmission in an international and historical comparison

Central banks in the CEE region started a cycle of interest rate hikes in 2021, but deposit rates are following with a delay. Between June and November 2021, the Czech, Hungarian, Polish and Romanian central banks started to raise their base rates, and the European Central Bank did the same in summer 2022. 3-month interbank rates have risen by around 3 percentage points in Slovakia, 5 percentage points in Romania, 6 percentage points in Poland, 7 percentage points in the Czech Republic and 15 percentage points in Hungary since mid-2021. However, deposit rates typically increased at a lower rate than interbank rates, leading to an increase in the deposit interest margin relative to interbank rates in both the household and corporate segments.

In the analysis of deposit interest rate transmission, the average level of interest rates both on existing deposits and new deposits can be examined, but the latter is distorted by statistical specificities. Similar to the situation in the euro area, the average level of interest rates on existing household term deposits and on new deposits in Slovakia, Czech Republic, Poland and Romania is nearly the same within the respective countries with the stock following the level of new deposits with a small delay due to the repricing period of existing deposits. In Hungary, however, the contracted interest rate on new deposits is on average almost double the average interest rate on existing deposits. Interest rates on new deposits are biased upwards by several factors: on the one hand, interest rate statistics for the household sector include non-profit enterprises that serve households and sole proprietors, who typically obtain higher interest rates than the general population (which also distorts the average interest rate level of the existing stock of deposits). On the other hand, the amount and interest rate of new deposits are biased upwards substantially by short-term deposits of wealthier households, often deposited more than once a month, which are included in the statistics with a higher amount and thus a higher weight. In Hungary, higher interest rates are typically only available to private bank clients, while the majority of clients still face interest rates of around 0 per cent on term deposits. Due to statistical bias, it is primarily the changes in the average interest rate level of the existing stock that are shown below.

There are only minor differences across the region in the transmission of interest rate increases into corporate deposit rates. By February 2023, the increase in 3-month interbank rates in Poland, Czech Republic and Slovakia was also reflected in the change in the interest rate on existing corporate term deposits lagging by around 0.7 to 0.85 percentage points. In Hungary, the difference is 1.5 percentage points, while in Romania the average interest rate on deposits held by corporates has risen by 0.1 percentage points more than the reference rate since the rate hike cycle started in October 2021. In all of the Visegrad countries except Slovakia, even for the more rapidly adapting corporate deposits, the highest deposit interest margin in the last 20 years were observed at one point in the interest rate hike cycle (*Chart **77***).

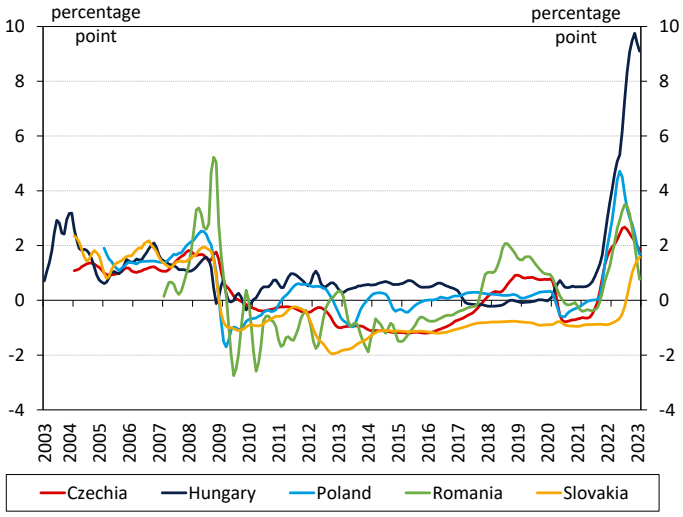
Chart 77: Interest rate spread between interbank interest rates and interest rates on corporate term deposits



Note: 3-month smoothed average. Source: ECB

For term deposits, the average interest rate level for the household segment has increased less and is at a lower level than that of the corporate deposits in all of the five countries surveyed. This could be for a number of reasons, such as the greater bargaining power of companies due to higher amounts of deposits, their deeper financial knowledge and better understanding of alternative investments, and the perceived or real costs of switching banks for the client. The difference between the average increase in the interest rate on corporate and household term deposits remained below 1.6 percentage points in the region, compared with 6.6 percentage points in Hungary in February 2023.[47] The increase in 3-month interbank rates was passed through to household term deposit rates by just 1 percentage point less in Poland and by 2 percentage points less in the Czech Republic and Slovakia. In Romania, household deposit rates roughly tracked the change in the reference rate, while in Hungary they increased by 8.1 percentage points less. This has led to a historically high interest rate differential in the household segment in Hungary (*Chart 78*), relative to the whole region, which is confirmed by our estimates using a more complex statistical method (Box 8).

Chart 78: Interest rate spread between interbank interest rates and interest rates on household term deposits



Note: Based on 3-month interbank rates and 3-month smoothed average of interest margins. Source: ECB

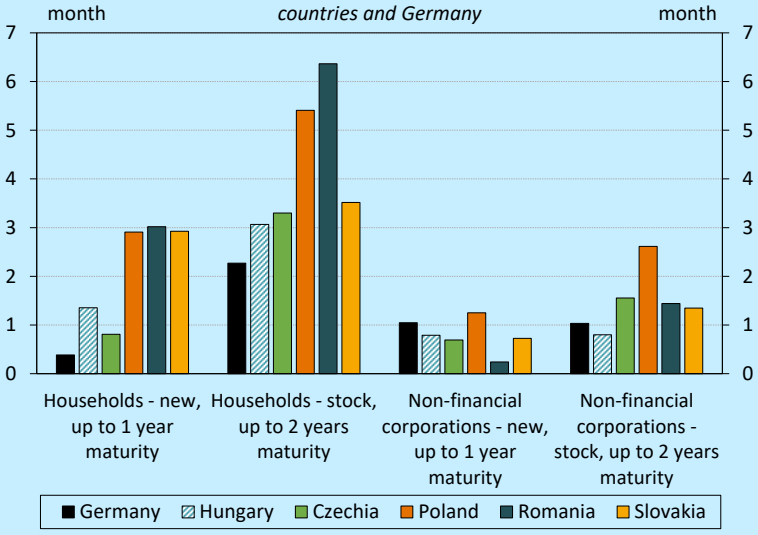
[47] Even in the case of interest rates on demand deposits, Hungary has the largest difference between the household and corporate segments in terms of the average increase in interest rates since June 2021. While in other countries the difference between interest rate changes in the two segments varies between 0 and 0.5 percentage points, in Hungary interest rates on demand deposits increased by 2.6 percentage points in the corporate segment and by only 0.5 percentage points in the household segment. As a result, companies in Hungary can receive the highest interest payments on their demand deposits in the region, while the same interest rate for households is close to the average of the five countries.

BOX 7: THE EFFICIENCY OF MONETARY TRANSMISSION THROUGH DEPOSIT RATES IN CEE COUNTRIES BASED ON A WAVELET TRANSFORMATION

One channel of monetary transmission is the savings-incentive – and also consumption-reducing – effect of rising deposit rates as a result of base rate hikes. In this Box, we investigate how quickly and to what extent deposit rates follow the rise in the base rate in Hungary, in CEE countries with similar economic conditions and in Germany, the EU Member State with the most advanced banking system. We used the wavelet transform and wavelet coherence to measure the speed of repricing.[48] With this statistical methodology, time series can be decomposed into cycles of different lengths, and the extent to which cycles of the same length in two time series move together synchronously in terms of the direction of the correlation and the lag structure can be investigated. Since business cycles of 2–8 years are relevant for monetary policy decision-making, we analysed the number of months of delay the 2- to 8-year deposit rate cycles follow the cycles of the same length of the three-month reference rate.

Interest rates on new deposits and term deposits[49] in the household and corporate segments were examined separately. As shown by the descriptive data, the repricing of corporate sector deposits is faster than that of the household sector for all countries; similarly, interest rates on new deposits change faster than interest rates on existing deposits. The Hungarian banking system is among the most efficient of the countries investigated in terms of repricing speed, with similar results to Germany and Czechia. Corporate interest rates are repriced in less than one month, the interest rate on new household deposits is repriced in over 1 month, and interest rates on existing deposits follow the reference rate with a 3-month delay. This, however, only provides information on *how quickly banks stop* repricing in response to a change in the base rate, but not on *how much* repricing this implies.

Speed of deposit interest rates' repricing in the case of CEE countries and Germany



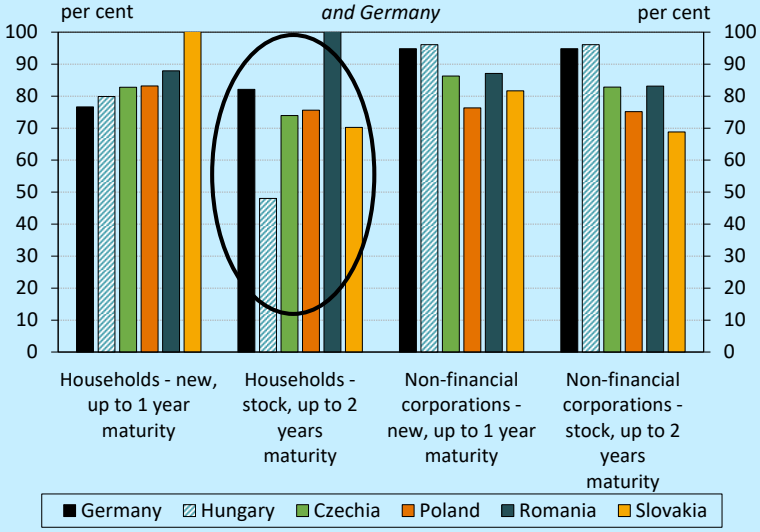
Source: MNB

[48] More details on the methodology can be found, for example, in the December 2021 Financial Stability Report, Box 4, "Analysis of the relationship between corporate lending and the real economy with the help of wavelet transformation". An important advantage of the methodology is that it is able to handle structural breaks, meaning that the results obtained for the interest rate cycle starting in 2021 are not distorted by the possibly different relations of earlier periods.

[49] The proportion of term deposits within the total deposit stock was similar in magnitude in the compared countries at the end of 2021, with the only exception being Romania. In the case of the corporate sector, this ratio ranged between 8 per cent and 15 per cent, while in the case of households it ranged between 7 per cent and 21 per cent, while in the case of Romania these values were 31 per cent and 45 per cent, respectively.

Thus, to assess the effectiveness of transmission through deposit rates, in addition to the speed of repricing, the share of the base rate increase that is channelled into deposit rates must also be taken into account. Taking into consideration the resulting lag structure, for the Hungarian household deposit portfolio we found that the repricing speed is 3 months, and therefore we examined what percentage of the reference rate 3 months earlier the deposit interest rates were. In the case of corporate deposits, the Hungarian banking system is also very efficient in this respect, with deposit rates barely below the reference rate, with a difference of only 3 per cent. However, when looking at household deposits, even in the case of new deposits, Hungarian deposits are characterised by one of the lowest values of 80 per cent.[50] In terms of the stock, the value is by far the worst, deposit rates are only 48 per cent of the reference rate.

Effectiveness of monetary transmission in the case of CEE countries and Germany



Source: MNB

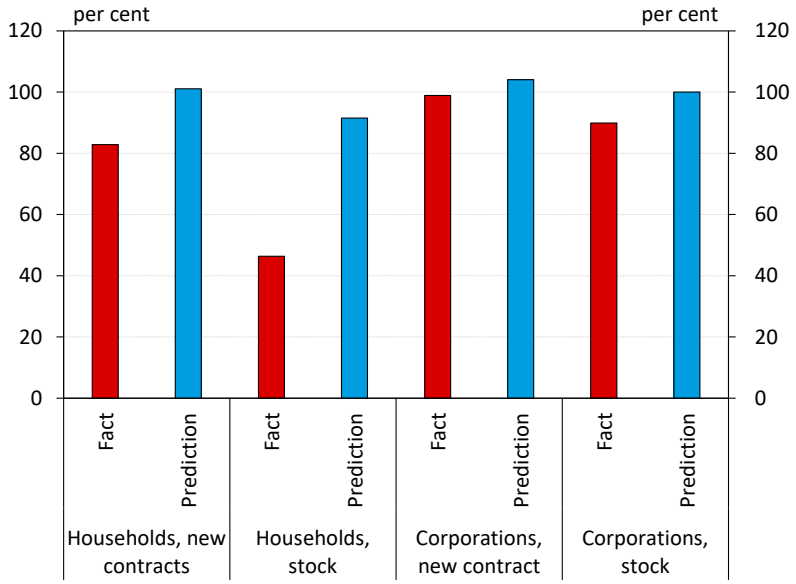
Overall, monetary transmission for corporate deposits is efficient by international standards as well, as the increase in the reference rate is almost fully reflected in deposit rates within 1 month. In the case of household deposits, however, although the speed of repricing is not lower than in the benchmark countries, a significantly smaller share of the interest rate hikes is reflected in the deposit rates, and hence transmission in household deposit rates is also weaker than in the other countries.

Hungarian deposit rates reflected the increase of policy rate at a low ratio, not only by international standards but also by the trends of the last two decades. The historical correlation between interbank interest rates and the average level of interest rates on term deposits in the corporate and household segments was also estimated using an error-correction model.[51] For this estimation, we used data for the period from January 2003 to June 2021, i.e., the years preceding the current tightening cycle. Based on the empirical correlation identified and given the change in interbank interest rates between June 2021 and February 2023, we also estimated the deposit rate levels that would have been expected to materialise in the market during the current tightening cycle if interest rate transmission had occurred as in the previous periods. Based on our findings, the estimated interest rates in all segments are higher than the currently observed average interest rates (*Chart 79*). The difference is negligible for new corporate deposits, while the actual transmission for existing corporate deposits is 90 per cent compared to an estimated 100 per cent. For new household deposits, a transmission of 80 per cent is observed compared to the predicted transmission of close to 100 per cent, but even this was only able to materialise due to the previously mentioned bias factors. The extent of the interest rate hikes was reflected proportionally the least in the interest rate level on existing household term deposits, and it was also the level most below that calculated on the basis of past experience. Based on the past two decades, we would expect a 92-per cent transmission of short-term interbank interest rates, but by February 2023, only 46 per cent of this was reflected in existing household deposit rates.

[50] The average interest rate on new deposits was 13 per cent in February 2023, however, this is biased by the factor mentioned earlier: higher interest rates for non-profit institutions and short-term deposits (even a few days) of private bank customers.

[51] The error-correction model breaks down the relationship between the time series studied (interbank interest rate and a deposit rate time series) into a long-run – equilibrium – relationship and a short-run equation describing the return to equilibrium.

Chart 79: Changes in deposit interest rates in Hungary by segment as a percentage of the change in interbank rates and estimated potential level of change



Note: The reference interest rate is the 3-month BUBOR; the estimate is based on historical data using the error-correction model. Source: MNB

The fact that the transmission is not in line with historical experience indicates a structural change in the correlation between interbank and deposit rates. Overall, deposit rates are tracking changes in interbank rates more slowly than they used to. There may be several reasons for this:

- **The liquidity position of banks is abundant**, the current level of the loan-to-deposit ratio is low by historical comparison, while liquid assets as a share of total assets have reached a high level. Therefore, banks do not need additional liquidity and are not forced to raise deposit rates for funding reasons.
- **There are also savings products readily available other than bank deposits, with substantially higher yields.** For many years now, retail government securities have provided savers with significantly higher returns than they can achieve on bank deposits, while their liquidity profile is similar. Presumably, less yield-sensitive households save in bank deposits and do not induce banks to raise interest rates.
- **Competition may also play an important role in the development of low deposit rates.** Among other things, this is reflected in higher interest rates in the corporate deposit market, where the negotiating position between companies and banks is more even. For households, bank competition may also be limited by the difficulty and complicated nature of switching bank accounts, which may also limit banks' motivation to engage in deposit price competition.
- **Low level of financial awareness of households.** Surveys have identified gaps in the financial awareness and financial literacy of domestic households. This could lead to many households failing to understand that low deposit interest rates with high inflation will lead to a decline in their wealth in real terms.
- **Government measures.** Finally, banks' pricing decisions may also be influenced by interest rate caps imposed on certain asset-side items and deposits, as well as by extra profit tax and other bank charges.

9.2. Structural changes in deposits and savings

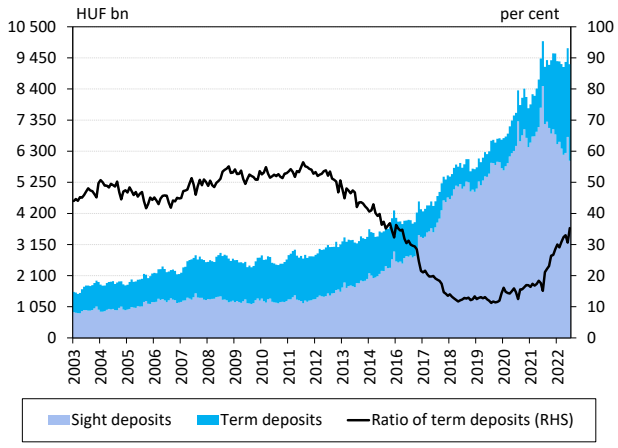
The speed and extent of interest rate transmission in deposits is a key factor in the quantitative and structural changes in the deposit portfolio. Bank actors are able to influence their clients' behaviour in their savings decisions through the setting of interest rates. The slow repricing of forint deposits contributes to the strengthening of the structural shift between currencies and also increases the likelihood of the decrease of deposits via the reallocation of

savings. In addition to changes in the volume of corporate and household deposits, maturity and denomination changes are also discussed below.

For corporate forint deposits, there seems to be a clear shift from demand deposits to term deposits. The stock of corporate term deposits increased from HUF 1,290 billion at the end of June 2021 to HUF 3,500 billion at the end of February 2023, while the stock of HUF demand deposits decreased by around HUF 740 billion. As a result of the changes, the share of corporate term deposits in forints increased by 21 percentage points to 37 per cent at the end of February 2023 (*Chart 80*). The shift in the structure of corporate deposits towards longer maturities was triggered by a significant premium of 13 percentage points in February 2023 on the interest rates available on new term deposits over demand deposits.

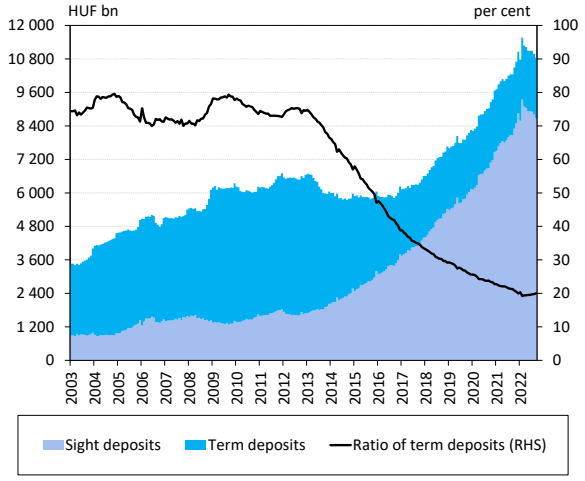
There has been no meaningful change in the maturity structure of households' forint deposits since the start of the interest rate hike cycle. The stock of household term deposits fell from HUF 2,200 billion at the end of June 2021 to HUF 2,030 billion at the end of February 2023, while the stock of forint demand deposits increased by around HUF 110 billion. As a result of the changes, household term forint deposits increased slightly to 20 per cent at the end of February 2023 (*Chart 81*). The opposite change seen in the maturity structure of household deposits compared to the corporate sector is due to the difference in the repricing of term deposits.

Chart 80: Maturity structure of total corporate HUF deposits and the share of term deposits in total deposits



Source: MNB

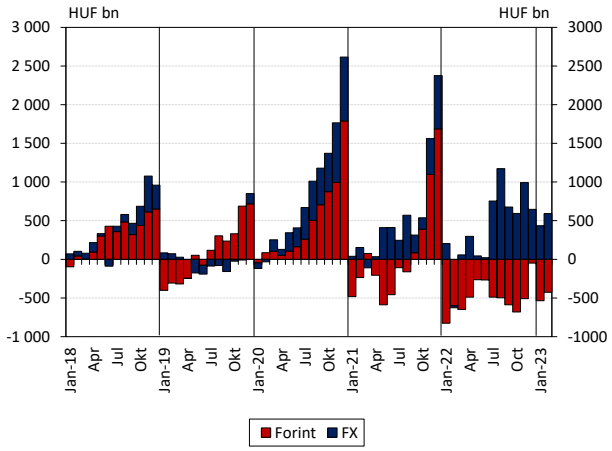
Chart 81: Maturity structure of total household HUF deposits and the share of term deposits in total deposits



Source: MNB

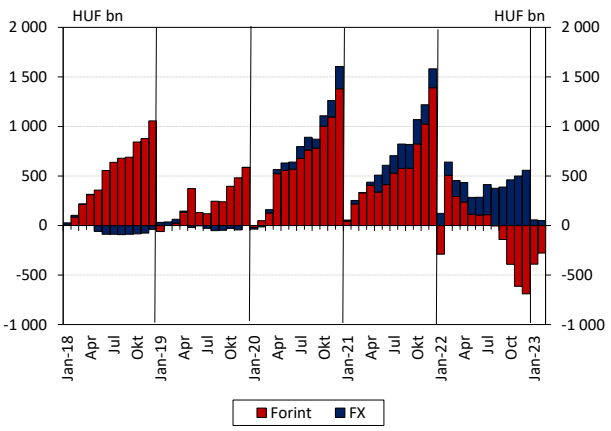
The share of foreign currency deposits increased for both corporates and households. The literature refers to the process when a foreign currency takes over the value-preserving and medium-of-exchange function of a domestic currency as dollarisation/euroisation. The process can be motivated by several factors, the most common being the high inflationary environment and the strong volatility and weakening of the domestic currency. As a result, monetary transmission becomes more complex and less efficient, and often results in growth sacrifices. In recent months, the risk of euroisation has increased in Hungary, but the level can still be considered low. Corporate foreign currency deposits increased while HUF deposits decreased considering transactions in recent months. Between the beginning of 2022 and the end of February 2023, corporate foreign currency deposits increased by HUF 1,240 billion, while forint deposits decreased by HUF 474 billion in terms of transactions (*Chart 82*). The combined effect of exchange rate changes and the trend in transactions was that the share of corporate foreign currency deposits in total deposits increased by 5 percentage points to 38 per cent at the end of February 2023. The share of foreign currency deposits in household deposits increased like that of corporates. Between the beginning of 2022 and the end of February 2023, household foreign currency deposits increased by HUF 608 billion, while forint deposits decreased by HUF 967 billion in terms of transactions (*Chart 83*). As a combined result of changes in exchange rates and transactions, the share of household foreign currency deposits in total deposits increased by 5 percentage points, similar to that of corporates, and reached 20 per cent at the end of February 2023.

Chart 82: Year-on-year cumulative transaction growth in corporate deposits by currency



Source: MNB

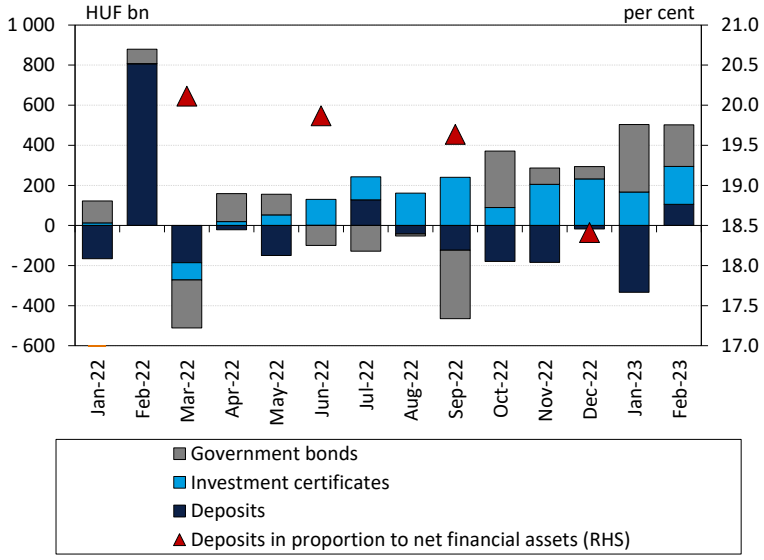
Chart 83: Year-on-year cumulative transaction growth of in household deposits by currency



Source: MNB

There has been an outflow of household deposits overall since September 2022. In terms of transactions, household deposits fell by HUF 608 billion between September 2022 and February 2023 (*Chart 84*). This decrease reflects on the one hand the partial use of savings and on the other hand the reallocation of savings. During this period, the stock of government securities and investment fund shares held by households increased by around HUF 1,850 billion. Households' deposit savings as a share of net financial wealth also declined, dropping to 18.5 per cent of net wealth at the end of 2022, which is about 1.5 percentage points lower than one year earlier. Meanwhile, the net financial wealth of households still grew by more than 8 per cent in nominal terms, but in real terms it has already fallen. The decline in real wages of households may further dampen the expansion of financial wealth, which increases the risk of further deposit outflows regarding household deposits.

Chart 84: Development of households' domestic bank deposits, investment certificates and government securities transactions and the proportion of deposits to net financial assets



Source: MNB

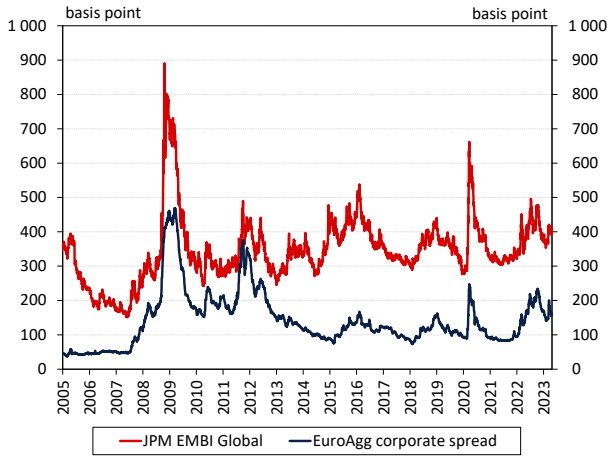
List of charts

LIST OF TABLES

APPENDIX: MACROPRUDENTIAL INDICATORS

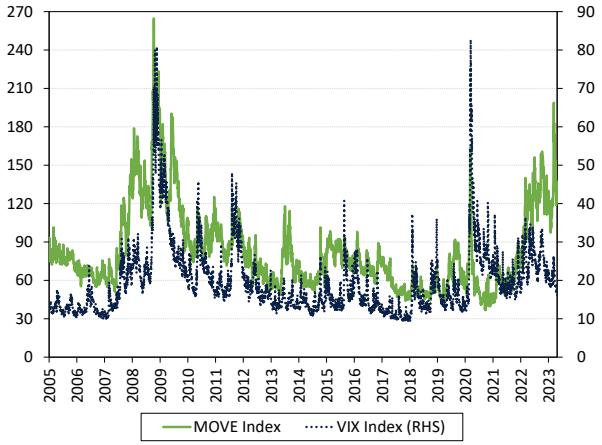
1. Risk appetite

Chart 1: Primary risk indicators



Source: Bloomberg

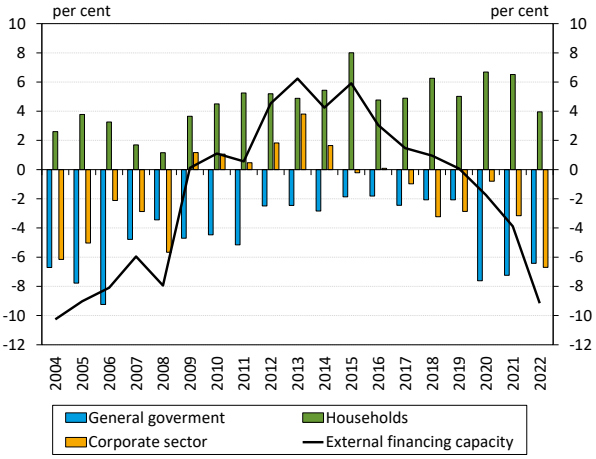
Chart 2: Implied volatility of the primary markets



Source: Bloomberg

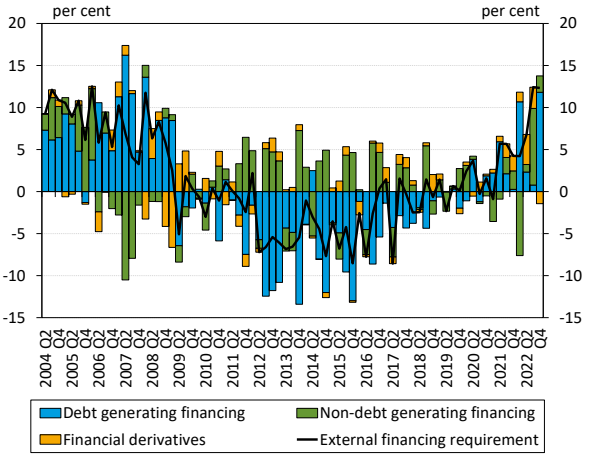
2. External balance and vulnerability

Chart 3: Net financing capacity of the main sectors and external balance as percentage of GDP



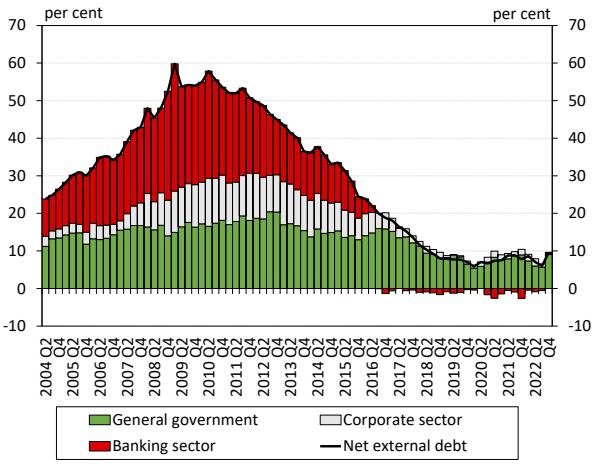
Source: MNB

Chart 4: External financing requirement and its financing as a percentage of GDP



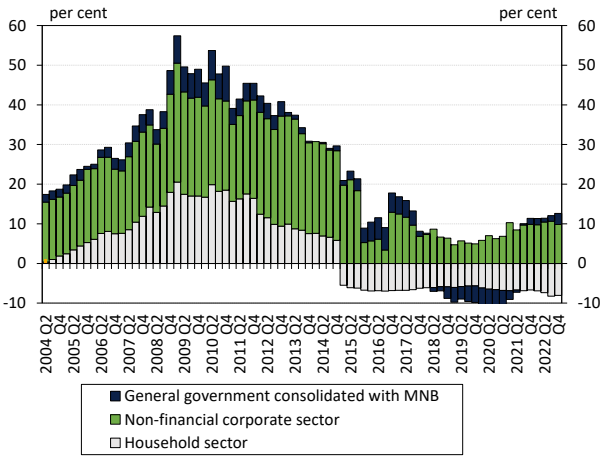
Source: MNB

Chart 5: Net external debt as a percentage of GDP



Source: MNB

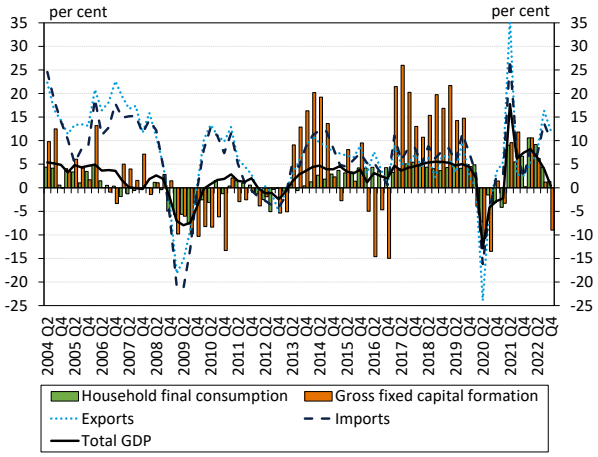
Chart 6: Open FX position of the main sectors in the balance sheet as percentage of GDP



Source: MNB

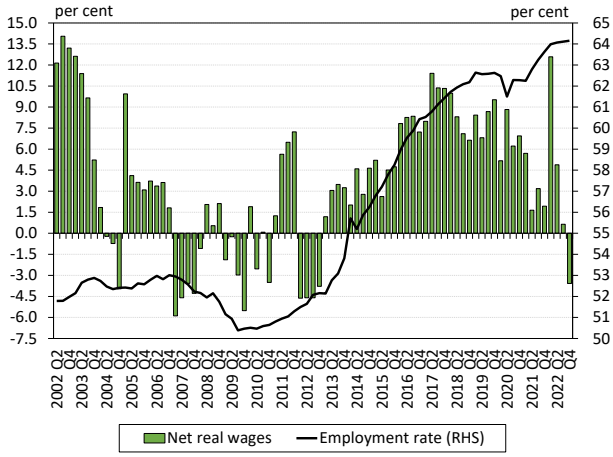
3. Macroeconomic performance

Chart 7: GDP growth and its main components (annual growth rate)



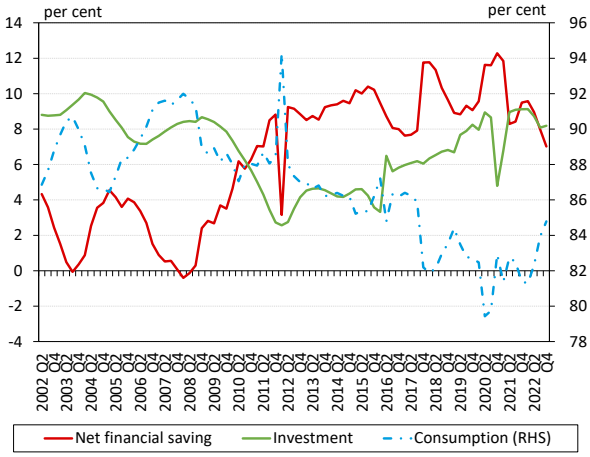
Source: HCSO

Chart 8: Employment rate and net real wage developments (annual growth rate)



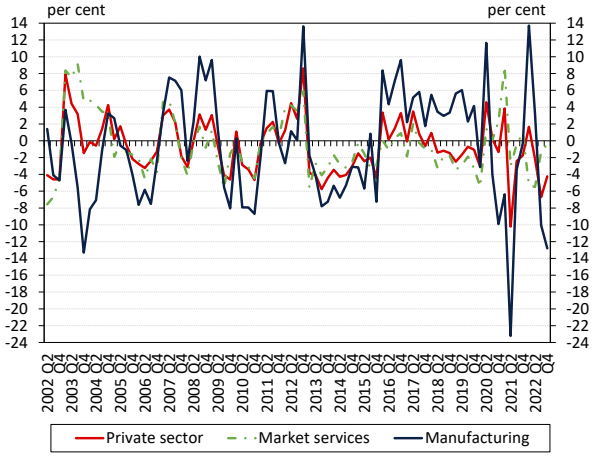
Source: HCSO

Chart 9: Use of household income as a ratio of disposable income



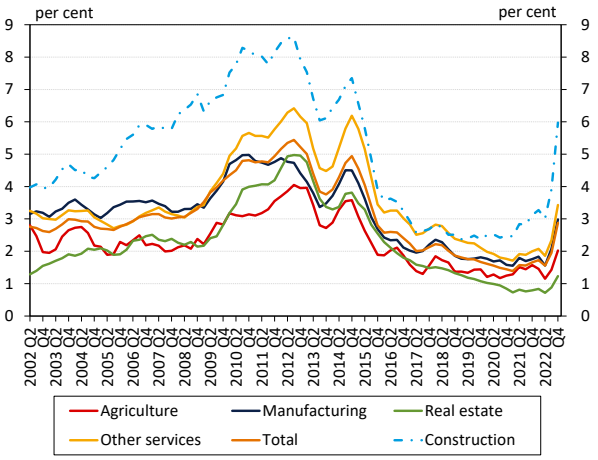
Source: HCSO, MNB

Chart 10: Corporate real unit labour cost in the private sector (annual growth rate)



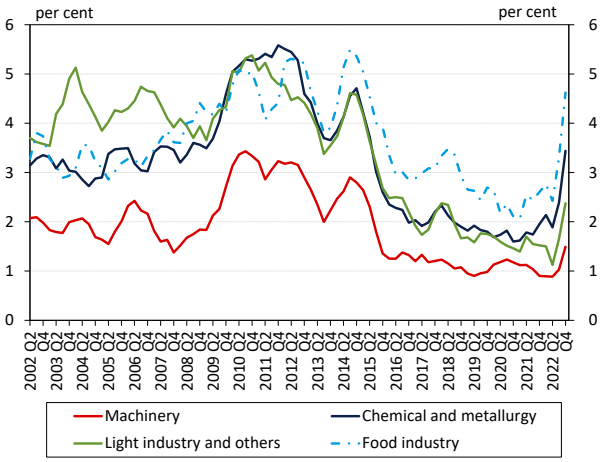
Source: HCSO, MNB

Chart 11: Sectoral bankruptcy rates



Source: Opten, MNB, HCSO

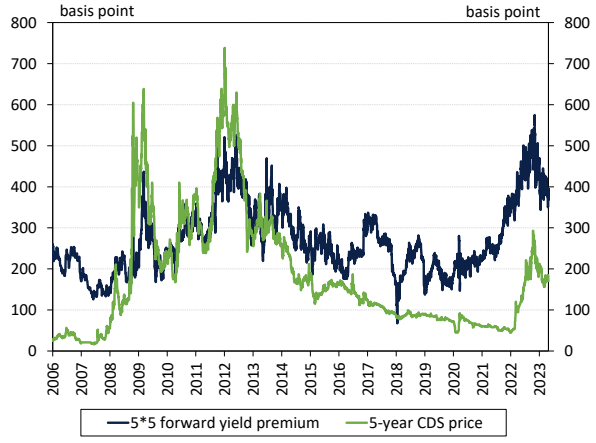
Chart 12: Bankruptcy rates for the subsets of manufacturing industry



Source: Opten, MNB, HCSO

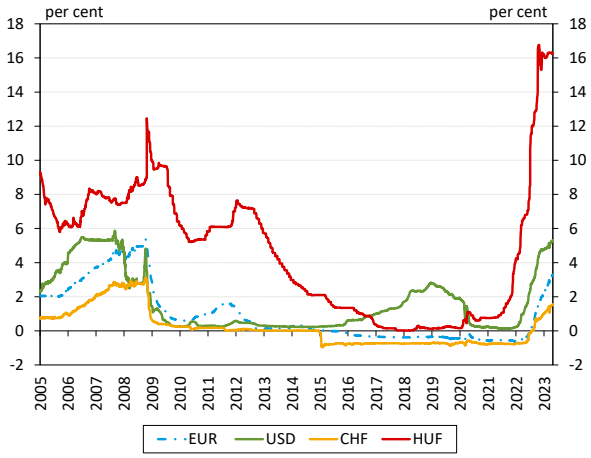
4. Monetary and financial conditions

Chart 13: Long-term sovereign default risk and forward premium of Hungary



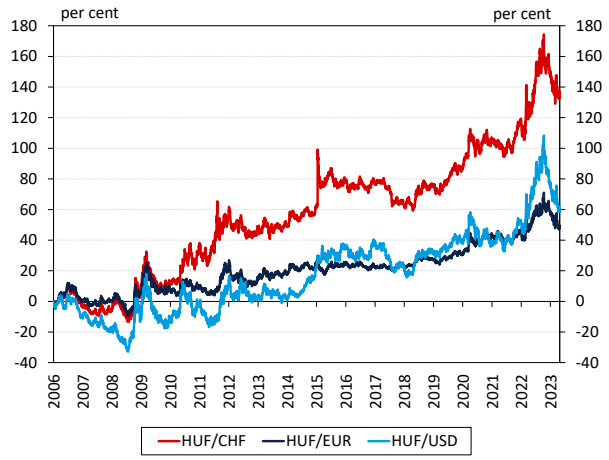
Source: Reuters, Bloomberg

Chart 14: Three-month EUR, USD, CHF and HUF money market interest rates (LIBOR and BUBOR fixing)



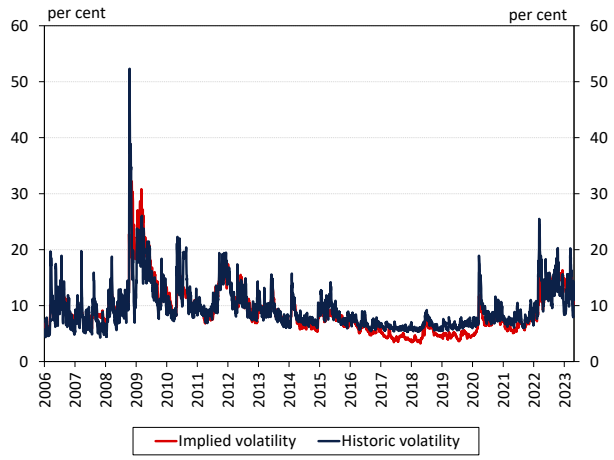
Source: Bloomberg

Chart 15: HUF/EUR, HUF/USD and HUF/CHF exchange rates changes compared to 2 January 2006



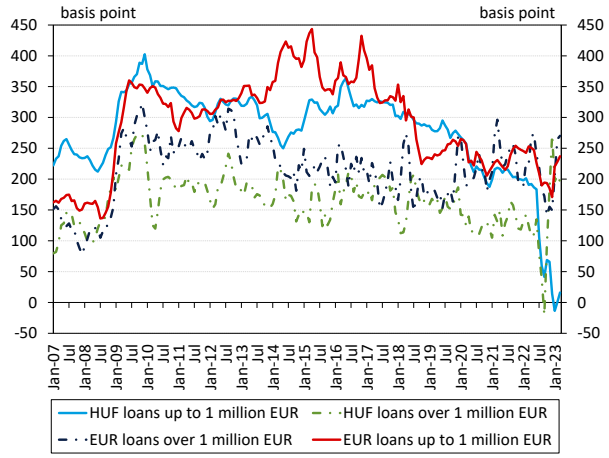
Source: Reuters

Chart 16: Volatility of the HUF/EUR exchange rate



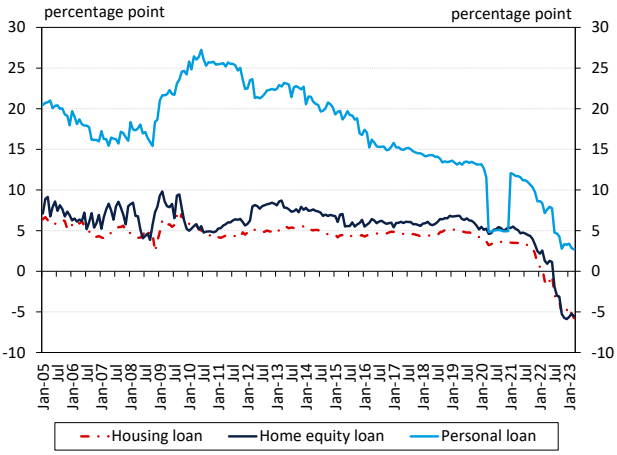
Source: Bloomberg, MNB

Chart 17: Interest rate premium of new loans to non-financial enterprises (over 3-month BUBOR and EURIBOR, respectively, 3-month moving average)



Source: MNB

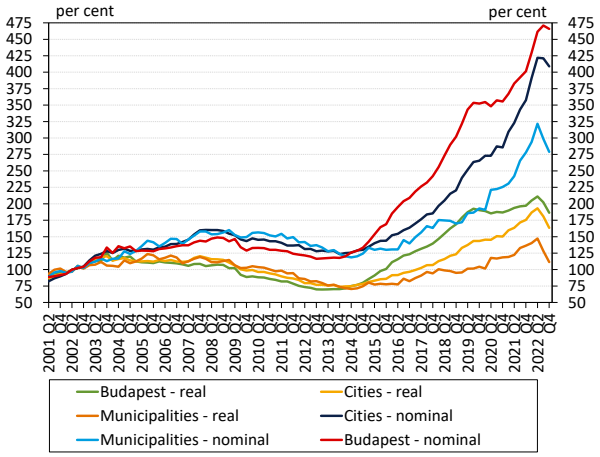
Chart 18: Interest rate premium of new HUF loans to households (over 3-month BUBOR)



Source: MNB

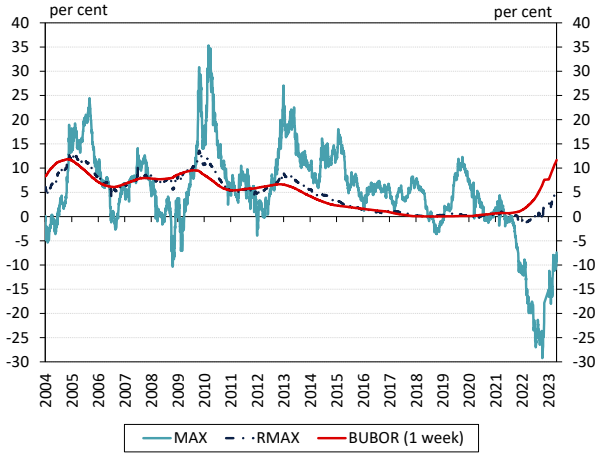
5. Asset prices

Chart 19: MNB house price index breakdown by settlement type



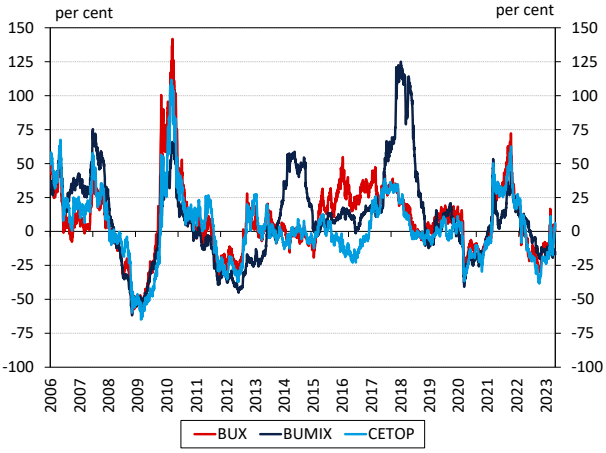
Source: MNB

Chart 20: Annualised yields on government security indices and money markets



Source: Government Debt Management Agency, MNB, portfolio.hu

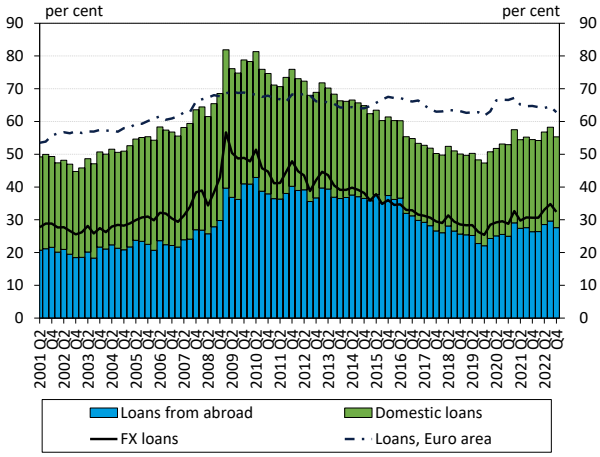
Chart 21: Annual yield of key Hungarian and Central and Eastern European stock market indices



Source: BSE, portfolio.hu

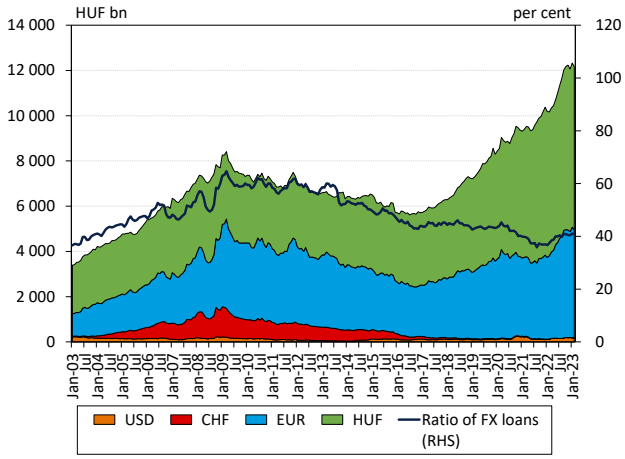
6. Risks of the financial intermediary system

Chart 22: Indebtedness of non-financial corporations as percentage of GDP



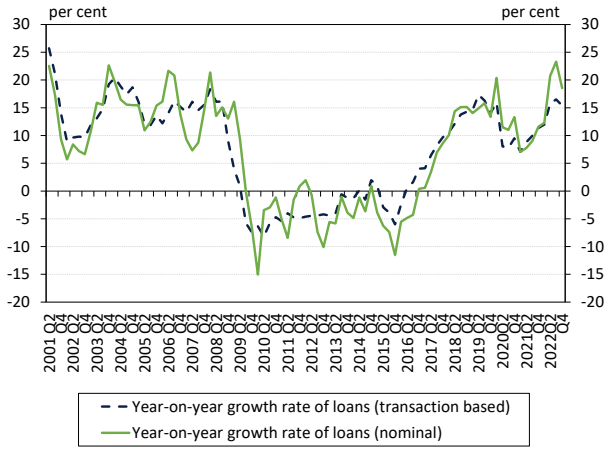
Source: MNB, ECB, Eurostat

Chart 23: Denomination structure of domestic bank loans of non-financial corporations



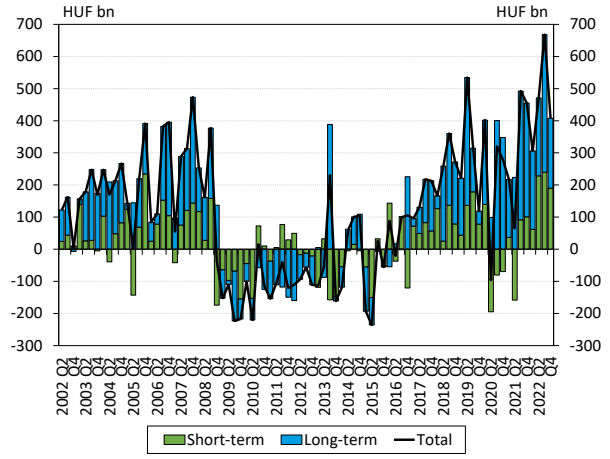
Source: MNB

Chart 24: Annual growth rate of loans provided to non-financial corporations by the financial intermediation system



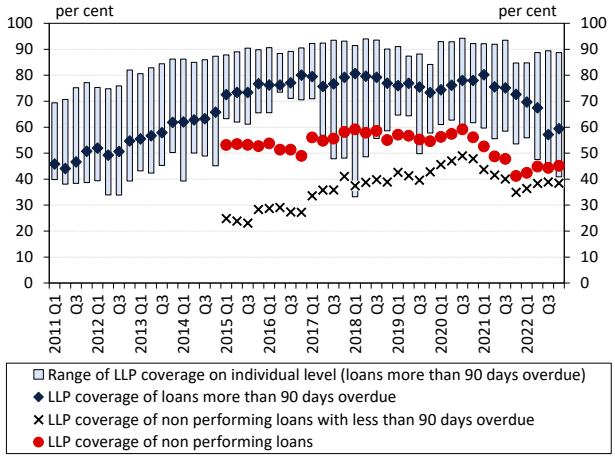
Source: MNB

Chart 25: Lending transactions to the non-financial corporate sector broken down by maturity



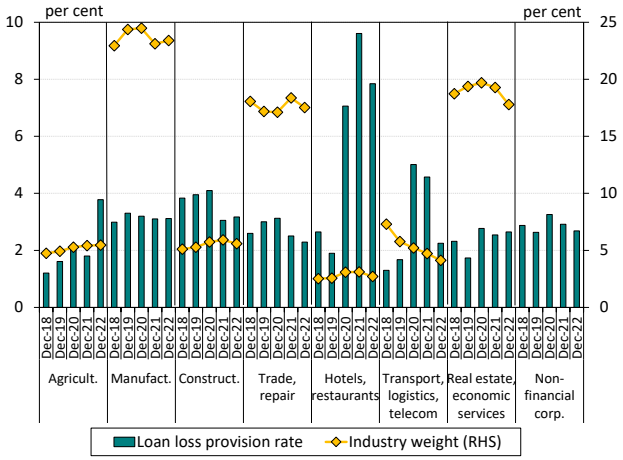
Source: MNB

Chart 26: Loan loss coverage ratio for non-performing corporate loans in the credit institutions sector



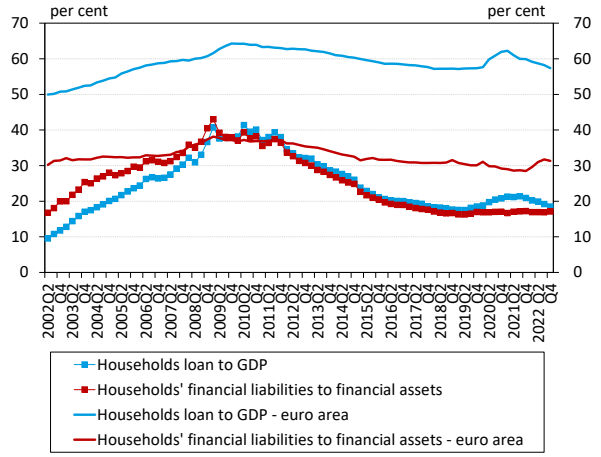
Source: MNB

Chart 27: Provisioning on loans of non-financial corporations by industry



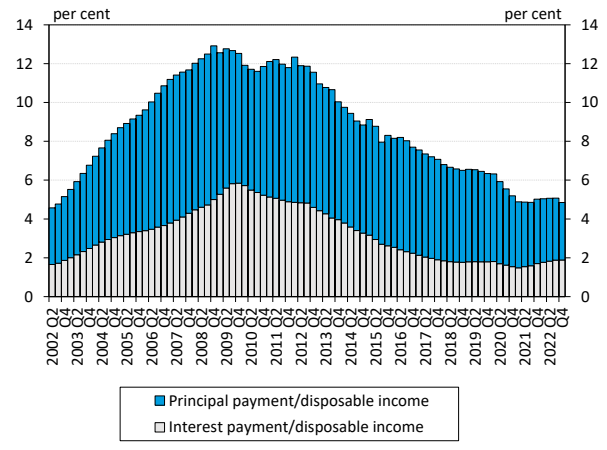
Source: MNB

Chart 28: Indebtedness of households in international comparison



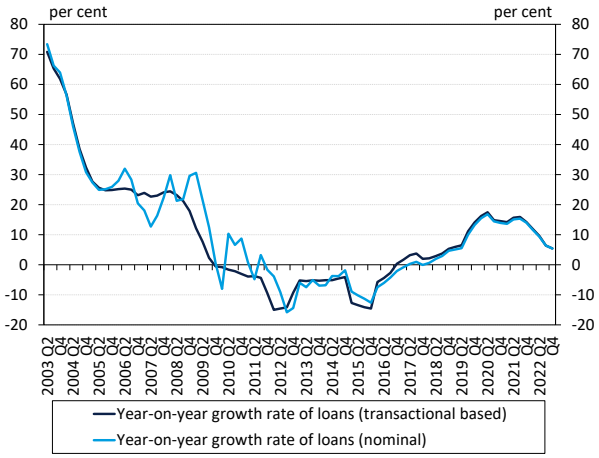
Source: MNB, ECB

Chart 29: Debt service burden of the household sector



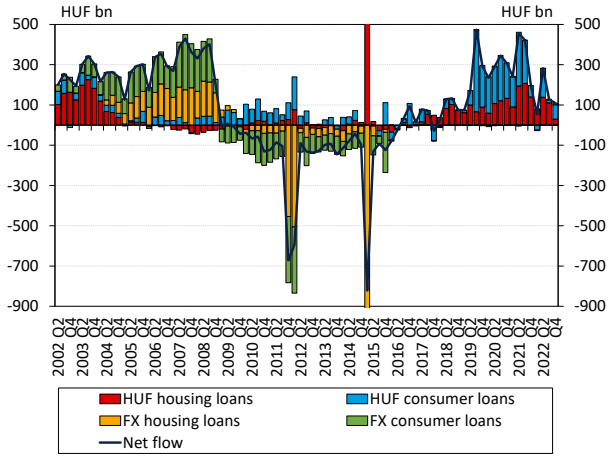
Source: MNB

Chart 30: Annual growth rate of total domestic household loans



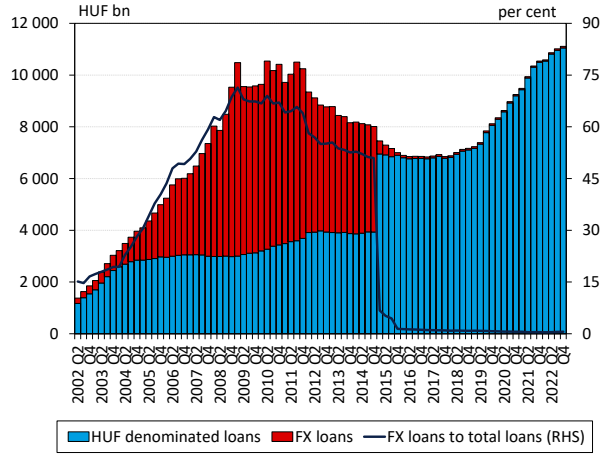
Source: MNB

Chart 31: Transactions of household loans broken down by credit purpose and denomination



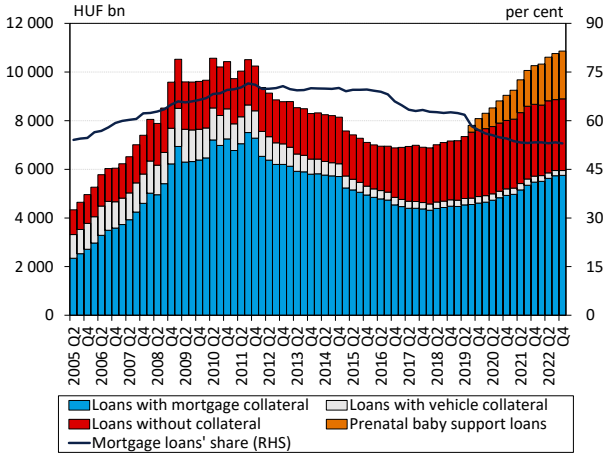
Source: MNB

Chart 32: The denomination structure of household loans



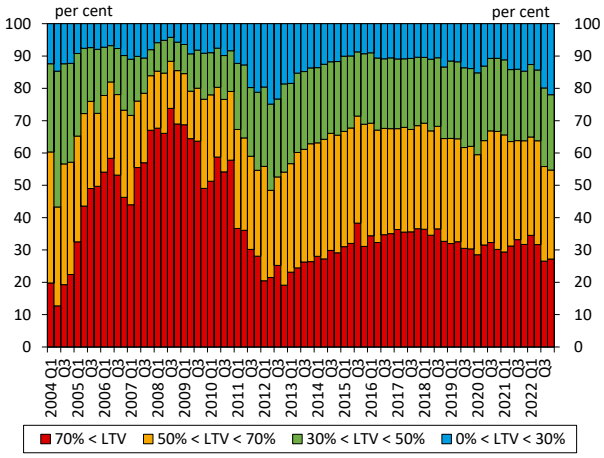
Source: MNB

Chart 33: Household loans distribution by collateralisation



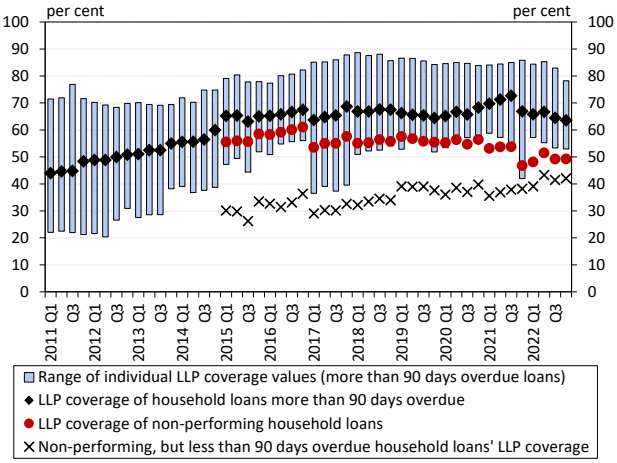
Source: MNB

Chart 34: Distribution of new housing loans by LTV



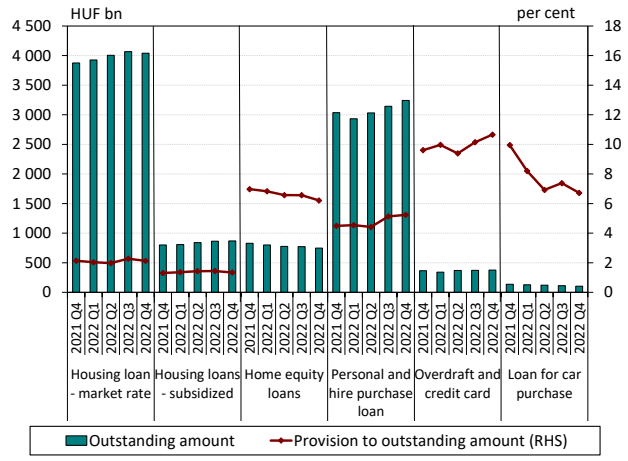
Source: MNB

Chart 35: Loan loss coverage ratio of non-performing household loans



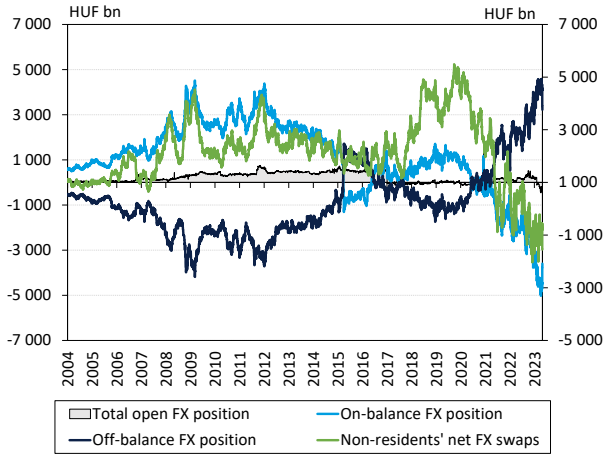
Source: MNB

Chart 36: Provisioning on household loans of financial institutions



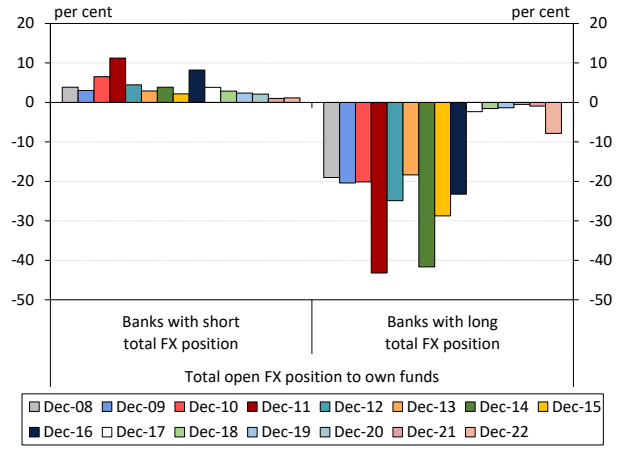
Source: MNB

Chart 37: Open FX position of the domestic banking sector



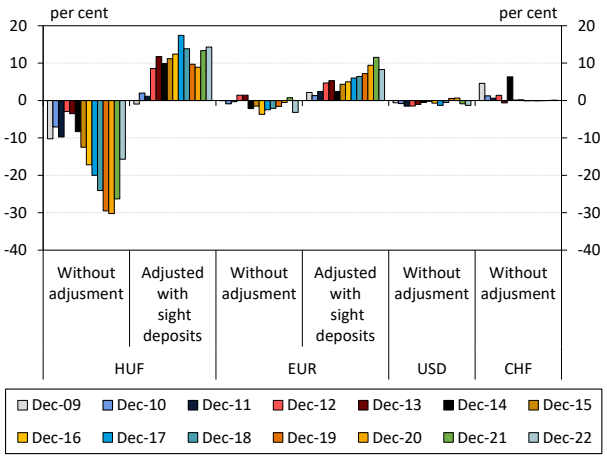
Source: MNB

Chart 38: The exchange rate exposure of the banking sector



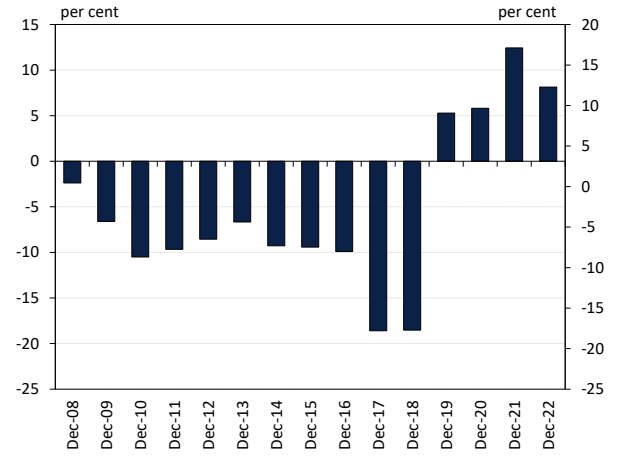
Source: MNB

Chart 39: 90-day re-pricing gap of the banking sector



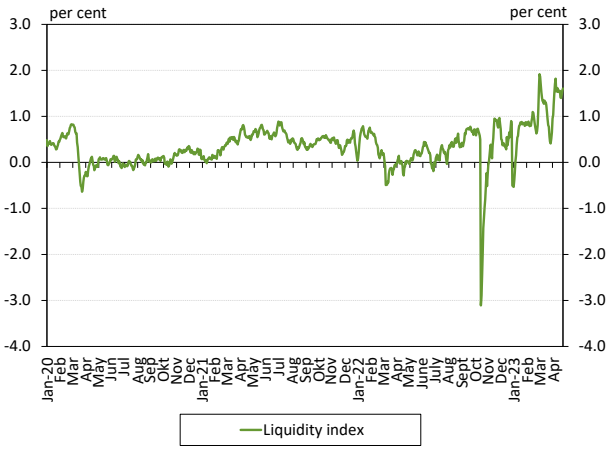
Source: MNB

Chart 40: Estimated maximum loss based on interest rate risk stress tests relative to equity



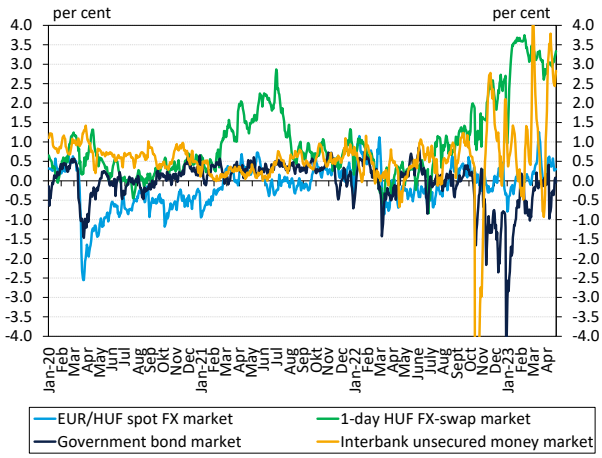
Source: MNB

Chart 41: Liquidity index



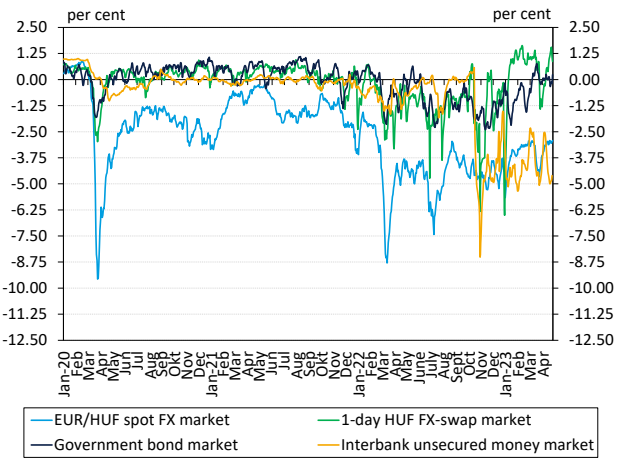
Source: MNB, KELER, Bloomberg

Chart 42: Liquidity indices of sub-markets



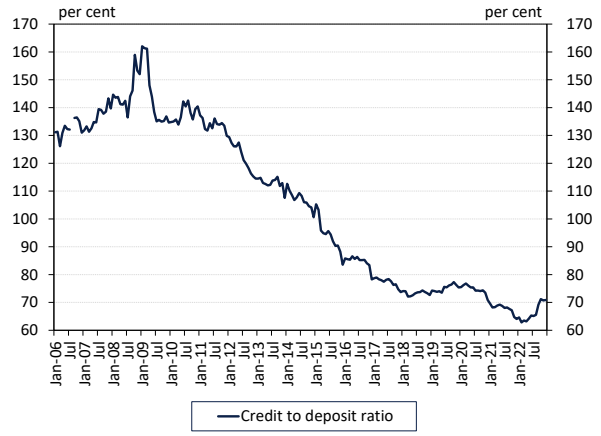
Source: MNB, KELER, Bloomberg

Chart 43: Liquidity sub-indices of bid-ask spreads of the major domestic financial markets)



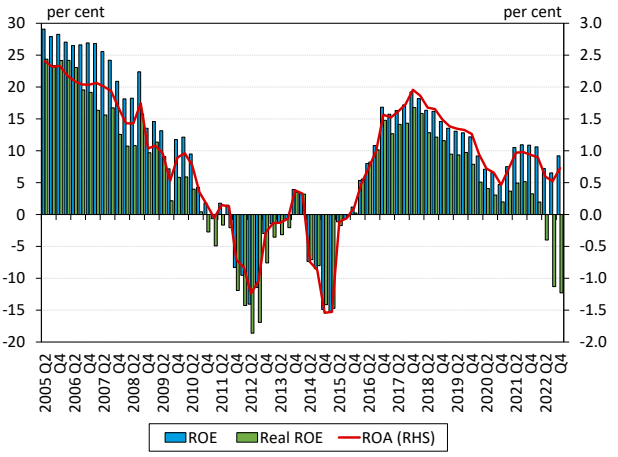
Source: MNB, KELER, Bloomberg

Chart 44: Credit to deposit ratio of the banking sector



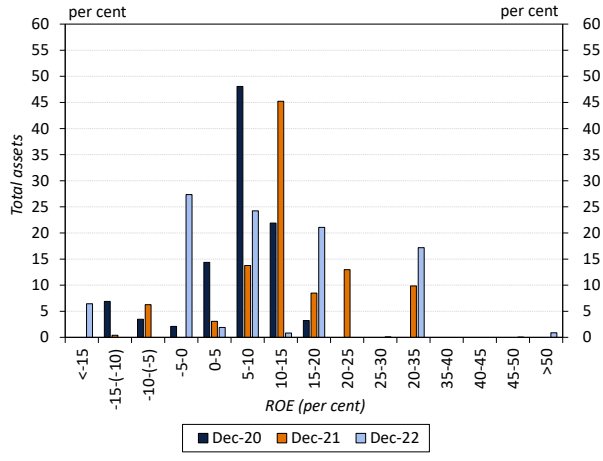
Source: MNB

Chart 45: ROA, ROE and real ROE of the credit institution sector



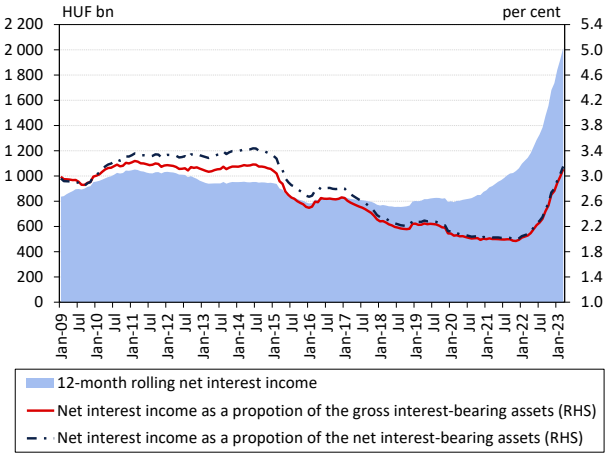
Source: MNB

Chart 46: Dispersion of banks' total assets by ROE



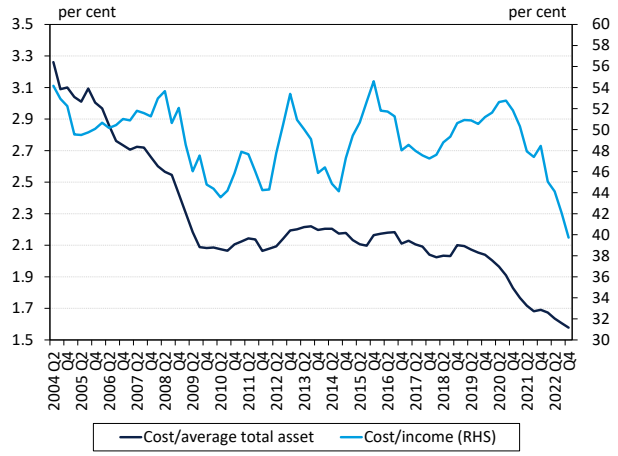
Source: MNB

Chart 47: Net interest income as a proportion of the gross and net interest bearing assets in the credit institution sector



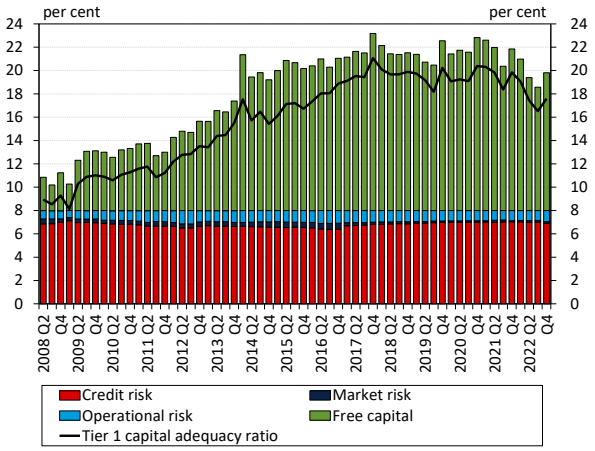
Source: MNB

Chart 48: Operating efficiency indicators of the banking sector



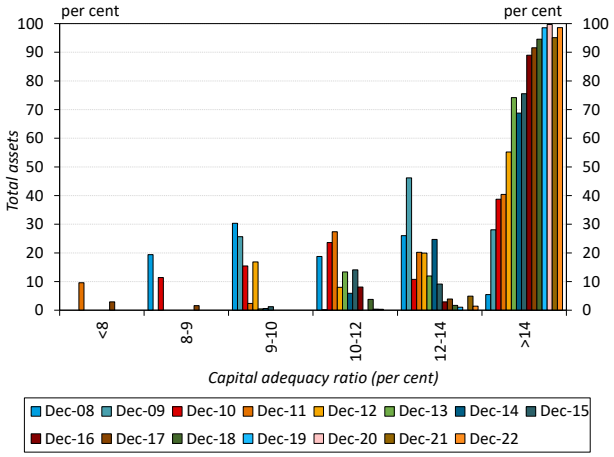
Source: MNB

Chart 49: Banks' capital adequacy ratio (CAR) and Tier 1 capital adequacy ratio



Source: MNB

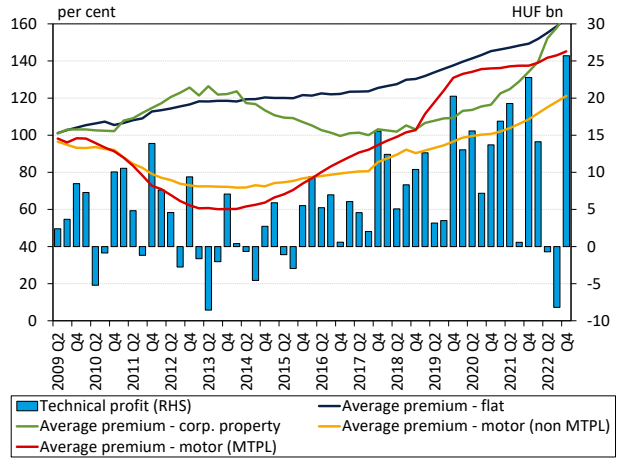
Chart 50: Dispersion of banking sector's total assets by capital adequacy ratio



Source: MNB

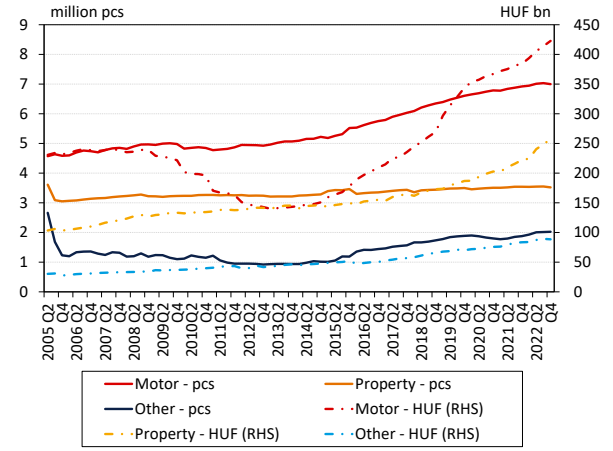
7. Institutional investors

Chart 51: Underline data of insurance tax



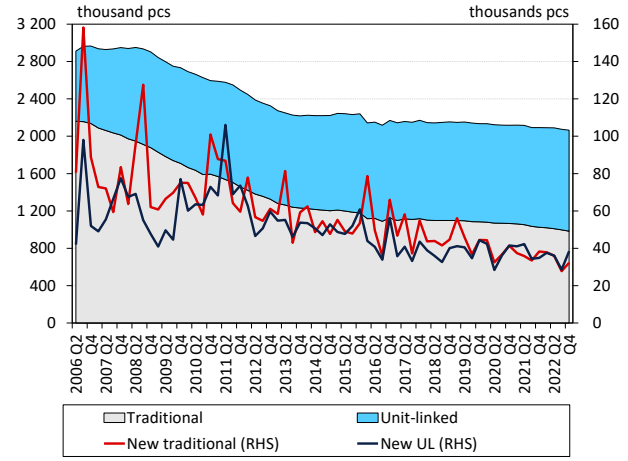
Source: MNB

Chart 52: Development of the outstanding amount of non-life insurance



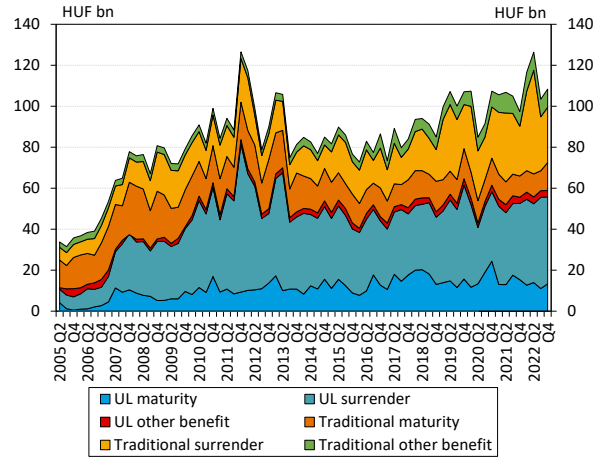
Source: MNB

Chart 53: Development of the outstanding amount of life insurance



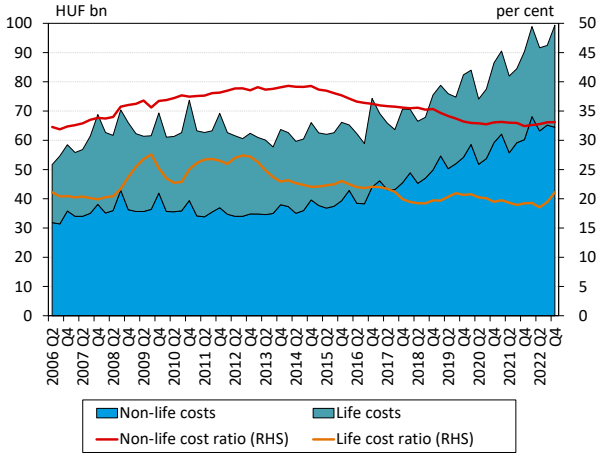
Source: MNB

Chart 54: Development of the outstanding amount of life insurance benefits



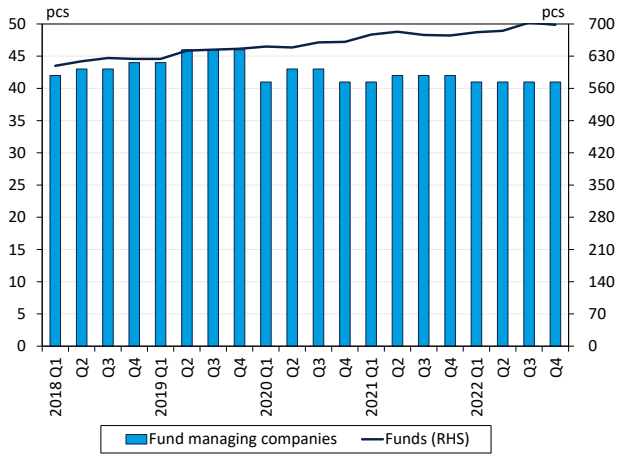
Source: MNB

Chart 55: Costs in the insurance sector



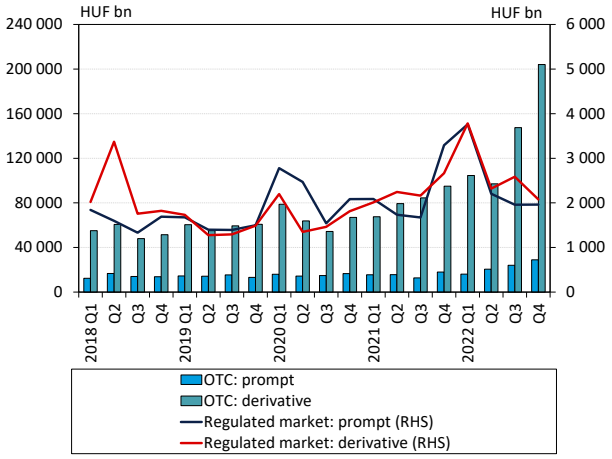
Source: MNB

Chart 56: Number of investment fund managing companies and investment funds



Source: MNB

Chart 57: Capital market turnover of investment firms



Source: MNB

Notes to the appendix

The chart date (e.g. 2020) means the end of the year (the 31st of December) unless indicated otherwise.

Chart 1:

The increased value of the indicator shows declining risk appetite or increasing risk aversion.

Chart 2:

VIX: implied volatility of S&P 500, MOVE: implied volatility of US Treasuries (Merrill Lynch).

Chart 3:

The increased value of the indicator shows declining risk appetite or increasing risk aversion.

Chart 5:

The fundamental development of debt is not influenced by the conversion between unallocated and bullion balances, thus this effect has been excluded.

Chart 6:

Excluding intercompany loans.

Chart 7:

The open FX position of households has turned because of the FX conversion. The compensation of this is shown at banks temporarily, then is was got to the consolidated state with the MNB.

Chart 10:

Disposable income is estimated by the MNB using household consumption, investment and financial savings data.

Chart 12:

Number of bankruptcy proceedings of legal entities, aggregated as of the date of publication and cumulated for 4 quarters, divided by the number of legal entities operating a year before.

Chart 13:

Number of bankruptcy proceedings of legal entities, aggregated as of the date of publication and cumulated for 4 quarters, divided by the number of legal entities operating a year before.

Chart 14:

The 5-year forward forint risk premium as of 5 years from now, compared to the euro forward yield (3-day moving average) and the 5-year Hungarian credit default swap spread.

Chart 17:

Historic volatility: weighted historic volatility of the exchange rate (GARCH method). Implied volatility: implied volatility of quoted 30-day ATM FX options.

Chart 18:

Spread on the 3-month BUBOR and EURIBOR. Loans with floating interest or with up to 1-year initial rate fixation. Adjusted for money market loans > 1M EUR since 2015.

Chart 19:

Spreads based on the APR.

Chart 20:

2002 average = 100 per cent.

Chart 23:

Nominal values, on current rates. Based on consolidated data (previously only unconsolidated data were available for the euro area).

Chart 26:

Exchange rate adjusted values.

Chart 27:

The individual loan loss coverage range covers the banks with at least 2 per cent share in corporate lending.

Chart 28:

In brackets below the names of sectors the weights within corporate credit portfolio are indicated for end-of-observation period.

Chart 35:

The category 0-30 percent contains also the loans disbursed without mortgage before 2008.

Chart 36:

The range of LLP coverage on the individual level refers to the larger banks.

Chart 38:

An increase in the swap stock stands for swaps with a long forint spot leg. Based on the daily FX reports of credit institutions. Calculated from swap transactions between credit institutions and non-resident investors. Revisions due to reporting errors and non-standard transactions can lead to significant subsequent modifications of the data series. The data series does not include swap transactions between branches, specialised credit institutions, cooperative credit institutions and non-resident investors. The swap stock is the sum of termin legs calculated at actual foreign exchange rates.

Chart 40:

From December 2019, the values for the security portfolio, the IRS portfolio, as well as for loans and liabilities were calculated on a cashflow basis instead of a contract basis. In addition, for loans and liabilities, from December 2019 onwards, we could only take into account the remaining maturities, not the time remaining until repricing.

Chart 41:

The interest rate risk stress test indicates the two-year projected result of an extreme interest rate event; in this scenario this event is a parallel upward shift of the yield curve by 300 basis points. For calculating the results, from December 2019 onwards, we applied the interest rate risk model detailed in Box 10 of the December 2019 Financial Stability Report. While for earlier calculations we assumed shocks of each currency's yield curve, for these new calculations we only assumed the shock-like upward shift of the HUF curve.

Chart 42:

A rise in the liquidity index indicates an improvement in the liquidity of the financial markets. The indicator is the unweighted average of the aggregate liquidity ratios of the sub-markets shown in Chart 43.

Chart 43:

Each aggregate liquidity index of a sub-market is the unweighted average of exponential moving averages normalized by the mean and standard deviation of the values of four sub-indices (number of transactions, average transaction size, bid-ask spread, and return to volume indices) between 2013 and 2017. An increase in the aggregate liquidity index indicates an increase in the liquidity of the given sub-market.

Chart 44:

A rise in the indices represents a narrowing bid-ask spread, thus an increase in the tightness and liquidity of the market. The liquidity-index of HUF FX swap market includes the data of USD/HUF and EUR/HUF segments, taking into account tom-next, overnight and spot-next transactions. The earlier version of the liquidity index included only the tom-next USD/HUF transactions.

Chart 45:

Client loans include loans and bonds of non-financial institutions, household loans, loans and bonds of financial and investment enterprises, government loans, municipal loans and municipal bonds. Client deposits include the deposits of non-financial institutions, household deposits, deposits of money market funds, deposits of financial and investment enterprises, government deposits and municipal deposits. The loan-to-deposit ratio is exchange-rate-adjusted with respect to the last period.

Chart 46:

ROE: pre-tax profit/average (equity - balance sheet profit).

ROA: pre-tax profit/average total assets.

Interim data are annualised.

Pre-tax profit: previous 12 months.

Average total assets: mean of previous 12 months.

Average (equity - balance sheet profit/loss): 12 month moving average.

Deflator: previous year same month=100 CPI (per cent).

Chart 47:

Pre-tax profit.

Chart 48:

Based on aggregated individual, non-consolidated data.

Net interest income: 12-month rolling numbers, the difference of interest revenue and interest expenditure.

Gross interest bearing assets: 12-month average numbers, total exposure.

Net interest bearing assets: 12-month average numbers, exposure minus the provision.

Chart 49:

Cost: previous 12 months.

Income: previous 12 months.

Average total asset: mean of previous 12 months.

Chart 50:

Capital adequacy ratio (CAR) = (total own funds for solvency purposes/minimum capital requirement)*8 per cent.

Tier 1 capital adequacy ratio = (tier 1 capital after deductions/minimum capital requirement)*8 per cent.

Chart 53:

Motor insurance premiums contains insurance tax from 2019.

Chart 58:

Sum turnover of investment firms and credit institution.

Ferenc Deák

(17 October 1803 – 28 January 1876)

Politician, lawyer, judge at a regional high court, member of parliament, minister for justice, often mentioned by his contemporaries as the ‘wise man of the homeland’ or the ‘lawyer of the nation’. Eliminating the ever-recurring public law disputes and clarifying the relationship between the ruling dynasty and the hereditary provinces, he not only reinforced the constitution and the existence of the nation but also paved the way for the development as well as the material and intellectual enrichment of Hungary.

Deák was actively involved in preparing the laws for the parliamentary period between 1839 and 1840, and he became an honorary member of the Hungarian Academy of Sciences in 1839. After the death of his elder brother in 1842, Deák the landowner liberated his serfs and voluntarily undertook to pay taxes proving that he was an advocate of economic reforms not only in words but also in deeds. He refused to fill the position of delegate to the 1843/44 parliament because he disagreed with the idea of having to be bound by the instructions received as delegate, and as a moderate political thinker he had his concerns about the radical group led by Kossuth.

He remained level-headed also with regard to the evaluation of the events of 1848, he was afraid of violence and rejected it as a political tool. All the same, he accepted the post of minister for justice in the government of Lajos Batthyány. In December 1849 he was arrested for revolutionary activities, but later on, after being tortured for information, he was released. From then on he acted as the intellectual leader of the national passive resistance movement, and believed from the very beginning that Austrian centralisation was doomed to fail due to its inherent faults. He became the leader of the Address Party in the parliament of 1861, and even though they failed to bring the monarch to accept their ideas, he increasingly managed to take over the initiative over time.

Based on his earlier proposals, in 1865 Deák published his so-called Easter Article – which radically influenced Hungarian politics of the time – and until 1867 he virtually devoted all his time to reaching a compromise with the Hapsburg dynasty. After the compromise between Austria and Hungary ratified in 1867, Hungary was able to return to the path of social and economic development.

FINANCIAL STABILITY REPORT

May 2023

Print: Prospektus Kft.

H-8200 Veszprém, Tartu u. 6.

mnb.hu

H-1013 BUDAPEST, KRISZTINA KÖRÚT 55.