# Financial Stability Report

## 2020/2021

Czech National Bank —— Financial Stability Report —— 2020/2021

CNB CZECH NATIONAL BANK

The Financial Stability Report 2020/2021 was discussed by the CNB Bank Board at its regular meeting on financial stability issues on 27 May 2021 and published on 15 June 2021. With a few exceptions, it contains information available as of 31 March 2021. It is available in electronic form on the CNB website, where the underlying data for the tables and charts used in this publication are also published. A list of abbreviations can also be found there.

# The mandate of the CNB

Maintaining financial stability is defined as one of the CNB's main objectives in Act No. 6/1993 Coll., on the Czech National Bank, as amended:

Article 2

(2) The Czech National Bank shall perform the following tasks:

...

**e) set macroprudential policy by identifying, monitoring and assessing risks jeopardising the stability of the financial system and, in order to prevent or mitigate these risks, contribute by means of its powers to the resilience of the financial system and the maintenance of financial stability; where necessary, it shall cooperate with the relevant state authorities in setting macroprudential policy,**

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The CNB defines financial stability as a situation where the financial system operates with no serious failures or undesirable impacts on the present and future development of the economy as a whole, while showing a high degree of resilience to shocks. The CNB's definition is based on the fact that financial stability may be disturbed both by processes inside the financial sector that lead to the emergence of weak spots, and by strong shocks, which may arise from the external environment, domestic macroeconomic developments, large debtors and creditors, economic policies or changes in the institutional environment. Any interaction between weak spots and shocks can result in the collapse of systemically important financial institutions and in disruption of the financial intermediation and payment functions of the financial system.

The CNB's aim with regard to financial stability is to ensure a degree of resilience of the system that minimises the risk of financial instability. To fulfil this aim, the CNB as the central bank and supervisory authority uses the instruments made available to it by the Act on the CNB, the Act on Banks and other applicable laws. Cooperation with other national and international institutions is also very important in this area. In order to maintain financial stability, the CNB focuses on prevention and broad communication with the public regarding the potential risks and factors posing a threat to financial stability. This Financial Stability Report is an integral part of such communication.

The global financial crisis led to a strengthening of the importance of the objective of financial stability in central banks. Macroprudential policy, which is intended to contribute to the maintenance of financial stability, was formally introduced in the Czech Republic in 2013 through an amendment of the Act on the CNB No. 227/2013 Coll. In line with the CNB's strategy, the main aim of macroprudential policy is to mitigate systemic risk, i.e. the risk of instability of the financial system as a whole. A debate about the tools of macroprudential regulation, i.e. the set of pre-emptive measures intended to prevent financial instability, is going on at international level. The European Systemic Risk Board (ESRB) has been operating at the European level since the start of 2011. Together with three pan-European sectoral supervisory authorities (EBA, ESMA and EIOPA) it makes up the European System of Financial Supervision (ESFS). If it identifies increased risks of a systemic nature, the ESRB issues warnings and recommendations to mitigate those risks. CNB representatives are involved directly in the ESRB's work; the CNB Governor and another board member are members of the General Board of the ESRB, and CNB experts participate in its working groups. Since 2011, the CNB has also been represented in the Regional Consultative Group of the Financial Stability Board established by the G20.

The CNB regularly monitors and closely analyses developments in all areas relevant to financial stability. The members of the CNB Bank Board meet with experts from key sections at regular meetings on financial stability issues. A wide range of information on developments of risks in the domestic financial system and abroad is presented at these meetings. The position of the Czech economy in the financial cycle is assessed and – if any risks to financial stability are identified – discussions are held regarding the use of regulatory, supervisory and other economic policy tools to suppress such risks or their potential effects.

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# Foreword

Dear Readers,

**Our main publication in the area of financial stability and macroprudential policy is the *Financial Stability Report***, which we have published usually in June since 2005. It is the key document for the regular spring Bank Board meeting on financial stability issues. The 17th Report – the **2020/2021** edition – is now at your disposal. I am sure you will welcome this opportunity to again get hold of information about this currently very important area of supervision and regulation.

**Last year, the preparation of the *Report* was significantly affected by the coronavirus pandemic.** Given the need to partially capture the impacts of the pandemic on the financial sector, the *Report* was published about four weeks later than in previous years. This year's *Report* is published at the usual time again. We continue to pay close attention to the consequences and implications of the pandemic in the *Report*. However, we also look in detail at the risks our financial sector will probably face in the post-pandemic period. We devote significant space to macroprudential capital buffers and instruments aimed at maintaining financial institutions' resilience to adverse shocks. We apply an increasingly large set of stress tests, in which we used two scenarios based on the forecast published in Monetary Policy Report – Winter 2021. The *Baseline Scenario* is based on the CNB's official January macroeconomic forecast. As in the previous year, the *Adverse Scenario*, which assumes a resurgence of the pandemic and a resulting longer economic downturn, represents an extreme stress.

**According to the Act on the CNB, maintaining financial stability is one of our key objectives.** In accordance with the Act, the CNB identifies, monitors and assesses risks jeopardising the stability of the financial system and, in order to prevent or mitigate these risks, contributes by means of its powers to the resilience of the financial system and the maintenance of financial stability. To do so, it primarily employs macroprudential policy tools, which it implements on the basis of its published strategy.

**The CNB defines financial stability as a situation where the financial system operates with no serious failures or undesirable impacts on the present and future development of the economy as a whole,** while showing a high degree of resilience to shocks. The CNB's definition is based on the fact that financial stability may be disturbed both by processes inside the financial sector that lead to the emergence of weak spots, and by strong shocks, which may arise from the external environment, domestic macroeconomic developments, large debtors and creditors, economic policies or changes in the institutional environment. Any interaction between weak spots and shocks can result in the collapse of systemically important financial institutions and in disruption of the financial intermediation and payment functions of the financial system.

**The CNB's aim with regard to financial stability is to ensure a degree of resilience of the system that minimises the risk of financial instability.** To fulfil this aim, the CNB as an integrated authority for financial market supervision and monetary policy uses the instruments made available to it by the Act on the CNB, the Act on Banks and other applicable laws. Cooperation with other national and international authorities is also very important in this area. In order to maintain financial stability, the CNB focuses on prevention and broad communication with the public regarding the potential risks and factors posing a threat to financial stability.

**The CNB regularly monitors and closely analyses developments in all areas relevant to financial stability.** The members of the CNB Bank Board meet with experts from key sections at regular meetings on financial stability issues. A wide range of information on developments of risks in the domestic financial system and abroad is presented at these meetings and the position of the Czech economy in the financial cycle is assessed. If any risks to financial stability are identified, discussions are held regarding the possible use of regulatory, supervisory and other economic policy tools to suppress such risks or their potential effects.

**The CNB is a member of the joint EU institution for the identification of systemic risks and macroprudential policy – the European Systemic Risk Board** (ESRB). Together with three pan-European sectoral supervisory authorities (EBA, ESMA and EIOPA), the ESRB makes up the European System of Financial Supervision (ESFS). CNB representatives are involved directly in the ESRB's work; the CNB Governor and another board member are members of the General Board of the ESRB, and CNB experts participate in its working groups. In line with an ESRB recommendation, macroprudential policy focuses on the fulfilment of several intermediate objectives. These objectives include (a) to mitigate and prevent excessive credit growth and leverage; (b) to mitigate and prevent excessive maturity mismatch and market illiquidity; (c) to limit direct and indirect exposure concentrations; (d) to limit the systemic impact of misaligned incentives with a view to reducing moral hazard; and (e) to strengthen the resilience of financial infrastructures. According to an ESRB assessment, the CNB is one of the most active authorities in the EU countries as regards the use of macroprudential policy at the national level.

**The macroprudential policy instruments used by CNB include above all a set of prescribed capital buffers for credit institutions.** The CNB sets a countercyclical capital buffer and a systemic risk buffer for systemically important banks at regular intervals. In previous years, the CNB dealt intensively with risks associated with property market developments and mortgage lending. To mitigate these risks, the CNB used a set of recommendations regarding the provision of mortgage loans.

**The publication is divided into five sections.** The *Real economy and financial markets* section deals with the macroeconomic environment, property markets, the public sector, non-financial corporations and households and analyses overall developments in the financial markets. The section called *The financial sector* discusses developments in the banking and non-banking financial sector. The *Stress tests* section assesses the resilience of sectors on the basis of stress tests and sensitivity analyses. The section *Macroprudential policy* contains an overall risk assessment, information on macroprudential instruments for mitigating risks identified, and an analysis of risks associated with developments in the regulatory environment.

**The CNB will publish additional detailed analyses of risks to financial stability and information about the macroprudential policy settings in December 2021**. It will do so in its regular document *Risks to financial stability and their indicators – December 2021*, which will be the underlying document for the autumn Bank Board meeting on financial stability issues.

**On behalf of the Czech National Bank**

**Jiří Rusnok**

Governor

# I. SUMMARY

*The Czech financial sector maintained high resilience to adverse shocks during the pandemic. The government's stabilisation and support programmes provided liquidity to the real economy and prevented a precipitous wave of credit defaults. The CNB's measures stabilised the debt service of the private non-financial and government sectors and supported the smooth operation of the financial markets. The income of many households and especially non-financial corporations fell markedly. This had an adverse effect on their solvency and, in turn, on the results of financial institutions. The stabilisation and support programmes significantly limited the adverse impacts. However, some of these impacts can be expected to materialise with a lag this year and the next. Although the pandemic receded in the spring months of 2021, the level of uncertainty regarding future developments remains significantly elevated. This still requires financial institutions to act very prudently in managing capital and in their dividend policies.*

*The capital position of the domestic banking sector remains robust, thanks in part to capital buffers and capital surpluses in excess of the regulatory requirements. In response to the pandemic, the CNB lowered the countercyclical capital buffer (CCyB) rate in the first half of 2020. This supported banks' ability to lend to non-financial corporations and households without interruption. Following an assessment of financial cycle indicators, banking sector vulnerability and other factors affecting resilience, the CNB Bank Board decided at its meeting on 27 May 2021 to increase the CCyB rate to 1%, the rate covering the usual level of risks. In taking this decision, the Bank Board took into account the standard rate concept, which the CNB is ready to apply every time the acute phase of an economic downturn fades away. This decision is supported by the fact that the total cyclical risks accepted earlier in the banking sector's balance sheet remained elevated due to low materialisation during the pandemic. The appropriate CCyB rate enables the banking sector to maintain capital which, together with other capital buffers, covers these risks.*

*The drop in economic activity and the worse labour market situation did not cool the mortgage and property markets. On the contrary, the volumes of genuinely new housing loans and mortgage loans reached record highs in the second half of 2020 and the first few months of 2021. Besides genuinely new mortgage loans, the volume of refinanced loans also increased. The high volumes of genuinely new mortgage loans are due mainly to a marked rise in the average loan size. The numbers of these loans were not beyond those common in previous years. The continued rapid growth in residential property prices in the Czech Republic has made housing less affordable and has led to a rise in potential house price overvaluation. The CNB estimates that apartments in the Czech Republic are overvalued by 18% on average for median-income households. In selected localities with a high share of investment apartments, the estimated overvaluation may be as much as 25%.*

*The Bank Board decided in the first half of last year to gradually ease or abolish the recommended LTV, DTI and DSTI caps. Lenders complied with the recommended LTV limit, aided by rapid growth in prices of property used as collateral. They did not abide too much by the DTI and DSTI levels representing increased risk according to the CNB. The share of risky mortgage loans increased in the second half of last year. In terms of credit standards expressed as DTI and DSTI ratios, the banking sector thus returned to conditions resembling the situation in the second half of 2018, when caps on these ratios were first introduced. After a thorough discussion, the Bank Board decided to keep the LTV limit unchanged at 90%, with the option of applying a 5% exemption. At the same time, it did not for the time being deem it immediately necessary to set DTI and DSTI limits or to tighten the other parameters of the existing Recommendation. However, it points out to lenders that it considers credit standards to be as relaxed as acceptable. For the time being, the CNB will respond to the related risks using instruments of microprudential supervision, for example an additional Pillar 2 capital requirement for risk management systems. The CNB would have to react using macroprudential policy tools to any further broad easing of credit standards and taking on of additional risks.*

## ASSESSMENT OF RISKS TO FINANCIAL STABILITY ASSOCIATED WITH THE REAL ECONOMY AND FINANCIAL MARKETS

**The economic situation continues to be adversely affected by the pandemic and its consequences**
The global economic contraction in 2020 was ultimately smaller than forecasted in the first half of the year. Despite that, most countries are grappling with an adverse epidemic situation or the immediate consequences of the pandemic. The return to pre-pandemic performance levels will thus be gradual, with a full recovery not expected to occur until 2022. A similar trend is expected for the domestic economy. According to the CNB's forecast published in Monetary Policy Report – Spring 2021 economic growth will be only moderate in 2021 and will not accelerate until next year.

**Highly expansionary fiscal policies in many countries have significantly helped mitigate the impact of the pandemic**
The stabilisation of economies has necessitated exceptionally high deficits and growth in government debts. Real debt service costs are currently low in most countries. This is increasing governments' borrowing capacity and reducing perceptions of risks associated with public debt sustainability. However, a too fast tightening of global financial conditions in response, for example, to rising risk premia or inflation expectations could significantly hinder some governments' access to funding. The significance of this risk is increasing for small, heavily indebted economies with a high share of non-residents in public debt holdings. Czech general government debt rose by 7.8 pp year on year to 38.1% of GDP at the end of 2020. The Czech Republic's need to fund its expansionary fiscal policy met with strong demand in 2020, with the domestic banking sector remaining the main counterparty.

**The risks associated with public finances remain relatively low**
Since 2015, based on its internal methodology, the CNB has been annually evaluating the risks of concentration of exposures to sovereign issuers in the balance sheets of banks based in the Czech Republic. The CNB regards their exposures to the Czech government as systemically important. The value of these exposures rose by CZK 276 billion year on year to CZK 790 billion at the end of 2020, accounting for 10.9% of banks' total assets. The key sovereign risk indicator in the stress test under the *Adverse Scenario* increased to its highest level in the history of the test. However, it is still well below the supervisory thresholds. Given the results of the Czech public finance stress test, the CNB will not require banks to meet an additional capital requirement to cover the risk of concentration of these exposures in the next three years. However, a decrease in the so far robust confidence of investors in Czech public finance sustainability as a result of growth in government debt without credible public finance consolidation may represent a medium-term risk.

**The start of monetary policy normalisation is being postponed**
Monetary policy rates in most countries have remained at exceptionally low levels since the onset of the pandemic, and central banks' other support measures are also being maintained in their full range. The "low-for-long" scenario, which was assessed to be likely even before the onset of the pandemic, is thus materialising. Monetary policies are therefore helping reduce the risks stemming from the impacts of the pandemic on both the public and private sectors by maintaining accommodative financial conditions. However, the environment of very low yields is also fostering an increase in risks to financial stability, consisting mainly in limited profitability of financial institutions, overvaluation of prices of market assets, and rising debt. These risks are intensifying as monetary policy normalisation is being postponed.

**Any sudden tightening of financial conditions may lead to increased financial market volatility**
A shortage of high-quality, liquid assets with positive yields persists on financial markets. This is motivating private investors to invest in riskier, higher-yielding assets. The result is very low risk premia and growth in corporate bond and stock prices, often above levels justified by fundamentals. Any tightening of global financial conditions might cause radical reshuffles of portfolios involving sell-offs of risky assets and a rise in financial market volatility.

**The ongoing pandemic is affecting some sub-sectors of the Czech non-financial corporations sector**
The situation in the Czech non-financial corporations sector was still strongly affected by the ongoing pandemic and anti-epidemic measures in the first half of 2021. These measures had the biggest impact on certain services, whose default rates rose sharply in late 2020 after the statutory moratorium ended. Some companies – mostly industrial ones – managed to adapt to the pandemic conditions, and industrial output exceeded the pre-pandemic levels in spring 2021. The main risks to the non-financial corporations sector consist in an extension or retightening of restrictive measures due to insufficient vaccination, a low willingness to get vaccinated and the emergence of virus strains resistant to the existing vaccines. The timing and strategy for terminating government economic support measures will also be crucial.

**The Czech household sector was hit only marginally by the pandemic**

Despite the sharp economic downturn, unemployment in the Czech Republic remained low and the income situation of most households did not deteriorate much. The current low default rate on loans to households is consistent with this. Easy financial conditions, supportive fiscal programmes and tax measures fuelled accelerating growth in loans for house purchase, reflected in continued growth in residential property prices. Given the favourable labour market situation, the default rate is not expected to rise sharply in the next few quarters. A deterioration of the labour market situation and continued excessive growth in housing loans with risky characteristics remain a risk to the household sector's solvency, as overindebted households may react sensitively to a rise in long-term interest rates.

**The domestic banking sector strengthened its capital and liquidity position, but its profitability declined significantly**

The capitalisation of the domestic banking sector has long been strong due to high surpluses on top of the regulatory capital requirements (CZK 236 billion, or around one-third of total capital in December 2020). The CNB's recommendation for restraint in profit distribution, which is based on an ESRB recommendation, and continued profitability further enhanced the sector's capitalisation, which is among the highest in Europe. Its level creates the right conditions for absorption of any further credit losses and for smooth lending to the real economy. Theoretically, the banking sector's current capitalisation would allow it to lend an additional CZK 3.5 trillion or so. Its ability to lend is supported by a strong liquidity position, characterised by a high proportion of liquid assets. After-tax profit fell by almost one-half year on year to CZK 47.5 billion at the end of 2020. Credit risk coverage costs rose and net interest income dropped due to the impacts of the pandemic on the economy. The government's stabilisation measures and the flexibility of the regulatory and accounting frameworks reduced or postponed the pass-through of credit risk to banks' balance sheets and profits. This remains the main risk to the sector's profitability in the years ahead.

**The end of the statutory moratorium led to partial materialisation of credit risks and a decrease in their latency…**

The change in economic conditions in 2020 caused asset impairment losses to increase from CZK 4 billion in 2019 to CZK 29 billion in 2020. Risks partially materialised after the statutory moratorium ended in October 2020, as the share of impaired exposures (Stage 3) grew by 0.4 pp year on year to 2.6% at the end of 2020. The ratios of non-performing loans with deferred instalments (under the statutory moratorium or bank moratoria) were and still are lower than banks had expected before the statutory moratorium ended. The volume of approved (statutory or individual) moratorium applications stood at around CZK 470 billion at the end of September 2020 (about 15% of banks' credit exposures to the private non-financial sector). Of this amount, CZK 94 billion had been repaid by the end of March 2021, taking the current stock of such loans down to CZK 376 billion. Interest in deferrals granted by banks after 1 October 2020 has been relatively low so far. Such loans amounted to around CZK 43 billion at the end of March 2021. As of the same date, more than half of the loans under some type of moratorium granted after the onset of the pandemic remained in Stage 1, i.e. the stage indicating no increase in the credit risk of the relevant exposures. The current trend thus signals a gradual decrease in the overall level and latency of credit risk in the banking sector.

**…and banks currently expect credit risk materialisation to slow**

Based on the information known at the end of March 2021, banks expect provisioning to total between CZK 10 billion and CZK 15 billion in 2021, i.e. less than in 2020 (around CZK 20 billion), and profits to be slightly above the 2020 level. In the first two months of 2021, banks recorded relatively low levels of new credit losses, whose annualised amount did not exceed CZK 10 billion. As a result, the highly adverse trend observed in the real economy in 2020 will probably be reflected in banks' IRB credit risk models to only a limited extent. This may lead to a stagnation or further decline in the risk weights of the main IRB credit portfolios, potentially reducing the banking sector's resilience.

**The domestic non-bank financial sector remains stable, with a sudden tightening of global financial conditions remaining a risk**

The segments of the domestic non-bank financial sector were not significantly affected by the pandemic and its immediate impacts on the aggregate level. Institutions remain sufficiently capitalised, partly due to the non-payment of dividends in 2020. They also maintain a good liquidity position. After falling in the first half of 2020, asset prices on global financial markets rose apace. This led to an increase in the value of the assets managed by domestic investment funds and fostered an inflow of new funds. A tightening of global financial conditions, accompanied by an abrupt repricing of risk premia, growth in yields and a relatively significant decline in prices of investment assets, is the primary risk to the solvency and liquidity positions of non-bank financial institutions. Results of stress tests of the most significant segments of the non-bank financial sector demonstrate that the current capitalisation, stable liquidity position and continued profitability of those segments continue to ensure their resilience to shocks.

## MACROPRUDENTIAL POLICY

**The CNB responds to credit risks in the banking sector associated with the financial and business cycle by applying the CCyB**

The countercyclical capital buffer (CCyB) is designed to increase the resilience of the banking sector to risks associated with the effect of the financial cycle. An appropriate CCyB rate reduces the negative impacts of the manifestations of this cycle on the banking sector and enhances banks' ability to lend to the real economy even in the event of adverse shocks. In response to the onset of the pandemic, the CNB Bank Board decided last year to gradually lower the CCyB rate from 1.75% to 0.5% with effect from July 2020. The partial release of the CCyB sent out a signal that the CNB is ready to support banks' ability to lend to non-financial corporations and households without interruption. The developments in the second half of last year and the first few months of this year convincingly document that this support is no longer necessary and that the countercyclical capital buffer rate can be returned to its standard level.

**The CNB Bank Board decided at its May meeting to increase the CCyB rate to 1% with effect from 1 July 2022**

The final decision on the CCyB rate is always a result of a comprehensive assessment of indicators of the financial cycle and the vulnerability of the banking sector and other factors affecting the sector's resilience. Following this assessment, the CNB Bank Board decided at its meeting on 27 May 2021 to increase the CCyB rate to 1%. In taking this decision, the Bank Board took into account the standard rate concept, which it is ready to apply every time the acute phase of an economic downturn fades away. The decision is consistent with the fact that banks in the Czech Republic currently meet the overall capital requirement – consisting of the minimum regulatory level in Pillar 1, the requirements based on the supervisory review of risks in Pillar 2 and macroprudential capital buffers – by a sufficient margin.

**…and, in setting the CCyB rate, it is ready to react flexibly to changes in economic and financial conditions**

In the event of continued rapid growth in lending to the household sector, renewed growth in loans to non-financial corporations and faster taking on of risks in the banking sector's balance sheet, the Bank Board is ready to increase this rate further. The fact that the increase in the rate takes effect after one year, i.e. on 1 July 2022, gives the CNB room to take a flexible approach in the event of unexpected adverse shocks. Should the economic situation worsen again, for example due to another wave of the pandemic, the Bank Board will be ready to review the announced increase in the countercyclical capital buffer rate or to release the buffer immediately and fully.

**The Czech economy has probably now come through the acute phase of the economic downturn…**

The Bank Board's decision on the CCyB rate was based on indicators and analyses assessing the position of the domestic economy in the financial cycle and the degree of vulnerability of the banking sector. They showed that the economy had come through the acute phase of the economic downturn and the cooling of credit growth in selected credit segments. At the same time, the relaxed financial conditions, banks' easing credit standards, and positive investment sentiment of households, combined with a series of support measures in the economic policy area, had fostered new cyclical risk-taking. The aggregate cyclical risks in the banking sector's balance sheet had thus grown further, albeit more slowly than in previous years.

**…and the cyclical risks in banks' balance sheets remain elevated**

Due to low materialisation of cyclical risks accepted previously during the pandemic, the aggregate cyclical risks in the banking sector's balance sheet meanwhile remain elevated. Prudent management of these risks is aided by banks' forward-looking creation of higher loan provisions in 2020 in expectation of higher credit losses. By contrast, risk weights on credit portfolios under the IRB approach hardly responded to the economic downturn and remain cyclically low.

**The banking sector remains resilient even in the *Adverse Scenario* thanks to capital surpluses…**

A record-high initial capital ratio (24.3% in December 2020) enabled the sector to maintain its capitalisation well above the 8% regulatory minimum and above the total capital requirement even in the *Adverse Scenario* over the stress test horizon. The sector's capital ratio falls to 20.9% in the *Baseline Scenario* and to 18.8% in the *Adverse Scenario*. However, if banks had no capital surpluses above the regulatory requirements at the start of the test (at the end of 2020 they had a surplus of 9.4 pp of the capital ratio), the sector's capital ratio would drop below the total Pillar 1 and Pillar 2 capital requirement in the *Adverse Scenario*.

**…which highlights the need for highly prudent capital management**

The results of the macro stress test of banks show that the capital surplus level can be key in maintaining banking sector stability in adverse economic conditions. Given the uncertainty associated with the future course of the epidemic and its long-term impacts on the economy, banks need to continue to act very prudently in managing capital and in their dividend policies. Premature use of a large proportion of banks' capital surpluses could become a source of systemic risk.

**In view of the drop in market stress, the CNB adjusted its two-week liquidity-providing repo operations**

As a precautionary measure, the Bank Board in March 2020 adjusted the rules of its monetary repo operations for providing liquidity to financial institutions. These operations were announced twice a week for two-week maturity and once a week for three-month maturity. Bids in these operations were fully satisfied at a fixed rate corresponding to the two-week repo rate, i.e. with a zero spread. The range of eligible collateral was broadened to include mortgage bonds. In addition, a two-week repo facility to provide liquidity to some non-bank financial institutions at a fixed rate equal to the two-week repo rate plus 20 bp was introduced for preventive reasons. This facility was collateralised by Czech government securities or CNB bills. Institutions did not use these facilities for liquidity reasons. In view of the overall drop in stress on the domestic financial market and the return of market conditions to the pre-pandemic state, the Bank Board decided on 6 May 2021 to abolish the three-month liquidity-providing repo facility for credit institutions. On 27 May 2021, it decided to reduce the frequency of the liquidity-providing repo operations for credit institutions to once a week and reintroduce the previously applied interest mark-up of 0.1 pp with effect from 28 May 2021. It left the terms of the liquidity-providing facility for non-bank financial institutions unchanged but also reduced its frequency to once a week.

**The affordability of housing has deteriorated further due to rapid growth in residential property prices, and the estimated overvaluation of apartment prices has increased slightly**

A renewed vicious loop between credit financing of residential property purchases and rapidly rising residential property prices is a significant source of systemic risk in the Czech economy. Transaction prices of residential property recorded buoyant growth in 2020 and the first few months of 2021 despite the coronavirus epidemic in the Czech Republic and many other countries. They are now around 70% higher than they were at their lowest point at the end of 2013. The continued strong growth in property prices has caused the affordability of housing to deteriorate and the potential overvaluation of housing prices to rise to 18% on average. The CNB estimates that in selected localities with a high share of investment apartments, the estimated overvaluation may be as much as 25%. The high overvaluation indicates that households are willing to take on increased credit risk when debt financing property purchases, or that investors are willing to accept low returns. This increases the sensitivity of property prices to negative shocks in the form of a significant rise in unemployment or fall in incomes and implies a higher risk of a price correction. A sharp rise in interest rates on housing loans or growth in yields requested by investors could have similar consequences. The CNB's projection based on the *Baseline Scenario* derived from its January macroeconomic forecast assumes that year-on-year property price growth will remain strong in the first half of 2021 and then start to weaken gradually due to rising interest rates on housing loans and to base effects.

**The volumes of genuinely new mortgage loans increased**

The volumes of genuinely new housing loans (excluding refinanced and refixed loans) reached record highs in the second half of last year and the first few months of this year. This was due mainly to a marked rise in the average loan size, which now exceeds CZK 2.6 million. The numbers of genuinely new mortgage loans were not beyond those common in previous years. Besides genuinely new mortgage loans, the volume of refinanced loans also increased. Demand for refinancing was boosted by expectations that mortgage interest rates will start to rise this year.

**Mortgage lenders were compliant with the recommended LTV limits**

From the second quarter of 2020 onwards, mortgage lenders were supposed to comply only with an individual LTV limit of 90%, to be exceeded only by loans representing a maximum of 5% of the reference volume (the average for the previous two quarters). All lenders complied with this volume exemption, exceeding the 90% LTV limit for 3% of loans on average. Applicants were capable of obtaining acceptable LTV values even in the event of a significant increase in the size of the loan sought, because the growth in property prices was reflected in growth in collateral value. However, the share of loans with LTVs of 80%–90% increased significantly to 18% of the volume provided in the last quarter of 2020. Lenders took account of the level of risk undertaken when setting interest rates. The higher level of risk was reflected above all in rates on loans with LTVs of over 80% where those loans simultaneously had a high DTI or DSTI ratio.

**Lenders did not abide too much by the DTI and DSTI levels representing increased risk according to the CNB**

Based on the conclusions of its analyses and stress tests, the CNB usually regards mortgage loans with a DSTI of over 40% of net income as very risky. Lenders were supposed to comply with a DSTI cap of 45% between October 2018 and March 2020 and of 50% in the second quarter of 2020, with a 5% volume exemption in both cases. From mid-2020 onwards, the CNB applied no recommended DSTI limit. In the second half of the year, this relaxation of regulation started to be reflected in less tight credit standards. The share of higher-risk mortgage loans increased in the second half of 2020. In the last quarter of the year, banks provided over 30% of the relevant reference volume of loans with a DSTI of over 40%, 20% of loans with a DSTI of over 45% and 10% of loans with a DSTI of over 50%. This was particularly true of second and subsequent mortgage loans, whose share in genuinely new loans is stable at around one-third. Similar trends could also be observed for the DTI ratio, for which the CNB considers a debt of eight times net annual income as the threshold for increased riskiness Between October 2018 and March 2020, the DTI limit was set at 9 with a 5% volume exemption. In the

last quarter of 2020, loans with DTIs of over 8 accounted for 35% and loans with DTIs of over 9 for almost 17% of the reference volume of loans.

**For the period ahead, the CNB confirms the LTV limit at 90% and is not applying DTI and DSTI caps; the other parameters of the Recommendation are also unchanged**

Despite the easy credit standards, the loop between debt financing of property purchases and optimistic expectations regarding future property price growth, as well as the persisting overvaluation of housing prices, the Bank Board decided in the current situation to keep the recommended LTV limit unchanged at 90%, with the option of applying a 5% exemption. At the same time, it does not currently deem it immediately necessary to set DTI and DSTI limits or to tighten the other parameters of the existing Recommendation. However, it points out to lenders that it considers credit standards to be as relaxed as acceptable. The CNB regards the high and increasing share of loans with a DTI ratio of over 8 and a DSTI ratio of over 40% of net income as highly risky and a potential source of systemic risk. Lenders should therefore take measures to ensure that such loans are indeed provided only to applicants who are highly likely to repay without problems. The CNB will focus on this in its microprudential supervision. For the time being, the CNB will respond to the risks associated with the highly relaxed credit standards of some lenders also using instruments of microprudential supervision, for example an additional Pillar 2 capital requirement for risk management systems. The CNB would have to react using macroprudential policy tools to any further easing of credit standards and taking on of additional risks.

**The risk associated with concentration of loans financing property purchases and construction is also rising**

Increasing concentration of loans connected with property financing is one of the structural risks to the domestic banking sector. These loans accounted for almost two-thirds of loans to the private non-financial sector at the end of 2020. The share of housing loans in loans to the private non-financial sector is close to one-half. This concentration is above-average compared with other EU countries. The CNB may apply macroprudential tools to mitigate the risk of concentration if necessary. These tools include the systemic risk buffer (SRB), which will also be available in a sector-specific variant after the transposition of CRD V into Czech law.

**Banks remain conservative in financing commercial property**

Pessimistic sentiment prevailed on the commercial property market due to the global developments. Investment and transactions decreased mainly in the hotels and other accommodation segment, but lower activity was also observed for other types of commercial property. The banking sector reduced its financing of this sector in the first half of last year. In the second half of the year, new loans returned to their stable half-year volume of CZK 40–50 billion, due mainly to increased growth in funding of new residential construction. Loans provided with LTVs of 50%–60%, or even below 50%, were most strongly represented in the second half of 2020.

The CNB will publish additional detailed analyses of risks to financial stability and information about the macroprudential policy settings in December 2021 in its publication *Risks to financial stability and their indicators*, which will be the underlying document for the autumn Bank Board meeting on financial stability issues.

# II. THE REAL ECONOMY AND FINANCIAL MARKETS

*The pandemic caused the global economy to contract sharply in 2020. Most countries are still grappling with it, so economies are likely to recover fully and economic policies to start normalising mostly in 2022. A faster recovery and an earlier start to economic policy normalisation can be expected in countries with higher vaccination coverage. Fiscal stabilisation measures and very favourable global financial conditions led to growth in private and public sector debt in most economies in 2020. Some countries now have very narrow fiscal space to respond to further potential shocks. Moreover, a possible tightening of global financial conditions, due either to a return of the compressed risk premium to its usual levels or to higher inflation expectations, poses a risk of rapid growth in not only public but also private sector debt service costs. The risk of growth in debt service amid increased indebtedness may lead to sovereign rating downgrades, rising household default rates among households and non-financial corporations, and higher volatility on financial markets. Central banks' accommodative monetary policies have so far postponed the materialisation of this scenario. However, this is fostering a further build-up of risks in the form of growth in asset prices above their fundamental levels.*

*The CNB forecast expects domestic economic activity to go up slightly in 2021 after the contraction seen during 2020. Monetary policy rates are expected to increase gradually from roughly the second half of 2021 onwards. A large part of the negative impacts of the pandemic in the Czech Republic have so far been absorbed by the public sector, whose debt has grown substantially. The CNB's accommodative monetary policy has also helped mitigate the adverse economic conditions by reducing the external financing costs of the private and public sectors. Residential property prices showed especially strong growth in the second half of 2020 and the first quarter of 2021. Housing thus became less affordable for most households. The adverse economic situation in 2020 and at the start of 2021 had a particularly negative impact on firms' profitability and investment activity. The corporate sector credit default rate rose mainly in sectors hit directly by the pandemic. It can be expected to rise slightly further in the period ahead. The true extent of credit risk materialisation will be affected by the further course of the pandemic and the strategy for phasing out economic support measures.*

## II.1 THE MACROECONOMIC AND FINANCIAL ENVIRONMENT

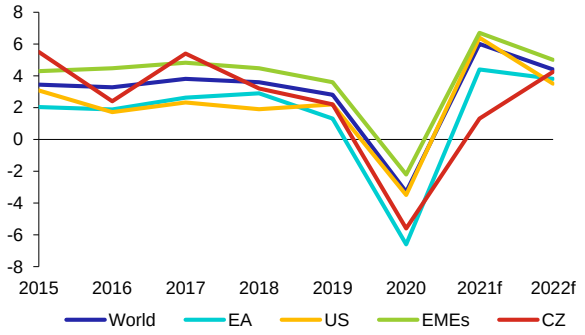
### II.1.1 The external environment

**The global economy continued to be affected by the coronavirus pandemic in the first few months of 2021…**
The world economy faced a sharp downturn in 2020 (see Chart II.1). Despite a relatively fast recovery in the summer months, anti-epidemic measures were tightened with the onset of a second wave of the pandemic (see Chart II.1 CB). This was reflected in a renewed slowdown. However, partial adjustment by economic agents and extraordinary economic support measures meant that the previous pessimistic expectations of a pronounced economic contraction for 2020 did not fully materialise (see Chart II.2). Owing to a slow pace of vaccination, the pandemic did not recede in most countries in the first few months of 2021. The global growth forecasts nonetheless remain fairly optimistic (see Chart II.1). They expect the economy to rebound gradually in the second half of 2021 and recover fully in 2022 (see Chart II.3).[1]

**…the scenario of a multi-speed recovery across countries is likely**
Owing to differences in the pandemic situation, in vaccination progress and in the fiscal space for mitigating the impacts of the pandemic, the economic recovery is likely to be asynchronous and mixed across countries. The risk of a slower return to the pre-pandemic conditions is heightened by concerns about lower efficacy of vaccines against new virus mutations and by a potentially decreasing willingness to get vaccinated. Global vaccination coverage weighted by the contribution of each country to global GDP stood at 30% at the end of May 2021 (see Chart II.4). Countries which had better access to vaccines and started to roll them out at the end of 2020 are expected to recover faster and start normalising economic policy sooner. By contrast, countries with persisting high numbers of new COVID-19 cases and low vaccination coverage may recover very slowly (see Chart II.2 CB – bottom-right quadrant). Moreover, the return to normal may be seriously hindered in these countries by tightening financial conditions as a result of increasing government borrowing requirements and potentially rising inflation expectations.

1 IMF (2021): World Economic Outlook, April 2021.

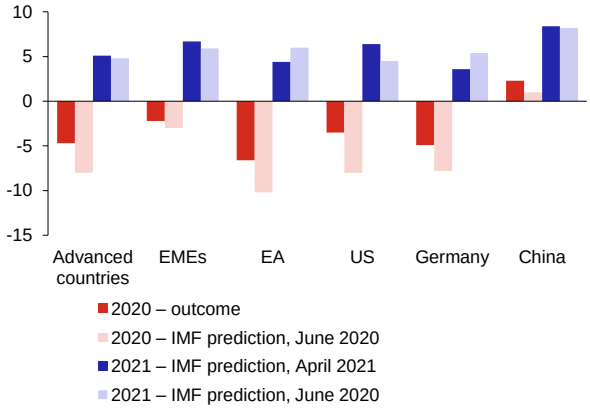
**Chart II.1**
**Economic growth in selected countries**
(annual real GDP growth in %)




Source: IMF, CNB

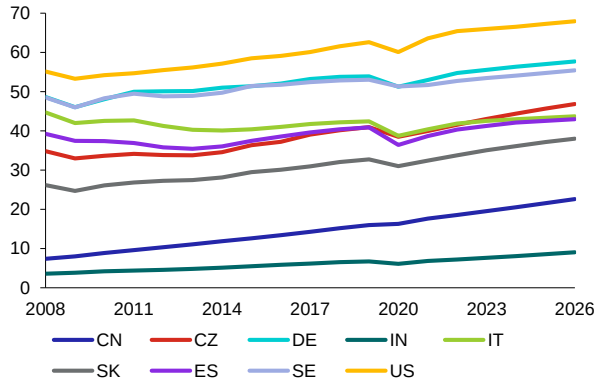
Note: f = forecast. The forecast for the Czech Republic is based on the CNB forecast published in Monetary Policy Report – Spring 2021. The forecasts for the other countries are based on the IMF's April forecast published in World Economic Outlook, April 2021.

**Chart II.2**
**Forecasts for economic growth in selected countries**
(annual real GDP growth in %)



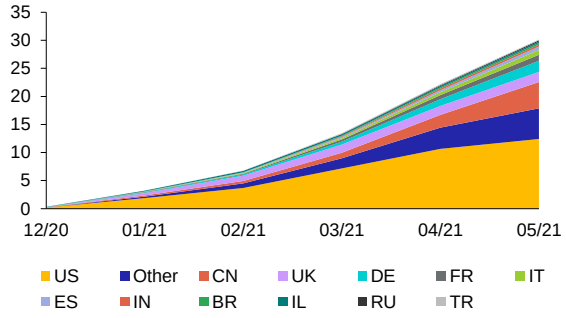

Source: IMF (World Economic Outlook)

**Chart II.3**
**GDP per capita at purchasing power parity**
(USD thousands per year)




Source: IMF (World Economic Outlook, April 2021)

**Chart II.4**
**Total global COVID-19 vaccination coverage taking into account the size of GDP in individual countries**
(vaccination coverage in %)




Source: Our World in Data

Note: Includes people who have only received the first dose of a double-dose vaccine. The 05/2021 figure is only an estimate.

**The indebtedness of households and non-financial corporations is increasing further across countries**

The extraordinary government support measures coupled with very easy global financial conditions are postponing the manifestation of credit and liquidity risk in the private non-financial sector on the one hand, while facilitating a further expansion of its debt on the other. The relative and absolute debt of non-financial corporations and households rose significantly across countries, including in Europe, in 2020 (see Box 1).

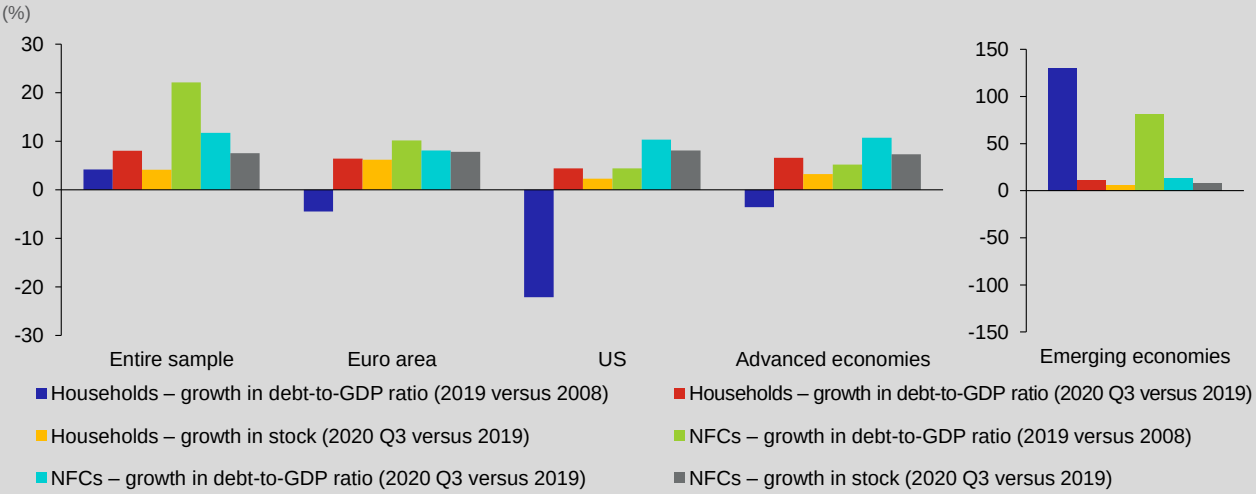
## BOX 1 COVID-19 and the debt of households and non-financial corporations around the world

One of the most visible and most widely discussed consequences of the pandemic is a pronounced rise in public debt in most of the countries affected. Less attention is devoted to the debt of the private non-financial sector – households and non-financial corporations. Yet its fast growth in advanced countries at the start of the century was one of the main causes of the global financial crisis. After the crisis, private non-financial sector debt declined in some of these countries but conversely started to rise rapidly in many developing economies. Economic or financial crises manifesting as strong recessions tend to involve growth in debt as measured by the ratio of debt to income (expressed in terms of GDP or gross disposable income). This is because the denominator of this ratio, i.e. income, decreases. In recessions, lenders and borrowers are meanwhile much more cautious and the total debt does not usually rise much. What has happened in the coronavirus pandemic so far? This question can be answered using BIS data on the debt of households and corporations in 43 major economies. Data on the debt-to-GDP ratio were available for the first three quarters of 2020.

Chart 1 shows the change in debt separately for households (the first three columns) and non-financial corporations (the other three columns) for all countries combined, for advanced and developing economies, and for the US and the euro area. It first shows the percentage rise in debt as measured by the debt-to-GDP ratio (2019 versus 2008, 2020 Q3 versus 2019). This is followed by the percentage rise in nominal debt during 2020. Using the whole sample of countries, the household debt ratio (the first column) was virtually unchanged between 2008 and 2019. In advanced countries, it declined slightly, mainly due to a sizeable drop in the US. In developing economies, by contrast, it rose sharply. In the case of non-financial corporations (the fourth column), the debt ratio increased in the period under review, due to rising levels in developing economies and the euro area. The second and fifth columns show that the debt ratio generally increased for households and non-financial corporations in 2020. However, this was due not only to a decline in nominal GDP in most countries, but also to a rise in the total amount of debt taken on (the third and sixth columns). Not surprisingly, the growth was more pronounced in non-financial corporations, which received less government support than households.

**Chart 1 (BOX)**

**Global changes in private non-financial sector debt**



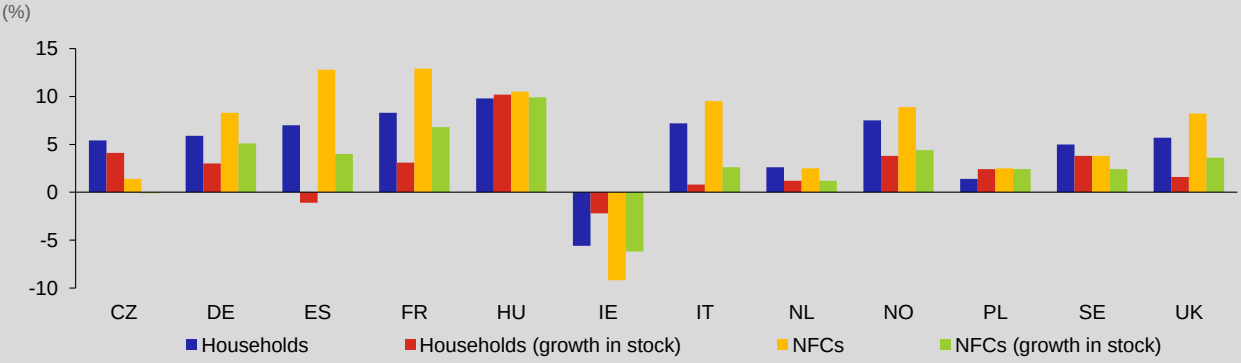

Source: BIS

Note: The data show the increase in the debt-to-GDP ratio of the relevant sector over the specified period in per cent (not percentage points) in the sample of 43 countries. The "growth in stock" category refers to the percentage increase in the sector's nominal debt between the end of 2020 Q3 and the end of 2019 (a source of data in dollar terms was used for the aggregate groups of countries and the US).

The trends in selected European countries (see Chart 2) were very mixed in 2020. The relative and absolute indebtedness of households and corporations rose in most of them. The increase in relative indebtedness tended to be stronger due to a prevailing decline in nominal GDP. Household debt decreased in absolute terms only in countries which had been hit by a banking crisis after 2008 and whose banking sectors had not yet recovered from it. In Spain, this applied to absolute household debt only, while in Ireland, both absolute and relative indebtedness decreased due to positive GDP growth. In our sample, the Czech economy ranked among the countries with moderate growth concentrated in household debt.

**Chart 2 (BOX)**

**Changes in the debt of households and non-financial corporations in selected European countries in 2020**



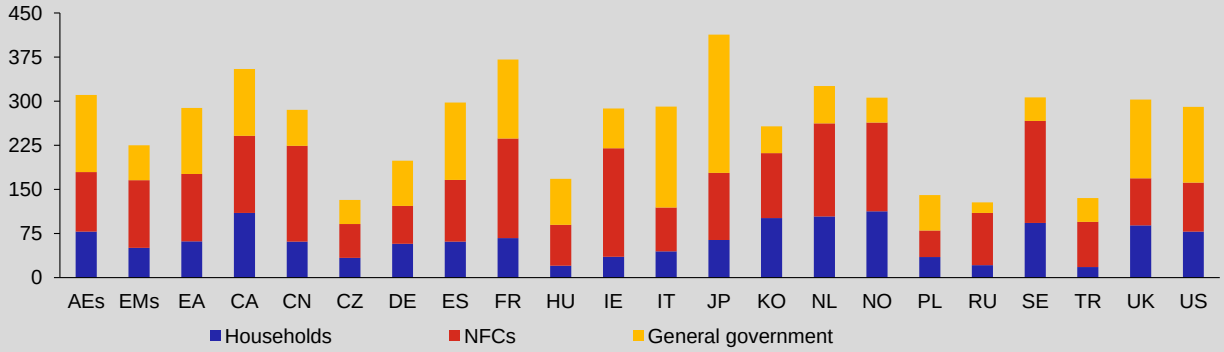

Source: BIS

A warning signal as regards risks to financial stability is that nominal debt has risen substantially in countries where private non-financial sector debt was already high before the pandemic. Chart 3 shows that household debt is close to 100% of GDP or even higher in many countries. In our sample, this applies not only to European economies (the Scandinavian countries, the Netherlands and the UK), but also, for example, to Canada and Korea. The debt of non-financial corporations is usually even higher, averaging 101% of GDP. It exceeds 150% of GDP in China, France, Ireland, the Netherlands, Norway and Sweden. It is thus not unusual for the private non-financial sector debt ratio to be 200% or more. It is worth mentioning that until the 1990s the ratio only rarely and briefly exceeded 50% of GDP. If we add general government debt, which exceeds 130% of GDP in the sample as a whole, to private non-financial sector debt, it is obvious that the relative level of debt is currently off the historical charts.

**Chart 3 (BOX)**

**Debt of households, non-financial corporations and general government in selected countries and country groups**

(% of GDP; as of the end of 2020 Q3)



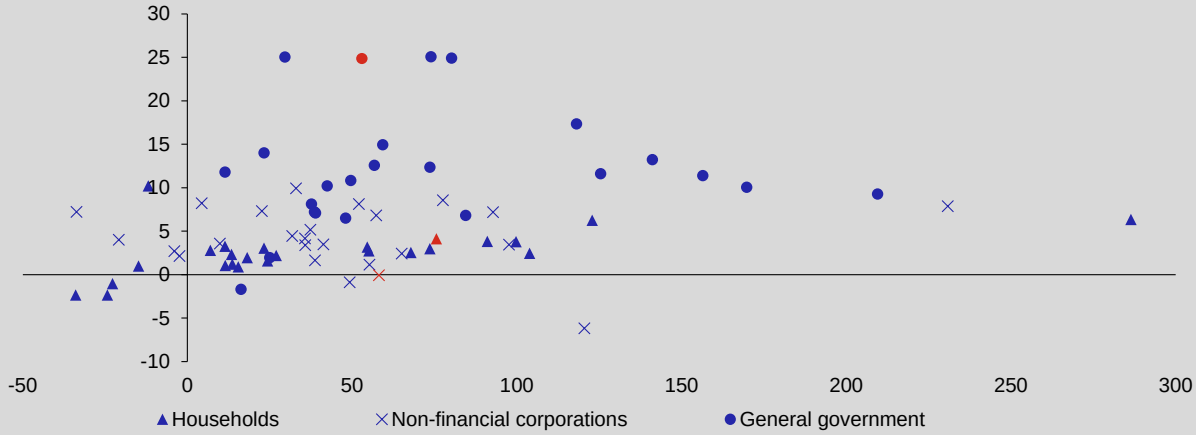

Source: BIS

Another interesting observation is that the percentage increase in nominal debt during the pandemic has very often been higher in countries where this debt also rose more after 2008 (see Chart 4). In many cases, this may be because the debt level rose faster after 2008 in countries which have performed relatively well economically and in which the financial sector has been little affected during the pandemic either. This may be the case of the Czech Republic. In other cases, though, it may be interpreted as meaning that if an economy starts to follow a path of rapid debt growth, it may need to take on more new debt in an adverse economic situation to avert systemic difficulties. The chart shows that the growth in debt during the pandemic has mainly concerned the government sector. The Czech Republic is among the countries with the highest growth, although this is due partly to base effects.

**Chart 4 (BOX)**

**Change in the debt of the non-financial sector during the pandemic relative to the post-2008 situation**

(change in debt between 2019 and 2020 Q3 in %; x-axis: change in debt between 2008 and 2019 in %)




Source: BIS

Note: Data on nominal debt in the national currency, with the exception of EMs and AEs, where the debt is expressed in USD. Data for the Czech Republic are indicated in red.

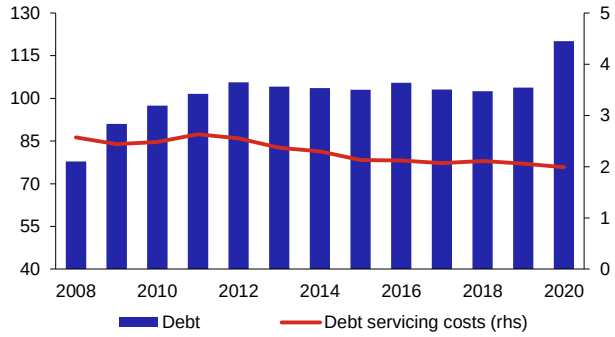
**Against a background of rising government indebtedness and a risk of a sudden tightening of global financial conditions, the vulnerability of the real economy sectors is rising**

A sharp rise in indebtedness in 2020 is also apparent in the government sector (see Chart 3 in Box 1 and Chart II.5). Many European countries are now well above the generally perceived sustainability threshold of 90% of GDP or the Maastricht debt criterion of 60% (see Chart II.3 CB) and their fiscal space for responding to more pandemic-related and other potential shocks is shrinking substantially.[2] Fiscal support is crucial to reducing the private sector default rate. Small firms affected by anti-epidemic measures with low profitability or high debt service remain the most vulnerable.[3] Moreover, the situation might worsen if the scenario of a too fast tightening of global financial conditions in response to rising risk premia or inflation expectations materialises. A possible materialisation of this scenario was suggested by yields on some countries' long-term government bonds in late 2020 and early 2021 (see Chart II.6 and Chart II.9 CB). Stricter conditions would not only increase the private sector's debt service and credit risk; the currently very low debt service of government sectors would rise as well (see Chart II.5). Governments' growing debt financing need is also increasing the risk of interconnectedness of the government and financial sectors[4] (see Chart II.4 CB). In the absence of debt consolidation plans, there is also a risk of downgrades of overindebted countries' ratings and related increased volatility on financial markets.

**Chart II.5**

**Government debt and its servicing costs in advanced economies**

(% of GDP)

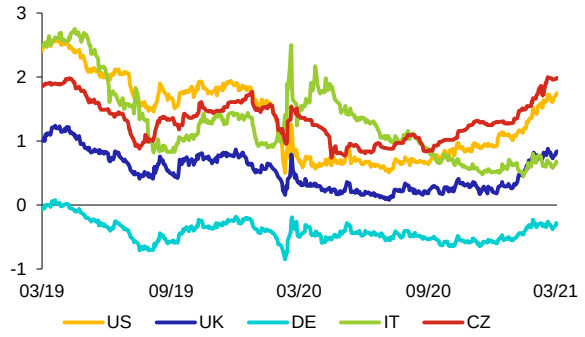



Source: IMF

**Chart II.6**

**Ten-year government bond yields for selected countries**

(%)




Source: Refinitiv, MTS

**Central banks continue to maintain exceptionally easy monetary conditions**

Global financial conditions have so far been prevented from tightening by the monetary policies of major central banks. Their monetary policy rates remain exceptionally low (see Chart II.5 CB). Other measures taken to foster easy monetary conditions have also been maintained in full (see Chart II.6 CB).[5] As there are concerns about an insufficiently robust economic recovery, it cannot be ruled out that normalisation of global monetary policies will be postponed and very low rates will persist in the coming quarters or years. The combination of easy monetary conditions and excess liquidity is fostering inflows of new funds on stock markets, which have reached new record highs (see Chart II.7). Perceived market risk indicators have fallen to pre-pandemic levels (see Chart II.7 CB) and the search for yield has pushed corporate bond yields to new lows across the rating spectrum (see Chart II.8). Against a background of deferred consumption, households are also taking advantage of the favourable financial conditions and investing their free funds in assets with non-negative returns, most notably real estate. This has been reflected in rapid growth in property prices (see Chart II.9).[6] An increase in directly-held quoted shares as a percentage of households' total financial assets can also be observed in countries where households traditionally invest their savings actively on financial markets (especially the US; see Chart II.8 CB).

2 In 2020, the largest government deficits among EU countries were recorded by Spain (11% of GDP), Italy (9.5%), Belgium (9.4%) and France (9.2%). This resulted in debt ratios rising to 120% of GDP in Spain, 155.8% in Italy, 114.1% in Belgium and 115.7% in France.

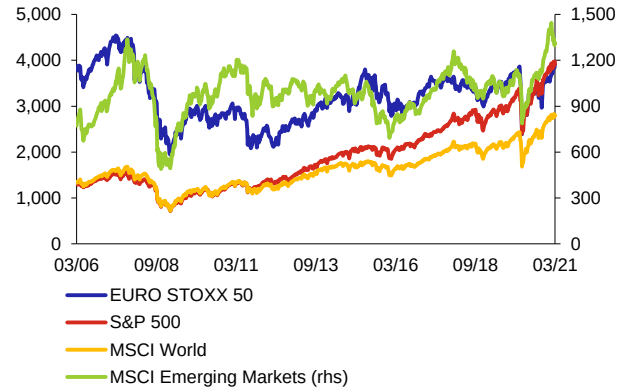
3 A debate has thus already started at international level between banks and representatives of economic policy institutions about targeting support more effectively at viable non-financial corporations that need debt restructuring.

4 For example, BCBS (2018): The regulatory treatment of sovereign exposures and ESRB (2015): ESRB report on the regulatory treatment of sovereign exposures.

5 The ECB's PEPP was increased in June and December 2020 from the original EUR 750 billion to EUR 1,850 billion. The ECB remained committed to ending the programme after the pandemic ends, but not before the end of March 2022. The maturing principal payments from bonds purchased will be reinvested until at least the end of 2023. The Fed continued to purchase government and mortgage-backed bonds in the second half of 2020 and the first months of 2021 at a pace of at least USD 120 billion a month and also partially maintained its emergency lending programmes into 2021.

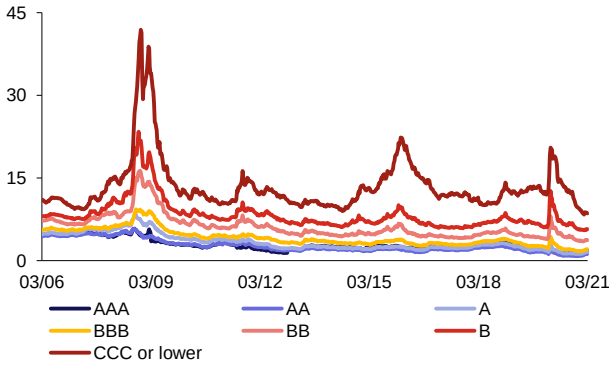
6 Debt financing of property purchases may partly explain the rise in saving rates seen in many countries during the pandemic and may affect future consumption. If the increase in saving rates is related to debt-financed property purchases and savings are being used for downpayments, the global effect of deferred consumption during the pandemic may be lower than generally expected.

**Chart II.7**
**Key global stock indices**
(indices in points)




Source: Refinitiv

**Chart II.8**
**Global corporate bond yield indices by rating grade**
(%)

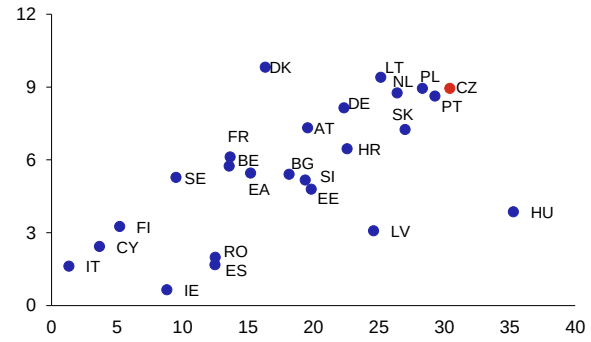



Source: Bank of America Merrill Lynch

**Government bond yields suggest a stronger risk of portfolio rebalancing…**

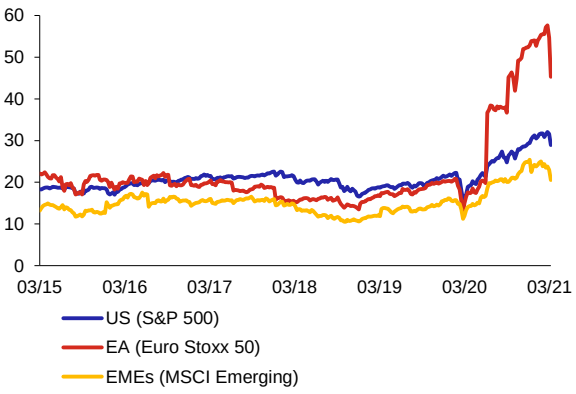
Stronger expectations of an increase in inflation pressures and relatively early normalisation of Federal Reserve monetary policy caused yields on some countries' government bonds to start rising in the second half of 2020 (see Chart II.6). The US government bond yield was 1.75% at the end of March 2021. The risk premium on government bonds of countries traditionally viewed as riskier remained low or decreased further. Growth in government bond yields in countries with relatively low perceived risk may give rise to changes in investors' portfolios due to a decline in the incentive to search for yield by purchasing riskier assets. These changes may have an adverse effect on developing economies' financial markets and exchange rates, posing a risk mainly to regions that make extensive use of cross-border foreign currency funding of the public or private sector. Depending on developments in individual economies, the uneven growth in yields may also be reflected in reallocation between European and US markets.[7]

**Chart II.9**
**Property price growth in selected EU countries in 2020**
(%; x-axis: three-year growth; y-axis: one-year growth)




Source: Eurostat
Note: Data as of 31 December 2020.

**Chart II.10**
**Price-to-earnings ratios**
(index value as multiple of annual earnings)




Source: Bloomberg

**…and may increase the probability of a correction on equity and corporate bond markets**

Another risk stemming from the rapid price growth on financial markets is a sudden correction of equity and corporate bond prices. Their current high levels may not be fully in line with the current or expected future macroeconomic situation and corporate profitability (see Chart II.10). Rather, they may reflect low subjective discount rates due to very low risk-free rates and compressed risk premia (see Box 2). If government bond yields rise, equity and corporate bond holders may thus start to view the current prices of riskier assets as excessive and partly reallocate their portfolios to government bonds.

7 US government bond yields have been increasing faster than euro area yields since the start of 2021, owing to more optimistic perceptions about the US economy and faster growth in inflation expectations in the medium term due to massive fiscal stimuli. Euro area government bond yields remain affected by the ECB's programmes, staying at low levels. The spread between US and German government bonds is thus increasing.

## BOX 2 The CNB's model-based approach to estimating equity risks

The CNB now uses a structural approach to assess equity risk in its analyses and in the construction of its stress test scenarios. That approach is based on assessing the risk of future changes in equity prices, or equity index levels, given the evolution of the required equity risk premium, expected dividends and risk-free interest rates.[8] By making assumptions about the future paths of these variables in line with the macroeconomic scenario, the CNB can also obtain consistent equity price scenarios. The CNB estimates stock market movements based on key US and European stock indices (the S&P 500 and the Euro Stoxx 50), as the equity portfolios of the financial institutions tested are dominated by stocks from these indices. Stock indices for other regions are derived from these key indices based on historical correlations in crisis periods.

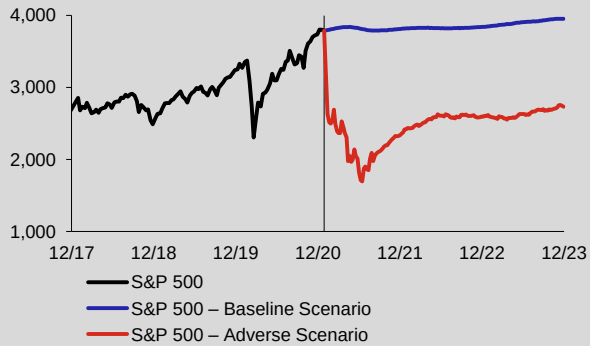
The approach consists in modelling discounted future dividends based on the assumption that the equity price is equal to the present value of expected future cash flows (dividends). The forward-looking nature of the model enables it to explain any mismatch between current equity prices implied by macroeconomic conditions and the model-estimated fundamental value of equities based on expected future corporate profitability (see Chart II.10). The required equity risk premium, which to some extent reflects market sentiment, is calculated ex post to close the model and links the index price implied by future cash flows and the current market price.[9]

This Box illustrates the equity risk premium estimates for the S&P 500 and Euro Stoxx 50 since the start of 2018 in order to obtain outlooks for these indices for the purposes of the *Baseline Scenario* and the *Adverse Scenario*. It uses the daily values of these indices, dividend futures for the related indices, and USD and EUR interest rate swap levels representing risk-free interest rates.

The model estimates (see Chart 1, Chart 2 and Chart II.10 CB) show that the sharpest decline in the monitored stock indices (March 2020) was caused by a sudden increase in the estimated risk premium. According to the model, the drop in stock indices was partly offset by a decline in risk-free interest rates, especially in the US, as the decline in the discount rate increased the present value of expected future dividends on S&P 500 stocks. The application of the model also pointed to a generally higher risk premium for the Euro Stoxx 50 compared to the S&P 500. This may be linked to some extent with euro area monetary policy rates.

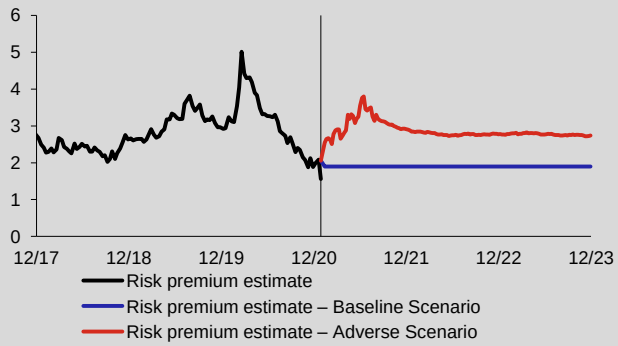
If the *Adverse Scenario*, which assumes that the equity risk premium for the selected indices increases to a similar extent as in March 2020 amid flat dividends and interest rates, were to materialise, the newly applied model implies a sizeable decrease in the S&P 500 below 2,000 points (see Chart 1 and Chart 2). The Euro Stoxx 50 would fall to levels comparable with its lowest level in the first half of 2020 (see Chart II.10 CB). The *Baseline Scenario* assumes a flat equity risk premium and dividend growth at the historical average rate, but also assumes growth in interest rates. This leads to a slight increase in the index in the US, where the effect of growth in dividends outweighs the rise in interest rates. In the euro area, conversely, the growth in rates dominates and the index thus declines very slowly in the scenario.

**Chart 1 (BOX)**
**S&P 500 scenarios**
(index in points)




Source: Bloomberg, CNB

**Chart 2 (BOX)**
**S&P 500 risk premium scenarios**
(%)




Source: Bloomberg, CNB

8 A more detailed description of the approach is given in Časta, M. (2021): *Deriving Equity Risk Premium using Dividend Futures*. CNB WP 1/2021.

9 A high required premium means a low willingness of investors to accept risks.

## II.1.2 The domestic environment

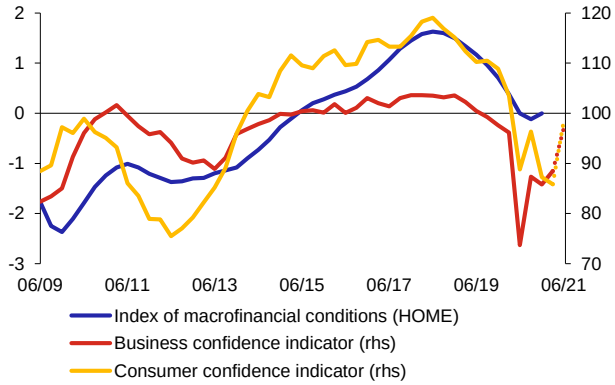
**The pandemic continues to slow the return of the domestic economy to normal**

The domestic economy contracted by 5.8% in 2020 (see Chart II.1). This was due to a sharp drop in household consumption and corporate investment. By contrast, government consumption and net exports slowed the decline. The reintroduction of anti-epidemic measures restricting part of retail and services in October 2020 dampened the summer economic recovery. The measures were tightened further in February 2021 due to a worsening pandemic situation and did not start to be eased until the end of April 2021. This was consistent with worsening business and household economic sentiment (see Chart II.11). According to the CNB's May forecast, quarterly GDP growth will remain subdued in the first half of 2021. In whole-year terms, GDP will grow by 1.2%.[10] In 2022, GDP growth will pick up to more than 4%, boosted by renewed household consumption and corporate investment as the anti-epidemic measures are fully lifted. The main risks to the forecast are lengthier lockdowns in some sectors due to a slow pace of vaccination at home and abroad and insufficient efficacy of vaccines against new variants of the virus, even though the level of uncertainty associated with the May forecast decreased compared to the previous period (see Chart II.12). Under the *Adverse Scenario*, where foreign and domestic economic activity declines, sentiment worsens and the risk premium increases, triggering a wave of failures of a large proportion of economic agents, GDP falls by as much as 11% at the end of 2021, similarly as in spring 2020 (see Chart II.23A, section II.1.3).

**Chart II.11**

**Confidence indicators and the index of households' macrofinancial conditions**

(index; right-hand scale: base index relative to long-term average: 2003–2020)



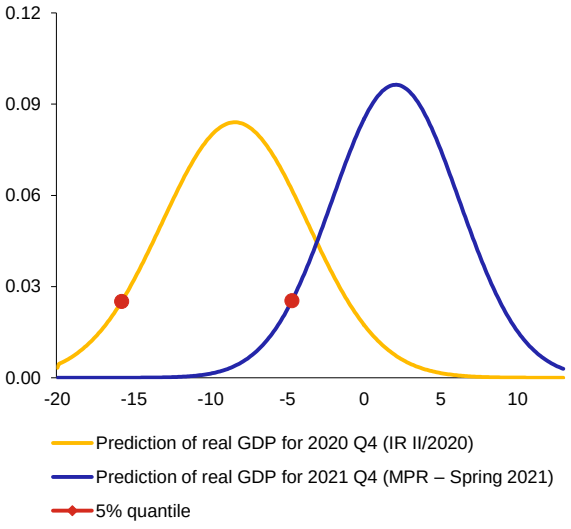

Source: CZSO, CNB

Note: The values of the confidence indicators are given by the averages for the individual months of the quarter. The values of the indicators in 2021 Q2 are the averages for April and May (highlighted by the dotted lines). The HOME index expresses the general macrofinancial conditions for households. Its construction method is described in: Malovaná, S., Hodula, M., Frait, J. (2021): What Does Really Drive Consumer Confidence? Social Indicators Research.

**Chart II.12**

**GDP growth outlook and the associated uncertainty**

(probability density; x-axis: annual real GDP growth in %)




Source: CNB

**The negative impacts of the pandemic are being softened by fiscal stabilisation measures…**

The impacts of the pandemic are being mitigated to a large extent by expansionary fiscal policy, implemented mainly through income and employment support (see Chart II.8 in Monetary Policy Report – Spring 2021). The positive effect of the extraordinary government support is apparent in a low, albeit rising, general unemployment rate (3.3% as of February 2021, year-on-year growth of 1.5 pp; see Chart II.23D) and continued relatively strong growth in disposable income (see Chart II.28 CB) and the average gross wage (of 6.5% year on year as of 2020 Q4) and also in the current default rates of non-financial corporations and households (see Chart II.37 and Chart II.38). However, economic agents from the hardest-hit sectors, which are dependent on extraordinary government support, may remain exposed to increased financial stress for most of the second half of 2021 (see section II.2.2), as the government may be cautious in easing anti-epidemic restrictions. Agents' ability to recover after government support is discontinued is one of the factors that will affect insolvency rates and subsequent defaults in the short term (see section II.2.2). To mitigate the fading adverse impacts of the pandemic on the private sector, the government may have to lengthen the period of fiscal expansion and postpone fiscal consolidation. On the one hand, the provision of fiscal support will help prevent a potential wave of insolvencies. On the other hand, tax changes improving the liquidity situation mainly of high-income households are driving up demand for

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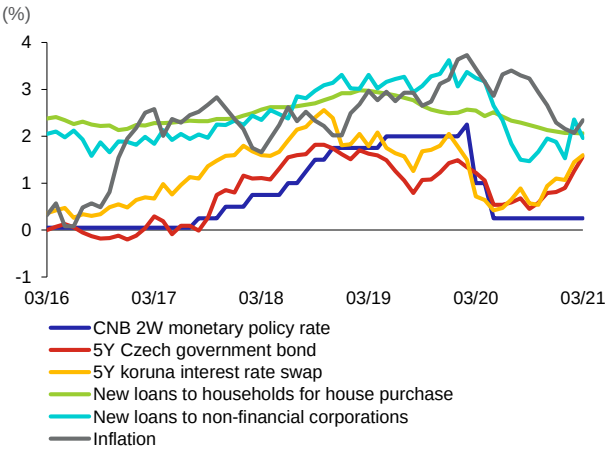
assets, especially residential property (see section II.2.2 and section IV.4), and creating additional risks to financial stability. In the medium term, an overly long period of high government budget deficits might also raise financial market concerns about government finance sustainability (see section II.2.1).

**…and accommodative CNB monetary policy**

The CNB's easy monetary policy is also moderating the adverse course of the pandemic by reducing economic agents' funding costs. The CNB's main monetary policy rate has remained at 0.25% since May 2020 (see Chart II.13). The CNB expects to increase its monetary policy interest rates gradually from roughly the middle of 2021 onwards in order to stabilise inflation close to the target in the future (see Monetary Policy Report – Spring 2021).

**Chart II.13**

**Selected interest rates, yields and inflation in the Czech Republic**

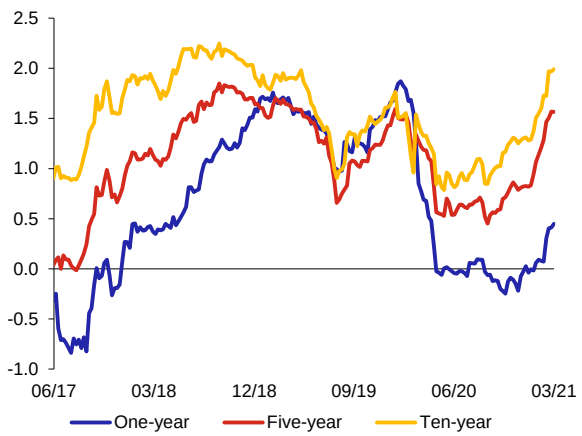



Source: CNB

Note: Month-end values are used, except for client rates, where monthly averages are used instead.

**Chart II.14**

**Czech government bond yields**




Source: MTS, CNB

**Government bond yields and some interest rates have been rising again since the end of 2020…**

Interest rate swap rates and Czech government bond yields have already begun to respond to the expected tightening of the CNB's policy rates in the second half of the year (see Chart II.13). Yields have been going up again since the end of 2020, rising particularly fast in 2021 Q1, with yields on bonds with longer residual maturities showing the strongest growth (see Chart II.14). Besides domestic inflation expectations and the CNB's related communication regarding the future path of monetary policy rates[11] (see Chart II.15, growth in the risk-free return and term risk premium), this growth has been driven by global financial expectations and yields on global government bond markets (see section II.1.1). The growth in government bond yields and interest rate swap rates was partly reflected in rates on loans to non-financial corporations, which were also affected by growth in interest margins in an environment of deteriorating credit portfolio quality and perceived growth in credit risks. By contrast, rates on loans to households for house purchase remained low in Q1 (see Chart II.13). Real rates and yields also went up.[12] Despite that, they remain mostly negative and are contributing to the very relaxed financial conditions in the domestic economy (see Chart II.11 CB), which are also evident from the spreads between domestic corporate and government bond yields, which dropped to very low levels in the first months of 2021 (see Chart II.12 CB).

**…the rise in government bond yields was due neither to the credit risk premium nor to foreign investor outflows**

Concerns about the Czech Republic's debt servicing ability potentially worsening due to the sharp rise in government debt (see section II.2.1) have not yet been reflected in Czech government bond yields (see Chart II.15, credit risk premium). Czech government bond holders' risk aversion has not risen due to the fiscal developments, nor have foreign holders started to sell their bonds on any large scale (see Chart II.15, portfolio risk premium, and Chart II.13 CB). This is also apparent from the koruna exchange rate, which remains mostly stable; the market-assessed probability of increased koruna volatility one year ahead has been following a downward trend from the March 2020 level (see Chart II.14 CB). The yield curve decomposition shows that the current trend in Czech government bond yields is being affected mainly by the macroeconomic outlook, with the longer end of the curve being linked relatively closely to the path of short rates.

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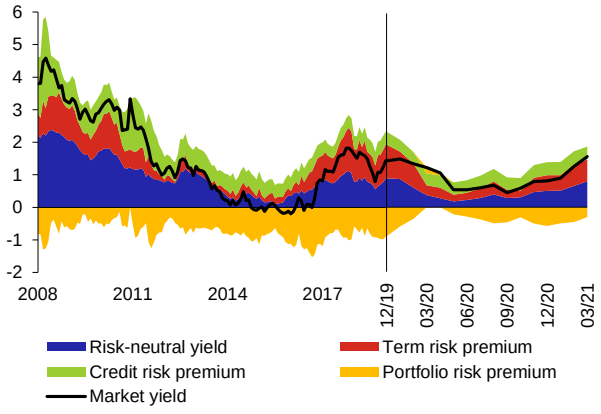
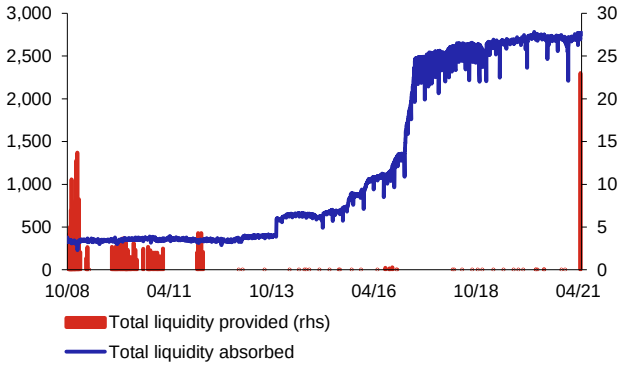
12 This refers to ex post real rates and yields – the observed inflation rate was deducted from the nominal values in each period.

**Chart II.15**
**Decomposition of the five-year Czech government bond yield**
(yield in %; components in pp)




Source: MTS, CNB

**Chart II.16**
**CNB monetary policy operations**
(CZK billions)




Source: CNB

Note: The purpose of the liquidity supplied in April 2021 was not to reduce the liquidity risk in financial institutions' balance sheets.

**An abrupt change in credit risk pricing is the main risk to the domestic financial system**

The overall drop in stress on the domestic financial market that occurred in March 2020 (see Chart II.7 CB) and the return of market conditions to the pre-pandemic state helped stabilise domestic financial institutions' investment portfolios and strengthen their liquidity positions (see section III). No koruna liquidity has been provided to domestic financial institutions for liquidity reasons since the framework for the CNB's liquidity-providing operations was changed in May 2020[13] (see Chart II.16). As in March 2020, a significant increase in volatility on domestic financial markets, particularly the Czech government bond market, might affect the liquidity positions of some domestic financial institutions. However, the risk of a repetition of the March market stress with a systemic impact on the domestic financial sector or the Czech government bond market is low due to domestic financial institutions' relatively high resilience and good liquidity position (see section III). Nevertheless, a global increase in credit risk premia on both public and private debt due to growing concerns about debt sustainability and rising debt service might have an adverse impact on investment portfolio returns and solvency and liquidity positions (see the *Adverse Scenario*, section II.1.3). However, this should not pose an immediate risk to domestic financial institutions' stability either (see section IV.1 and section IV.2).

**Growth in property prices accelerated in the second half of 2020**

In 2020, property transaction prices maintained a robust pace of year-on-year growth, which started to accelerate to 10% in the second half of the year (see Chart II.17). Available market data suggest that the strong growth continued into 2021 Q1 and may even have accelerated further. The observed trend reflected favourable conditions for financing property on credit (see section V.4.1) and large excess demand for property. The higher demand was caused, among other things, by efforts of mainly high-income households to increase the value of their free funds in an environment of low returns on alternative assets, or to maintain their value amid increased uncertainty and expectations of higher inflation. As regards the individual property types, increasing growth was observed mainly for apartment and land prices (see Chart II.15 CB). From a regional perspective, the trend of recent years of faster growth in property transaction and asking prices outside the capital than inside it continued[14] (see Chart II.16 CB and Chart II.17 CB). In the *Baseline Scenario* derived from the January macroeconomic forecast, the CNB assumes that year-on-year property price growth will remain very strong in the first half of 2021 and then start to weaken gradually due to rising interest rates on housing loans and to base effects (see Chart II.23E). However, year-on-year price growth is expected to remain positive over the entire forecast horizon.

**The rapid growth has made housing less affordable for the median household…**

The estimated overvaluation of apartment prices remained elevated amid the robust growth in prices (see Chart II.18). Apartments are currently overvalued by 18% on average for households with median incomes. The overvaluation in localities with a high share of investment apartments may still be as high as 25%. The high overvaluation indicates that

13 The CNB changed the framework for liquidity-providing repo operations for precautionary reasons in May 2020 in response to the outbreak of the coronavirus pandemic. For more details on the framework see Parameters of the liquidity-providing repo operations and Financial Stability Report 2019/2020 (Box 1 and Box 6).

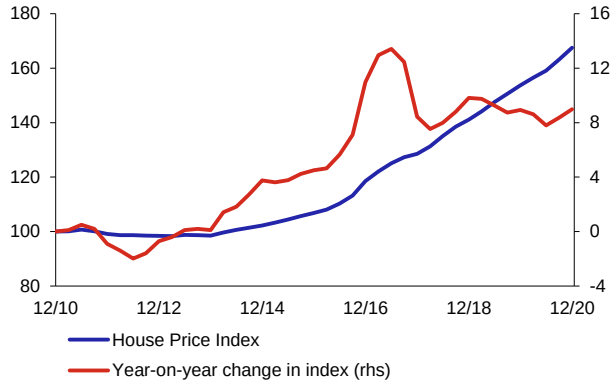
14 Available data on property prices at the regional level suggest that this is due to non-affordability of housing in the capital and the migration of some households to more affordable regions with good transport links (especially the Central Bohemia and Liberec regions). Rapid property price growth has also been seen in recent years in regions where property prices were significantly undervalued compared with the rest of the Czech Republic (especially the Ústí nad Labem region; see Chart II.18 CB).

households are willing to take on increased credit risk when debt financing property purchases, or that investors are willing to accept low returns. This increases the sensitivity of property prices to shocks in the form of a significant rise in unemployment or fall in incomes and implies a higher risk of a price correction. A sharp rise in interest rates on housing loans or growth in prime yields could have similar consequences. The property market stress was also reflected in housing affordability, which worsened further in the second half of 2020 according to all the indicators monitored (see Chart II.19). If the *Baseline Scenario* materialises, housing affordability is not likely to improve significantly in the short term. This may increase the pressure on households to take on excessive credit risk in the future.

**Chart II.17**

**Transaction prices of residential property**

(2015 = 100; right-hand scale: %)

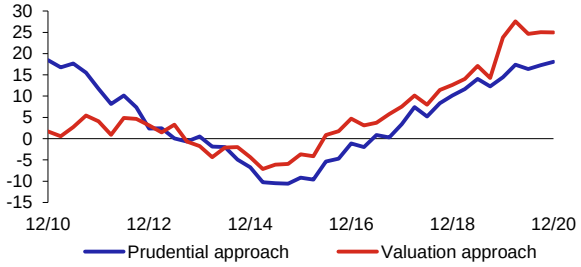



Source: CZSO

**Chart II.18**

**Estimated overvaluation of apartment prices**

(%)




Source: CNB

Note: The methodology of the indicators is described in Plašil, M., Andrle, M. (2019): Assessing House Price Sustainability, Thematic Article on Financial Stability 1/2019, CNB. The current level of overvaluation is based on the forecast published in Monetary Policy Report – Spring 2021.

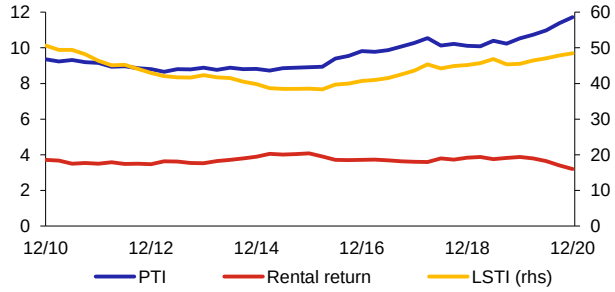
**…growth in affordability may be dampened in the longer term by slower construction during the pandemic**

The number of apartment starts and completions fell markedly in 2020 due to the anti-epidemic measures (see Chart II.20). This interrupted the upward trend in housing construction seen in previous years, which had reduced the mismatch between property supply and demand, although in terms of market equilibrium the previous rate of construction had not been sufficient either. The drop in construction could be long-term in nature given the typically slower recovery of construction after economic downturns, and may be a structural factor that will affect housing affordability in the longer run.[15] The rising share of institutional investors on the domestic property market may also foster significant excess demand in the future if construction remains low. It could also make house prices more volatile during upward and downward phases of the cycle.

**Chart II.19**

**Selected apartment affordability indicators**

(PTI in years; yields in %; right-hand scale: in %)



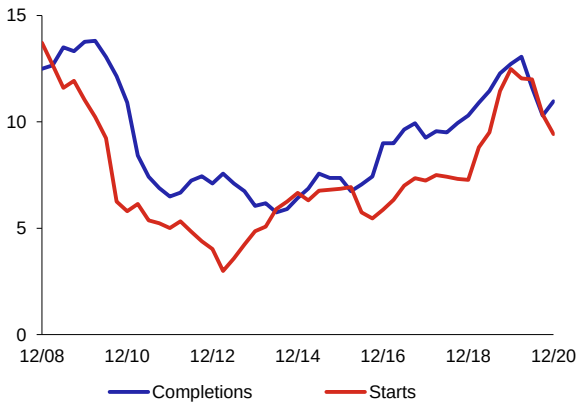

Source: CNB, CZSO, IRI, Společnost pro cenové mapy ČR, s.r.o.

Note: PTI is the price-to-income ratio and LSTI the loan service-to-income ratio. The price is defined as the average price of a 68 $m^2$ apartment. Income is defined as the annual moving total of the average gross wage. A loan with an LTV of 80% and a repayment period of 25 years was considered for the LSTI calculation.

**Chart II.20**

**Numbers of housing starts and completions**

(annual moving totals in thousands of apartments; apartment blocks)




Source: CZSO

15 On the other hand, insufficient property supply prevents prices from falling, so the scenario of a fall in prices is very unlikely and would only occur in the event of a further, very substantial deterioration in the economic situation and growth in risk aversion.

**On the commercial property market, planned investment was postponed and market sentiment worsened**

In contrast to residential property, pessimistic sentiment started to prevail on the commercial property market in the second half of 2020 due to the global developments. The index of market sentiment in the Czech Republic fell by 20%–30% (RICS, 2020).[16] This reflected a worse economic outlook and uncertainty about the form of the return to normal (the future scale of working from home and the related need for office space, and the share of online shopping). In line with that, overall investment activity declined and planned investments were postponed. The drop in transactions pertained mainly to hotels and other accommodation (-80%), but lower transaction activity was also seen for other types of commercial property in the second half of the year (see Chart II.21). Lenders responded to the tight commercial property market situation; they were less willing to finance projects in this area or required investors to meet stricter credit conditions (see section V.4.2). The worse access to funding may lead to growth in financial stress for some entities, particularly developers. Despite the current pessimistic market sentiment, most participants expect the situation to calm in the second half of 2021 and return fairly quickly to pre-crisis levels, aided, among other things, by a relatively low supply of free property in the hardest-hit sectors (hotels and retail space) and sufficient liquidity among potential investors.

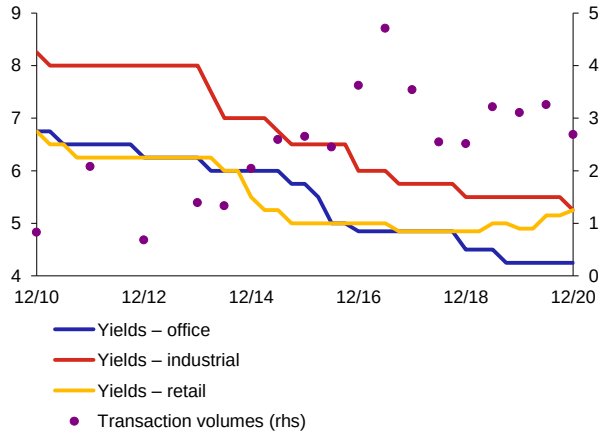
**The anti-epidemic measures had mixed impacts on the different types of commercial property**

The anti-epidemic measures limiting social contact mainly affected accommodation[17] and office leasing, whereas interest in industrial premises increased further. Vacancy rates were in line with this (see Chart II.22). As a result, there was an increase in the pressure to renegotiate current lease conditions for retail space (a 20% drop in Q4) and some offices where owners were willing to retain current lessees by offering them rent cuts and other incentives. The conditions for lessees are expected to continue to improve in the first half of 2021 (particularly for those willing to move into new office premises). Despite the observed downward pressure on rents, there has so far been no significant change in the returns demanded by investors. The prime yield has grown only slightly so far even in the hardest-hit segments (see Chart II.21). Prices of retail premises may thus be considerably overvalued in the current conditions and sharp growth in yields is not ruled out in this segment if the adverse epidemic situation persists.

**Chart II.21**

**Yields on commercial property and transaction volumes**

(%; right-hand scale: EUR billions)



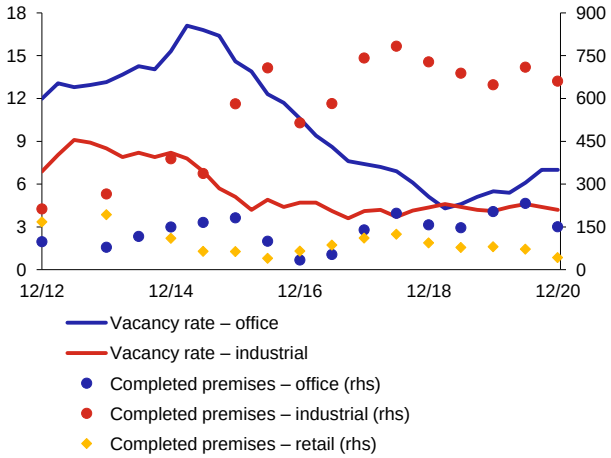

Source: Jones Lang LaSalle

Note: Prime yields. Transaction volumes are reported at annual frequency until 2013 and as annual moving totals at semi-annual frequency from 2014 onwards.

**Chart II.22**

**Vacancy rates and completed premises for commercial property**

(vacancy rates in %; right-hand scale: space in thousands of $m^2$)




Source: Jones Lang LaSalle

Note: Stocks of completed premises are reported at annual frequency until 2013 and as annual moving totals at semi-annual frequency from 2014 onwards.

16 RICS Economics: *Q4 2020: Global Commercial Property Monitor*.

17 Hotel occupancy (the number of overnight stays) dropped by around 80% year on year.

### II.1.3 Alternative economic scenarios

Two scenarios were used for the stress tests. The *Baseline Scenario* is based on the CNB's official macroeconomic forecast presented in Monetary Policy Report – Winter 2021.[18] The *Adverse Scenario* assumes repeated resurgences of the pandemic and lockdowns of both the domestic and foreign economy. Charts II.23A–F illustrate the paths of the key macroeconomic variables in the *Baseline Scenario* and the *Adverse Scenario*. The evolution of other indicators and variables is described in charts in sections II–V.

**In the *Baseline Scenario* the economy returns to normal…**

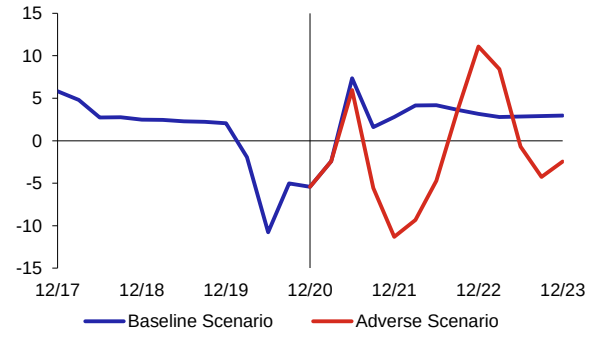
The *Baseline Scenario* assumes that growth in domestic economic activity picks up slowly in 2021 as herd immunity is gradually achieved. Real GDP grows by 2.3% on average over the four quarters of 2021. The economy starts running normally again in 2022. Robust household consumption is accompanied by investment activity, and GDP grows by 3.8%. In 2023, GDP growth returns to 2.9%, close to the potential rate of growth of the economy. Developments in the labour market are also consistent with a gradual fading of the pandemic. The unemployment rate peaks at 3.8% in 2021 Q3 and then falls gradually. Wage growth is volatile until mid-2022 due to one-off factors and then shows an upward trend, rising to 5% at the scenario horizon. In line with the expected economic recovery and growth in inflation pressures in the second half of 2021, the *Baseline Scenario* assumes a gradual increase in monetary policy interest rates and appreciation of the koruna against the euro. The PRIBOR reference rate rises above 2% in the last year of the scenario and the koruna strengthens to CZK 24.5 to the euro. Czech government bond yields also go up as monetary policy rates increase. Yields on domestic and foreign financial markets increase in line with the launch of global monetary policy normalisation. This is reflected in slower growth and even a temporary slight drop in prices on global stock markets. The decline in the incentive to search for yield also fosters modest growth in risk premia on corporate bonds. Growth in domestic property prices starts to slow gradually due to rising interest rates on housing loans and base effects.

**…while in the *Adverse Scenario* the economy would experience repeated downturns**

The *Adverse Scenario* assumes repeated declines in foreign and domestic economic activity, due mainly to further waves of the pandemic, a slow pace of vaccination, and mutations resistant to existing vaccines. Global market sentiment would worsen and risk premia on financial assets and client loans would rise sharply. Prices of foreign assets and bonds with low ratings would fall back in 2021 to the lows they recorded in the first half of 2020 and reverse this fall only partially in subsequent years. Household consumption and investment activity would decline further in the second half of 2021 and the first half of 2022 against a backdrop of negative sentiment and renewed lockdowns of the domestic economy, including industrial sectors. A serious epidemic situation abroad would lead to a drop in external demand and a deterioration in the economic and financial situation, especially in industrial sectors. GDP would fall by 3.3% on average in the first year of the scenario and remain flat for the next two years while being volatile in individual quarters. Fiscal policy would be countercyclical throughout the scenario, but supportive expenditure measures would be scaled down due to rising government debt. The weaker effect of fiscal measures and firms' economic exhaustion would be reflected in a sharp rise in unemployment and muted wage growth, which would temporarily turn negative even in nominal terms in 2022. This would lead to strong growth in the default rate and a sharp fall in credit growth in both the household and non-financial corporations sectors. Residential property prices would record a sharp correction and their year-on-year growth would turn significantly negative and stay there until the end of the test period. An elevated default rate, accompanied by a drop in collateral value, would result in large credit losses and a drop in the banking sector's profit. The PRIBOR would fall to zero in the first two years due to still strongly supportive monetary policy. However, yields on Czech government bonds, especially those with long residual maturities, would rise, mainly because of a rise in the credit risk premium, which would foster growth in Czech government debt service. An outflow of foreign investors' capital from the Czech government bond market would also make a minor contribution to the growth in yields. The koruna would gradually depreciate to CZK 27 to the euro in line with these developments. Interest rates on new loans would rise due to an increase in the risk margins of banks, which would revise their view of credit risk. The growth in debt service would further increase the default pressure on households and non-financial corporations. In the third year of the scenario, the risk-free component of domestic yields and interest rates would also start to contribute to their growth, as expectations of a relatively early and rapid exit from the environment of very low yields would start to strengthen against a backdrop of briskly growing inflation pressures.

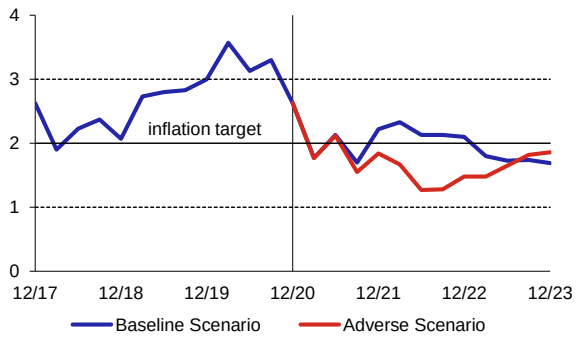
18 In the first two years, the *Baseline Scenario* is based on the CNB's official forecast. The *Baseline Scenario* for the third year and the *Adverse Scenario* were created solely for stress testing purposes. Therefore, neither the *Baseline Scenario* beyond the forecast horizon, nor the *Adverse Scenario* is an official forecast of the CNB.

**Chart II.23A**
**Alternative scenarios: real GDP**
(year on year in %)



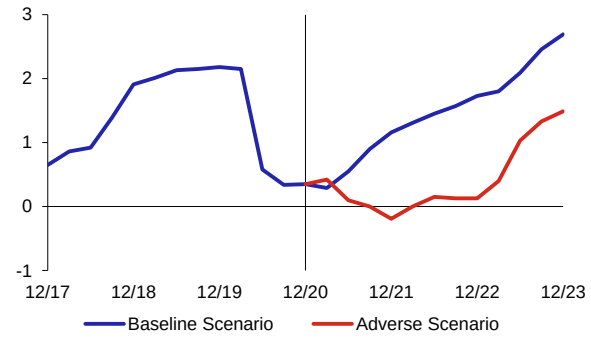

Source: CNB

**Chart II.23B**
**Alternative scenarios: inflation**
(year on year in %)



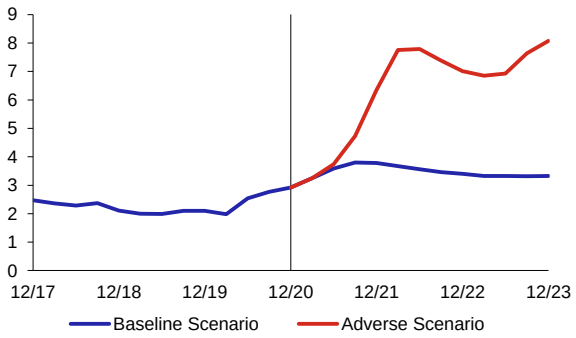

Source: CNB

**Chart II.23C**
**Alternative scenarios: 3M PRIBOR**
(%)



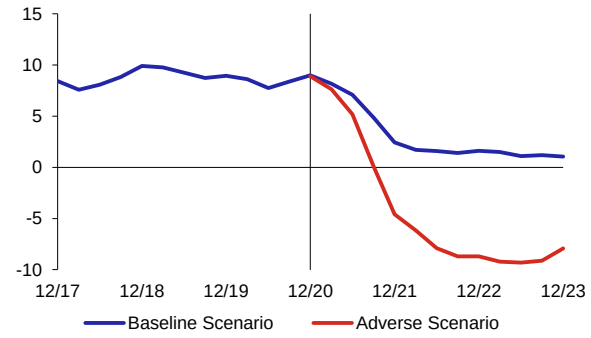

Source: CNB

**Chart II.23D**
**Alternative scenarios: unemployment rate**
(%)



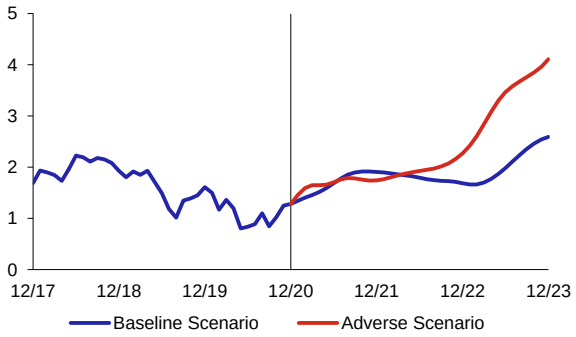

Source: CNB

**Chart II.23E**
**Alternative scenarios: property prices**
(year on year in %)




Source: CNB

**Chart II.23F**
**Alternative scenarios: ten-year Czech government bond yield**
(%)




Source: CNB

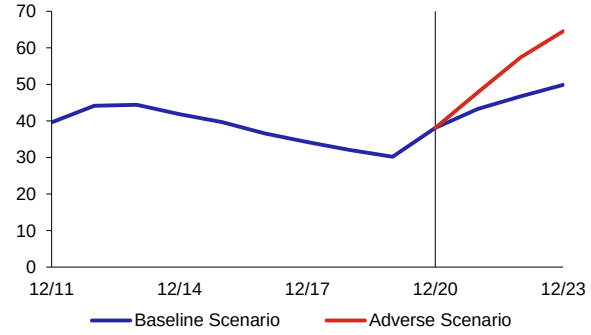
## II.2 THE NON-FINANCIAL SECTOR

### II.2.1 The public sector

**Government stabilisation measures significantly affected the general government budget balance**

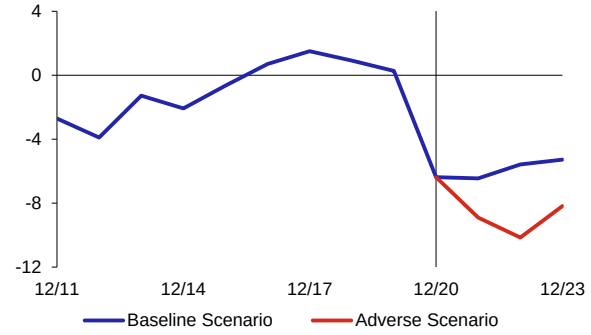
The Czech Republic's government debt-to-GDP ratio rose by 7.8 pp to 38.1% as of the end of 2020 (CZK 2,153 trillion; see Chart II.24), due both to a significant general government deficit (see Chart II.25) and a drop in GDP (a year-on-year change in GDP at current prices of -1.7%; see Chart II.23A). Fiscal stabilisation measures[19] and a decline in revenue due to the contraction in economic activity were the main causes of the general government deficit of CZK 348 billion (6.2% of GDP) in 2020.[20]

**Chart II.24**
**General government debt**
(% of nominal GDP)




Source: CNB

**Chart II.25**
**General government balance**
(% of nominal GDP)




Source: CNB

**A continued budget deficit and further growth in government debt are expected in the years ahead**

The slow economic recovery (see Chart II.23A) and the Czech Republic's persisting expansionary fiscal policy in the first year of the *Baseline Scenario* will be replaced by relatively moderate fiscal restriction[21] due to the lifting of the pandemic-related stabilisation measures (see section II.1.3).[22] General government debt will continue to grow as a result of budget deficits (see Chart II.25), reaching 50% of GDP at the end of 2023 (see Chart II.24).[23] In the *Adverse Scenario*, which assumes a deep decline in economic activity and a sizeable rise in unemployment (see Chart II.23D) and risk premia in government bond yields (see Chart II.23F), general government debt would grow much faster over the scenario horizon, reaching 64.5% of GDP. General government debt would exceed the debt brake threshold as early as 2022 (see section IV.5). This would greatly limit the government's ability to use fiscal policy actively.[24]

**The government's good position on the government bond market aids its current increased funding needs**

The need to secure budget deficit financing, combined with regular debt repayment expenditure, was reflected in record-high government security issuance in 2020 (CZK 615 billion, a year-on-year rise of CZK 383 billion; see Chart II.19 CB). Despite the record-high deficit, the Czech Republic's rating was not downgraded and its stable outlook was also left unchanged (see Table II.1). This enabled government debt to be financed at still low risk mark-ups. The new debt in 2020 was financed by debt securities with lower yields (an average yield to maturity of 1.11%) than the average yield on the existing debt (1.94%). The average debt maturity remained at six years. Domestic financial institutions' demand for government bonds was the primary source of funding of the government sector's borrowing requirements in 2020 (see Box 3). The nominal value of their Czech government debt holdings increased by CZK 374 billion in 2020. There was also continued demand from non-residents (growth in nominal value of CZK 36 billion in 2020), who were mostly holding bonds with shorter maturities at the end of 2020 (see Chart II.26).

19 The measures included an extraordinary quarantine benefit, an extension of and increase in compensation bonuses and the Antivirus programme, extraordinary bonuses for health care and social services workers, growth in health care expenditure due to purchases of vaccines and tests, and other programmes providing targeted support to the sectors affected.

20 The structural deficit was 5.4% of GDP in 2020.

21 Pursuant to Act No. 23/2017 Coll., on Budget Responsibility, the structural deficit should be reduced by 0.5 pp a year from 2022 onwards.

22 For details see Monetary Policy Report – Winter 2021.

23 In its April Macroeconomic Forecast, the Ministry of Finance of the Czech Republic predicts a general government debt of 54.6% of GDP, just below the debt brake level of 55%, for 2024.

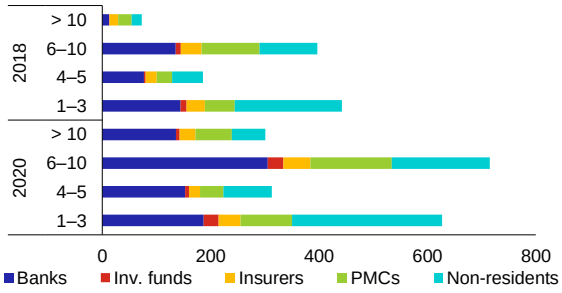
24 For details see Article 14 of Act No. 23/2017 Coll., on Budget Responsibility.

**Table II.1**
**The Czech Republic's credit ratings**

| Rating agency | Rating | Outlook |
|---|---|---|
| Moody's | Aa3 | Stable |
| S&P Global Ratings | AA | Stable |
| Fitch Ratings | AA- | Stable |
| JCR | AA | Stable |
| R&I | AA- | Stable |
| Scope Ratings | AA | Stable |
| Dagong Global Credit Rating | A+ | Stable |
| ACRA Europe | AA | Stable |
| ACRA | AA | Stable |

Source: Ministry of Finance of the Czech Republic
Note: Long-term domestic debt ratings. Data as of 13 April 2021.

**Chart II.26**
**Selected creditors of the Czech Republic's central government**
(maturity in years; x-axis: nominal amount in CZK billions)



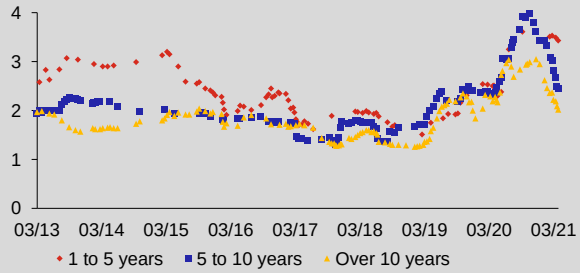

Source: CNB
Note: Data on holdings of government securities based on supervisory data as of 31 December 2018 and 31 December 2020.

## BOX 3 Funding of borrowing requirements on the government bond market

The supply of government bonds of many countries, including the Czech Republic, has risen sharply since the onset of the pandemic due to an increase in borrowing requirements. These are caused by high primary government deficits and the need to refinance outstanding government debt (see Chart II.20 CB). Governments' access to funding is an important liquidity indicator for analysing the level of sovereign risk, as a mismatch between the required funding (covered mainly by the supply of government securities) and the sources of funding (i.e. the demand for government securities) could result in a sovereign crisis under very adverse financial conditions.[25]

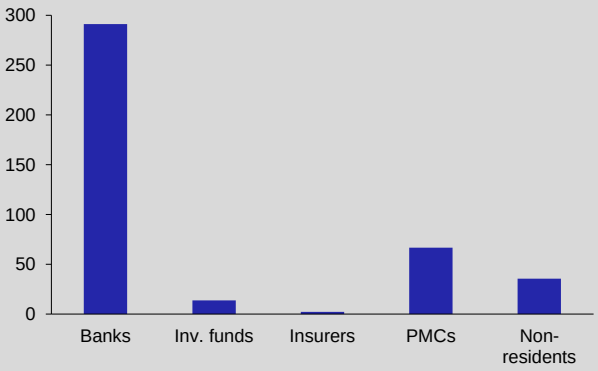
The Czech government's borrowing requirements are covered mainly by Czech government bonds, which currently account for 98% of central government debt. Their supply on the primary market rose significantly year on year in 2020 (see Chart II.19 CB) but was successfully absorbed by strong demand, which exceeded the amount sold several times over (see Chart 1). Domestic banks held a significant position on the demand side (see Chart 2). Other domestic institutional investors and non-residents also increased their exposures to Czech government bonds. Domestic financial institutions have long been major investors in Czech government bonds (see Chart II.21 CB) across all maturities (see Chart II.26). Non-residents may show a more variable preference for holding Czech government bonds, and hence for absorbing the Czech government's borrowing requirements, due to their higher sensitivity to market risk. Their government securities holdings accounted for around 30% of total debt at the end of 2020 (see Chart 3).

**Chart 1 (BOX)**
**Demand for Czech government bonds in primary auctions**
(bid-to-cover ratio)




Source: CNB
Note: Data as of 13 April 2021. The bid-to-cover ratio is the ratio of the amount of bids received to the amount sold (adjusted for the Ministry of Finance portfolio). The dots are the moving averages of volume-weighted bid-to-cover ratios in the last twelve auctions for the given maturity basket.

**Chart 2 (BOX)**
**Change in Czech government bond holdings in 2020 at nominal value**
(CZK billions)

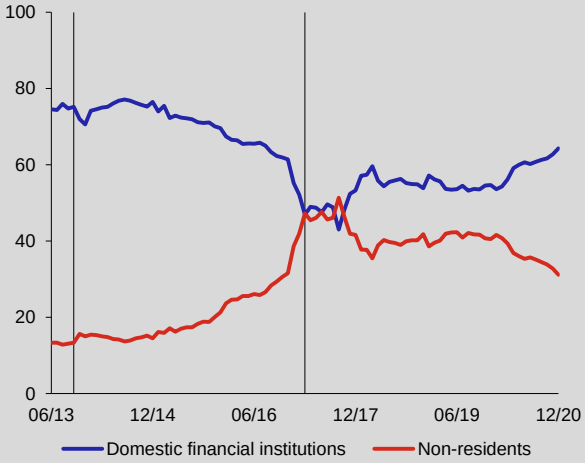



Source: CNB

25 Take, for example, the increase in the three-year Greek government bond yield from 2.2% in October 2009 to 12.2% at the end of April 2010 in response to a record-high budget deficit of 15.4% of GDP and a total debt of 126.8% of GDP at the end of 2009.

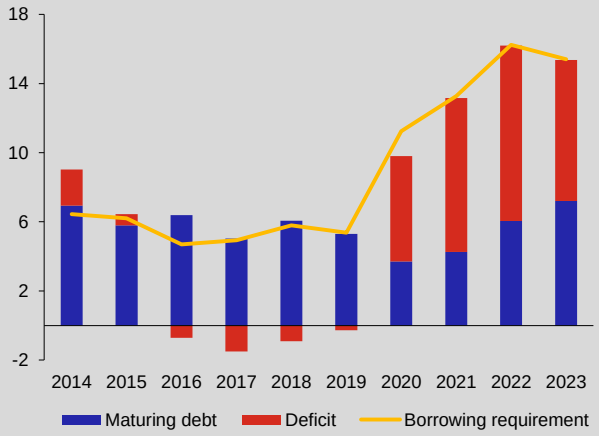
Under the *Adverse Scenario*, the Czech Republic's borrowing requirements increase significantly compared to 2020 (to CZK 918 billion in 2022; see Chart 4), due not only to growth in the government deficit, but also to refinancing of the outstanding debt.[26] The *Adverse Scenario* assumes a rise in the cost of funding government debt due to growth in both term and credit risk premia (see Chart II.23F). However, growth in yields on newly issued government bonds would not represent any major problem over the horizon of the *Adverse Scenario*. The effective interest rate on the total government debt would remain very low in historical terms due to cheap funding in the past (see Chart 5).

**Chart 3 (BOX)**
**Holders of Czech government bonds**
(% of stock of Czech koruna government bonds)




Source: Ministry of Finance of the Czech Republic, CNB
Note: The vertical lines indicate the last monthly observations before the announcement and discontinuation of the CNB's exchange rate commitment.

**Chart 4 (BOX)**
**Borrowing requirement in the *Adverse Scenario***
(% of GDP)




Source: CNB
Note: The borrowing requirement is the primary cash deficit plus debt repayments including outstanding principal and SFA, which the chart does not show due to their low volumes.

Domestic financial institutions' incentive to bid for Czech government bonds is affected by the need to manage liquidity risk in their balance sheets, by the regulations,[27] by internal rules affecting the amount of exposures, and by the relatively high returns on the bonds. The importance of returns is also evidenced by the period of the impending exit from the exchange rate commitment between 2016 and 2017, when domestic financial institutions' demand for government bonds fell gradually against a backdrop of a negative yield curve beyond five-year maturity (see Charts II.13–15). Given their size, domestic non-bank institutions' absorption capacity is relatively low, as the ratio of the total assets of domestic insurance companies, pension funds and investment funds to total government debt was less than 79% at the end of 2020. The absorption capacity of domestic banks – the government's main creditors – might be restricted by internal limits on significant exposures.[28] However, banks' end-2020 financing plans for the next three years show a planned increase in debt securities holdings of CZK 103 billion (see Chart 6). Government bonds in domestic financial institutions' portfolios maturing at the end of 2023 amounted to almost CZK 200 billion at the end of 2020. Assuming that the maturing amount is repurchased and the planned additional increase of CZK 103 billion goes into Czech government bonds only, this would imply net purchases of almost CZK 303 billion at nominal value over the next three years. From the regulatory point of view, the leverage ratio could potentially limit growth in sovereign exposures.[29] However, the leverage ratio for the banking sector as a whole was almost 8% (see Chart III.3) at the end of 2020, well above the lower limit of 3% (see section III.2). So, this limit should not constrain domestic banks' capacity to absorb the growing government debt in the near future.

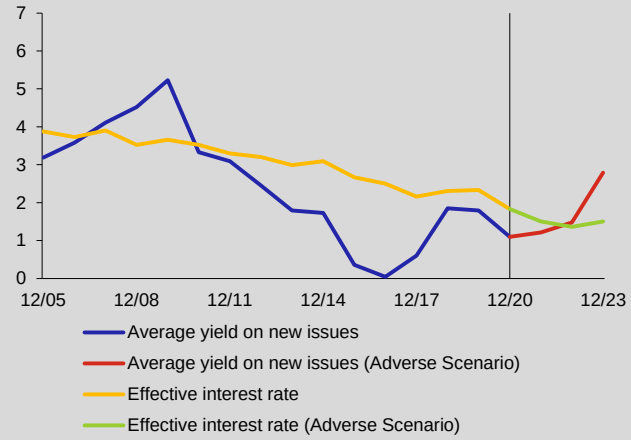
26 However, the refinanced amount would grow only slightly despite the rising debt in the *Adverse Scenario*. This is due to the assumed maturity structure of the new debt in the years of the scenario, when the average maturity of the total debt is expected to remain around the Ministry of Finance's current target of six years.

27 Moreover, banks usually hold zero or very low capital against these exposures. These exposures increase the amount of liquid assets for the binding liquidity coverage ratio (LCR). Furthermore, sovereign exposures are exempted from the concentration limits. From the regulatory point of view, the MREL can be expected to have a possible positive effect on the absorption capacity, as banks could invest funds obtained by issuing eligible liabilities on the government bond market and raise their demand. An amendment to the Act on the CNB (Act No. 219/2021 Coll., which amends Act No. 6/1993 Coll., on the CNB) could affect demand for government bonds, as it broadens the range of counterparties in securities transactions, including government bond transactions.

28 Banks subject to CRD IV/CRR are required, among other things, to ensure consistent and effective management of concentration of exposures, including sovereign ones, in their risk management systems.

29 For details see Komárková, Z., Hodula, M., Pfeifer, L. The Relationship between Capital and Liquidity Prudential Instruments, Thematic Article on Financial Stability 1/2020.

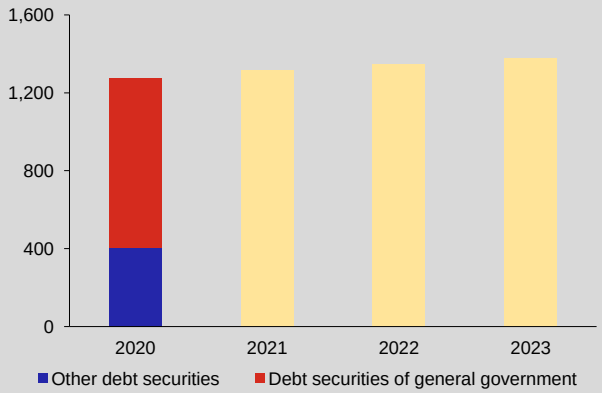
**Chart 5 (BOX)**
**Average koruna Czech government bond yield**
(average yield in %)




Source: CNB

Note: Only coupon bonds in koruna auctions on the primary market. Weighted by the supply in auctions. The effective yield is calculated as the ratio of debt service to total debt.

**Chart 6 (BOX)**
**Debt securities holdings according to domestic banks' plans**
(CZK billions)




Source: CNB

Note: The shares of government bonds are not available for banks' plans (yellow columns). To give an idea, the chart shows the share as of the end of 2020.

The absorption capacity of non-residents is much higher than that of domestic financial institutions. However, it is very sensitive to interest rate, credit and exchange rate risk and to general sentiment on global financial markets. For these reasons, non-residents' demand is concentrated on shorter maturities (see Chart II.26). In the event of changes in market sentiment, non-residents may cause undesirable volatility, especially at the shorter end of the Czech government bond yield curve, and thus make these bonds less attractive.[30] An important guide to non-residents' demand is the credit rating, which in the case of the Czech Republic is currently very high with a stable outlook (see Table II.1). In some cases, non-residents' investment decisions are also guided by the inclusion of bonds in benchmark indices. The possible exclusion or inclusion of a bond in an index can also cause temporary volatility in demand for it. Moreover, demand from non-residents has been also affected in recent years by central banks' government bond purchase programmes, which are pushing down foreign government bond yields and thus increasing the relative return on bonds offered on the domestic market. Non-residents' demand is therefore ultimately very sensitive to macrofinancial developments, so the shocks considered in the *Adverse Scenario* could lead to an abrupt change in its level.

**The fiscal space should be increased again by timely fiscal consolidation considering higher future costs related to population ageing**

The favourable pre-pandemic conditions associated with economic growth were not used to set aside reserves or launch reforms of the pension and health systems. Instead, there was procyclical growth in government expenditure,[31] primarily because of higher pension valorisation and public sector wage growth, but also due to tax cuts. The pandemic, which was reflected in record-high growth in government debt, contributed to limiting the fiscal space for countercyclical policy in the event of future recessions or crises. Therefore, not only to maintain public finance stability, but also to avoid jeopardising the stability of the financial sector as a major general government creditor, the Czech government should prepare a public finance consolidation strategy[32] taking into account the negative effect of continuing population ageing after 2030, which represents a significant medium-term risk.[33]

30 In mid-October 2008, for example, demand from foreign institutional investors weakened significantly. This had a negative impact on bid-offer spreads.

31 Total current primary general government expenditure has increased by a sizeable 41% over the past five years and by 12.4% year on year over the past year. The share of mandatory state budget expenditure in total state budget expenditure was 51% in 2020.

32 The absence of a consolidation strategy in the 2021 Convergence Programme of the Czech Ministry of Finance was criticised by Moody's.

33 Report on the Long-Term Sustainability of Public Finances (June 2020).

## II.2.2 The private non-financial sector

**The pandemic significantly affected the non-financial corporations sector in 2020 and early 2021…**

At the end of 2020 Q1 the private non-financial sector was hit by the pandemic. It led to sharp drops in production, value added and operating surplus in the non-financial corporations sector (see Chart II.22 CB) and a downturn in investment activity, especially in 2020 Q2. The fall in year-on-year investment growth to strongly negative levels resulted in a sizeable drop in the investment rate (see Chart II.27). Corporations' accounting results also reflected the highly adverse situation: the number of loss-making firms rose to 23.5% and return on equity fell in all corporation size categories (see Chart II.28). The fall in profitability could be seen across almost all industries but was particularly strong in manufacturing (including the automotive industry) and transport (see Chart II.29). By contrast, comparable profitability rates over time were recorded by property developers (due to rising prices and strong activity on the residential property market) and construction.

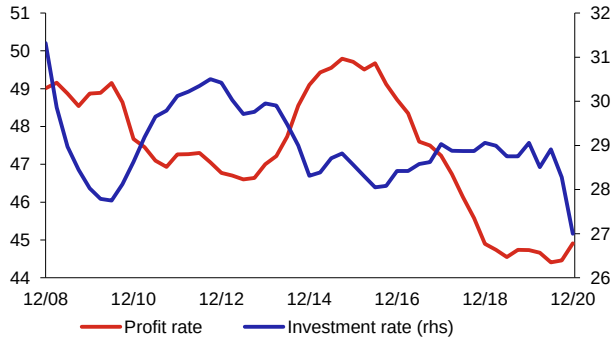
**…but the impact on the household sector has not been strong so far**

The transmission of the shock to the household sector was partly absorbed by the public sector (see section II.2.1). Despite a record plunge in GDP, the unemployment rate rose only modestly (see Chart II.23 CB). Wage growth was volatile, but the overall trend suggests only a slight slowdown (see Chart II.23 CB). However, there were also some differences across industries (see Chart II.30). The biggest declines in the number of employed persons were recorded in the hardest-hit sub-sectors of hotels and restaurants (-18.9%) and administrative and support services (-12.2%).

**Chart II.27**

**Profit rate and investment rate in the non-financial corporations sector**

(% of gross value added)



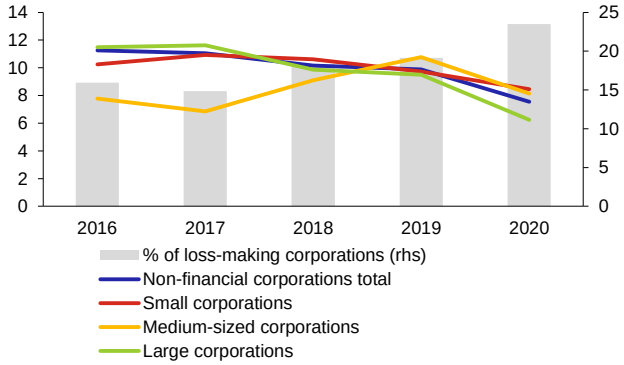

Source: CZSO

Note: Profit is expressed by the annual moving total of gross operating surplus and investment by the annual moving total of gross fixed capital formation.

**Chart II.28**

**After-tax return on equity and percentage of loss-making non-financial corporations**

(%)



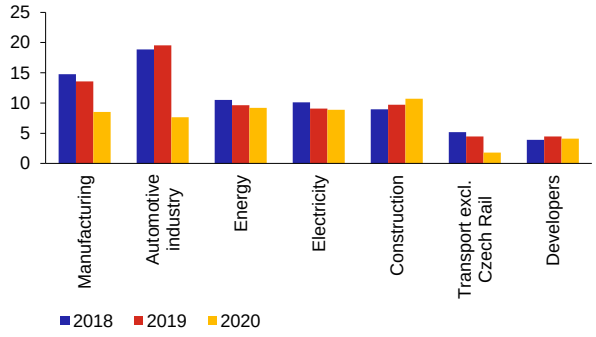

Source: CZSO

Note: The results are based on a sample of around 1,800 corporations together accounting for more than 40% of the sector's gross value added.

**Chart II.29**

**After-tax return on equity in selected sub-sectors**

(%)



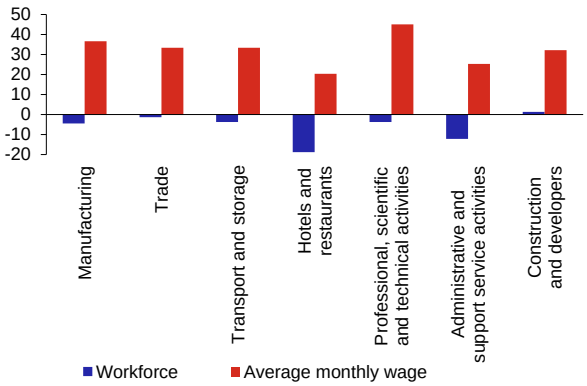

Source: CZSO

Note: Energy comprises electricity, gas, heat and air-conditioned air. The automotive industry is included in manufacturing. Property development projects are included in the results for construction. The results are based on a sample of non-financial corporations.

**Chart II.30**

**Employment and average wage in selected sub-sectors at the end of 2020**

(annual percentage change in workforce; monthly wage in CZK thousands)




Source: CZSO

**Lending decreased, with the exception of loans to households for house purchase…**

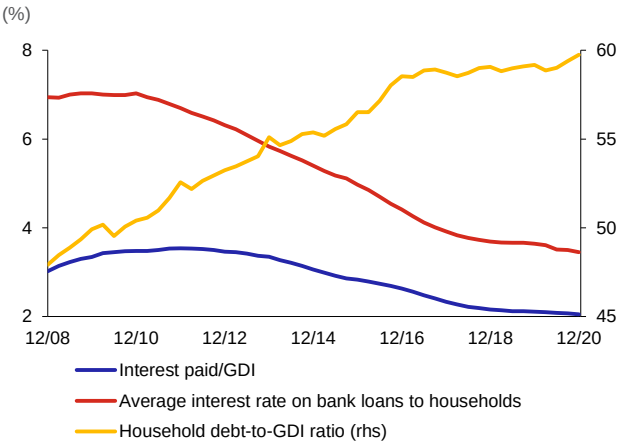
Year-on-year growth in bank loans to households for consumption and to non-financial corporations declined steadily from 2020 Q2 onwards and turned negative in 2021 Q1 (see Chart V.6). Drawdown of new loans by non-financial corporations differed substantially from the pre-pandemic averages, especially in the hardest-hit sub-sectors, such as hotels and restaurants and other services (see Chart II.24 CB), where a sharp decrease (of more than 40%) was recorded. Construction and property development also recorded significant declines.[34] By contrast, a sizeable increase was observed for information and communication technology firms. The growth rate of loans to households for house purchase rose gradually throughout 2020 and 2021 Q1 (see section V.3).

**…which continued to be drawn mainly by high-income households**

A closer look at the structure of new mortgage loans reveals that mortgage loans were taken out mainly by high-income households, whose share in total new mortgage loans has long been between 60% and 70% (see Chart II.25 CB). However, 2020 saw a modest rise in the share of new loans drawn by low-income households (the first and second income quintiles), taking into account the incomes of multiple applicants (see Chart II.27 CB). The share of new loans with rate fixation periods of over five years also fell gradually in 2020. While this share had stood at almost 75% of new mortgage loans in early 2020, it was just 50% in early 2021 (see Chart II.25 CB). This reflects a slight rise in the cost of loans with long fixation periods compared with those of up to five years. The growing share of loans with shorter fixation periods in the overall mortgage portfolio suggests a slight rise in this portfolio's sensitivity to interest rate changes. If interest rates were to rise, liquidity risk would increase in households with mortgage loans with shorter fixation periods (see section IV).

**Chart II.31**

**Debt ratio and interest paid by households**

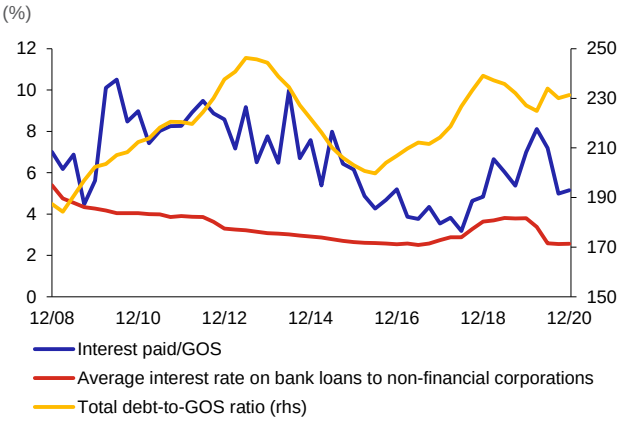



Source: CNB, CZSO

Note: GDI stands for gross disposable income. The household sector also includes data for NPISHs. The interest rate is calculated as the average interest rate on the stock of bank loans to households.

**Chart II.32**

**Debt ratio and interest paid by non-financial corporations**




Source: CNB, CZSO

Note: GOS stands for gross operating surplus. The interest rate is calculated as the average interest rate on the stock of bank loans to non-financial corporations.

**After years of stagnation, the debt ratio of households started to rise slightly…**

Weaker wage growth and rising unemployment amid accelerating growth in loans for house purchase led to an increase in household sector debt (see Chart II.31). The ratio of interest paid to the total disposable income of households was almost unchanged, owing to a slight decrease in interest rates (see Chart II.13 and Chart II.31). Constantly low interest rates, combined with government support for jobs and bank loan moratoria, prevented a dramatic increase in the share of unsustainable (risky) debt[35] despite the economic downturn (see Chart II.33).

**…the debt ratio in the non-financial corporations sector was little changed…**

The non-financial corporations sector, which was hit harder by the coronavirus pandemic on the aggregate level, stabilised its debt at around 230% of gross operating surplus (see Chart II.32). However, the ratio of interest paid to gross operating surplus fell markedly in response to the decline in loan rates. The latter was much larger than for households, owing to the

34 The slowdown in credit growth in construction and property development may seem surprising given the high return on equity. Loans to these sub-sectors are generally characterised by high one-off amounts connected with the launch of new projects and provide funding for long periods of time ahead. This may have distorted the average amounts given the decline in new construction during 2020. Several such loans were provided in 2020 Q1 and hence fall within the pre-pandemic period. The current drop in new loans may therefore not reflect low activity in the sub-sector.

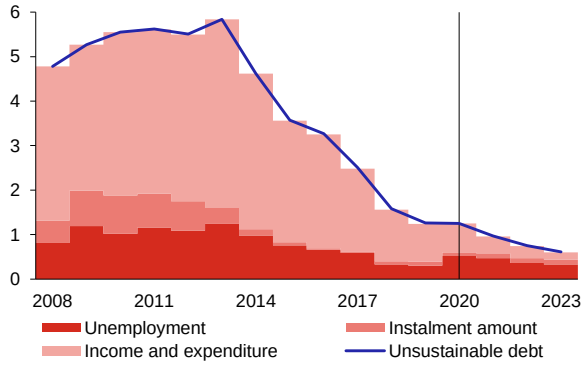
35 The share of unsustainable household debt refers to the portion of mortgage loans in the portfolio for which repayment problems can potentially be expected. The concept of unsustainable debt reflects cyclical factors (the unemployment rate, nominal income and interest rates) and captures the impact of excessive risk-taking in mortgage borrowing (high debt service and a high propensity to consume).

provision of most loans at variable rates (see Chart II.13 and Chart II.32). The ratio of interest paid to gross operating surplus did not exceed 10% even at the higher interest rates observed in previous years and has long been low compared with other costs.[36] Therefore, a potential rise in interest rates should not markedly affect the sector's financial performance.

**Chart II.33**

**Share of unsustainable mortgage debt in the *Baseline Scenario***

(% of total mortgage debt)



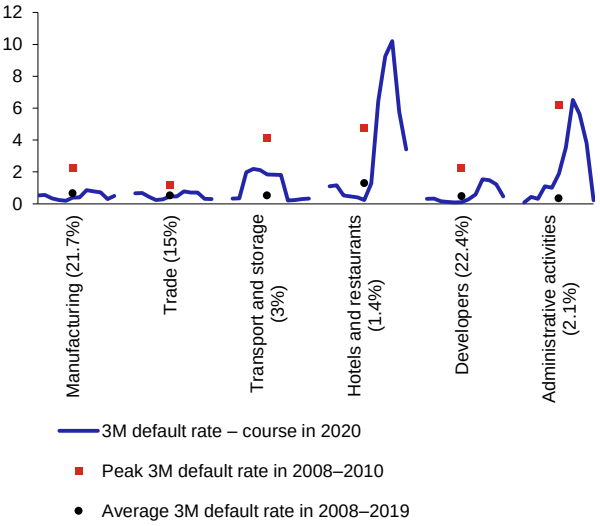

Source: CNB

Note: The share of unsustainable debt refers to the portion of loans in the portfolio for which repayment problems can potentially be expected. A breakdown into individual factors shows what the predominant factor was in loans becoming unsustainable. Instalment amount and unemployment reflect the business cycle and their effect is thus largely natural. By contrast, the income and expenditure factor reflects an unrealistic assessment of the income and expenditure sides of the household's budget when taking out a mortgage. The influence of this factor should be minimal for growth in debt to be sustainable over the long term.

**Chart II.34**

**Default rate in selected NFC sub-sectors in 2020**

(%)




Source: CNB

Note: The number shown in brackets after the name of the sub-sector is the ratio of loans in the sector to performing loans.

**…but the default rate in the non-financial corporations sector increased in late 2020**

The default rate in the non-financial corporations sector increased after the statutory loan moratorium ended. The increase was due to defaults on loans in the hardest-hit sub-sectors, especially hotels and restaurants (where the three-month default rate exceeded 10%, well above the highs observed in the crisis years of 2008–2010), administrative and support service activities[37] and transport (see Chart II.34). However, the share of loans to these sub-sectors in total loans is low and the rise in the default rate is relatively modest in the context of the depth of the downturn, despite significant increases in sub-sectors. Developers also recorded a minor rise in the default rate as a result of financial problems in several firms.

**The *Baseline Scenario* assumes mixed credit growth in the main credit segments…**

Despite the expected economic recovery, non-financial corporations' investment activity remains muted in the *Baseline Scenario*, resulting in negative credit growth in this sector (see Chart II.35). Investment activity increases in the subsequent years and drawdown of loans by non-financial corporations picks up. Credit growth thus increases towards 6% at the scenario horizon. Credit growth in the household sector in the *Baseline Scenario* differs according to credit market segment (see Chart II.36). While a slowdown towards 6% is expected in the loans for house purchase segment after a peak in 2021, the growth rate of loans for consumption gradually accelerates after the current moderation, reaching 5% in 2023.

**…and a rise in the default rate, especially in the non-financial corporations sector**

The *Baseline Scenario* assumes a further rise in the default rate in the non-financial corporations sector to 3.5%, followed by a slight decline to 2.5% (see Chart II.37). The default rate thus remains above average from the long-term perspective (see section IV.3). Owing to a low unemployment rate, low interest rates and continued wage growth, the default rate in the household sector does not rise markedly in the *Baseline Scenario* (see Chart II.38).[38] An increase above the pre-pandemic levels can be observed for loans for house purchase, but the default rate remains exceptionally low in historical terms. In the *Baseline Scenario*, the estimated share of unsustainable debt does not indicate higher risk for mortgage loans

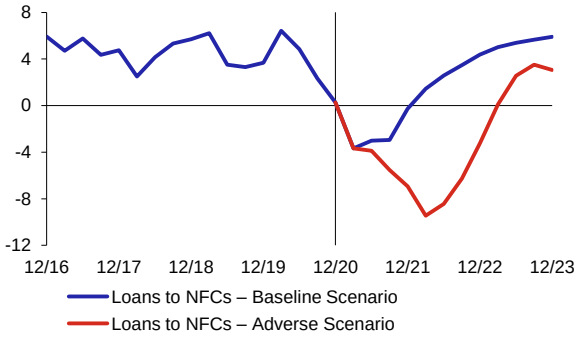
36 For example, the wage costs of non-financial corporations represent around 120% of gross operating surplus.

37 Including activities of travel agencies.

38 An estimate of the 12M default rate on mortgage loans only in both the *Baseline Scenario* and the *Adverse Scenario* is also published in the section on the stress test of households (see section IV.4). Owing to different methodological approaches, the results of the estimate for mortgage loans may differ from those for loans for house purchase. While the estimate for loans for house purchase is based on the macroeconomic approach used, among other things, in the banking sector stress tests the default rate on mortgage loans is determined on the basis of the household stress test, which is based on a microeconomic approach that additionally reflects structural changes on the mortgage loan market (see the household stress test methodology).

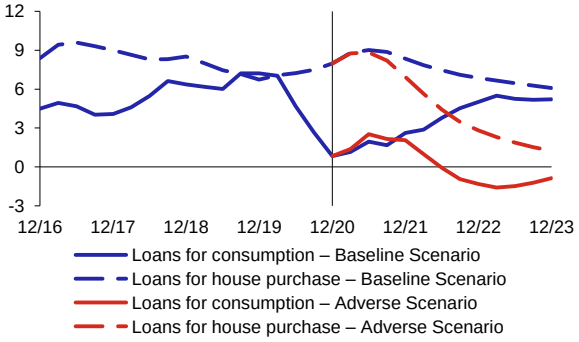
either (see Chart II.33). If this scenario materialises, unsustainable debt will continue to decrease slightly over the scenario horizon.

**Chart II.35**
**Bank loans in the non-financial corporations sector**
(year on year in %)



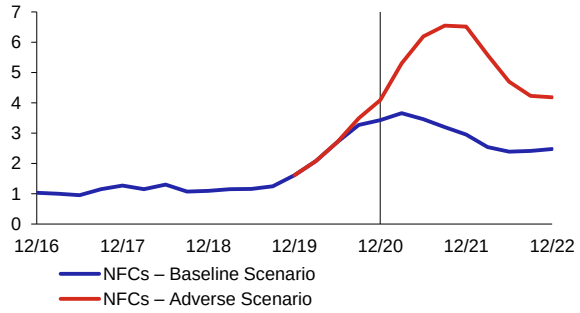

Source: CNB

**Chart II.36**
**Bank loans in the household sector**
(year on year in %)



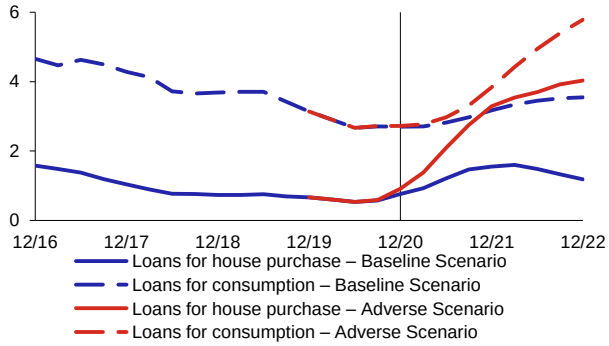

Source: CNB

**Chart II.37**
**12M default rate on bank loans to non-financial corporations**
(%)




Source: CNB

**Chart II.38**
**12M default rate on bank loans to households**
(%)




Source: BRCI, CNB

**Risks going forward are linked with both demand and supply factors**

Risks to the Czech economy in the months and years ahead are linked mainly with the pandemic situation (see section II.1.2). Solvency and liquidity in the sectors of households and non-financial corporations could be adversely affected by premature and significant tightening of economic policies. Risks associated with excessive tightening of financial conditions are also crucial for the global economy (see section II.1.1). Their materialisation could ultimately have a significant impact on demand for Czech exports. Besides risks directly related to the pandemic, short-term risks on the supply side can be identified in selected sub-sectors (especially manufacturing and information and communication technology), linked with problems in supply chains arising from a shortage of chips and materials and a lengthening of the time it takes to supply them. A specific type of long-term risk is linked with the switch to a low-emission and sustainable economy, whose impact on the domestic non-financial corporations sector may be significant (see Box 4).

**In the *Adverse Scenario*, the default rate rises significantly and credit growth slows**

If the *Adverse Scenario* (see section II.1.3) were to materialise, credit growth would drop substantially (see Chart II.35 and Chart II.36), recording negative levels in the non-financial corporations sector for most of the period. The *Adverse Scenario* also has a negative impact on the default rate, which increases substantially in both sectors monitored (see Chart II.37 and Chart II.38). In the non-financial corporations sector, the aggregate 12M default rate peaks at over 6%, well above the levels observed during the economic crisis of 2008–2010 (see section IV.3). A sizeable increase would also be recorded in the household sector, where the default rates on loans for consumption and house purchase would increase. The rise in the default rate on loans for house purchase would stem from the wage and sector breakdown of borrowers, as a drop in employment even in sub-sectors with relatively high wages was assumed in the stress simulation (see Chart II.29 CB). The NPL ratio rises in both sectors in line with the increase in the default rate (see Chart II.30 CB).

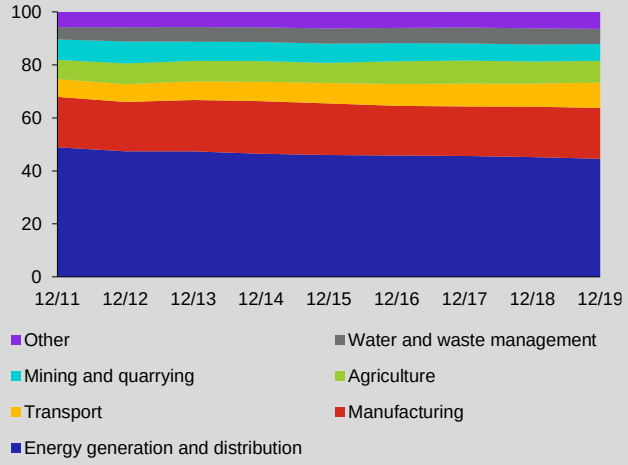
## BOX 4 Greenhouse gas emissions in the Czech non-financial corporations sector

Initiatives to take sustainable development criteria into account in the functioning of the financial system have strengthened in recent years. A recent EU regulatory initiative produced a package of measures aimed, among other things, at incorporating sustainability factors (ESG factors[39]) into financial institutions' risk assessment processes (see section V.6 and Box 7 in FSR 2019/2020). Integrating sustainability categories into risk assessment processes may change the financing conditions of many non-financial corporations, and this may no doubt affect their financial performance. Higher external financing costs or other obstacles to funding of non-financial corporations will also indirectly affect the credit and corporate bond markets.[40] The overall financial situation of corporations will also be affected by regulations aimed directly at reducing greenhouse gas emissions and enhancing environmental protection through additional taxation in the form of a "carbon tax" or emission limits. The impact of these regulatory activities on individual sub-sectors of non-financial corporations will depend among other things on the volume of greenhouse gas emissions they produce.[41] The effect of "green regulation" can be expected to be stronger in countries with higher relative emission intensity.

Energy generation and distribution has the biggest share in greenhouse gas emissions in the non-financial corporations sector, although its contribution to total emissions has fallen slightly over time (to around 45% in 2019, see Chart 1).[42] Other sub-sectors with high shares include manufacturing, transport, agriculture, mining and quarrying, and waste management. In an EU-wide comparison, the Czech Republic's mix of sub-sectors with high shares of emissions is the most similar to the Visegrad countries and Germany. In most euro area countries, by contrast, manufacturing is the biggest contributor to total emissions (see Chart 2). In terms of relative emission intensity (the ratio of total emissions produced by non-financial corporations to their value added), the Czech Republic has significantly higher figures than Western European countries. The situation in the other countries that entered the EU in 2004 or later is similar to that in the Czech Republic.

**Chart 1 (BOX)**
**Greenhouse gas emissions in the Czech non-financial corporations sector**

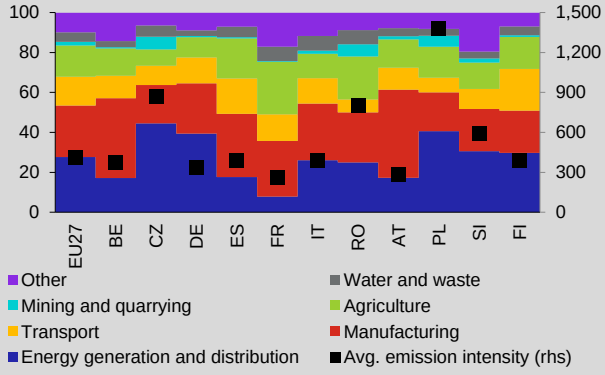
(%)




Source: Eurostat

**Chart 2 (BOX)**
**Emissions in the non-financial corporations sector by European comparison**

(%; right-hand scale: in tonnes of $CO_2$ equivalent per EUR million of gross value added)




Source: Eurostat

Note: The average emission intensity is the ratio of greenhouse gas emissions produced by non-financial corporations to their gross value added expressed in euros.

The largest impact can be expected in sub-sectors with a high relative emission intensity, i.e. an unfavourable ratio of sales to greenhouse gas emissions (direct emission intensity). As emission intensity increases, some sub-sectors will be forced to use part of their funds to adapt to potential regulatory and social obligations or to terminate a relatively large proportion of their activities. In the Czech Republic, energy generation and distribution has the highest direct emission intensity, followed by waste management, land transport and agriculture (see Chart 3). By contrast, the direct emission intensity of manufacturing is low relative to its sales (2.3 tonnes of $CO_2$ per CZK million of sales) despite the high total volume of

39 Environmental, social and governance factors. Sustainability factors in the environmental field include implementing measures to combat climate change, reducing carbon footprints, ensuring the protection of water resources, and applying responsible waste management policies.

40 In the area of debt financing, regulation may be reflected, for example, in credit pricing or collateral quality assessment.

41 Besides environmental risks, sustainability risks include risks in the social area, such as data handling and protection, working conditions and human rights protection, and governance risks, such as lobbying and whistleblowing.

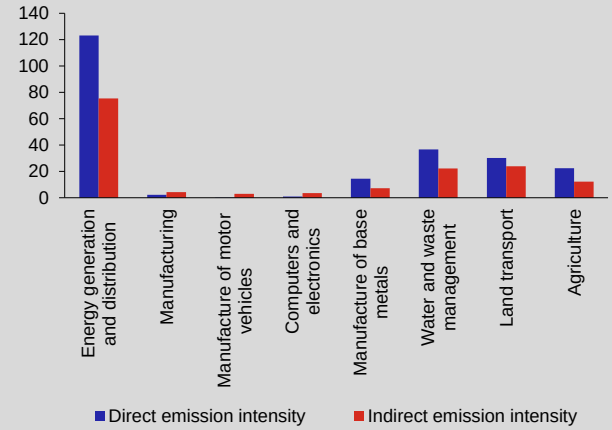
42 According to Eurostat data.

emissions produced. Within manufacturing, the most important segments, such as manufacture of motor vehicles and manufacture of computers and electronics, have below-average emission intensities (0.16t and 0.97t of $CO_2$ per CZK million of sales respectively). By contrast, heavy manufacturing, such as manufacture of base metals and manufacture of chemicals, is more emission-intensive. As regards the strength of the links between emission-intensive sub-sectors and the domestic financial sector, the exposures of energy generation and distribution are sizeable (see Chart 4). However, the potential adverse effect on financial sector stability in the Czech Republic should be limited owing to a low share of bank debt and directly held bonds and to the quasi-state nature of the exposures.[43]

**Chart 3 (BOX)**

**Direct and indirect emission intensity of selected NFC sub-sectors in the Czech Republic in 2019**

(tonnes of $CO_2$ equivalent per CZK million of sales)

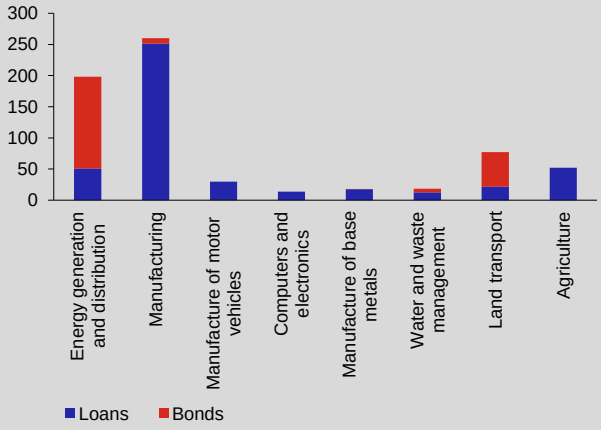



Source: Eurostat, CZSO

**Chart 4 (BOX)**

**Bank loans and bonds issued by selected NFC sub-sectors in the Czech Republic**

(CZK billions)




Source: CNB, CZSO

Note: Data as of 31 December 2019.

Non-financial corporations (and, in turn, entire sub-sectors) will probably attempt to pass on at least part of the costs associated with the new regulations to other firms in the production chain or to final consumers. Therefore, indirect emission intensity is more suitable for assessing the potential impacts of greenhouse gas regulation. This requires identification not only of the primary producers of sources of emissions, but also of indirect forms of emissions reflecting demand for the output of highly emission-intensive sub-sectors in the production chain.[44] The latter can be identified using data on the links between sub-sectors (intermediate consumption in the macroeconomic supply and use table compiled for the Czech Republic by the Czech Statistical Office).[45] Energy generation and distribution also attains the highest emission intensity levels in indirect terms, but its indirect intensity is 39% lower than its direct one.[46] Other emission-intensive sub-sectors also show lower emission intensities in indirect terms. By contrast, most other sub-sectors record higher indirect than direct emission intensity levels (in motor vehicle manufacture, for example, indirect emission intensity was 2.9t of $CO_2$ per CZK million of sales in 2019). The identification of indirect emissions has reduced the differences between sub-sectors, but they remain substantial. Estimating the potential transfer of the economic costs between sub-sectors and consumers will be key to determining the final impact of regulation on the non-financial corporations sector.

In light of the Czech economy's relatively high emission intensity and potential vulnerability to "green" regulation, the CNB will continue to pay attention to this transfer of costs, mainly by incorporating the impacts of such regulation into its stress testing framework.

43 Energy utility ČEZ accounts for more than half of the sector's total debt.

44 A simplified example: the process of making one car requires one tonne of emissions (direct emissions). Indirect emissions include all emissions created in the production chain, including delivery to the final consumer (e.g. manufacture of metals, rubber and plastics, and energy and transport in the production process).

45 Supply and use tables (CZSO).

46 The calculations do not take into account the allocation of the emissions produced to the individual final use items (household consumption, government expenditure, investment and exports). In reality, the distribution of the additional costs related to the regulation of emissions would also involve the transfer of a part of the price to these components of demand for firms' output.

# III. THE FINANCIAL SECTOR

*The domestic financial sector recorded growth in all its main segments in 2020 and maintained its stability even during the coronavirus pandemic. The banking sector remained very well capitalised, in part due to measures taken by the CNB to restrict profit distribution. The profitability of the banking sector was hit by a rise in impairment loss coverage costs and a decline in net interest income. However, due to the application of flexibility in the regulatory and accounting frameworks and to the government's stabilisation measures, the credit risk was not fully reflected in banks' balance sheets and financial results and thus remains the main risk to future profitability. The liquidity position of the banking sector remains robust due to a high proportion of liquid assets. Domestic non-bank financial institutions remain sufficiently capitalised and are maintaining a good liquidity position. After falling in the first half of 2020, asset prices on global financial markets rose apace. This led to an increase in the value of the assets managed by domestic investment funds and fostered an inflow of new funds. An abrupt repricing of risk premia and a decline in prices of investment assets remain the primary risks to the solvency and liquidity positions of non-bank financial institutions. Results of stress tests of the most significant segments of the financial sector demonstrate that the current capitalisation, liquidity and profitability of those segments continue to ensure their resilience to shocks.*

## III.1 DEVELOPMENTS IN THE FINANCIAL SECTOR

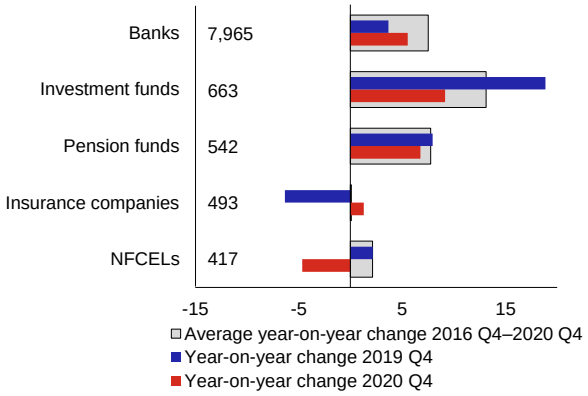
**The total assets of the segments of the financial sector mostly increased in 2020**

The total assets of all segments of the financial sector except non-bank financial corporations engaged in lending (NFCELs) increased in 2020 (see Chart III.1). The total assets of the financial sector grew by 5% to CZK 10.1 trillion (178% of GDP; 689% in the euro area at the end of 2019). The banking sector, which accounts for almost 80% of the financial sector's assets, recorded the largest growth in absolute terms (CZK 418 billion, or 5.5%). The increase in the banking sector's total assets was due mainly to growth in government bond holdings (of CZK 300 billion year on year) and in loans to households (of CZK 116 billion). The fastest year-on-year growth in assets was recorded by pension funds (CZK 34 billion, or 6.8%) and especially investment funds (CZK 56 billion, or 9.1%), whose total assets grew mostly in the second half of 2020. The insurance sector recorded a slight year-on-year increase (of CZK 6 billion year on year, or 1.3%). By contrast, following four years of growth, NFCELs recorded a decline in total assets (of CZK 20 billion, or 4.7%).

**Chart III.1**

**Rates of growth of segments of the financial sector**

(%)



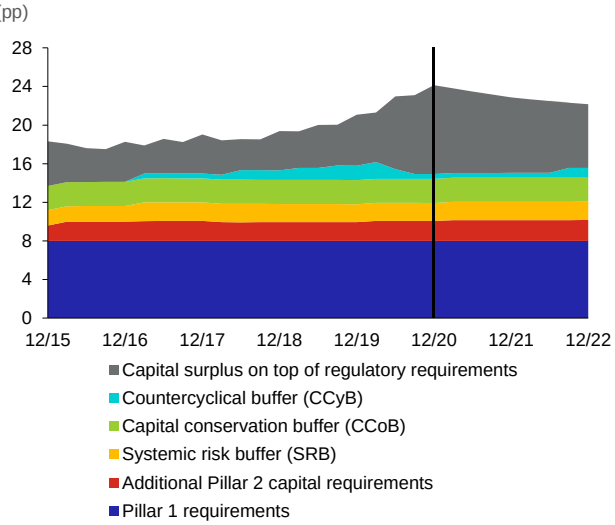

Source: CNB

Note: NFCELs = non-bank financial corporations engaged in lending. Figures in CZK billions as of end-2020. The banking sector also includes credit unions.

**Chart III.2**

**Structure of capital requirements in the domestic banking sector**

(pp)




Source: CNB

Note: The capital prediction for 2021 and 2022 assumes constant risk weights. Risky exposures are calculated on the basis of banks' assumptions about future loans, which banks report in the statement "Bank financing plans" (FPSIFE10).

## III.2 BANKS[47]

### III.2.1 Capital

**The capitalisation of the domestic banking sector is at record-high levels…**

The domestic banking sector strengthened its robust capital adequacy in 2020. Total regulatory eligible capital rose by CZK 91 billion in 2020, to CZK 619 billion. The overall capital ratio increased by 3.1 pp to 24.1% (see Chart III.2) and the Tier 1 capital ratio rose by 3 pp to 23.6%.[48] The capital ratio was affected mainly by an increase in capital from profit, associated with restrictions on dividend payments (+3.6 pp of the capital ratio). Growth in client loans and other assets acted in the opposite direction (-0.5 pp). The aggregate risk weight of exposures, which was virtually unchanged year on year, had a neutral effect.

**…and, coupled with a high capital surplus on top of the regulatory requirements, is enhancing the sector's ability to absorb credit losses and lend to the real economy…**

Capitalisation has long been strongly dependent on capital surpluses (see Chart III.2), which reached historical highs in both relative and absolute terms at the end of 2020. This was due to a decrease in the CCyB rate in 2020 (see section V.3) and also to a CNB recommendation calling on banks to temporarily restrict dividend payments and other actions that might jeopardise their resilience until the acute and longer-running consequences of the coronavirus pandemic recede. Banks abided by this recommendation. The Czech banking sector had paid dividends of around CZK 50 billion on average a year over the previous three years, with an average payout ratio of about 60%. The domestic banking sector's robust capital position and persisting profitability (see section III.2.3) are creating good conditions for it to absorb potential credit losses related to the coronavirus pandemic and to lend to the real economy. At the end of 2020, the available lending capacity in the capital surplus totalled around CZK 3.5 trillion (see Table III.1 CB), of which CZK 460 billion was from the released part of the CCyB.

**…and can also help the banking sector meet the binding interim MREL target**

The CNB has been setting a minimum requirement for own funds and eligible liabilities (MREL) for institutions in its area of competence on an annual basis since 2020. The MREL must be fully met by 1 January 2024.[49] In February 2021 the CNB communicated that it had revised and supplemented its General Approach to the MREL, which, among other things, newly sets the MREL expressed in relation to the leverage ratio. The CNB further specified that in order to ensure a steady increase in own funds and eligible liabilities to the required level, it was also setting a binding intermediate target in accordance with Directive (EU) 2019/879. Institutions are obliged to meet this intermediate target by 1 January 2022. The MREL can be met using eligible liabilities or capital, or a combination of the two. The current capital surplus may help banks comply with the binding interim target. However, IMF analyses indicate that the usability of the capital surplus for absorbing losses and/or lending to the economy may be weakened in such cases (see section V.1).[50]

**A leverage ratio requirement will become binding at the end of June 2021**

The leverage ratio of the domestic banking sector rose by 0.8 pp year on year to 7.8% (see Chart III.3). Only one small bank with a specific business model would currently be below the 3% level applicable upon the entry into force of CRR II on 28 June 2021. From this date onwards, there will be two binding capital requirements for banks – a capital (risk-weighted) ratio one and a leverage (non-risk-weighted) ratio one. Banks will have to maintain their capital based on the requirement that requires the higher absolute level of capital. The level of the specific requirement depends mainly on the aggregate risk weight for the bank's exposures, which is significantly affected by its business model.[51] In the domestic banking sector, the leverage ratio is also significantly affected by high exposures to the CNB. They make up around one-third of banks' assets and reduced the leverage ratio by 3.2 pp as of the end of last year (see Chart III.3). The leverage ratio adjusted for these exposures has risen by 0.6 pp to 11.0% since the start of 2020, signalling a strong capital position of the domestic banking sector in the non-risk-weighted capital regime.

47 The Czech Export Bank and the Czech-Moravian Guarantee and Development Bank are excluded from the analysis of the capital of the banking sector as a whole in the entire section III.2. This is because these banks are wholly owned by the Czech state (providing implicit state guarantees for their liabilities) and have different business models and volatile credit portfolios.

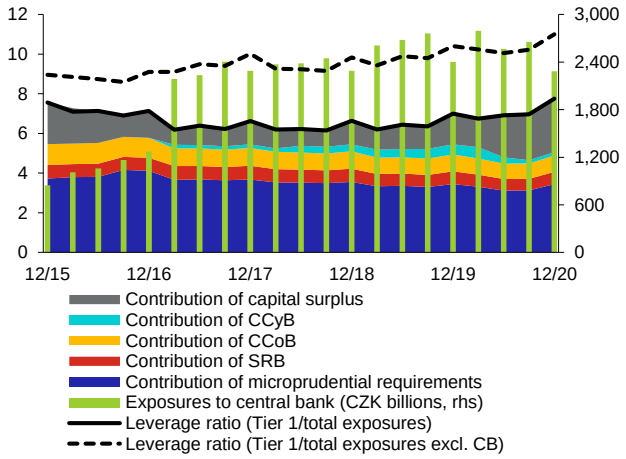
48 Most banks meet the overall capital requirement, consisting of the minimum level of regulatory capital in Pillar 1 (8%), a requirement based on the supervisory review and evaluation process in Pillar 2 (an average of 2.1% for the sector) and capital buffers (an average of 4.9% for the sector), by a sufficient margin. The capital surplus on top of the regulatory requirements amounted to CZK 236 billion as of 31 December 2020, of which that of systemically important banks to CZK 165 billion and that of other banks to CZK 71 billion.

49 The MREL is designed to ensure that banks have sufficient capacity for the absorption of losses and subsequent recapitalisation in the event of resolution. For more details on the MREL see https://www.cnb.cz/en/cnb-news/news/The-CNB-has-set-the-minimum-requirement-for-capital-and-eligible-liabilities-for-banks/, https://www.cnb.cz/en/cnb-news/news/CNB-revises-and-supplements-General-Approach-to-MREL/ and the article Kahoun, T. (2019): *Minimum Requirement for Own Funds and Eligible Liabilities (MREL): General Approach of the Czech National Bank*, Thematic Article on Financial Stability 4/2019.

50 See Chapter 1 of International Monetary Fund (2021): Global Financial Stability Report, April 2021: Preempting a Legacy of Vulnerabilities.

51 See Pfeifer, L., Hodula, M., Holub, L., Pikhart, Z. (2018): The Leverage Ratio and Its Impact on Capital Regulation. CNB WP 15/2018.

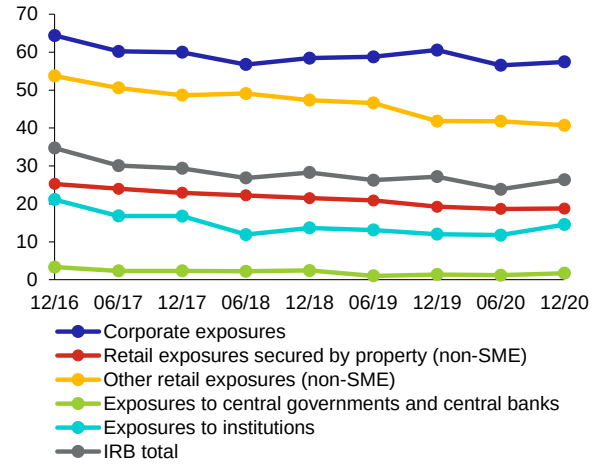
**Chart III.3**
**Structure of the leverage ratio by capital source**
(%; right-hand scale: CZK billions)




Source: CNB

Note: Due to unavailability of data in a longer time series, the denominator of the leverage ratio up to 2016 Q3 contains total assets instead of total exposures. The contribution of the capital surplus consists of total capital (not just Tier 1 capital).

**Chart III.4**
**Average risk weights of the main categories of exposures under the IRB approach**
(%)




Source: CNB

**Banks do not expect their capital position to weaken substantially due to the coronavirus pandemic**

Banks' current capital plans as of the start of 2021 expect the capital ratio to decrease slightly in the next two years due to expected growth in loan portfolios and a moderate increase in risk weights (see Chart III.2). This suggests that the sector expects no systemic credit losses and envisages moderate dividend policy even after the profit distribution recommendations issued by the CNB, ESRB and the ECB have expired. However, there is still a risk that a prolonged period of restricted economic activity due to the current course of the coronavirus pandemic may be reflected in an increase in credit losses. They, in turn, could adversely affect banks' capital position. The stability of domestic banks' capital surpluses may also be affected by potential pressures to strengthen their foreign parents' capital positions (see Box 5). The current situation thus continues to require institutions to exercise a high level of prudence in managing capital, paying due regard to already approved or planned regulatory changes, especially the phase-in of the output floor as from 1 January 2023.[52]

**The risk weights for the main portfolios under the IRB approach declined again year on year…**

The decline seen in previous years in risk weights for exposures of banks that use internal models to set those weights (the IRB approach) continued into the first half of 2020. This trend came to a halt in some categories of exposures at the year-end (see Chart III.4).[53] The risk weights for corporate exposures recorded the largest year-on-year decline as of the end of 2020 (of 3.1 pp to 57.4%). In addition to regulatory amendments in the area of SMEs, this was due to banks' higher collateral requirements and the provision of loans with state guarantees. At the end of 2020, the average risk weight for retail exposures for exposures secured by residential property was down by 0.5 pp year on year to 18.8%, while the risk weight for other retail exposures (especially consumer credit) was down by 1.1 pp to 40.7%.

**…but the second half of 2020 suggests a possible change in trend…**

Developments seen in the second half of 2020 may signal a change in the downward trend in risk weights for corporate exposures, exposures secured by residential property and exposures to institutions (see Chart III.4). The situation in 2020 suggests that the highly adverse trend in the real economy is being reflected more slowly in banks' IRB credit risk models than theoretical assumptions might suggest.[54] The change in risk weights thus reflects in particular the relatively low, albeit gradually rising, default rate (which has an impact on the PD; see Table III.1, FSR 2019/2020). According to supervisory findings, this was and still is due largely to stabilisation programmes (previously the moratoria and now mainly direct

52 See *Basel III: Finalising post-crisis reforms* of December 2017 at https://www.bis.org/bcbs/publ/d424.htm and the March 2020 communication on the deferral of the finalisation of the Basel III reforms at https://www.bis.org/press/p200327.htm.

53 The analysis of risk weights uses data on implicit risk weights. These are calculated as the weighted value of the exposure divided by the original value of the exposure under the European COREP reporting framework. Exposures whose risk weights are set using the IRB approach amount to CZK 5.3 trillion (see Chart III.1 CB), which corresponds to 70.8% of the exposures of the domestic banking sector as of the end of 2020.

54 For details on the risk of procyclicality of risk weights under the IRB approach, see also Malovaná, S. (2021): The pro-cyclicality of risk weights for credit exposures: Driven by the retail segment, *Economic Systems*, Elsevier, vol. 45(1). and Brož, V. and Pfeifer, L. (2021): Are the Risk Weights of Banks in the Czech Republic Procyclical? Evidence from Wavelet Analysis, *Journal of Central Banking Theory and Practice*, vol. 10(1).

support programmes) and to the flexibility in the regulatory and accounting frameworks (see Box 3, FSR 2019/2020). Another factor is the regulatory requirement for banks applying the advanced IRB approach to set the LGD parameter in an upward phase of the cycle in such a way as to take greater account of conditions in an adverse phase. This reduces the risk of a large price correction affecting risk weights for exposures in an environment of rising residential property prices (see section II.1.2).

**…nonetheless, the evolution of risk weights will depend on the future impacts of the coronavirus pandemic on banks' balance sheets**

The evolution of risk weights will be affected most of all by the longer-term consequences of the coronavirus pandemic, but also by the duration and extent of the economic stabilisation measures applied. Therefore, any increase in risk weights may not be strong at first. Other things being equal, though, growth in risk weights generally increases the capital requirements in absolute terms and reduces the capital ratio. This may magnify the effect on banks' capital position, especially if combined with major credit losses (see section IV.1.1). The application of the methodological change to IRB models relating to the new definition of default according to EBA guidelines in the case of certain retail exposures may weaken the potential for growth in risk weights in 2021. This may even lead to a further decline in risk weights and thus increase the long-term risks to financial stability. The CNB will therefore continue to carefully assess the evolution of risk weights in the context of both the systemic macroprudential cyclical risks (see section V.3) and structural risks (see section V.2) to financial stability and the microprudential risks to individual banks.[55]

## BOX 5 Capitalisation of the parent groups of domestic other systemically important banks and its implications for macroprudential policy

Where a banking sector is substantially foreign-owned, it is important for the domestic macroprudential authority to monitor parent companies, particularly in terms of their capital position and profitability. These variables indicate their ability to maintain a regulatory compliant capital position and thus, indirectly, the strength of the incentive for them to reallocate available capital (the capital surplus on top of the regulatory requirements) from their domestic subsidiary banks (especially systemically important banks, i.e. O-SIIs).

It is vital for the CNB as the authority responsible for maintaining financial stability and conducting macroprudential policy in the Czech Republic to assess the intensity of this incentive and its potential consequences for the capital positions of subsidiaries in the Czech Republic. It is effective for large multinational financial groups (usually O-SIIs or G-SIIs for the Czech Republic) with significant geographical and sectoral diversification to manage their risks centrally to a large extent. It is also assumed that the parent can, where necessary, provide capital support to its subsidiaries and thereby enhance their stability.[56] On the other hand, academic research on banks' response to the global financial crisis shows that foreign parents' behaviour can amplify adverse shocks in certain situations.[57] This applies in particular to strong and synchronous shocks across EU economies with across-the-board adverse impacts on the banking sector, such as the current coronavirus pandemic. Such a situation may increase the risk of disruption to domestic financial stability in the event of a major weakening of subsidiaries' capital position as a result of reallocation of their available capital to other jurisdictions. The implications for domestic financial stability may be particularly significant if capital is reallocated before the long-term consequences of the shock become evident in banks' performance and capital.

To assess the situation in the Czech Republic, we compare the capitalisation (CET1 capital ratio; see Chart 1) and profitability (return on equity RoE; see Chart 2) of parents and their subsidiaries based on data as of 31 December 2020. In all cases, the CET1 capital ratios of subsidiaries (domestic O-SIIs) are currently above those of their parents. The different capital ratios are due to numerous factors. One of them may be the different approaches taken by the CNB and macroprudential authorities in other countries to the creation of capital buffers in good times, i.e. the macroprudential policy strategy chosen for the creation of sufficient macroprudential space and the resilience of the banking sector to shocks.[58] The key principles of the CNB's strategy are timely preventive macroprudential policy action and a higher degree of conservatism due to the highly open nature of the Czech economy. Parents' profitability, or return on equity, is also generally weaker than for their subsidiaries (see Chart 2). This is largely related to the environment of sustained very low rates in the euro area.

55 At the same time, based on EBA analyses, it has long appeared that the variability of risk weights under the IRB approach can mostly be explained by varying loan quality and by the composition of banks' portfolios. For details see https://www.eba.europa.eu/eba-releases-its-annual-assessment-consistency-internal-model-outcomes-2020.

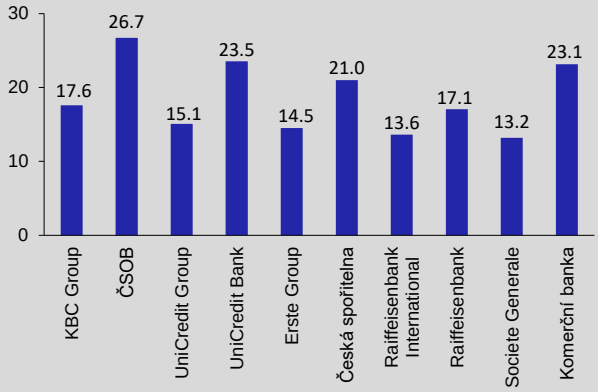
56 See EBA (2020): EBA Report on the appropriate methodology to calibrate O-SII buffer rates.

57 See Cull, R., Soledad Martinez Peria, M. and Verrier, J. (2017): Bank Ownership: Trends and Implications, IMF Working Paper No. 17/60.

58 See https://www.cnb.cz/export/sites/cnb/en/financial-stability/.galleries/macroprudential_policy/cnb_macroprudential_policy_strategy.pdf.

**Chart 1 (BOX)**
**Comparison of the CET1 capital ratios of domestic O-SIIs and their foreign parents as of 2020 Q4**

(pp)

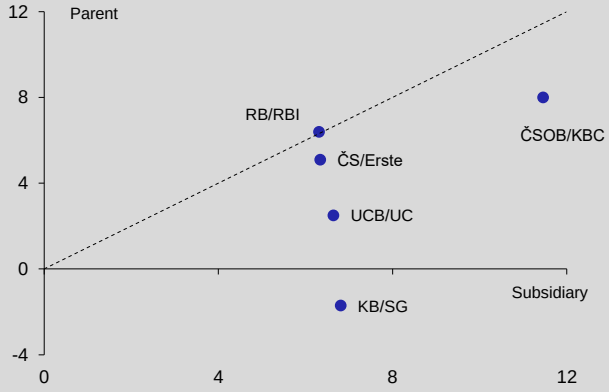



Source: CNB, banks' presentations

Note: The figures above the columns are CET1 capital ratios.

**Chart 2 (BOX)**
**Comparison of the RoE of domestic O-SIIs and their foreign parents as of 2020 Q4**

(x-axis: RoE of subsidiary in %; y-axis: RoE of parent in %)




Source: CNB, banks' presentations

Note: The black line shows the x = y axis.

The available capital of subsidiaries and the capital position and profitability of parents may thus represent an incentive to reallocate available capital to subsidiaries. Upon the expiration of the ESRB recommendation on dividend payment restrictions, which is currently valid until 30 September 2021, and the parallel CNB recommendation, higher transfers of subsidiaries' available capital than envisaged in banks' current financing plans cannot be ruled out.[59]

The transfer of available capital within a consolidated group may temporarily help enhance the parent's stability, but at the same time it will lead to a decrease in the resilience of a subsidiary in another jurisdiction. Where the long-term consequences for the banking sector of the current strongly adverse coronavirus pandemic shock are not sufficiently clear, the negative implications of the early transfer of available capital for the financial stability of subsidiaries and the economies in which they operate may be significant. In such a situation, a recommendation for restraint in the distribution of banks' profits until the long-term affects of the shock become sufficiently clear is an appropriate microprudential and macroprudential policy instrument for the CNB to use.

## III.2.2 Credit risk

**The change in economic conditions led to higher provisioning, but this did not stop the NPL coverage ratio falling**

The provisions of the domestic banking sector rose by CZK 19.9 billion year on year to CZK 77.6 billion at the end of 2020 (see Table III.1). Provisioning was subdued in January and February 2021 (at CZK 0.5 billion). Provisions were created in all loan stages in 2020. The highest increase in both absolute and relative terms was recorded for Stage 2 loans, indicating increased credit risk for the relevant exposures. This mainly signalled increased uncertainty regarding the impact of the coronavirus pandemic. As regards sectors, provisions for loans to non-financial corporations increased at a higher rate than provisions for loans to households (see Table III.2 CB). The cyclically conditional decline in the total coverage ratio observed in previous years halted because of the economic downturn (see Chart III.2 CB). The total coverage ratio for exposures in all stages increased year on year, but the coverage ratio for non-performing loans (NPLs) dropped to its lowest level since 2012 (51.8%; see Table III.1) and declined further to 50.9% at the end of February.[60]

**In line with banks' expectations, the end of the statutory moratorium led to partial materialisation of risks**

The gradual rise in the share of Stage 2 client exposures since the start of the coronavirus pandemic indicates that banks perceive a gradual rise in credit risk (see Table III.1 and Table III.2 CB). Net migrations from Stage 1 to Stage 2 totalled CZK 159 billion last year, two and a half times higher than in 2019. Further partial risk materialisation occurred after the statutory moratorium ended. The ratio of NPLs to total loans, which is essentially the same as the share of impaired

59 See https://www.esrb.europa.eu/pub/pdf/recommendations/esrb.recommendation201215_on_restriction_of_distributions_during_the_COVID-19_pandemic~2502cd1d1c.en.pdf, https://www.cnb.cz/en/cnb-news/press-releases/CNB-standpoint-on-the-extension-of-dividend-payment-restrictions/ and https://www.cnb.cz/en/cnb-news/press-releases/Information-of-the-CNB-on-the-distribution-of-profits-for-2019-and-2020-by-credit-institutions/.

60 The observed trend in the NPL coverage ratio may be generally related to better loan collateralisation. According to supervisory findings, the latest NPL coverage ratio was also partly affected by banks' expectations that the problems of many borrowers caused by the coronavirus pandemic will only be temporary and such exposures will thus become sound again. The fact that slightly overdue exposures newly classified as non-performing are usually less provisioned for than long overdue loans also contributed to the drop in the coverage of non-performing exposures by provisions.

exposures (Stage 3), rose by 0.4 pp year on year to 2.6% at the end of 2020 (see Chart III.5) and stayed there in January and February 2021. At portfolio level, the growth in the NPL ratio was driven mainly by loans to non-financial corporations and consumer credit. However, the ratios of NPLs with deferred instalments (under the statutory moratorium or bank moratoria or similar arrangements with clients) were and still are lower than banks had expected.[61]

**Table III.1**

**Client exposures, provisions and coverage ratios by risk stage**

| Client | | Exposures | | Provisions | | Coverage ratio | |
|---|---|---|---|---|---|---|---|
| Stage | Date | Volume (CZK billions) | Change (%) | Volume (CZK billions) | Change (%) | Ratio (%) | Change (pp) |
| **Total** | 12/19 | 3,371 | 3.4 | 58 | 34.5 | 1.71 | 0.51 |
| | 12/20 | 3,487 | | 78 | | 2.23 | |
| **S1** | 12/19 | 3,150 | -0.8 | 7 | 43.6 | 0.21 | 0.09 |
| | 12/20 | 3,123 | | 10 | | 0.30 | |
| **S2** | 12/19 | 215 | 64.5 | 7 | 175.1 | 3.32 | 2.23 |
| | 12/20 | 354 | | 20 | | 5.55 | |
| **S3** | 12/19 | 76 | 22.9 | 44 | 10.3 | 57.72 | -5.91 |
| | 12/20 | 94 | | 48 | | 51.82 | |

Source: CNB

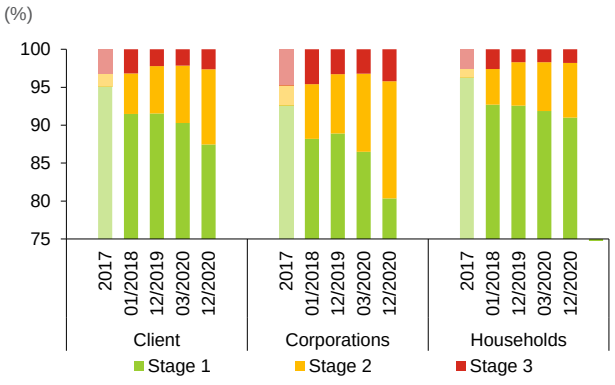
Note: S1 and S2 comprise performing loans; S3 can be considered identical to non-performing loans.

**Credit risk latency decreased after the statutory moratorium ended…**

Credit losses turned temporarily latent in 2020 due to stabilisation measures and related flexibility in the accounting framework (see section III, FSR 2019/2020). This means that credit risk was not fully reflected in banks' balance sheets and financial results. More than 365,000 applicants (firms and households), with approved applications totalling CZK 470 billion (around 15% of banks' portfolio of loans to the private non-financial sector), had made use of a moratorium (either statutory or granted by banks) as of the end of September 2020. In the non-financial corporations sector, loans under moratorium amounted to CZK 211 billion, or 16% of this portfolio. Most of the applications in the household sector involved mortgage loans, totalling CZK 180 billion (around 13% of this portfolio). Moratorium applications amounting to almost CZK 61 billion concerned consumer credit (23% of this portfolio).[62] Based on supervisory data, it can be said that, of the loans for which some kind of pandemic-related relief had been used by 30 September 2020, a total of CZK 94 billion (20%) had been repaid by the end of March 2021. The current stock of such loans had thus dropped to CZK 376 billion (around 12% of banks' portfolio of loans to the private non-financial sector).

**Chart III.5**

**Loan structure by portfolio**

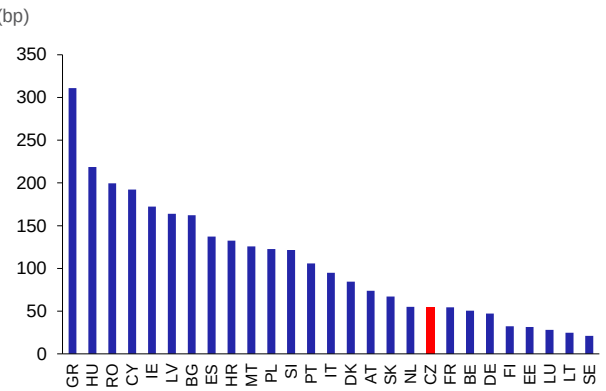



Source: CNB

Note: The loan breakdown for 2017 corresponds to the classification into standard, watch and loss loans under the former IAS 39 standard. Under the new IFRS 9 accounting standard (in effect since 1 January 2018), non-performing loans (NPLs) correspond to loans classified in Stage 3 – impaired loans.

**Chart III.6**

**Comparison of impairment losses in the EU as of 31 December 2020**




Source: EBA

Note: The figures for the Czech Republic differ from those used by the CNB because the EBA has a different data source.

61 Based on the end-September 2020 information, banks were expecting 13% of loans to non-financial corporations under moratorium (CZK 27 billion), 7% of housing loans (CZK 13 billion) and 15% of consumer credit (CZK 9 billion) to become NPLs after the end of the statutory moratorium. Data as of 31 December 2020 show that the ratios of NPLs with deferred instalments have so far been lower (7.9% of loans to non-financial corporations, 1.9% of house purchase loans and 4.5% of consumer credit to households). For details (in Czech only) see https://www.cnb.cz/export/sites/cnb/cs/dohled-financni-trh/.galleries/souhrnne_informace_fin_trhy/statistika_odkladu_splatek_a_uveru_v_programech_covid/zprava_o_moratoriich_2020.pdf.

62 The volume of approved applications includes deferrals granted both in the Czech Republic and abroad. Deferral under the statutory moratorium could be applied for until 30 September 2020 and lasted until 31 October 2020.

**…interest in deferrals granted by banks since 1 October 2020 has been relatively low so far…**

Loans with deferred instalments or other relief (such as reduced instalments or temporary repayment of collateral or interest only) which, due to the pandemic, banks have continued to allow clients to make use of under individual agreements since 1 October 2020 amounted to CZK 43.1 billion (1% of all bank loans to the private non-financial sector) at the end of March 2021. Of this amount, borrowers with loans totalling around CZK 25.1 billion had also made use of the "spring" moratorium (either statutory or granted by banks).[63] To sum up, the end of the statutory moratorium reduced the potential credit risk latency. The subsequent evolution of "moratorium" portfolios also suggests a gradual decrease in the overall level of credit risk in the banking sector. The same is indicated by provisioning in early 2021. As of the end of March, around 56% of loans under some type of moratorium granted after the outbreak of the pandemic remained in Stage 1, i.e. the stage indicating no increase in the credit risk of the relevant exposures.

**…loans with government guarantees are not increasing significantly either**

Government COVID support schemes – in particular the COVID III scheme for non-financial corporations with up to 500 employees and for the self-employed – are another stabilisation measure positively affecting banks' credit risk (especially LGD). Under COVID III, banks' clients may apply for operational financing, with 30% of the scheme's loan portfolio covered by a state portfolio guarantee. According to CNB data, loans totalling around CZK 50.1 billion had been provided under the COVID programmes as of the end of March 2021. This represents around 7.5% of new loans provided to non-financial corporations since the coronavirus pandemic started and 4.5% of total loans provided to non-financial corporations. COVID III will run at least until mid-2021 but may be extended further extension. Interest in loans with state guarantees may also rise due to the approval of the COVID Invest scheme, which firms will be able to use until the end of 2021. Any further extension of guarantee schemes may lead to a further decrease in the credit risk of non-financial corporations' portfolio. This may be reflected in the portfolio's risk weights, too.

**Banks expect lower credit risk materialisation in 2021 than in 2020…**

Based on the end-March 2021 information, banks expect provisioning to total between CZK 10 billion and CZK 15 billion in 2021, i.e. less than in 2020 (around CZK 20 billion). Banks continue to expect profits slightly above the 2020 level. In terms of financial stability, this would signal a prudent approach of banks to risk management in the previous expansionary phase of the financial cycle, and also a favourable effect of macroprudential policy instruments in the area of housing loans in 2015–2020 and of microprudential supervision. Given the adverse evolution of the pandemic and economic situation on both the domestic and European scale in the first months of 2021, it will not be possible to draw more informed conclusions regarding the credible capture of the credit risk associated with the coronavirus pandemic until the end of 2021.[64]

**…which macroprudential policy must take into account in the capital area in particular**

The credit risk situation can be characterised by persisting uncertainty regarding future economic developments.[65] Although credit risk latency risk is decreasing, the lag in the pass-through of credit risk to banks' profits may still give rise to a cliff effect. Under certain conditions, the cliff effect could lead to the creation of large amounts of provisions in a short period of time. This in turn might represent a shock to banks' finances, potentially spilling over to the capital position (see Box 3, Risks to financial stability and their indicators 2020). According to supervisory findings, provisioning across domestic banks is heterogeneous but does capture the idiosyncratic level of credit risks. However, impairment losses in the domestic banking sector are below the EU average (see Chart III.6).[66] From the macroprudential policy perspective, the overall credit risk situation therefore continues to require a balanced approach to the capital surplus and capital buffers, including communication of their purpose and of expectations regarding the approach to their use by banks (see section V.1).

63 At the portfolio level, relief on loans to non-financial corporations dominated (CZK 30.4 billion, of which CZK 15.3 billion were spring moratorium loans), followed by relief on housing loans (CZK 7.1 billion, of which CZK 5.4 billion were spring moratorium loans) and consumer credit (CZK 5.6 billion, of which CZK 4.4 billion were spring moratorium loans).

64 In the longer run, it will also be relevant to monitor the risk of insufficient coverage of possible future losses, given the uncertainty about the long-term structural consequences of the coronavirus pandemic for some industries.

65 The uncertainty regarding credit risk is confirmed by banks' less than 50% success in estimating the rate of expected credit losses (the coverage ratio) in their answers in the Bank Lending Survey (see Chart III.3 CB). In the Survey, banks answer a question on what coverage ratios they expect one quarter ahead. By comparing their expectations with the subsequent actual rates, we obtain the success rate. It ranges from 17% to 67% and is higher on average for the ECL rate for loans to non-financial corporations than that for loans to households.

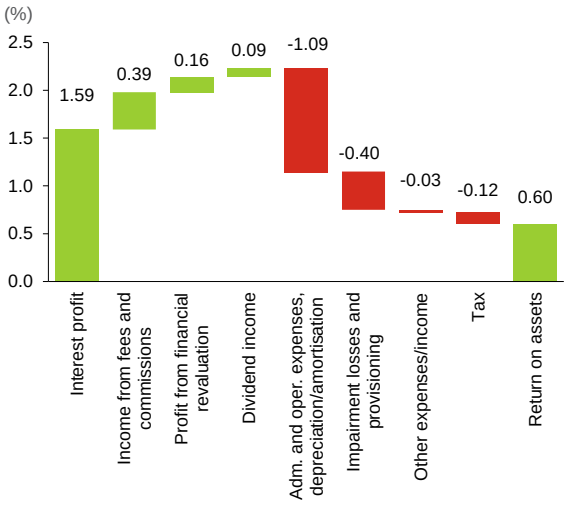
66 As the intensity of the economic stabilisation measures in EU countries is similar, this is probably explained solely by higher quality of domestic credit portfolios compared with other EU countries.

## III.2.3 Profitability and liquidity

**Profitability fell significantly in 2020…**

Profit after tax fell by 48% year on year to CZK 47.5 billion at the end of 2020, the lowest level since 2008. Return on assets dropped by 0.6 pp year on year to 0.6% (see Chart III.7). Return on equity fell even more markedly, by 10 pp to 8.2%, due not only to a drop in profits but also to an increase in capital, mainly as a result of restricted dividend payments. Cyclically conditional sources of profit, which the CNB had repeatedly pointed to in previous years, disappeared due to the coronavirus pandemic. They included interest income on excess liquidity deposited with the CNB and linked to the repo rate and relatively low impairment losses. Interest income on excess liquidity fell by 57% year on year to CZK 22 billion. Most of this was generated in 2020 Q1 before the CNB eased monetary policy (see Chart III.8). Impairment losses rose from CZK 4 billion in 2019 to CZK 29 billion in 2020 (see Chart III.9). Their absolute level in 2020 was similar as in 2009, but in relation to assets and client loans they were lower. This was linked with the government's different response to the situation and to the higher resilience of the real economy after a relatively long period of growth. Prudent credit risk management by banks, linked partly to the CNB's microprudential and macroprudential policy in this area, also had a positive effect.

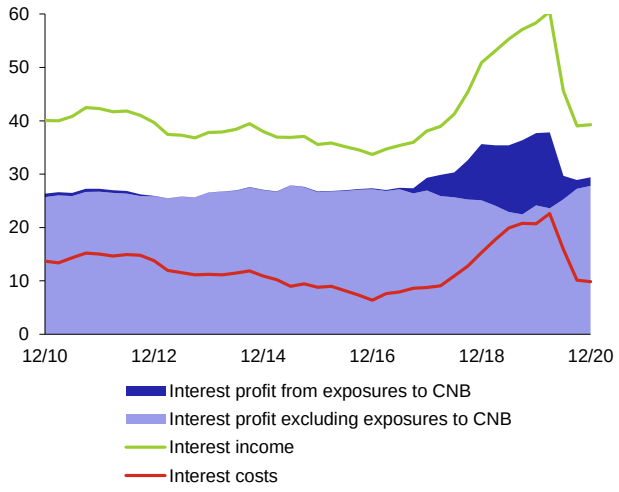
**Chart III.7**
**Decomposition of return on assets**




Source: CNB

Note: The given value is the ratio of the given type of income/expense to the level of assets.

**Chart III.8**
**Decomposition of interest profit**




Source: CNB

**…future profitability will depend on maintaining interest profit…**

Interest profit fell by 12.9% year on year to CZK 127 billion in 2020 due to a drop in income on excess liquidity and in interest profit on loans to non-financial corporations, which declined by 11.2% year on year to CZK 35 billion. Interest profit will continue to depend on credit activity and margins on new and current loans. Total interest margins on new loans[67] kept following a downward trend at the end of 2020 (falling by 0.6 pp year on year to 2.7%; see Chart III.10), reaching all-time lows. This was due mainly to a decrease in margins on loans to non-financial corporations (of 1.4 pp to 2.2%), where, however, there have been signs of a change in trend since 2020 Q3, perhaps caused by a rise in the risk premium. Year-on-year decreases were also recorded for margins on housing loans (of 0.2 pp to 2.0%) and consumer credit (of 0.4 pp to 7.6%). If interest rates stay relatively low, margins on housing loans may continue to be weakened by loan refinancing before the agreed interest rate change date. Interest margins will continue to be adversely affected by banks' almost exhausted manoeuvring room for deposit rates (a year-on-year decrease of 0.2 pp to 0.1%; see Chart III.10).[68]

67 Margins are calculated as loan rates for the given sector minus the average deposit rate.

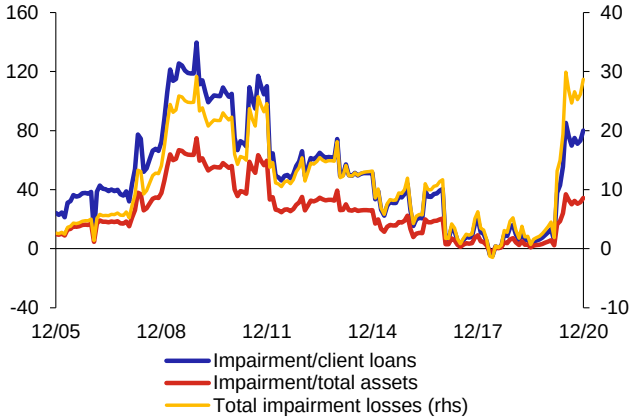
68 The average interest rate on household deposits was 0.05% on current accounts, 0.5% on savings accounts and 1.2% on time deposit accounts.

**…which might be supported by monetary policy tightening**

Materialisation of the predicted tightening of CNB monetary policy[69] could favourably affect interest profit. It would be reflected initially in a gradual rise in interest profit on excess liquidity, followed by growth in interest margins as well. Interest margins would first increase for loans to non-financial corporations, a large part of whose portfolio bears interest based on current market rates (particularly the 3M PRIBOR), meaning that monetary policy transmission is relatively fast. Slower growth in margins could then be expected in the mortgage portfolio due to the large share of the portfolio with longer interest rate fixations. If mortgage interest rates increase, the motivation to refinance before the end of the contractual interest rate fixation period will simultaneously weaken. This may further stabilise interest income on the mortgage portfolio. Given the excess liquidity, interest rates on deposits are unlikely to grow at a pace offsetting the growth in interest income.

**Chart III.9**
**Impairment losses**

(bp; right-hand scale: CZK billions)

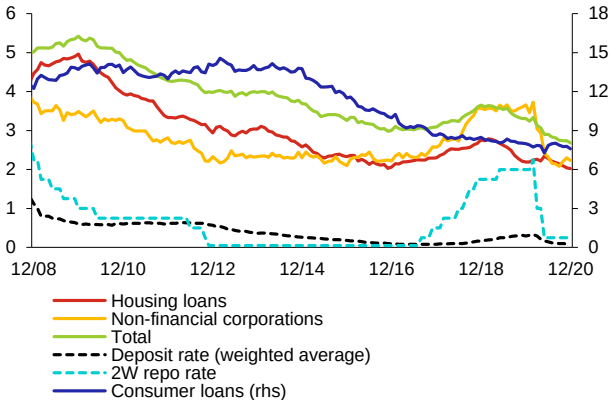



Source: CNB

Note: Impairment losses are annualised. Client loans comprise loans to the private sector.

**Chart III.10**
**Interest margins on new loans**

(rates in %; margins in pp)




Source: CNB

Note: Margins are calculated as loan rates for the given sector minus the average deposit rate. The non-financial corporations item excludes revolving loans and credit cards.

**Profitability will also be significantly affected by impairment losses and future changes in efficiency**

Profitability will probably remain under downward pressure in 2021, mainly from impairment losses on client loans. In January and February 2021, banks recorded low levels of new credit losses, whose annualised amount did not exceed CZK 10 billion. However, they will continue to be strongly influenced by stabilisation measures and banks' internal approaches to provisioning (see section III.2.2; Box 3, Risks to financial stability and their indicators 2020). One way banks can offset the drop in profitability is to cut their administrative expenses. They were flat year on year in 2020 after seven years of growth. By international comparison, however, the Czech banking sector is displaying above-average efficiency (see Chart III.4 CB), even though its cost-to-income ratio increased by 6 pp year on year to 51% as of 2020 Q3.

**The sector's liquidity and LCR are at record highs…**

The banking sector's aggregate liquidity coverage ratio (LCR) reached an all-time high of 196% at the end of 2020 (see Chart III.11). All banks were compliant with the regulatory limit of 100%[70] throughout 2020. The LCR for the sector as a whole was consistently above the limit, averaging 183%.[71] The LCR exceeded the limit due to a number of factors.[72] It was favourably affected by a sharp rise in highly liquid claims on central governments (which rose in market value by 90% to CZK 829 billion as of the end of 2020, due in part to a drop in rates; see Chart III.7 CB), which contributed to a year-on-year rise in the liquidity buffer of 14% to CZK 2.4 trillion.[73] The share of highly liquid claims on central governments in the buffer increased by 14 pp to 34%, while claims on the CNB made up the rest. Given the level of the safe buffer above the regulatory limit and the high share of claims on the CNB in the liquidity buffer, the potential risk of a decrease in the market value of government bonds for compliance with the LCR is negligible. A hypothetical one-off gross revaluation of the

69 The CNB's forecast published on 4 February 2021 assumes a gradual rise in the interbank interest rate (3M PRIBOR) from 0.3% in 2021 Q1 to 1.6% in 2022 Q3. For details see https://www.cnb.cz/export/sites/cnb/en/monetary-policy/.galleries/monetary_policy_reports/2021/2021_winter/download/mpr_2021_winter.pdf.

70 An LCR of 100% is required under normal circumstances. However, the LCR is designed for safe coverage of liquidity outflows in a situation of a (systemic or idiosyncratic) liquidity shock, even if this were to mean a drop in the ratio below 100% (see Article 412(1) of the CRR in conjunction with Article 4(3) of Commission Delegated Regulation (EU) 2015/61).

71 The strong liquidity position of domestic banks during 2020 is confirmed by the fact that no liquidity was provided to them in the CNB's extraordinary repo operations (see section II.1.2, Chart II.16).

72 The above-average aggregate year-end value is due to the annual optimisation of bank balance sheets related to contributions to the Resolution Fund, which historically accounts for an average increase in the aggregate LCR of 12 pp.

73 Banks hold almost CZK 860 billion of debt securities issued by general government, 18% of which is encumbered as collateral.

government bonds held in the liquidity buffer at the end of 2020 based on the yield curve at the end of the *Adverse Scenario* (see Chart II.23F) would cause the market value to drop by CZK 111 billion. Such a revaluation would have no effect on LCR compliance. The value of the liquidity buffer sufficiently offset the year-on-year growth in net liquidity outflows (7%), which was caused mainly by a sharp rise in deposits[74] (of 32% compared to December 2019). The rise in deposits was due mainly to households' conservative behaviour, deferred consumption and investment, a solid amount of loans provided during the year (see section V.3) and government stabilisation measures.

**…and the evolution of the non-binding foreign currency LCR was also favourable**

The LCR in EUR and USD rose due to a rise in liquid claims on central governments in the given currency (especially in EU countries). Still, some institutions' foreign currency LCRs were below 100%. Foreign currency liquidity mismatch may create sources of risk in the form of excessive dependence on access to foreign currency liquidity via domestic institutions' parent companies or via the FX swap market, which may be illiquid and very costly in the event of market stress.[75]

**The NSFR confirms that institutions have sufficient stable funding**

The domestic banking sector's aggregate NSFR was also at a stable level of 135% (see Chart III.11). The high ratio was due to a growing base of client deposits, which are considered stable funds (see Chart III.5 CB). For this reason in particular, building societies had the highest aggregate NSFR. Unlike other groups of institutions, they traditionally have a high share of stable funds with a contractual maturity of over three months (see Chart III.11). An amendment to the CRR (CRR II) expected to take effect on 28 June 2021 will introduce a minimum standard for calculating the NSFR in the EU.

**The structural stability of the liquidity position is also being enhanced by a drop in the relatively high share of short-term liabilities to non-resident credit institutions**

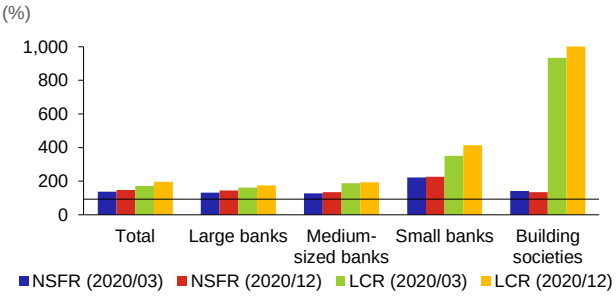
The main reasons for domestic banks' high resilience to liquidity shocks remain the same. They include a high share of liquid assets and an excess of client deposits over client loans (see Chart III.12). The banking sector's claims on the CNB account for almost 30% of its balance-sheet total (see Chart III.12). A relatively elevated share of liabilities to non-resident credit institutions persists in banks' balance sheets. However, their share in total assets declined significantly year on year, from 12.5% to 8.2%. This implies a continued downward trend from the record highs observed in 2017 (19.6%), maybe linked with the lowering of the CNB's monetary policy rates in 2020.

**According to banks' plans, coverage of loans by primary funds will remain high in the future**

In their end-2020 funding plans, domestic banks were expecting loans to the private sector to increase on average by 5.8% year on year, from CZK 3.6 trillion to around CZK 4.4 trillion three years ahead (see Chart III.8 CB). They were planning to increase private sector deposits and issuance of debt securities with maturities of at least three years from CZK 4.8 trillion to CZK 5.8 trillion. The planned funds of banks would sufficiently exceed their planned loans and would even cover credit growth over the entire three-year horizon in the *Baseline Scenario* (see Table IV.1 and Chart III.8 CB). According to banks' expectations, the sector's liquidity position should thus remain favourable.

**Chart III.11**

**Comparison of selected indicators of banks' balance-sheet liquidity**

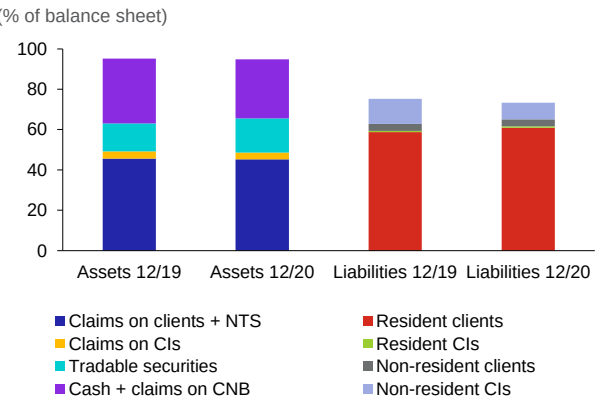



Source: CNB

Note: The LCR is the ratio of the liquidity buffer to the net liquidity outflow of banks over a 30-day stress horizon as defined by EC Regulation 2015/61. The NSFR is the ratio of available stable funding to required stable funding as defined by Basel III. The results take liquidity subgroups into account and exclude state-owned banks.

**Chart III.12**

**Selected balance-sheet items of the domestic banking sector**




Source: CNB

Note: CIs = credit institutions. NTS = nontradable securities.

74 The modelled outflow weight for retail exposures is low (10% on average).

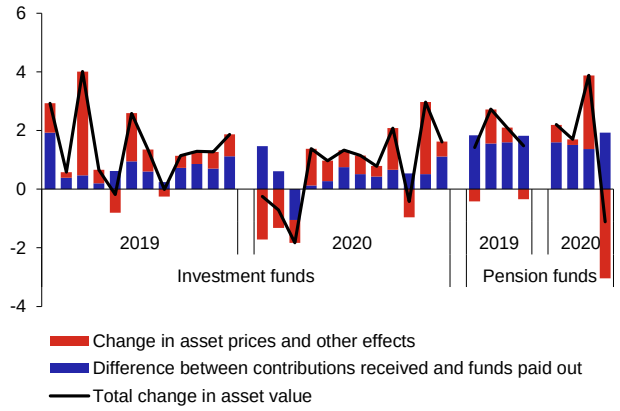
75 EBA Report on Liquidity Measures under Article 509(1) of the CRR: https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Reports/2020/961603/EBA%20Report%20on%20Liquidity%20Measures%20under%20Article%20509(1)%20of%20the%20CRR.pdf.

## III.3 NON-BANK FINANCIAL INSTITUTIONS

**The assets of domestic investment funds increased in 2020…**

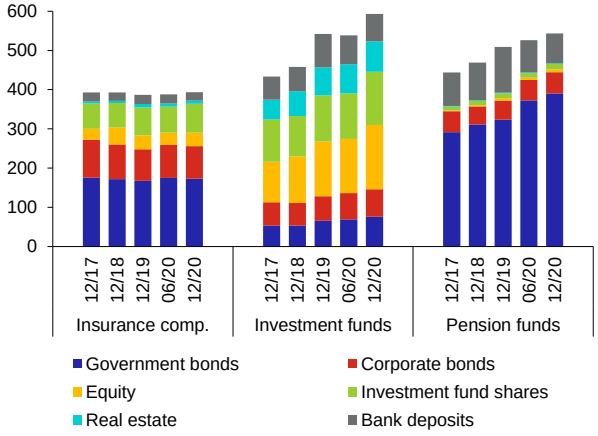
The total assets of domestic investment funds rose by 9.1% (CZK 56 billion) year on year to CZK 663 billion at the end of 2020. This was due mainly to buoyant growth in asset prices on global financial markets in the second half of 2020, which replaced a drop in prices recorded in the first half of the year (see section II.1). The growth in assets managed by domestic investment funds was also due to an inflow of new funds (a net inflow of CZK 37 billion in 2020), which gradually picked up pace in the second half of 2020 (see Chart III.13). The price growth pertained mainly to equity prices. Equity and mixed funds therefore rose the fastest (see Chart III.9 CB). The percentage of shares in portfolios also increased (see Chart III.14). Bond funds recorded a net outflow of CZK 7.7 billion as of the year-end (see Chart III.9 CB).

**Chart III.13**
**Decomposition of the change in the value of investment and pension funds' assets**
(% of assets as of end of previous period)




Source: CNB
Note: Monthly data for investment funds and quarterly data for pension funds.

**Chart III.14**
**Main components of domestic institutional investors' investment assets**
(CZK billions)




Source: CNB

**…while pension funds and insurance companies also recorded a rise in assets during 2020**

The pension fund sector's total assets grew by CZK 34 billion (6.8%) year on year to CZK 542 billion. Growth in assets was recorded both by transformed funds (3.6% year on year to CZK 463 billion; 3.1 million participants at the end of 2020) and by participation funds (30% year on year to CZK 79 billion; 1.3 million participants). The sector's assets grew mainly on account of an inflow of new funds, whereas prices of assets held had no significant impact on total assets (see Chart III.13).[76] The assets of the insurance companies sector[77] rose only modestly year on year (by CZK 9 billion, or 2%) to CZK 461 billion. The structure of insurance companies' investment assets was also little changed (see Chart III.14).

**Investment funds remained resilient to potential liquidity stress in 2020…**

The share of liquid assets on domestic investment funds' balance sheets remained stable for most funds in 2020 (see Chart III.15). In bond funds, the downward trend in the share of liquid assets observed in previous years not only halted, but switched to growth.[78] Domestic investment funds' sufficient resilience to a potential outflow of funds as of the end of 2020 was confirmed on the aggregate level by the results of the investment fund macro-stress test (see section IV.2.3).

**…and pension management companies (PMCs) and insurance companies also showed sufficient resilience amid temporarily higher volatility of government bond prices**

Movements in Czech government bond yields and prices (see Chart II.14) fostered higher volatility of transformed funds' aggregate surplus of assets over liabilities in 2020. A temporary rise in Czech government bond yields in March 2020 led this surplus to decline (see Chart III.16), while a subsequent drop in yields in 2020 Q2 (see section II.1.2) caused it to go up again. PMCs' capital surplus rose in 2020 due to the retention of 2019 profits. These two factors contributed to a

76 The faster growth in assets in Q3 and their decline in Q4 were caused by factors other than the inflow of new funds (see Chart III.13, "Change in asset prices and other effects" series) and were not connected primarily with price changes on financial markets. They were due mainly to changes in pension funds' use of synthetic hedging.

77 The description of developments in the domestic insurance sector excludes the Export Guarantee and Insurance Corporation. The stated values correspond to the balance sheet under the Solvency II framework.

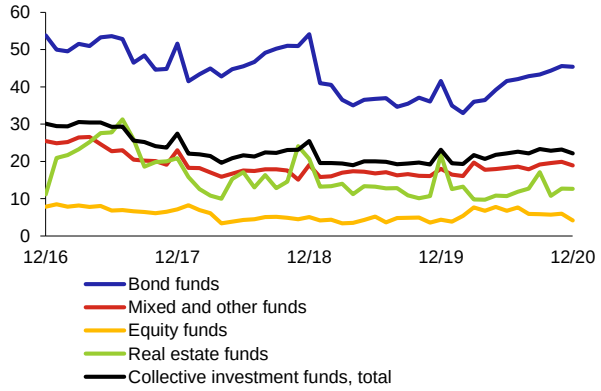
78 The strong liquidity position of domestic investment funds during 2020 was confirmed by the fact that no liquidity was drawn in the CNB's extraordinary repo operations (see section II.1.2, Chart II.16).

stabilisation of the aggregate combined capital surplus[79] and a rise in PMCs' aggregate capital adequacy (see Chart III.17). Similarly, insurance companies' aggregate solvency position was not disrupted by the temporary stress seen on the Czech government bond market in March 2020. It, too, was supported by retention of 2019 earnings and was higher at the end of 2020 in year-on-year terms (see Chart III.18). The stability of insurance companies was also fostered by the sector's continued profitability (see Chart III.10 CB) and favourable aggregate trends in key insurance variables (in non-life insurance, premiums written increased amid flat claim settlement costs, while in life insurance, premiums written stagnated and settlement costs declined; see Chart III.11 CB). On the aggregate level, an adverse trend in claims arising from insurance products affected by the pandemic was offset by a favourable trend in claims related to the decrease in mobility, especially in motor insurance. On the individual level, however, the pandemic had different impacts on the profitability of insurance products and the stability of insurance companies in 2020 (see Chart III.12 CB).

**Chart III.15**

**Quick assets on the balance sheets of collective investment funds**

(%)



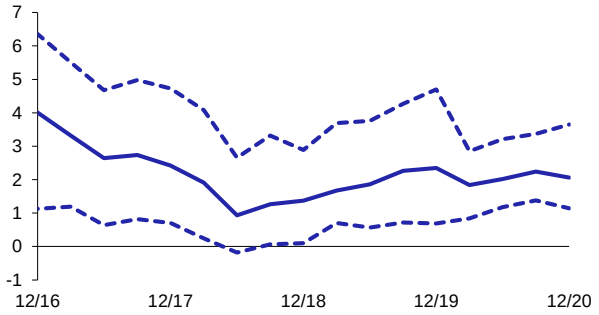

Source: CNB

Note: Quick assets comprise cash, debt securities issued by general government, and bank deposits and other claims payable on demand. The collective investment funds sector excludes funds for qualified investors. The share of liquid assets is not shown for the latter because this segment is highly heterogeneous and changes in the aggregate indicator are therefore difficult to interpret.

**Chart III.16**

**Surplus of assets over liabilities of transformed funds**

(% of total assets of TFs)



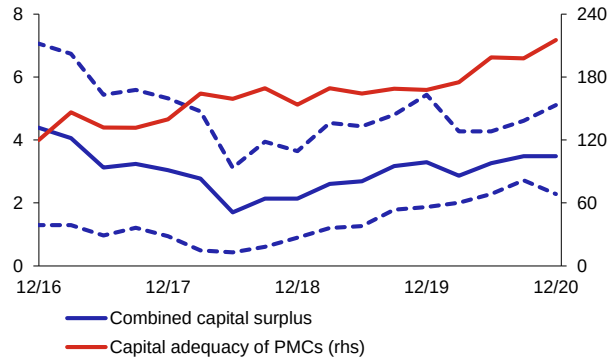

Source: CNB

Note: Dashed lines denote the minimum and maximum values across TFs.

**Chart III.17**

**Combined capital surplus and capital adequacy of the pension fund sector**

(%)



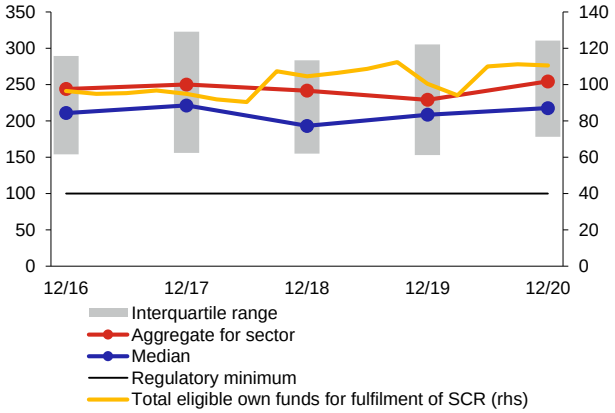

Source: CNB

Note: Dashed lines denote the minimum and maximum values of the combined capital surplus across TFs. The combined capital surplus is the ratio of the sum of the capital surplus of PMCs to the difference between the assets and liabilities of TFs.

**Chart III.18**

**Ratio of insurance companies' eligible own funds to the solvency capital requirement**

(%; right-hand scale: CZK billions)




Source: CNB

Note: SCR = solvency capital requirement.

79 The combined capital surplus is used as a measure of resilience or vulnerability. It is the sum of the capital surplus of PMCs and the difference between the assets and liabilities of transformed funds.

**The risks associated with the coronavirus pandemic are substantial more in the medium term…**

The growth in global financial markets, often to new record highs, is creating potential for future elevated volatility on financial markets (see section II). This continues to pose a significant risk for domestic non-bank financial institutions. Increased concerns of a sudden correction of equity or bond prices could motivate investors to exit investment funds, which in turn could affect the funds' liquidity position. In the event of highly adverse developments, investment funds could be forced to sell off some of their assets, possibly triggering or deepening a decline in their prices and contributing to financial system stress via indirect shock propagation channels.[83] By contrast, a potential longer-lasting environment of very low interest rates amid higher uncertainty regarding a renewed deterioration of the epidemic situation could strengthen the incentive for financial institutions to allocate their investment portfolios increasingly into riskier and potentially less liquid assets, further increasing the sensitivity of these institutions to a financial market correction. A deepening of the economic impacts of adverse developments on household and non-financial corporations could also lead, over the medium term, to a decline in demand for some non-bank financial products. This could foster a partial outflow of funds, disrupting the growth of non-bank financial institutions and affecting their profitability.

**…temporarily higher volatility on the Czech government bond market should not pose a systemic threat to the solvency position of domestic insurance companies and PMCs…**

The continued large importance of Czech government bonds in the investment portfolios of domestic insurance companies and pension funds (see Chart III.14) may expose these sectors to sensitivity to volatility on the Czech government bond market. However, the situation in March 2020 and the stress test results (see section IV.2) both suggest that the temporary rise in stress on the Czech government bond market, connected mainly with interest rate and liquidity risks, should not lead to systemic disruption of their aggregate solvency position. Moreover, liquidity risk is largely affected by the fact that Czech government bonds are accepted from non-banks as collateral in the CNB's liquidity-providing repo operations. The risks for PMCs related to Czech government bond holdings may also decline because of changes in the accounting framework.[80] In view of the rise in the Czech government's borrowing requirements, along with the low sovereign credit risk of Czech government bonds (see section II.2.1) and the growth in their yields seen in the first few months of 2021 (see section II.1.2), domestic insurance companies and pension funds are expected to continue generating much of the demand for Czech government bonds.

**…a substantial deterioration in perceived sovereign risk and a rise in the credit risk premium on Czech government bonds could have a greater effect on the stability of their holders**

A sharp and unexpected drop in prices of Czech government bonds or an excessive bid-ask spread on them could, in certain circumstances, lead to a decline in their holders' capital surpluses and to materialisation of liquidity risks connected with the emergence of an adverse spiral of falling prices and sell-offs of Czech government bonds (see section III.4). This could happen if the perceived sovereign risk of the Czech government were to increase (see section II.2.1). At the end-2020 portfolio levels, a sharp rise in the credit risk premium on Czech government bonds of 1.5 pp[81] could cause Czech government bonds held by domestic investment funds to fall in value by CZK 5 billion (see Chart III.19; a drop of 7.1% in the value of Czech government bond holdings, or 0.8% in the value of the sector's assets). In the case of pension funds the losses would be CZK 34 billion (9.1%, or 6.3% of assets) and in the case of insurance companies CZK 17 billion (10.1%, or 3.6% of assets).[82] In reality, however, a deterioration in the perceived sovereign risk of the Czech government and a rise in the credit risk premium could be expected to happen gradually over several months or years rather than as a one-off jump. Thus, the estimated losses in the value of Czech government bond portfolios would also be spread over a longer period of time, enabling the domestic non-bank institutions affected to react to this adverse trend.

**The segment of non-bank financial corporations engaged in lending stopped growing during the coronavirus pandemic…**

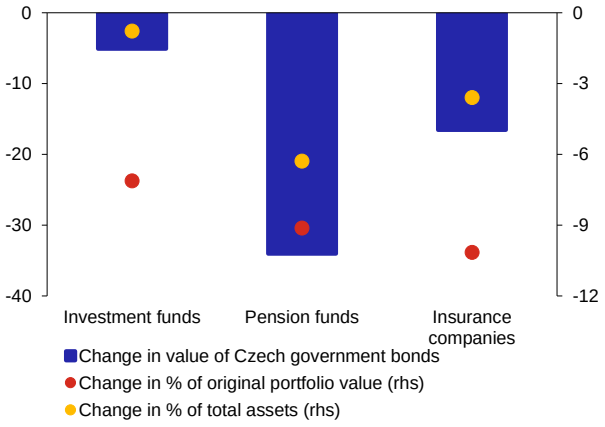
Total loans provided by non-bank financial corporations engaged in lending (NFCELs) fell by 2% year on year to CZK 314.7 billion at the end of 2020 (see Chart III.20). The growth trend of this segment observed in previous years thus reversed. As with banks, the impacts of the coronavirus pandemic lowered demand for some loan types. The overall year-on-year decline was due predominantly to loans to households for consumption (-5.9%), partly offset by a modest rise in loans to non-financial corporations (+0.8%).

80 Given PMCs' switch to the IFRS 9 standard in 2021, an increase in the size of the portfolio held at amortised cost was observed in the first few months of this year. As of February 2021, bonds recorded at amortised cost accounted for 42% of the total book value of transformed funds' bond portfolio, an increase of 7 pp compared with the regulatory limit applicable in the previous accounting framework. A gradual increase in the size of the portfolio held at amortised cost may make PMCs more sensitive to any volatility on the Czech government bond market.

81 This figure is roughly equal to the biggest increase in the credit risk premium on the 10Y Czech government bond recorded in 2009–2012 by comparison with the situation before the global financial crisis.

82 This calculation abstract from pension funds' potential holdings of bonds to maturity, as provisions could be created for such bonds in the event of a material deterioration in sovereign risk. Similarly, it excludes the effect of the related change in volatility adjustment, which would help mitigate the impact on insurance companies.

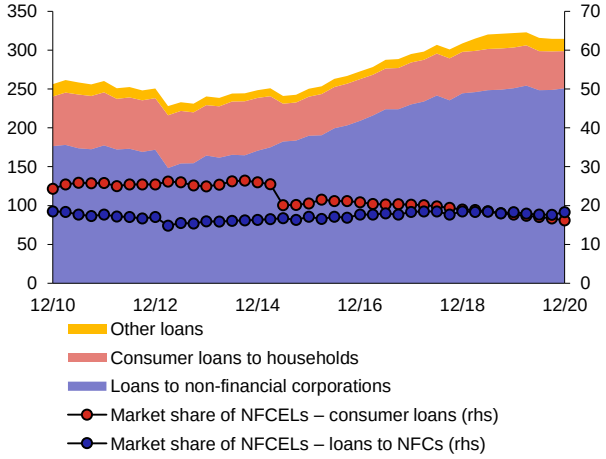
**Chart III.19**
**Change in the value of Czech government bond portfolios given a rise in the credit risk premium**
(CZK billions; right-hand scale: %)




Source: CNB

Note: A rise in the credit premium of 1.5 pp is considered. The calculation is based on portfolios as of 31 December 2020. It abstracts from bonds not being repriced due to their being held to maturity and from the use of volatility adjustment for insurance companies.

**Chart III.20**
**Loans provided by non-bank financial corporations engaged in lending**
(stock of loans in CZK billions; right-hand scale: %)




Source: CNB

Note: The market share of NFCELs relates to total loans provided to residents by banks and NFCELs combined.

**…while a different trend in loan portfolio volumes had an impact on market shares**

The market share of NFCELs in loans to non-financial corporations edged up to 18.3% at the end of 2020 as a result of a stronger slowdown in bank lending to corporations. Their market share in loans to households (usually for consumption) continued to fall as in recent years, reaching 19%. The NFCEL segment is thus increasingly becoming an alternative source of funding for non-financial corporations, primarily in the form of leasing (about 75% of loans to corporations).

**The evolution of portfolio risk and profitability is signalling no risks to the segment's financial stability**

NFCEL loan riskiness, as measured by the 3-month default rate on loans to households for consumption, rose by 0.8 pp year on year to 3.3%. This above-trend increase compared with previous years was due to the coronavirus pandemic. Riskiness rose significantly by comparison with banks (see Chart III.13 CB). However, the volume of non-performing loans is not signalling any systemic risk to financial stability. The default rate on loans to non-financial corporations continued to decline as in previous years, reaching 0.3% in 2020. It is lower than in the banking sector and is thus having a positive effect on the segment's stability. This is mainly because secured leasing loans make up a large proportion of the loans.

## III.4 INTERCONNECTEDNESS OF THE FINANCIAL SYSTEM

**The aggregate interconnectedness in the Czech financial system saw no major changes owing to the pandemic**

The domestic financial system is connected through links that can be direct or indirect.[83] Banks remain the key node in the network of direct interconnectedness, as they are the natural counterparty for domestic and foreign financial and non-financial institutions. The main channels of direct interconnectedness in the domestic financial system are non-banks' deposits at banks, links between banks in the form of the interbank market and participating interests, banks' participating interests in and claims on NFCELs, and insurance companies' holdings of investment fund units (see Chart III.14 CB). A year-on-year comparison of the main channels of direct interconnectedness suggests that the pandemic caused no major changes in the structural component of systemic risk, which therefore remains relatively low. The Czech government bond market is a significant element of indirect interconnectedness, as these bonds are a common asset in the balance sheets of domestic institutional investors (see Chart III.14). A sell-off of Czech government bonds by any of their holders subject to stress could result in a drop in their prices and propagate the stress to other holders. Following a temporary increase in stress on the Czech government bond market in 2020, the situation stabilised and the risk of stress spreading through the government bond market is currently not of systemic importance. This is confirmed by tests of indirect interconnectedness of non-bank financial institutions (see section IV.2.4). The risk of contagion is also reduced by the fact that domestic banks and pension funds largely hold Czech government bonds to maturity, so a change in market prices would not have an immediate material effect on their solvency and liquidity positions. However, if perceived sovereign credit risk were to deteriorate (see section II.2.1) and the credit risk premium on Czech government bonds were to rise, a drop in their prices could also be reflected in held-to-maturity bonds (see section III.3), amplifying the risk of contagion.

**Banks remain in a net creditor position in their ownership groups…**

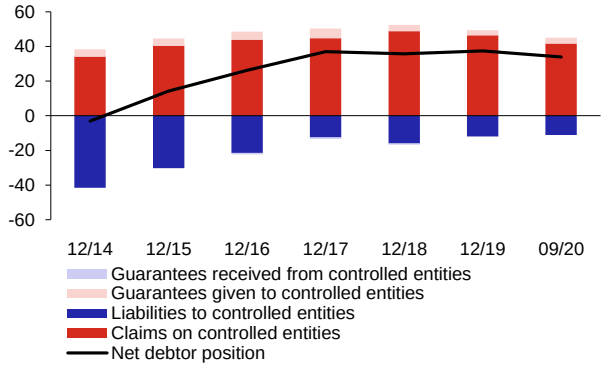
The overall creditor position of the five largest domestic banks in their groups was unchanged in 2020 Q3 (see Chart III.21). The net claim on controlled entities rose by CZK 8 billion year on year to CZK 143.9 billion, but domestic banks' net creditor position fell by 3.9 pp to 33.9% of the total regulatory capital of domestic banks. On banks' asset side, claims on own NFCELs declined (by CZK 4.4 billion year on year). NFCELs nevertheless remain the largest debtor within bank groups (76% of all claims). However, the high concentration of claims on NFCELs has long been stable and, given the nature of the controlled companies' transactions (leasing and factoring), does not give rise to increased risk. Liquidity from building societies also decreased year on year (by CZK 12.2 billion). As in previous years, this item represented the largest part of banks' liabilities within their groups (63.9%).

**…but the upward trend in the net debtor position of banks vis-à-vis non-residents is reversing**

The net debtor position of the five largest domestic banks vis-à-vis their foreign parent financial institutions changed year on year from -250.5% to -175.3% of domestic banks' regulatory capital at the end of 2020 Q3 (see Chart III.22). The upward trend in the net debtor position of recent years is thus reversing, driven by an increase in domestic banks' capital (see section III.2.1) and a fall in domestic banks' liabilities to their parent institutions (of CZK 151.5 billion year on year to CZK 797.8 billion), possibly reflecting the decrease in CNB monetary policy rates in 2020.

**Chart III.21**
**Interconnectedness in domestic bank groups**

(% of regulatory capital of domestic parent banks)

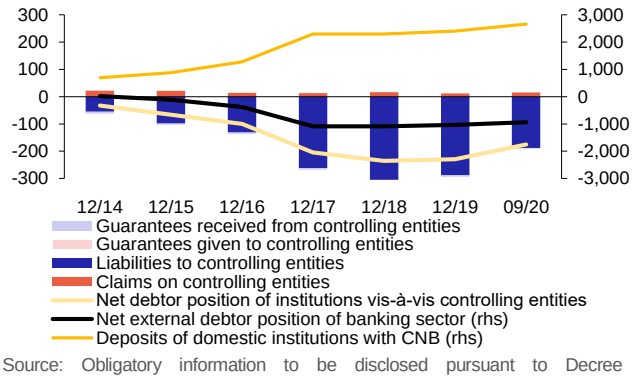



Source: Obligatory information to be disclosed pursuant to Decree No. 123/2007 Coll. and Decree No. 163/2014 Coll.

Note: The chart depicts the aggregate credit interconnectedness of the largest domestic banks, i.e. Česká spořitelna, ČSOB (except Hypoteční banka), Komerční banka, UniCredit Bank and Raiffeisenbank.

**Chart III.22**
**Interconnectedness vis-à-vis non-residents**

(% of regulatory capital of domestic banks; right-hand scale: CZK billions)




Source: Obligatory information to be disclosed pursuant to Decree No. 123/2007 Coll. and Decree No. 163/2014 Coll., banks' annual reports, CNB

Note: The chart depicts the aggregate credit interconnectedness of the five largest domestic banks vis-à-vis their parent companies. The net debt position of the banking sector represents the overall net position of all banks vis-à-vis all non-residents excluding shares and other equity.

83 A description of interconnectedness in the Czech financial system, direct and indirect interconnectedness and the main channels of contagion in the domestic financial system can be found in Kučera, A., and Szabo, M. (2020): Interconnectedness and Contagion in the Czech Financial System, Thematic Article on Financial Stability 5/2020.

# IV. STRESS TESTS

*The resilience of selected sectors was stress tested using a Baseline Scenario and an Adverse Scenario as usual (see section II.1.3). The Baseline Scenario assumes a gradual return of the economy to its pre-pandemic levels, while the Adverse Scenario assumes a persisting contraction of the economy due to a lengthening pandemic.*

*The macro stress test of the banking sector demonstrated the sector's capital and liquidity resilience to the selected scenarios. The initial capital position, strengthened by measures taken by the CNB to restrict profit distribution, made it possible to maintain the sector's overall capital ratio significantly above the 8% regulatory minimum and also above other capital requirement levels over the stress test period even in the Adverse Scenario. Banks' resilience to liquidity shocks is founded on a high proportion of liquid assets in their balance sheets and a stable client deposit base and is also supported by their level of capital.*

*The results of the insurance sector macro stress test confirmed that the sector would remain solvent and liquid overall in the Adverse Scenario. The stress test of pension management companies showed an increase in their resilience due to a strengthening of their capitalisation and the application of accounting rules reducing the volatility in the valuation of some assets. The results of the macro stress test of investment funds demonstrated that their contribution to systemic network risk remains relatively low.*

*The stress test of non-financial corporations signals that the default rate can be expected to increase. In the Baseline Scenario, the default rate rises moderately, especially in the sub-sectors hit hardest by the pandemic, while in the Adverse Scenario branches of industry also contribute. The stress test of households with a mortgage loan suggests moderate growth in credit risk. Despite that, the household sector remains highly resilient to potential shocks. An increased probability of default can be expected in low-income households and households with a debt service-to-income ratio of over 40%. The CNB has long regarded credit institutions' sovereign exposures to the Czech government as systemically important. The Czech public finance stress test signals growing risks linked with government debt. However, it did not show any need to require credit institutions to create additional capital to cover the risk of concentration of these exposures over the next three years.*

*The stress test results show that the financial sector and the sectors of the real economy are resilient to the Adverse Scenario and hence should not be a source of systemic risks to financial stability even in the event of adverse economic developments.*

## IV.1 STRESS TESTS OF BANKING INSTITUTIONS

### IV.1.1 Solvency macro stress test of banks

The solvency stress test is a traditional tool for assessing the resilience of the domestic banking sector to potential risks to its stability. The CNB conducted a stress test at the usual three-year horizon in two scenarios. The *Baseline Scenario*[84] is based on the macroeconomic forecast published in Monetary Policy Report – Winter 2021 and the *Adverse Scenario* involves hypothetical adverse developments amid a potentially lengthening coronavirus pandemic.

**The availability of a longer reporting time series has allowed the CNB to develop its modelling system**
In the field of modelling capital requirements for credit risk, the CNB has taken advantage of longer time series[85] on the riskiness of individual banks' portfolios to update its models for risk-weighted assets under the regulatory approaches applied to banks' relevant portfolios (STA, F-IRB, A-IRB). The new model displays less intense transmission of macroeconomic developments to risk weights, due, among other things, to the capture of non-linearities of transmission, which the previous model did not allow. The framework for forecasting adjusted operating profit has also been extended to model the paths of its components in more detail. Modelling of profit/loss on equity exposures has been integrated into the market risk area;[86] however, given the current size of these exposures, this does not fundamentally affect the test results.

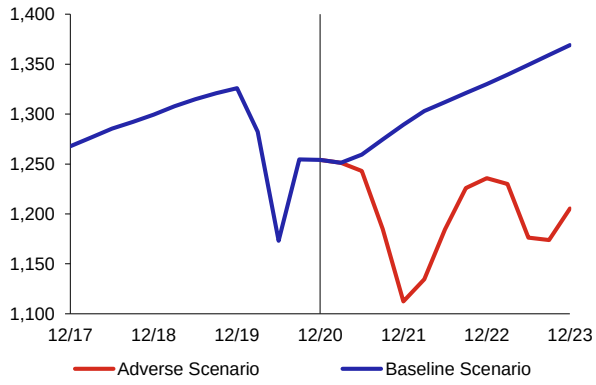
84 The time series of the variables for the third year of the *Baseline Scenario* and all three years of the *Adverse Scenario* were created solely for stress testing purposes. For this reason, neither the *Baseline Scenario* beyond the forecast horizon, nor the *Adverse Scenario* is the CNB's official forecast.

85 Since the introduction of FINREP and COREP in 2014: https://www.eba.europa.eu/risk-analysis-and-data/reporting-frameworks.

86 A more detailed description of the approach is given in Časta, M. (2021): Deriving Equity Risk Premium using Dividend Futures. CNB WP 1/2021.

**The current stress scenario reacts to the uncertainty associated with the future course of the pandemic…**
Central banks and macroprudential authorities set their adverse stress scenarios in such a way as to test the banking sector's resilience to severe but plausible developments. In the current situation, the need to assess how a potentially lengthening coronavirus pandemic could affect the banking sector's resilience has moved to the forefront. For this reason, the *Adverse Scenario* involves the hypothetical situation of a longer-lasting economic contraction, with GDP remaining at significantly lower levels than before the pandemic over the test period (see Chart IV.1).

**Chart IV.1**
**Alternative scenarios: real GDP**
(CZK billions; quarterly data)




Source: CNB

**…and also reflects the key elements of the EBA scenario for supervisory stress testing of euro area banks**
In view of the simultaneous performance of supervisory stress tests of systemically important banks in the EU (EBA 2021)[87] and supervisory stress tests of the domestic banking sector,[88] the evolution of the key macroeconomic variables (especially GDP) in the Czech *Adverse Scenario* has been aligned to some extent with the EBA scenario. This creates, among other things, a comparable base for a deeper analysis of the mechanism of transmission of a macroeconomic shock to profit and capital from the perspective of banks and supervisory authorities. The results of the analyses will help the CNB refine its macro and supervisory stress test methodology to best capture the effect of shock transmission mechanisms. However, it may be of limited applicability due to the specificities of the macroeconomic environment in the coronavirus pandemic.

**The stress test takes into account the government's and CNB's stabilisation measures…**
Both scenarios take into account the government's stabilisation measures and the CNB's recommendation for restraint in profit distribution by banks in 2021.[89] In the *Adverse Scenario*, continued fiscal policy support for the economy is expected due to a persisting strong contraction in economic activity. This would be financed through issues of government bonds. The increased issuance activity would lead to an increase in the share of government bonds in banks' balance sheets. This could, under certain assumptions, positively affect their profits. However, growth in concentration could also increase the risks associated with the interconnectedness of banks and the state (see section IV.5).

**…and the possibility of persisting credit risk latency**
Due to the comprehensive stabilisation measures, there has been no significant materialisation of household credit risk so far (see Table IV.1 CB) and latency risk (see section III.2) remains relevant to the *Adverse Scenario*. The default rate on loans to households reflects this fact (see Table IV.1). It is rising as the pandemic persists, and its level also makes it possible to prudently assess the possible need to respond to mortgage portfolio risks using macroprudential capital tools (see section V.2). Credit risk for loans to non-financial corporations recorded material growth in 2020 and its latency may therefore have been reduced.

**A robust initial capital position allows for various dividend policy scenarios…**
At the start of the test, banks are well capitalised (see section III.2) and ready to absorb even large credit losses over the test period. The level of capitalisation also creates room for active bank dividend policy in the event of the CNB relaxing its related recommendation, so the approach to modelling dividend policy affects the resulting capital position.

87 https://www.eba.europa.eu/eba-launches-2021-eu-wide-stress-test-exercise
88 https://www.cnb.cz/en/financial-stability/stress-testing/supervisory-stress-test/
89 Information of the CNB on profit distribution by credit institutions in 2019 and 2020: https://www.cnb.cz/en/cnb-news/press-releases/Information-of-the-CNB-on-the-distribution-of-profits-for-2019-and-2020-by-credit-institutions/.

**…partly as a result of the sector's approach to including profits in capital**

If certain conditions are met,[90] banks may include part of their current accounting period profit that will not be paid out as dividends in their regulatory capital in the current year. The incorporation of banks' observed procedures means that the capital ratio now also includes part of current accounting period profit during the test and over the test horizon.

**The *Baseline Scenario* assumes a recovery in economic activity…**

The *Baseline Scenario* assumes that the anti-epidemic measures will be eased cautiously during the first half of 2021 amid ongoing vaccination. In 2022, herd immunity is expected to be achieved and the economy is expected to return to normal. Despite continued employment support programmes for the sectors affected, unemployment is expected to remain slightly higher (see Table IV.1). The fading impacts of the pandemic continue to be reflected in the investment sentiment of domestic firms, which will reduce their fixed investment compared to 2020. Conversely, households will start to make up partly for deferred consumption. However, the income decline during the pandemic will preclude a rapid return to the pre-pandemic level, and it will take until the end of 2022 for the economy to recover and GDP to reach its pre-pandemic level.

**…but accumulated credit risks are materialising**

The receding pandemic and the gradual lifting of government stabilisation measures lead to a rise in the default rate of firms and households. Financial market developments cause risk mark-ups to increase. Rising returns on alternative investments cause property price growth to slow. Growth in loans to households for house purchase remains at high levels. Lending to households for consumption continues to fall on average year on year in the first year of the scenario but returns to its long-term rate of growth in the second and third years. The rate of growth of loans to non-financial corporations follows a similar path. It is negative on average in the first year due to a decline in fixed investment, but positive on average and increasing in the second and third years.

**Table IV.1**
**Key variables**

(averages for given years in %)

| | Actual value | *Baseline scenario* | | | *Adverse Scenario* | | |
|---|---|---|---|---|---|---|---|
| | 2020 | 2021 | 2022 | 2023 | 2021 | 2022 | 2023 |
| **Macroeconomic variables (y-o-y)** | | | | | | | |
| GDP | -5.8 | 2.3 | 3.8 | 2.9 | -3.3 | 0.1 | 0.3 |
| Inflation | 3.2 | 2.0 | 2.2 | 1.7 | 1.8 | 1.4 | 1.7 |
| Unemployment* | 2.6 | 3.6 | 3.5 | 3.3 | 4.5 | 7.5 | 7.4 |
| Nominal wage growth | 2.6 | 5.4 | 3.3 | 4.5 | 4.9 | -0.2 | 1.4 |
| Effective GDP in EMU | -5.3 | 4.6 | 4.2 | 2.2 | -2.0 | 1.0 | -0.2 |
| **Credit growth** | | | | | | | |
| Non-financial corporations | 3.5 | -2.5 | 3.0 | 5.5 | -5.0 | -6.9 | 2.3 |
| Loans for house purchase | 7.4 | 8.8 | 7.3 | 6.4 | 8.2 | 4.1 | 1.7 |
| Consumer credit | 3.4 | 1.9 | 4.1 | 5.3 | 2.0 | -0.3 | -1.3 |
| **Default rate (PD)** | | | | | | | |
| Non-financial corporations | 2.9 | 3.3 | 2.5 | 2.5 | 6.1 | 4.7 | 4.4 |
| Loans for house purchase | 0.6 | 1.3 | 1.4 | 1.1 | 2.4 | 3.8 | 4.5 |
| Consumer credit | 2.7 | 2.9 | 3.5 | 3.6 | 3.2 | 5.1 | 7.1 |
| **Loss given default (LGD)** | | | | | | | |
| Non-financial corporations | 32 | 33 | 34 | 35 | 34 | 49 | 50 |
| Loans for house purchase | 15 | 16 | 18 | 18 | 17 | 23 | 29 |
| Consumer credit | 42 | 45 | 46 | 45 | 46 | 57 | 59 |
| **Asset markets** | | | | | | | |
| 3M PRIBOR | 0.9 | 0.7 | 1.5 | 2.3 | 0.1 | 0.1 | 1.1 |
| 5Y GB yield | 0.7 | 1.3 | 1.5 | 2.0 | 1.1 | 1.3 | 2.8 |
| 3M EURIBOR | -0.4 | -0.6 | -0.5 | -0.5 | -0.6 | -0.5 | -0.5 |
| 5Y EUR GB yield | -0.7 | -0.7 | -0.5 | -0.3 | -0.6 | -0.6 | -0.4 |
| Residential property | 8.4 | 5.6 | 1.6 | 1.2 | 2.1 | -7.9 | -8.9 |
| Equities | -2.0 | | -5.0 | | | -15.0 | |

Source: CNB, BRCI

Note: * The ratio of the number of unemployed persons to the labour force under ILO methodology.

**Table IV.2**
**Impact of the scenarios on the banking sector**

| | Actual value | *Baseline scenario* | | | *Adverse Scenario* | | |
|---|---|---|---|---|---|---|---|
| | 2020 | 2021 | 2022 | 2023 | 2021 | 2022 | 2023 |
| **Provisions for non-performing loans (credit losses)** | | | | | | | |
| CZK billions | -15.1 | -20.7 | -24.2 | -23.1 | -24.1 | -57.3 | -61.6 |
| **Provisions for performing loans** | | | | | | | |
| CZK billions | -13.9 | -7.5 | -0.7 | -1.2 | -35.4 | -6.2 | -7.9 |
| **Provisions, total** | | | | | | | |
| CZK billions | -29.0 | -28.3 | -24.8 | -24.3 | -59.5 | -63.5 | -69.5 |
| % of assets | -0.4 | -0.3 | -0.3 | -0.3 | -0.7 | -0.8 | -0.9 |
| **Profit/loss from market risks** | | | | | | | |
| CZK billions | 10.2 | -2.7 | -0.4 | -3.6 | -3.3 | -1.3 | -6.5 |
| **Earnings for covering losses (adjusted operating profit)** | | | | | | | |
| CZK billions | 78.4 | 76.8 | 90.7 | 105.0 | 67.4 | 65.8 | 87.1 |
| **Pre-tax profit/loss*** | | | | | | | |
| CZK billions | 59.6 | 45.9 | 65.5 | 77.1 | 4.6 | 1.0 | 11.1 |
| % of assets | 0.7 | 0.6 | 0.8 | 0.9 | 0.1 | 0.0 | 0.1 |
| **Capital ratio at end of period in %** | | | | | | | |
| **Total** | 24.3 | 24.1 | 21.0 | 20.9 | 23.4 | 20.2 | 18.8 |
| **Tier 1** | 23.6 | 23.4 | 20.3 | 20.2 | 22.7 | 19.6 | 18.2 |
| **Capital injections** | | | | | | | |
| CZK billions | | | 0.0 | | | 0.002 | |
| % of GDP | | | 0.0 | | | 0.0 | |
| **No. of banks** | | | | | | | |
| below 8% capital ratio | | | 0 | | | 1 | |

Source: CNB

Note: Provisions are presented with a minus sign. * Pre-tax profit/loss excludes costs of cash contributions to resolution funds and deposit insurance schemes and modification gain or loss, which are not modelled.

90 Pursuant to Article 26(2) of CRR2.

**A repeated lockdown of the economy is modelled in the *Adverse Scenario*…**

The *Adverse Scenario* assumes greatly subdued economic activity due to the persisting pandemic and anti-epidemic measures restricting business. Continuing pessimistic expectations would lead to deferred consumption and investment expenditure and to a higher saving rate. Fiscal policy would remain countercyclical, but support measures would be scaled down owing to a rise in government debt. GDP would fall on average year on year in the first year of the scenario (see Table IV.1) and would be flat in the following two years. A drop in consumption, investment and net exports would play a decisive role, although net exports would stay positive due to a decline in import demand. Many economically exhausted businesses would gradually close, leading to a gradual rise in the unemployment rate from an average of 4.5% in the first year to 7.5% in the second year of the scenario. In this adverse economic situation, a proportion of households and non-financial corporations would gradually exhaust their funds. Coupled with a rise in real debt, this would cause their debt servicing ability to worsen significantly. The probability of default of non-financial corporations would increase, especially in the first year of the scenario. It would also increase for households later on. The problems in the real economy would also affect the financial sector, which would record credit losses, especially on non-performing loans.

**…which would lead to growth in risk aversion and risk mark-ups**

The rise in global risk aversion would be reflected in growth in Czech government bond yields. Domestic banks would tighten their view of credit risk and increase their risk mark-ups on interest rates on new loans. The worsening sentiment would cause property prices to slow and decline quite sharply in the last two years of the scenario. These factors would lead growth in house purchase loans to drop below its long-term average and growth in consumer credit to turn negative. Loss given default would increase over the entire scenario horizon due to falling collateral value.

**In the *Baseline Scenario*, profitability gradually rises, creating favourable conditions to cover credit losses…**

Profitability falls slightly relative to the initial situation in the first year of the scenario only. It then gradually rises due to interest income, supported by changes in the yield curve and, compared to 2020, by flat or moderately falling credit losses. Losses from market risk have no material impact. Chart IV.2 illustrates the impacts of the main factors on the change in the capital ratio.

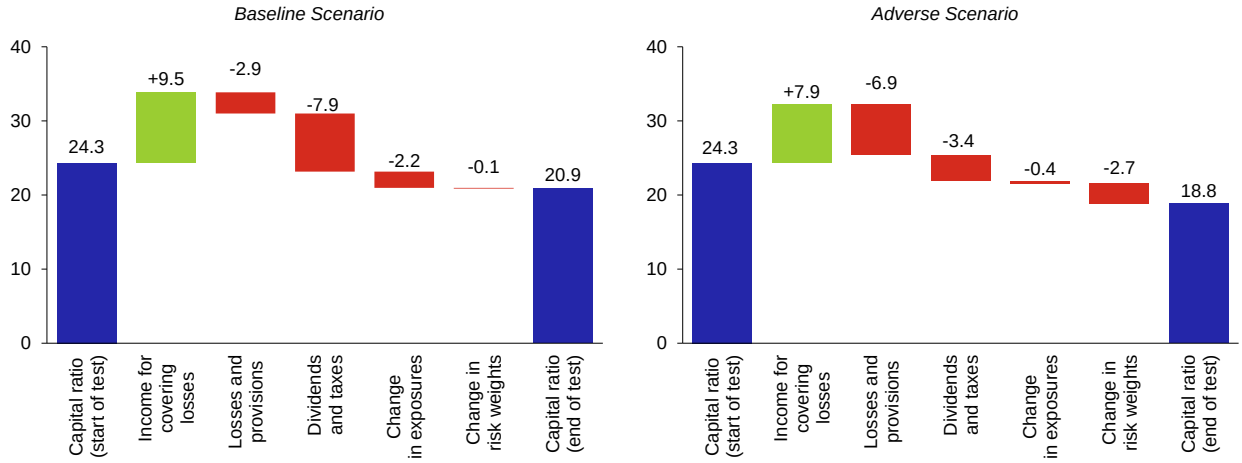
**…which increase especially for non-performing loans**

After the effects of the stabilisation measures fade away, provisioning for non-performing loans increases. However, total provisions are flat or slightly falling. Credit losses lower the capital ratio (-2.9 pp). However, they are adequately covered by income for covering losses (+9.5 pp), which is boosted by higher rates on loans and other assets. Growth in total loans reaches the pre-pandemic level in the second and third year and is thus the main driver of growth in risk-weighted exposures, which lowers the capital ratio by a total of 2.3 pp (the growth in exposures reduces the capital ratio by 2.2 pp, while the rise in risk weights only lowers it by 0.1 pp).

**Chart IV.2**

**Decomposition of the change in the capital ratio of the banking sector in the *Baseline* and *Adverse Scenarios***

(%)




Source: CNB

**Dividend policy has the biggest impact on the resulting capital ratio**
Dividend payments in the second and third year of the *Baseline Scenario* are the biggest factor behind the drop in the capital ratio (-7.9 pp). This is enabled by model assumptions targeting the end-2019 capital ratio (i.e. the ratio before profit distribution was restricted). A substantial part of earnings from the previous two years is thus paid out. Taking all factors into account, the overall capital ratio of the domestic banking sector falls by 3.4 pp from the initial 24.3% and thus still shows a robust level of 20.9% at the test horizon in 2023.

**Despite a substantial decline in profitability, the sector would not record a loss in the *Adverse Scenario*…**
The scenario assumes a double dip in real GDP, whose year-on-year growth would turn slightly positive in the second and third years of the test (see Table IV.1). Repeated or persisting business-restricting anti-pandemic measures in the Czech Republic and elsewhere would impact on non-financial corporations, whose default rate would peak in the first year of the scenario and decline only slowly thereafter. For households, gradual exhaustion of financial reserves would lead to a gradual rise in the default rate. The banking sector's profitability would fall substantially but would stay positive. This drop would be caused mainly by credit loss materialisation staying at a high level over the entire test period.

**…the resulting capital ratio would be affected most of all by credit loss materialisation…**
Growth in risk parameters leading to high credit losses, rising slightly at the test horizon, would have a major negative impact (-6.9 pp; see Chart IV.2). However, they would be fully covered by income (+7.9 pp), which would stay relatively high due to stable interest income on loans and government bonds. Growth in risk-weighted assets would lead the overall capital ratio to fall by a further 3.1 pp, with higher risk weights playing the main role (-2.7 pp), while the increase in total exposures would only be moderate (-0.4 pp). Losses arising from market risk would be negligible.

**…and partly also by dividend policy**
In the *Adverse Scenario*, the way dividend payments are modelled would also be a significant factor in the fall in the capital ratio in the second and third years of the scenario. Assuming compliance with the CNB's recommendation for restraint in profit distribution for 2021 and targeting of the end-2019 capital ratio, banks would have room to pay out retained earnings even in this scenario. This would cause the capital ratio to go down by 3.4 pp. Taking all factors into account, in the *Adverse Scenario* the domestic banking sector's overall capital ratio would fall by 5.5 pp from the initial 24.3% and would thus, at 18.8%, remain above the regulatory capital requirement at the end of 2023. This relatively favourable result is due mostly to (i) stabilisation measures, although their effect would gradually diminish, (ii) higher interest income, affected directly and indirectly by increased government activity on the bond market, (iii) the new approach to modelling risk weights, and (iv) the inclusion of part of current-year earnings in regulatory capital.

**The banking sector shows resilience in the hypothetical situation of a persisting coronavirus pandemic**
The resulting capital ratio indicates that the Czech banking sector has sufficient capital to absorb shocks associated with the longer-lasting pandemic represented by the *Adverse Scenario*.[91] In the *Baseline Scenario*, the capital ratio of the banking sector as a whole does not fall below the minimum capital requirement. In the *Adverse Scenario*, the capital ratio would fall just below this threshold in one bank, but the necessary capital injection would be only CZK 2 million. In the *Baseline Scenario*, the capital ratio falls below the TSCR[92] in two banks and the capital injection needed to meet the requirement is CZK 0.2 billion. In the *Adverse Scenario*, three banks would not meet the TSCR, but even in this case the necessary capital injection would be small, amounting to just CZK 0.9 billion (see Table IV.3).

**However, a potential significant reduction in the capital surplus could reduce resilience**
The banking sector strengthened its capital during the first year of the pandemic, due in part to the CNB's recommendation for restraint in profit distribution. As a result, the hypothetical model situation associated with continued restrictions on certain economic activities and a slow return of the pandemic-hit economy to normal does not lead the capital ratio of the sector and individual banks to drop to a level which could jeopardise the financial stability of the banking sector or lead to shocks spilling over to other sectors of the financial market or the real economy. However, the use of a large proportion of capital surpluses on top of the regulatory requirements could increase the likelihood of a need to use capital buffers in the *Adverse Scenario* (see Chart IV.3).

91 In a situation where government stabilisation measures continue to varying degrees.

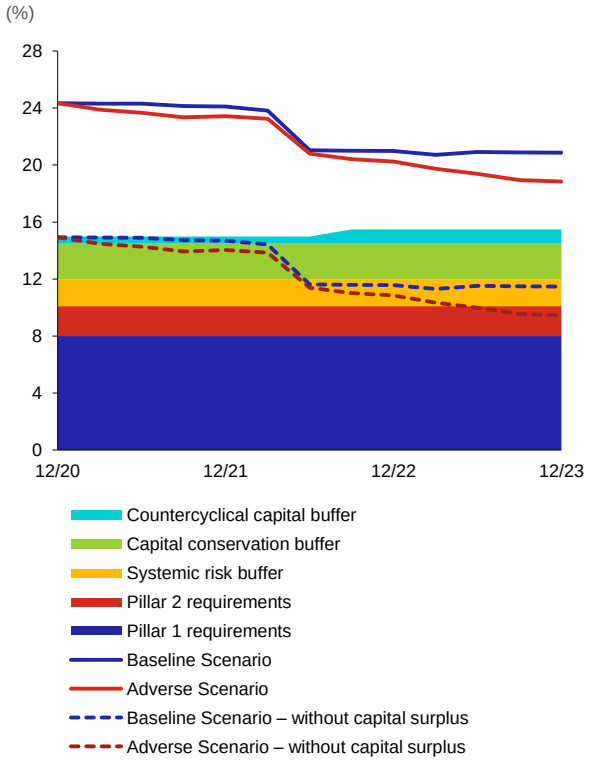
92 The total supervisory review and evaluation process (SREP) capital requirement. This is the sum of the Pillar 1 and Pillar 2 requirements.

**The new binding leverage ratio is well above the regulatory minimum in both scenarios**

From June 2021 onwards, a minimum 3% leverage ratio will act as a prudential backstop against the risk of excessive growth in leverage (see section III.2).[93] As of 31 December 2020, the leverage ratio in the domestic banking sector was 7.8% and thus complied with the regulatory minimum by a sufficient margin. In the *Baseline Scenario*, the leverage ratio declines to 6.6% owing to a sharp rise in the total exposure value and a decline in Tier 1 capital due to payments of dividends. In the *Adverse Scenario*, the leverage ratio would decline less, falling to 6.9% at the scenario horizon. This would be due mainly to an only moderate increase in total exposures amid a drop in capital. The evolution of the leverage ratio in both scenarios suggests that it is not a capital instrument that could systemically limit the banking sector's capacity to lend to the real economy in the economic conditions considered.

**Chart IV.3**

**Capital surplus and potential interactions with the capital requirements of the banking sector**




Source: CNB

**Table IV.3**

**Results of the stress tests for different minimum capital settings**

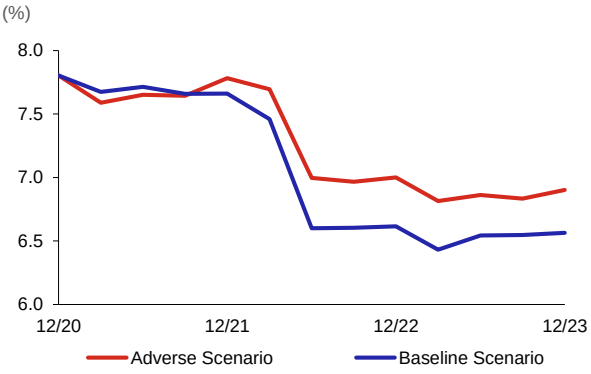
| | *Baseline scenario* | | *Adverse Scenario* | |
|---|---|---|---|---|
| Minimum settings | Capital injections in CZK bn | Banks below minimum | Capital injections in CZK bn | Banks below minimum |
| Pillar 1 (8%) | 0.0 | 0 | 0.002 | 1 |
| TSCR (Pillar 1 + Pillar 2) | 0.2 | 2 | 0.9 | 3 |
| TSCR + SRB | 0.2 | 2 | 0.9 | 3 |

Source: CNB

Note: SRB = systemic risk buffer. Constant Pillar 2 and systemic risk buffer requirements over the entire test period are assumed for the calculation of capital injections.

**Chart IV.4**

**Leverage ratio in the *Baseline* and *Adverse Scenarios***




Source: CNB

93 The leverage ratio is defined as the ratio of Tier 1 capital to the value of exposures, comprising both balance sheet and off-balance sheet exposures.

## IV.1.2 Bank liquidity stress test

**The CNB stress tested the banking sector's resilience to liquidity risk**

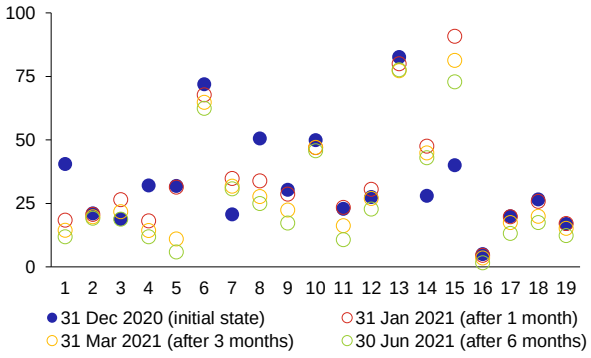
The stress test of the banking sector's liquidity is idiosyncratic[94] and static. It aims to monitor the extent to which each bank balances its expected liquidity outflows using its expected liquidity inflows and its initial counterbalancing capacity over a period of six months (the liquidity gap[95]). The test yields information about whether and which banks would experience a liquidity shortfall (a negative liquidity gap), i.e. fully exhaust their counterbalancing capacity in the form of liquid assets, in the stress scenario. It is assumed that over the entire test period banks do not respond to any liquidity shortfall. Banks were tested using a scenario designed solely to test their resilience to liquidity risk. The scenario parameters based on the methodology can be considered quite severe (see Table IV.2 CB). Except for state-owned banks, all 22 domestic banks were tested for liquidity risk. This involved a total of 19 entities after taking liquidity subgroups into account.

**The stress test confirmed domestic banks' robust liquidity position**

The domestic banking sector has long been highly liquid (see section III.2.3). The test results confirmed domestic banks' considerable resilience to the liquidity risk tested. If the scenario were to materialise, all the banks tested would show a positive liquidity gap, even over a six-month stress horizon (see Chart IV.5). As in the previous year, the sufficient level of liquid assets (33% of total assets on average) together with the high volume of stable retail deposits (60% of total liabilities on average) of the banks tested was able to cover the net outflows in the given period even in the event of an idiosyncratic shock. As in the previous year, deposits accounted for the bulk of the potential outflows. The robust liquidity position was aided mostly by the composition of domestic banks' liquid assets,[96] which totalled CZK 2.4 trillion. Some of the liquid assets are marked to market (see section III.2.3) and are therefore very sensitive to changes in market sentiment. However, even this risk is low for domestic banks, as claims on the CNB, which are not marked to market, make up 62% of their liquid assets. Marked-to-market government securities account for 35% of liquid assets.

**Chart IV.5**
**Results of the idiosyncratic test of the liquidity of individual liquidity subgroups**

(liquidity gap in % of total assets; x-axis: liquidity subgroup)




Source: CNB

Note: The data as of 31 December 2020 (the initial state) represent the share of highly liquid assets in total assets.

**Table IV.4**
**Selected indicators of systemic liquidity**

(%; as of 31 December 2020)

| | Large banks | Medium-sized banks | Small banks | Building societies |
|---|---|---|---|---|
| Ratio of encumbered assets to total assets, including collateral received | 11 | 6 | 2 | 0 |
| Ratio of transactions with CNB to sources of encumbered assets | 96 | 100 | 100 | 100 |
| Ratio of encumbered collateral received to total assets, including collateral received | 21 | 9 | 3 | 0 |
| Ratio of counterbalancing capacity accepted by CNB to total assets | 41 | 29 | 49 | 18 |
| Ratio of LCR outflows to counterbalancing capacity accepted by CNB | 61 | 66 | 25 | 18 |
| Ratio of wholesale funding sources to total assets | 22 | 10 | 1 | 6 |
| Loan-to-deposit ratio | 61 | 68 | 55 | 85 |

Source: CNB

Note: Averages weighted by the bank's balance sheet size.

**Indicators of systemic liquidity also show robust values**

Certain ratios were selected to assess the banking sector's systemic liquidity (see Table IV.4). They track the main sources of systemic liquidity risk in the form of domestic banks' reliance on short-term or less stable sources of funding and excessive interconnectedness or similarity in sources of funding. Domestic banks are characterised by a very low ratio of encumbered assets to total assets (including collateral received) and low rehypothecation (the ratio of encumbered collateral received to total assets; see Table IV.4). Repo operations with the central bank are the main source of such encumbrance. This, along with a low share of short-term wholesale or less stable funding and a robust loan-to-deposit ratio, signals a limited risk of interconnectedness and similarity in sources of funding.[97]

94 The test focuses on the liquidity flows of individual banks and assumes that an outflow of liquidity from one bank means an inflow of liquidity into another. The test thus does not assume a simultaneous outflow of liquidity from all the banks tested or a liquidity outflow from the banking sector. The test results therefore cannot be simply aggregated and used to assess systemic liquidity risk.

95 For details see the Stress test methodology.

96 Level 1 assets under Commission Delegated Regulation (EU) 2015/61.

97 For more details on interconnectedness see Kučera, A., Szabo, M. (2020): Interconnectedness and Contagion in the Czech Financial System, Thematic Article on Financial Stability 5/2020.

## IV.2 MACRO STRESS TESTS OF NON-BANK FINANCIAL INSTITUTIONS

### IV.2.1 Stress test of the insurance sector

**The macro stress test of the domestic insurance sector assessed the sector's resilience to solvency and liquidity stress…**

The macro stress test of insurance companies[98] was based on insurance companies' balance sheets under Solvency II as of 31 December 2020. The test covered 22 domestic insurance companies, which together accounted for 85% of the life insurance market and 92% of the non-life insurance market as measured by their share in net premiums written.[99] Based on the two scenarios, the test modelled the dynamic evolution of insurance companies' balance sheet solvency and profit at quarterly frequency over a period of three years. Balance sheet and profit items were affected by prices of insurance companies' investment assets, the gradual maturing of insurance policies, the underwriting of new policies, repayment of debt securities held by insurance companies, profitability, and distribution of profits in the form of dividends. The output of the test was an assessment of the sector's aggregate resilience. In order to assess resilience to solvency stress, the test monitored the solvency capital ratio (the ratio of eligible capital to the solvency capital requirement), which insurance companies are required to maintain above 100%. The test also evaluated net cash flows related to the investment assets held by insurance companies and the insurance products provided by them. It monitored the extent to which cash inflows cover cash outflows and the extent to which insurance companies will sell investment assets in the event of net outflows.[100] The test abstracted from change in the solvency capital requirement relative to the level at the start of the test.[101]

**…developments under the *Baseline Scenario* and the *Adverse Scenario* were considered**

In the scenarios considered (see section II.1.3), assumptions made in three areas are key to the macro stress test of insurance companies. First, the movement of risk-free interest rates affects the value of insurance companies' liabilities through changes in discount rates.[102] This movement is derived from the dynamics of monetary policy rates and interest rate swap rates. In the *Baseline Scenario*, risk-free interest rates increase in line with the gradual normalisation of monetary policy and growth in short-term interest rates (see Chart II.23C). In the *Adverse Scenario*, risk-free interest rates would initially decline to zero but then start to rise again in the third year of the scenario. Second, prices of investment assets – shares, bonds, property, investment fund units and financial derivatives – are determined by the impact of market risk on insurance companies' balance sheets.[103] Depending on the issuer's country, the *Baseline Scenario* assumes a slight rise in share prices (US shares: +6% as of 31 December 2023) or a decline in share prices (other countries: a maximum decrease of 8% relative to the initial level). It also assumes a slight increase in credit risk premia on corporate bonds and foreign government bonds, especially in 2021 (of 0–80 bp depending on rating and residual maturity). Czech government bond yields in the *Baseline Scenario* move broadly in line with monetary policy rates (see Chart II.23F). Under the *Adverse Scenario*, share prices would fall sharply in 2021 (US shares by 45%, European shares by 15%–20% and shares of other countries by 54%) and risk premia on corporate bonds would surge (those on speculative grade bonds by more than 500 bp). This adverse trend would reverse slightly in the following years, but prices would still not reach their initial levels at the end of 2023. Czech government bond yields would rise in the *Adverse Scenario*, first due to growth in risk premia and in the third year of the scenario also due to an increase in risk-free yields (see section II.1.3). The third area of the scenarios involves insurance variables. In both the *Baseline Scenario* and the *Adverse Scenario*, premiums and claim settlement costs in non-life insurance reflect the path of GDP (see Chart II.23A).[104] In addition, the *Baseline Scenario* takes

98 In 2021, the CNB is also conducting a supervisory ("bottom-up") stress test of selected insurance companies, the results of which will be published in the final quarter of 2021.

99 Branches of foreign insurance companies were not included in the macro stress test.

100 The quantification of sales of investment assets by insurance companies allows the results of the macro stress test to be used to assess insurance companies' capacity to buy newly issued Czech government bonds (see section II.2.1). It also makes it possible to evaluate insurance companies' contribution to the risk of contagion through indirect interconnectedness of the domestic financial sector (see section III.4) in the form of fire sales of Czech government bonds (see section IV.2.4).

101 The solvency capital requirement would tend to decline, improving the results of the test. As in previous years, the test for simplicity also abstracted from change in the exchange rate, as the results of the supervisory stress tests and the size of the capital requirement for exchange rate risk indicate that insurance companies are hedged against exchange rate movements to a large extent. The test makes a number of other simplifying assumptions, which are described in detail in the methodology of the macro stress test of insurance companies.

102 Insurance technical provisions are calculated in the test by discounting the originally expected future cash flows by changed discount rates which reflect movements of the risk-free yield curves in the scenarios. This method for calculating the impact of changes in the risk-free yield curves is simplified, as it ignores the absorption capacity of technical provisions to respond to changes in the yield curves (for example by reducing the originally expected payments of shares in investment income to clients). It thus represents the upper bound of the impact of changes in the yield curves on technical provisions.

103 The test takes into account the fact that, in the case of unit-linked life insurance products, the impact of market risks on the value of investment assets is adequately reflected in the change in liabilities arising from these products. The test also considers insurance companies' option to apply volatility adjustment, which enables some of the increased volatility of investment asset prices to be incorporated into the discount rates used to calculate the value of liabilities.

104 The coefficients of correlation between change in insurance variables and change in GDP are set at 0.7–1.5 depending on the individual non-life insurance segments and are taken from Hodula, M., Janků, J., Časta, M., Kučera, A. (2020): On the Determinants of Life and Non-Life Insurance Premiums. CNB WP 08/2020.

into account the expected gradual return to pre-pandemic levels in segments affected by the pandemic (especially travel health insurance and credit and guarantee insurance), while the *Adverse Scenario* assumes that the adverse trend in these segments continues. Furthermore, the lapse rate of life insurance policies rises in the *Adverse Scenario* as GDP deteriorates, reflecting the financial stress experienced by some households. The average additional annual lapse rate in life insurance in excess of the lapses expected by insurance companies would be 7.3% in each year of the scenario. The impact of additional life insurance policy lapses was evaluated solely from the perspective of insurance companies' liquidity position; the effect of this shock on their capital position was not considered. Both scenarios assume a dividend policy similar to that applied to profit generated in 2017 and 2018.

**The test results indicate no threat to the insurance sector's aggregate resilience at the three-year horizon…**

In the *Baseline Scenario*, the solvency capital ratio rises from its initial level of 252% to 262% as of 31 December 2023. In the *Adverse Scenario*, it drops to 224% as of 30 September 2021 then rises again to 234% as of 31 December 2023. The aggregate solvency capital ratio thus remains far above the regulatory threshold of 100% in both scenarios (see Table IV.5 and Chart IV.6). Under the *Adverse Scenario*, the aggregate solvency ratio records the largest decrease to roughly the level as of 31 December 2019. The actual increase in the ratio recorded in 2020, fostered by the non-payment of dividends by insurance companies and the good performance of some non-life segments (see section III.3), thus covers the impact of the shock. However, stress test results also reflected the large differences in the impact of the pandemic on insurance companies' solvency and profitability in 2020 depending on their specialisation by insurance segment (see section III.3 and FSR 2019/2020). The solvency capital ratio of one of the insurance companies tested is below the regulatory limit of 100% over the entire scenario horizon in the *Adverse Scenario*. However, the shortfall in its capital adequacy is initially small, reaches CZK 69 million at the end of 2021 and then gradually increases to CZK 222 million.

**Table IV.5**

**Results of the stress test of insurance companies**

(CZK billions; year-end values, profit/loss for whole year)

| | Actual value | *Baseline scenario* | | | *Adverse Scenario* | | |
|---|---|---|---|---|---|---|---|
| | 2020 | 2021 | 2022 | 2023 | 2021 | 2022 | 2023 |
| **Total assets** | 434 | 404 | 407 | 399 | 376 | 364 | 338 |
| Investments excl. ULI | 283 | 252 | 227 | 191 | 245 | 217 | 177 |
| ULI assets | 77 | 69 | 62 | 58 | 65 | 61 | 57 |
| **Total liabilities** | 315 | 288 | 289 | 276 | 278 | 262 | 230 |
| **Profit/loss** | | 10 | 10 | 15 | -8 | 5 | 10 |
| Investments excl. ULI | | -8 | 5 | -4 | -14 | 0 | -10 |
| LI TPs excl. ULI | | 8 | -3 | 8 | -1 | 3 | 15 |
| ULI (assets and TPs) | | 3 | 0 | 3 | 2 | 1 | 5 |
| Non-life insurance | | 9 | 11 | 12 | 7 | 3 | 2 |
| Tax on profit | | -2 | -2 | -4 | -1 | -1 | -2 |
| **Excess of assets over liabilities** | 118 | 116 | 118 | 124 | 98 | 102 | 107 |
| **SCR** | 43 | 43 | 43 | 43 | 43 | 43 | 43 |
| **Eligible capital** | 108 | 109 | 110 | 113 | 98 | 99 | 101 |
| **Solvency capital ratio (%)** | 252 | 254 | 256 | 262 | 228 | 230 | 234 |

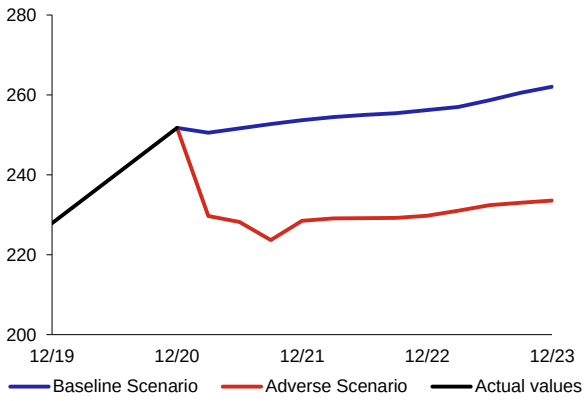
Source: CNB

Note: LI = life insurance, ULI = index-linked and unit-linked life insurance. TPs = technical provisions. SCR = solvency capital requirement. Profit on ULI investments and assets includes repricing effects and income and dividends received.

**Chart IV.6**

**Solvency capital ratio**

(%)




Source: CNB

Note: Insurance companies are required to maintain the solvency capital ratio above 100%.

**…the drop in the solvency capital ratio in the *Adverse Scenario* was mainly due to asset revaluation**

The drop in the solvency capital ratio in 2021 in the *Adverse Scenario* would be due mainly to a decline in the value of holdings of shares, bonds and investment fund units (see Chart IV.7).[105] Their contribution to the change in the solvency capital ratio in 2021 would be 67 pp. However, some of the drop would be due to index-linked or unit-linked life insurance where investment risk is borne by the policy holder. Insurance liabilities would thus also decrease accordingly, significantly offsetting the impact of the drop in investment asset prices (see Chart IV.7, line: Transfer to ULI policies). Profits on non-life insurance products, which would also help slow the drop in the solvency capital ratio, would be a major source of

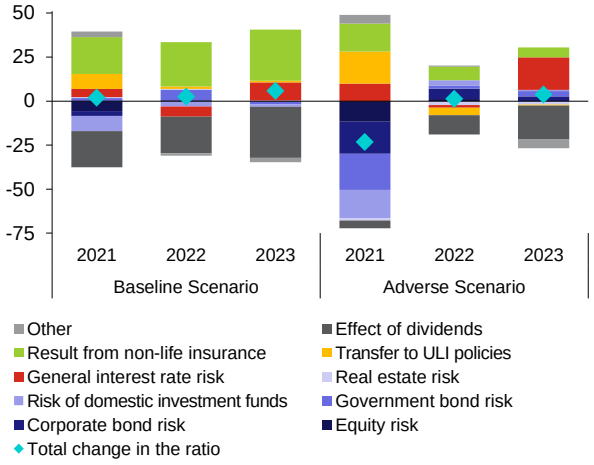
105 For the first time ever, this year's test combines stress tests of investment funds and insurance companies (see section IV.2.4). In both the *Adverse Scenario* and the *Baseline Scenario,* the value of insurance companies' holdings of units of domestic investment funds simultaneously subject to the macro stress test of investment funds was given directly by the results of the test of investment funds (see section IV.2.3). The value of the units amounted to CZK 64.5 billion as of 31 December 2020, representing 92% of all investment fund units held by the insurance companies tested and 17% of their total investment assets.

insurance companies' resilience in the first year of the *Adverse Scenario*. Likewise, the impact of changes in risk-free interest rates would also be positive in the *Adverse Scenario*, even without taking into account the absorption capacity of technical provisions.[102] This would reflect the application of volatility adjustment by some insurance companies and different average durations of assets and liabilities. In 2022–2023, the impact of market risks in the *Adverse Scenario* would be mostly positive, and renewed growth in the solvency capital ratio would be driven by continued slight profitability of non-life insurance and change in risk-free interest rates but slowed by increased dividend payouts.

**Chart IV.7**

**Decomposition of year-on-year changes in the solvency capital ratio**

(pp)



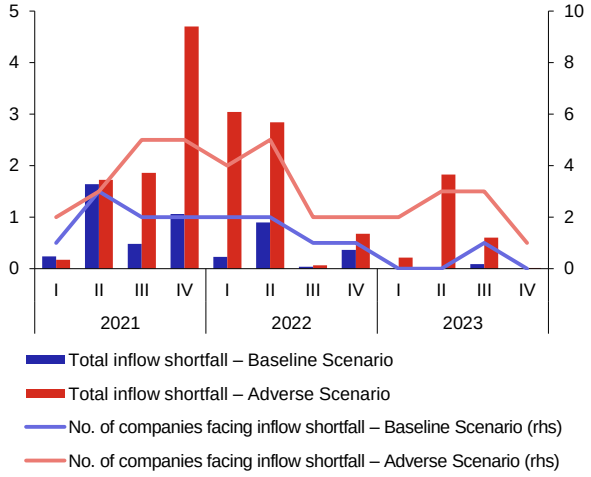

Source: CNB

Note: Other comprises taxes, income and dividends on investment, and fixed costs. ULI = index-linked and unit-linked life insurance. In addition to the effect of change in risk-free interest rates, general interest rate risk reflects the possible application of volatility adjustment.

**Chart IV.8**

**Matching of insurance companies' cash inflows and outflows**

(CZK billions; right-hand scale: number of companies)




Source: CNB

Note: The inflow shortfall is the total difference between cash outflows and cash inflows for insurance companies whose outflows exceeded inflows in the given quarter.

**The liquidity position of insurance companies would remain sufficient even in the *Adverse Scenario*, but a sell-off of Czech government bonds could contribute to a shift in equilibrium on their market**

In the *Baseline Scenario*, insurance companies cover a large part of their cash outflows from technical insurance activities and dividends paid with cash inflows in the form of premiums received, maturing bond coupons and principal and other income on investment assets. The need to obtain additional liquidity through asset sales[106] to cover cash outflows thus does not exceed CZK 2 billion in any quarter (see Chart IV.8). In the *Adverse Scenario*, however, net income on non-life insurance products and investment assets would fall, while outflows due to growth in withdrawals from life insurance policies would rise. The largest aggregate inflow shortfall would be almost CZK 5 billion in 2021 Q1 and the total shortfall would be CZK 18 billion at the test horizon. Insurance companies would sell assets to obtain additional liquidity equal to this amount. This would not represent a significant liquidity risk for insurance companies, because at the test horizon they would be holding CZK 96 billion of Czech government bonds,[107] which they could sell on the secondary market or use as collateral to raise funds.[108] However, insurance companies could contribute to a temporary rise in volatility on the Czech government bond market if they responded to a liquidity shortfall mostly by selling Czech government bonds and if multiple companies were to do so in a relatively short period of time.[109] If this was accompanied by market uncertainty, by the increased government issuing activity considered in the *Adverse Scenario* (see section II.2.1 and section IV.5) and by sell-offs by other institutional investors (see section IV.2.3), insurance companies could to some extent contribute to systemic risk through indirect interconnectedness via the Czech government bond market (see section III.4 and section IV.2.4).

106 In addition to direct sales, insurance companies may obtain additional liquidity through secured funding in the form of repo operations, i.e. asset sales with a future repurchase commitment.

107 The test abstracts from reinvestment of maturing bond coupons and principal. If reinvestment were taken into account, the liquidity shortfall would be higher. However, the volume of government bonds that could be used to obtain additional liquidity would also be higher.

108 The strong resilience of domestic insurance companies to potential liquidity stress is confirmed by the fact that insurers have not used the CNB's liquidity-providing operations since May 2020 (see section II.1.2, Chart II.16).

109 This is prevented to some extent by the CNB's repo operations, which are aimed, among other things, at supporting the smooth functioning of the government bond market.

## IV.2.2 Stress test of pension management companies

**The stress test of pension management companies assesses the sector's resilience at the one-year horizon**

The stress test of pension management companies (PMCs) focuses on assessing the risks to transformed funds (TFs) managed by PMCs.[110] Due to the adoption of the IFRS 9 accounting standard,[111] the test was performed on the data as of 31 January 2021. This enables the CNB to factor in the impact of the relevant scenario in accordance with the characteristics of the new accounting classification of exposures and their valuation. The test was performed on TFs' portfolios using the end-2021 rate and risk parameter projections as the parameters of the *Baseline Scenario* and the *Adverse Scenario* (see section II.1.3 and Table IV.1). The *Baseline Scenario* is characterised by a recovery in economic activity, while the *Adverse Scenario* is used to analyse the hypothetical situation of a lengthening coronavirus pandemic.

**IFRS 9 may lead to a fall in the volatility of TFs' asset value**

IFRS 9 has removed the regulatory limit on government bonds held to maturity (a maximum of 35% of TFs' assets) which can be valued on a basis other than fair value. This enables TFs to recognise all assets meeting the conditions for such valuation at amortised cost. Wider use of such measurement may reduce the volatility in the value of TFs' assets held to maturity and their need to top up capital. The share of assets held to maturity in TFs' total assets rose sharply at the start of this year (by 8.5 pp to 39%). The reclassification process had not been completed by the test date and the share continues to grow (see Chart IV.1 CB). Under IFRS 9, however, TFs must assess expected credit losses on portfolios valued at amortised cost and create loss allowances (previously done as part of fair value valuation), which reduce profit.[112]

**Transformed funds are still sensitive mainly to general interest rate risk and credit spread risk**

The impact of shifts in risk-free rates affecting general interest rate risk is mitigated by derivative hedging and a gradual increase in exposures valued at amortised cost. The *Baseline Scenario* assumes a recovery in economic activity, accompanied by growth in the koruna yield curve. The euro yield curve sees a further, albeit moderate, decline, especially at its long end. The overall impact on asset value is -1.2% if derivative hedging is taken into account (see Table IV.6). In the *Adverse Scenario*, by contrast, accommodative monetary policy would reduce the koruna and euro risk-free rates (see Chart II.23C). This would lead to a 0.7% rise in TFs' total assets (see Table IV.6).

**Table IV.6**
**Results of the stress test of PMCs**

| | ***Baseline Scenario*** | | ***Adverse Scenario*** | |
|---|---|---|---|---|
| PMC equity (start of test, CZK bn) | 12.6 | | 12.6 | |
| Capital ratio (start of test, %) | 229.2 | | 229.2 | |
| **Change in TF asset value due to:** | CZK bn | % of TF assets | CZK bn | % of TF assets |
| general interest rate risk | -5.7 | -1.2 | 3.3 | 0.7 |
| credit spread risk for CS | -0.6 | -0.1 | -3.7 | -0.8 |
| credit spread risk for GS | 0.8 | 0.2 | -7.0 | -1.5 |
| exchange rate risk | 0.0 | 0.0 | -0.1 | 0.0 |
| equity risk | 0.0 | 0.0 | -0.4 | -0.1 |
| real estate risk | 0.0 | 0.0 | -0.2 | 0.0 |
| **Total impact of risks on TF assets** | -5.4 | -1.1 | -8.1 | -1.7 |
| **TF asset top-up need (CZK bn)** | 0.9 | | 2.1 | |
| PMC equity (end of test, CZK bn) | 12.2 | | 10.9 | |
| Capital ratio (end of test, %) | 224.5 | | 206.6 | |
| **Capital injection into PMCs (CZK bn)** | 0.0 | | 0.0 | |

Source: CNB
Note: TF = transformed funds, PMC = pension management companies, CS = corporate securities, GS = government securities.

**Table IV.7**
**Year-on-year comparison of PMC stress test results in the *Adverse Scenario***

| Scenario | Last year's (FSR 2019/2020) | This year's (FSR 2020/2021) | **This year's (FSR 2020/2021)** |
|---|---|---|---|
| Data on capital and exposures as of | 31 Dec 2019 | 31 Dec 2019 | **31 Jan 2021** |
| Fall in TF asset value due to shocks considered (%) | 2.5 | -2.5 | **-1.7** |
| TF top-up need (CZK bn) | 3.9 | 3.8 | **2.1** |
| Number of TFs needing top-ups | 7 | 7 | **5** |
| Injections by owners to meet capital requirements (CZK bn) | 1.0 | 0.9 | **0** |
| Number of PMCs needing capital injections to meet capital requirements | 3 | 2 | **0** |

Source: CNB

**Growth in the credit spread would outweigh the positive effect of the drop in risk-free rates in the *Adverse Scenario***

Government bonds account for 88% of the value of securities held, of which almost half (49%) were recognised at amortised cost in January 2021. The remainder respond to shifts not only in risk-free rates, but also in the credit spread (of risk premia). The spread on Czech government bonds in the *Baseline Scenario* falls slightly and TFs' assets thus increase in value by 0.2% overall. Foreign government bonds have no major effect on the results, as they account for just 3% of all government bond holdings. In the *Adverse Scenario*, growth in risk premia on government bonds would lead to

110 Participation funds were not tested, as their market losses affect funds' clients and not PMCs. They account for 14.7% of the sector's total assets.
111 IFRS 9 lays down accounting rules for financial instruments.
112 Conversely, the release of loss allowances would improve the profit.

a drop in TFs' assets of 1.5% (see Table IV.6). Corporate bond risk reduces assets by 0.1% in the *Baseline Scenario* and by 0.8% in the *Adverse Scenario* (see Table IV.6). The impacts of shifts in interest rates are slightly reduced by derivative hedging in both scenarios (+0.2% of assets in the *Baseline Scenario* and -0.1% of assets in the *Adverse Scenario*). However, TFs have long made little use of derivative hedging against interest rate risk.

**The other risks monitored have no significant impact in the stress test**

Foreign currency assets account for 8.9% of TFs' balance sheets. Due to long-term high-quality derivative hedging, however, exchange rate risk (see Chart IV.9) would have no material impact. Equity securities account for only 0.7% of TFs' assets,[113] so the impact of equity risk would be limited despite a considerable fall in share prices (of 51.8%) in the *Adverse Scenario*. Risks associated with investment in real estate have a minimal impact.

**Both scenarios show a need to top up the capital of transformed funds…**

PMCs guarantee non-negative returns for TF participants by law. If a TF's assets declined below its liabilities, the relevant PMC would be obliged to top up the TF's assets with capital equal to the difference between its assets and liabilities. In the *Baseline Scenario*, this situation arises in three TFs, where the need is estimated at CZK 0.9 billion, or 0.2% of the TFs' assets. The *Adverse Scenario* would lead to a need to top up the capital of five TFs by a total of CZK 2.1 billion, or 0.5% of the TFs' assets. If the current *Adverse Scenario* were applied to the end-2019 data, seven TFs would have to top up their capital by a total of CZK 3.8 billion, or 0.9% of the TFs' assets (see Table IV.7).

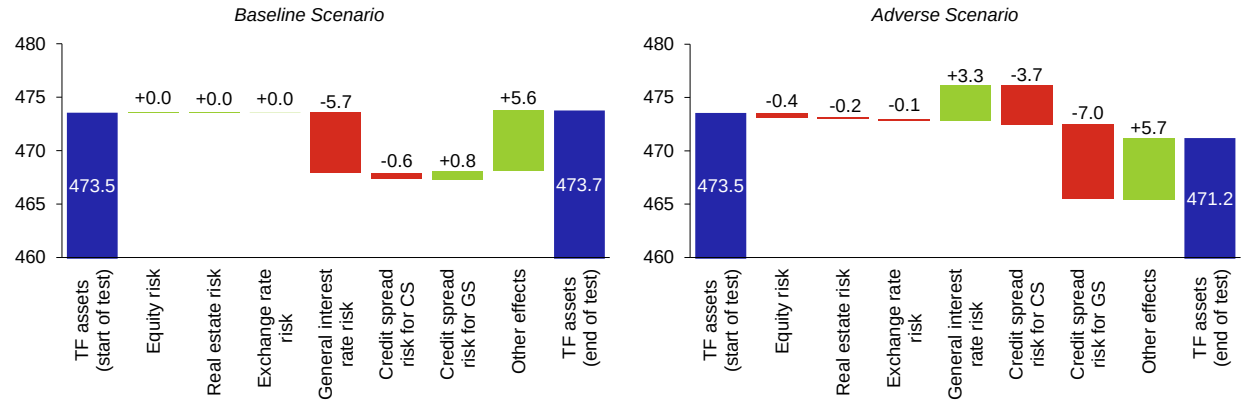
**…but the PMCs sector would remain stable due to a higher combined capital surplus**

The restrictions on dividend payouts by PMCs imposed by the regulator last year helped increase their capital surplus at the start of the test. Its level[114] allows them to fully cover the impacts on TFs' capital in both scenarios (see Table IV.6) without needing to increase their own capital. If the *Adverse Scenario* were applied to the sector's situation at the end of 2019, PMCs would be required to top up their capital by CZK 0.9 billion (see Table IV.7). PMCs' current capital surplus is helping maintain the stability of the entire sector. However, it could be undermined by an increase in market volatility and in the riskiness associated with the dominant portfolio of Czech government bonds.

**Chart IV.9**

**Change in the value of assets of transformed funds due to the types of risks in the *Baseline* and *Adverse Scenarios***

(CZK billions)




Source: CNB

Note: CS = corporate securities, GS = government securities. Other effects represent dividend income, bond coupons received and the return on the AC and FVOCI portfolio. Change in the value of foreign currency liabilities (cross-currency repos) is accounted for when considering exchange rate risk.

113 TFs' equity holdings declined by 0.7 pp compared to the previous year. This was due to a general sell-off of holdings and the sale of some investments to mutual funds.

114 Capital increased by CZK 2.1 billion compared to the end of 2019. Capital adequacy stands at 229% at the start of the test (as against 168% last year).

### IV.2.3 Stress test of investment funds

Since 2020, the CNB has been using the stress test of investment funds to assess the contribution of investment funds to systemic risk in the domestic financial sector stemming from risk in the form of asset and liability liquidity mismatch.[115] The test is based on the assumption that in the event of adverse developments on financial markets, sell-offs of investment fund units may increase and a fund's liquidity need may grow unexpectedly. By redeeming units, investment funds exhaust their liquidity buffers and may be forced to sell off assets if the buffers are insufficient. Increased sell-offs of assets shared in financial institutions' portfolios may create an additional source of contagion in the financial system through a fall in the prices of those assets. The test considers the endogenous impact of sell-offs of Czech government bonds, which are important assets shared in the portfolios of domestic financial institutions.[116]

**The test is performed dynamically under the conditions of the *Baseline Scenario* and the *Adverse Scenario* on a significant part of the collective investment funds sector.**

The test involves repricing of individual funds' assets under a macroeconomic scenario (see section II.1.3), followed by additional rounds of stress multiplication caused by investors' reactions. The assets are repriced in each quarter and the new repricing is used to derive the liquidity stress caused by the outflow of investors.[117] The balance sheets and active derivatives of individual investment funds as of December 2020 were chosen for the initial period for the test. Due to the macroprudential and simplified nature of the test, new inflows of investors into funds and purchases of further assets by funds are not considered (a static balance sheet is assumed).[118] The test covered 142 open-ended collective investment funds. Funds for qualified investors were not included. The CZK 393 billion of assets managed by the funds tested represented 94% of the assets of the collective investment funds sector.

**The *Baseline Scenario* does not indicate any significant risks to the sector**

In the *Baseline Scenario*, the aggregate test result will be affected most strongly by a slight correction of prices on stock markets and growth in monetary policy rates (see Table IV.1), which will adversely affect interest rate-sensitive instruments. However, these negative impacts will be partially offset by income on debt securities earning positive rates of interest (see Chart II.23F). A drop is recorded mainly by equity and mixed funds, whose assets will fall in value to CZK 80 billion (-9%) and CZK 136 billion (-16%) respectively at the end of the first year (see Table IV.8) due to a partial correction of prices on some stock markets[119] (see Box 2). The assets of bond funds amount to CZK 78 billion (-17%) at the end of the first year. However, this drop will be partially offset by growth of real estate funds (see Chart II.23E)[120] over the entire test period (CZK 1.4 billion; an increase of 2.6% compared to the start of the test). The assets of the sector as a whole will decline on aggregate (by CZK 53 billion, or 13% compared to the start of the test) to CZK 340 billion as of the end of 2023 (see Table IV.8). However, if the effects excluded from the test follow their historical trends (the inflow of new investors, for example), the assets of this sector will continue to grow in subsequent years.

**The *Adverse Scenario* would give rise to a significant drop in funds' assets**

The *Adverse Scenario* would have the greatest impact on equity funds (see Box 2), whose assets would fall in value by CZK 35 billion to CZK 53 billion in 2021 Q3 (see Chart IV.10). These funds would experience significant investor outflows fostering a liquidity need of CZK 8.2 billion in the first year of the test; the value of equity funds' assets would amount to CZK 58 billion at the end of the first year (see Table IV.8). Mixed funds[121] would also be hit hard; their unit value would drop by almost 15% and the value of their assets would reach a low of CZK 113 billion in 2021 Q3 (see Chart IV.10). At the end of the first year, their assets would stand at CZK 118 billion. Bond funds would be affected by a rise in the credit risk premium on financial markets (see Chart II.23F), which would cause their assets to fall to CZK 75 billion at the end of the first year. This drop would be partially offset over the entire test period by income on their debt securities earning positive rates of interest. Property prices would undergo a correction over the entire test period and real estate funds' assets would be down 13% in value at the end of the test. This would cause investor outflows totalling CZK 1 billion (see

115 Liquid assets comprise the deposits of investment funds on bank accounts with maturities of up to one year. The liabilities of investment funds consist mainly of the deposits of individual investors.

116 For details see the investment fund sector stress test methodology.

117 A 10% decline in the value of a fund's assets would lead to an outflow of investors holding 4% of assets in the case of equity funds, 8% of assets in the case of mixed and other funds, and 12% of assets in the case of bond funds. In the case of real estate funds, the fact that these funds have one year to redeem investors' units was reflected.

118 The test takes into account future liquidity inflows from debt security holdings. Inflows from bond coupons and maturing principal will increase funds' deposits at banks. Their reinvestment and bond issuer default are not considered. The test also considers derivative hedging using currency forwards. An assumption of constant derivative collateralisation over the entire test period was adopted for these derivative contracts, due to the duration of the test and the short maturities of the contracts. The exchange rate path is also scenario consistent. Its volatility is a potential source of margin requirements on derivatives and represents another potential outflow of liquid assets.

119 The *Baseline Scenario* for global markets is not based on the CNB's official forecast and thus represents a sensitivity analysis of a slight price correction against the backdrop of a general economic recovery.

120 The scenario for property prices abroad is the same as that for the Czech Republic.

121 The asset portfolios of mixed funds consist mainly of various combinations of shares and bonds.

Table IV.8).[122] At the end of the test, the average unit value across all the funds tested would be almost 90% of the value at the start of the test due to a falling number of investors in individual funds. The resulting unit value indicates that the remaining investors would see a significant return on their investments (see Chart IV.10). The assets of the sector as a whole would fall on aggregate (by CZK 80 billion, or 20%, compared to the start of the test) to CZK 313 billion (see Table IV.8).

**The investment fund sector does not currently represent a systemic risk**

Some of the bond, mixed and other investment funds covered by the test held Czech government bonds totalling CZK 58 billion (i.e. 3% of the total government debt and 5% of the total Czech government bond portfolio held by domestic financial institutions) in their balance sheets at the end of 2020. For these collective investment funds, the test considered a multiplication of the initial fall in the price of Czech government bonds due to potential sell-offs. In the *Baseline Scenario*, the value of the Czech government bonds sold did not exceed CZK 1.7 billion and there was virtually no impact on prices. Even under the *Adverse Scenario*, funds would not be forced to sell off large amounts of Czech government bonds, owing to their relatively high liquid asset holdings and low Czech government bond holdings. The sell-offs would amount to almost CZK 10 billion at the three-year horizon in the *Adverse Scenario* and the total additional fall in prices would be only around 2% (see Table IV.8).

**The resulting level of stress reflected the riskiness of the hardest-hit investment funds**

The resulting volume of Czech government bonds sold was connected with both the size of the sector (7% of the Czech financial sector) and the relative distribution of the stress by investment fund size and riskiness. The assets of most bond investment funds were little changed in value at the test horizon, and total liquid assets also remained broadly constant in relation to the balance sheet total (see Chart IV.2 CB and Chart IV.3 CB). The large impact of the initial shock, the investor outflow, and the formation of a liquidity need would pertain mainly to smaller funds, particularly equity funds. These funds either do not hold Czech government bonds at all, or only hold insignificant quantities.[123]

**Table IV.8**

**Results of the stress test of investment funds**

(CZK billions)

| | Actual value | *Baseline scenario* | | | *Adverse Scenario* | | |
|---|---|---|---|---|---|---|---|
| | 2020 | 2021 | 2022 | 2023 | 2021 | 2022 | 2023 |
| **Assets of funds covered by test** | | | | | | | |
| Coll. investment funds | 393.2 | 349.1 | 343.3 | 340.3 | 303.9 | 311.9 | 313.1 |
| Equity funds | 87.8 | 79.6 | 77.4 | 77.6 | 58.0 | 63.0 | 65.6 |
| Bond funds | 94.1 | 77.9 | 77.3 | 75.9 | 74.7 | 76.1 | 74.5 |
| Real estate funds | 55.0 | 55.6 | 56.1 | 56.4 | 53.4 | 50.6 | 48.3 |
| Mixed and other funds | 156.3 | 135.9 | 132.5 | 130.4 | 117.8 | 122.3 | 124.6 |
| **Unit value (% of initial value)** | | | | | | | |
| Coll. investment funds | 100 | 93 | 91.8 | 91.6 | 85.2 | 86.6 | 87.2 |
| Equity funds | 100 | 91.9 | 90.0 | 90.2 | 73.0 | 78.0 | 80.5 |
| Bond funds | 100 | 91.5 | 91.3 | 90.9 | 89.5 | 90.8 | 90.3 |
| Real estate funds | 100 | 102.4 | 104.0 | 104.8 | 98.0 | 91.3 | 86.4 |
| Mixed and other funds | 100 | 92.5 | 91.4 | 91.0 | 85.4 | 86.7 | 87.7 |
| **Liquidity need** | | | | | | | |
| Coll. investment funds | | 22.1 | 3.5 | 2.8 | 41.8 | 2.6 | 3.8 |
| Equity funds | | 2.2 | 0.6 | 0.1 | 8.2 | 0.3 | 0.1 |
| Bond funds | | 9.3 | 0.8 | 1.8 | 12.4 | 0.7 | 2.5 |
| Real estate funds | | 0.0 | 0.0 | 0.0 | 0.2 | 0.5 | 0.3 |
| Mixed and other funds | | 10.5 | 2.1 | 0.9 | 21.0 | 1.2 | 0.9 |
| **Impact on Czech government bond (GB) market** | | | | | | | |
| Czech GBs sold | | 1.4 | 0.2 | 0.1 | 9.5 | 0.1 | 0.1 |
| Decrease in bond price (%) | | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 |

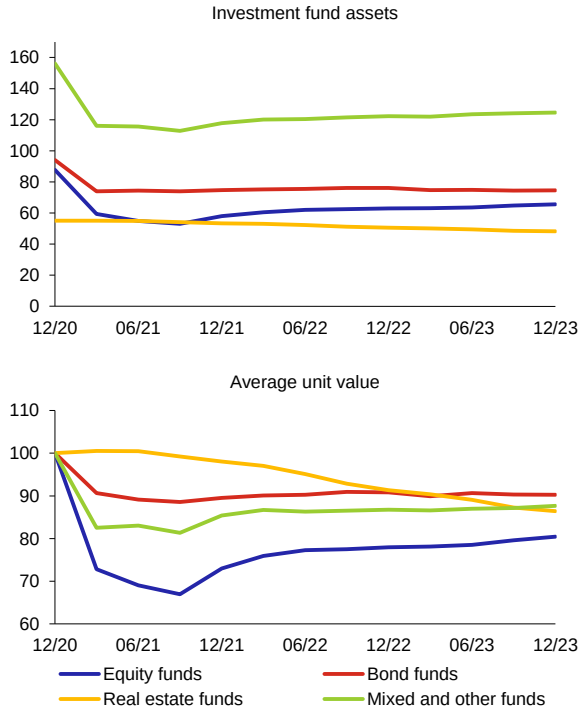
Source: CNB

Note: The unit value is normalised to 100 as of the start date of the test. The liquidity need consists of the value of redeeming investors' units and margin requirements on derivative transactions. The waterfall method is used for portfolio sales.

**Chart IV.10**

**Aggregate paths of investment funds' assets and units in the *Adverse Scenario***

(upper panel: CZK billions; lower panel: % relative to start)




Source: CNB

122 The test does not take the effect of income on real estate financial flows into account. It thus represents the upper bound of the impact of changes in property prices on real estate funds.

123 The test did not consider the effect of reinvestment on liquid assets, counterparty default and the effect of other Czech government bond holders (banks, insurance companies and pension funds) on market developments and the subsequent rounds of sell-offs.

### IV.2.4 Testing of the interconnectedness of non-bank financial institutions

**The CNB's macro stress tests of insurance companies and investment funds now include elements of direct interconnectedness…**

Systemic risk in the financial system may be increased by direct and indirect interconnectedness (see section III.4).[124] The CNB now includes some elements of interconnectedness in its tests. This year's test of investment funds (see section IV.2.3) took into account the direct interconnectedness between investment funds via mutual unit holdings. The value of the units of the investment funds tested after the application of the scenarios was also used directly in the test of investment funds that held those units. Such mutual exposures ran to CZK 23.7 billion, or 18.5% of all the units held by the investment funds tested and 3% of their total assets, as of 31 December 2020. Direct interconnectedness between investment funds and insurance companies was likewise taken into account. The resulting unit value after the application of the scenarios in the stress test of investment funds directly determined the value of these units in the balance sheets of the insurance companies tested (see section IV.2.1, Chart IV.7). They totalled CZK 64.5 billion, or 92% of all the investment fund units held by the insurance companies tested and 17% of their total investment assets, as of 31 December 2020.

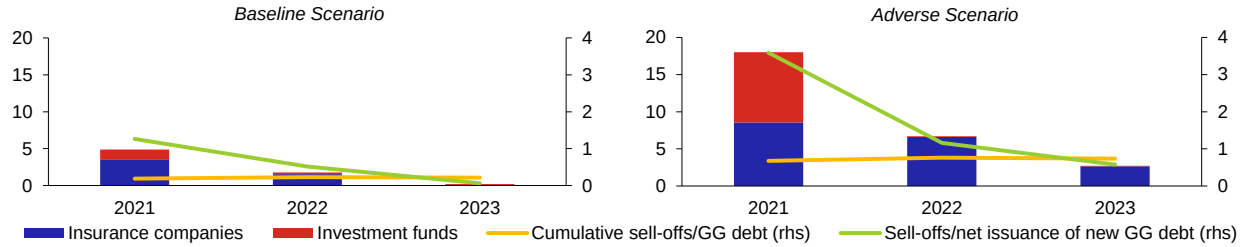
**…the results of the macro stress tests also enabled the CNB to assess the contribution of insurance companies and investment funds to contagion through sell-offs of Czech government bonds**

Indirect interconnectedness through the Czech government bond market is also a relevant channel of contagion in the Czech financial system (see section III.4). One result of the macro stress tests of investment funds and insurance companies was the hypothetical amount of Czech government bonds that investment funds and insurance companies could sell to obtain additional liquidity (see Table IV.8 and Chart IV.8). The total possible sell-offs in the *Baseline Scenario* are CZK 5.1 billion for insurance companies and CZK 1.8 billion for investment funds. In the *Adverse Scenario*, the sell-offs by insurance companies and investment funds would total CZK 17.7 billion and CZK 9.6 billion respectively (see Chart IV.11). As regards risks to domestic financial stability, the amounts are relatively low, together representing less than 1% of the Czech Republic's total government debt. The sell-offs would also be negligible (no more than 3.6% in 2021) relative to the total net new debt that the Czech Republic would place on the market (CZK 517 billion a year on average; see section IV.5) if the *Adverse Scenario* were to materialise. Despite the low importance of these sell-offs in the context of the Czech Republic's total government debt, they could generate a temporary increase in the volatility of Czech government bond prices on the secondary market. The results also indicate a potentially lower capacity of some domestic insurance companies and investment funds to buy newly issued Czech government bonds under the *Adverse Scenario*.[125] The CNB has been paying attention to indirect interconnectedness, the risk of contagion through the Czech government bond market and the links between public finances and financial institutions' balance sheets, and will continue to refine its model framework for assessing the relevance of these risks in subsequent stress test rounds.

**Chart IV.11**

**Size of potential sell-offs of Czech government bonds**

(CZK billions; right-hand scale: %)




Source: CNB

Note: GG = general government. Debt and net new debt are, respectively, the amount at the end of each year and the amount for the given year. The figures were taken from the results of the public finance stress test (see section IV.5).

124 Direct interconnectedness is the sum of the direct exposures between two financial institutions. It includes mutual debt and equity securities holdings, deposits, loans, financial derivatives, guarantees, etc. Unlike direct interconnectedness, indirect interconnectedness between financial institutions runs through factors common to them. Such common factors include non-financial entities (households, non-financial corporations and general government) and foreign entities. Indirect interconnectedness is based on the fact that a change in the link between such an entity and a specific financial institution may be reflected in a change in the link between that entity and other financial institutions. Other important common factors include markets in financial and real assets, as financial institutions often invest in such assets or use them to collateralise their exposures. Interconnectedness in the Czech financial system, the distinction between direct and indirect interconnectedness, and the main channels of contagion in the Czech financial system are described in Kučera, A., Szabo, M. (2020): Interconnectedness and Contagion in the Czech Financial System, Thematic Article on Financial Stability 5/2020.

125 Given the assumptions made in the macro stress tests of insurance companies and investment funds, this is the upper bound on the estimated amount of sell-offs. The actual impact of the *Adverse Scenario* would probably be smaller, as it can be assumed that investment funds and insurance companies would cover part of their liquidity needs from sources other than Czech government bond sell-offs. In this regard, the analysis did not consider the possible use of the CNB's repo operations, which are aimed, among other things, at supporting the smooth functioning of the government bond market. Neither did it assess in detail the capacity for buying Czech government bonds among financial institutions facing no liquidity stress.

## IV.3 STRESS TEST OF NON-FINANCIAL CORPORATIONS

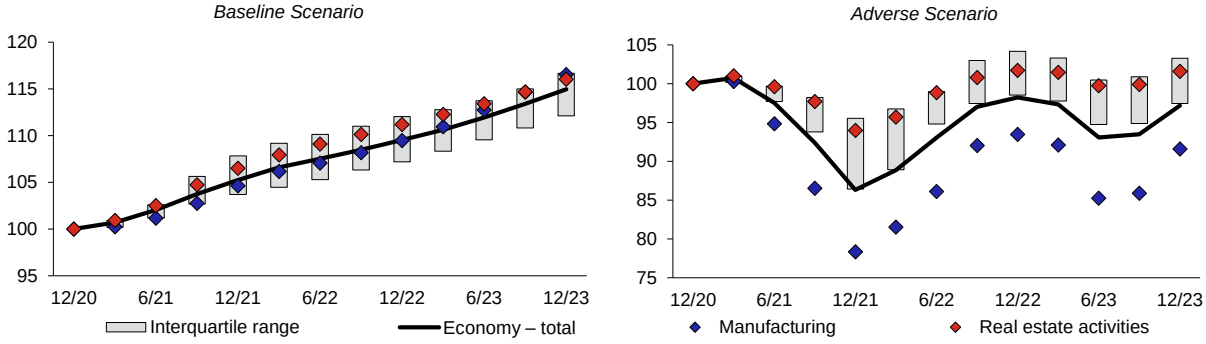
**The stress test of the non-financial corporations sector simulates the impacts of hypothetical scenarios on individual sub-sectors**

The CNB conducts a macro stress test of non-financial corporations to identify – mainly using estimated default rates – the sub-sectors that would be hit hardest if a hypothetical macroeconomic scenario were to materialise.[126] Of key importance for financial stability purposes is an analysis of the adverse impacts on the sub-sectors with the highest shares of loans[127] – currently manufacturing and real estate activities (also referred to here as property developers) in the Czech economy.[128] The stress test of the non-financial corporations sector was based on the structure of demand in the individual sub-sectors and the relations between them observed in 2019. This structure was estimated for 2020 based on the observed evolution of the economy and the banking sector's credit exposures. All sub-sectors were tested in both the *Baseline Scenario* and the *Adverse Scenario*. The estimated default rates for the sub-sectors were aggregated (see Chart II.37) and the aggregate values were also used as one of the key inputs for the stress tests of banks (see section IV.1.1, Table IV.1).

**The 2020 pandemic affected the sub-sectors unevenly; most of them entered the stress test weakened**

The pandemic and the related anti-pandemic measures in the form of shutdowns of business premises and hotels and restaurants and restricted mobility of persons and goods (and the resulting decrease in foreign trade and limited supply) hit the non-financial corporations sector hard. The spring wave paralysed not only the services sub-sectors, but also industrial segments. After the situation improved in the summer, further waves of the pandemic arose, business premises were shut down again and revenues dropped, especially in sub-sectors specialising in non-essential services. Most industries avoided these measures or adjusted to them in order to continue operating and avoid further large economic losses (see section II.2.2). Despite supportive economic policy measures, the aggregate default rate started to increase in this sector at the end of 2020.

**Chart IV.12**
**Output in sub-sectors in the *Baseline* and *Adverse Scenarios***
(index of nominal variables, 12/20 = 100)




Source: CNB
Note: Owing to a delay in the availability of the input-output table for 2020, the figures for 12/20 are also estimated.

**In the *Baseline Scenario*, output starts to grow again, profitability normalises and the default rate rises with a lag**

In the *Baseline Scenario*, output gradually returns to growth. The variability across sub-sectors is relatively low (see Chart IV.12). As export growth increases, the performance of manufacturing relative to the other sub-sectors improves at the test horizon. As the pandemic recedes and the situation gradually returns to normal during 2021, the aggregate profit rate stabilises close to 50% (see Chart IV.13) and the differences across sub-sectors increase slightly. This is due mainly to aggregate upward pressure on wages amid an uneven recovery in demand for the output of individual sub-sectors, the recovery being weaker in sub-sectors specialising in the provision of non-essential services. The default rate is thus mixed across sub-sectors. It remains especially high in the hotels and restaurants and transport sub-sectors (see Chart IV.14). However, the share of loans provided to these sub-sectors in total loans to the non-financial corporations sector is relatively low. The sub-sectors with higher shares of loans that have slightly above-average default rate levels in historical terms in the *Baseline Scenario* at the test horizon are property developers (due to slowing growth in property prices and higher debt

126 More information on stress testing of non-financial corporations can be found in a methodological document on the CNB website and in Siuda, V. (2020): *A Top-down Stress-testing Framework for the Nonfinancial Corporate Sector.* CNB WP 12/2020.

127 Given the relatively low volume of corporate bonds issued by domestic non-financial corporations in the balance sheet of the domestic financial sector, the stress test focuses on bank loans.

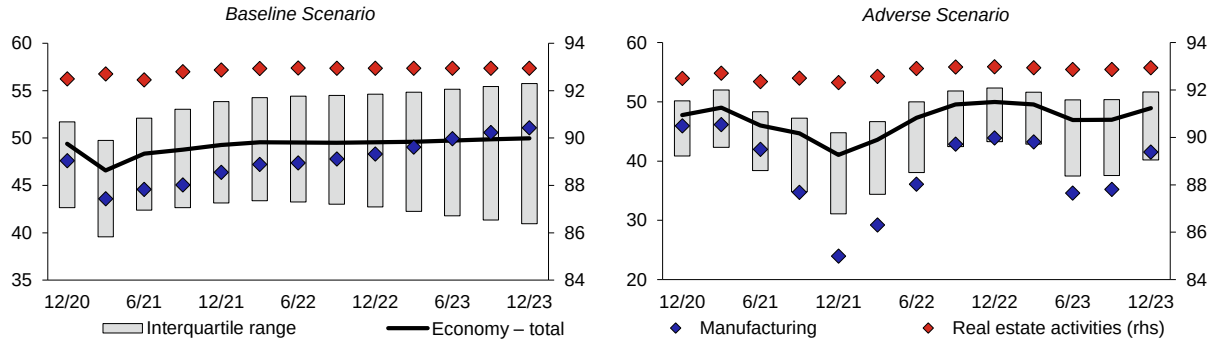
128 As of 31 December 2020, loans provided to these sub-sectors totalled around CZK 475 billion, i.e. almost half of all bank loans provided to non-financial corporations which are not categorised as non-performing (see section II.2.2, Chart II.34).

service) and wholesale and retail trade (due to higher debt service and weaker relative profitability). The default rate in manufacturing stays close to its long-term average, since performance in this sub-sector returns relatively quickly to its pre-pandemic levels after the 2020 slump. The aggregate default rate exceeds 3% in the first two years of the stress test and drops to 2.5% in the last year.

**Chart IV.13**

**Profit rate in sub-sectors in the *Baseline* and *Adverse Scenarios***

(%)




Source: CNB

Note: The profit rate is the ratio of gross operating surplus to gross value added. Owing to a delay in the availability of the input-output table for 2020, the figures for 12/20 are also estimated.

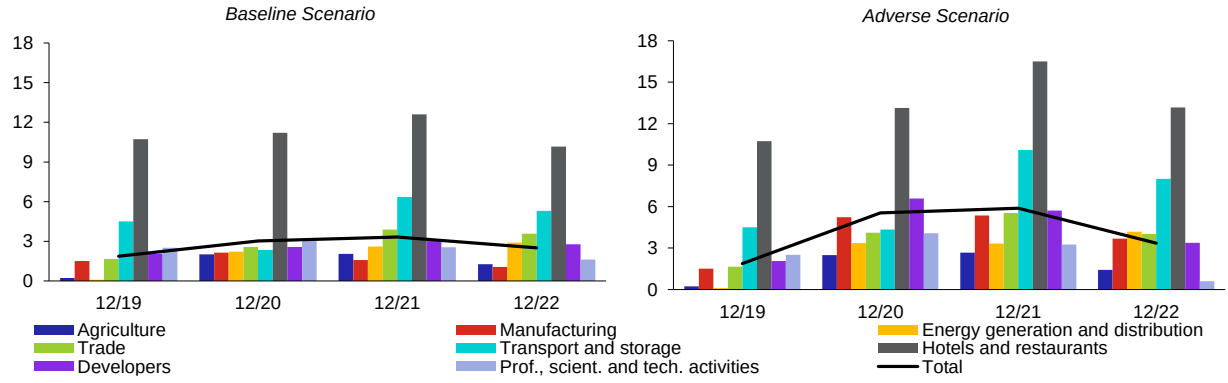
**If the *Adverse Scenario* were to materialise, output would drop again, with sectors geared towards foreign trade being subject to the largest stress**

Materialisation of the *Adverse Scenario* would mean repeated declines in output, which would not return to its 2020 Q4 level even at the test horizon. Construction, transport and manufacturing would be hit hardest, due to a significant slowdown in exports and investment activity (see Chart IV.12). The economic volatility would also be reflected in large differences in profitability across sub-sectors (see Chart IV.13). Although the profit rate would attain a similar aggregate level at the test horizon as in the *Baseline Scenario* on the back of lower labour costs due to a decline in employment, the trends would be mixed due to drops in demand. The smallest declines in relative profitability in this scenario would be recorded by property developers (with long-running very stable relative profitability), energy generation and distribution, and professional, scientific and technical activities. The decreases in profitability would generate an increase in the default rate of as much as 6% on the aggregate level (see Chart IV.14). The default rate would rise mainly in the hard-hit sub-sectors of transport and hotels and restaurants. Owing to the fall in economic performance, the default rate would also rise significantly in manufacturing and also among property developers, which would react sensitively to the expected decline in property prices and reduced demand for property (see Chart II.23E and Chart II.36).

**Chart IV.14**

**Default rate in selected sub-sectors in the *Baseline* and *Adverse Scenarios***

(%)

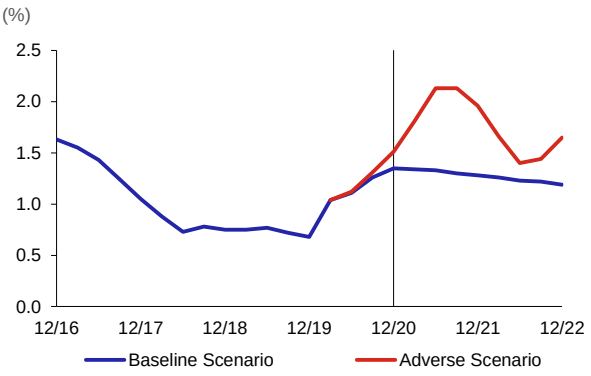



Source: CNB

## IV.4 THE HOUSEHOLD STRESS TEST[129]

The household stress test focuses on household credit risk, which the CNB measures using the 12-month default rate on mortgage loans. The CNB monitors the default rate over a three-year period using the *Baseline* and the *Adverse Scenarios*.

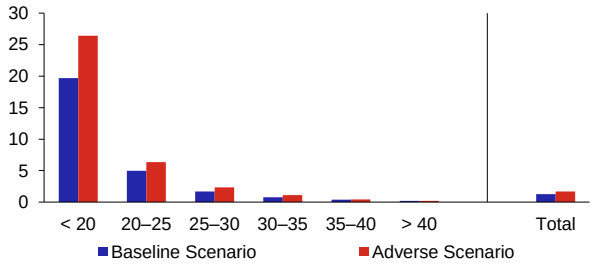
**Chart IV.15**
**12M default rate on mortgage loans to households by scenario**




Source: CNB

**Chart IV.16**
**Average default rate by income group**

(% of loans in given income group; x-axis: borrower's net income in CZK thousands)




Source: CNB

Note: The chart shows the average default rate calculated across the years of the scenario. Net income is the net monthly income of the principal mortgage loan applicant. The interval is closed from the right.

**Household credit risk is low in the *Baseline Scenario*…**

Credit risk rises only slightly in the *Baseline Scenario* (see section II.1.3). Despite the adverse developments assumed in the first half of 2021, the household sector remains sufficiently resilient in terms of financial soundness. The default rate[130] does not exceed 1.5% over the entire horizon of the *Baseline Scenario* and gradually returns to 1% at the end of the test period (see Chart IV.15).[131] This was aided by the statutory loan moratorium in place from April to October 2020, after which clients could use voluntary bank moratoria. The moratoria led to a smaller decrease in the stock of performing loans than would otherwise have occurred. This prevented major growth in the default rate in the first year of the stress test. The CNB's past recommendations establishing limits on total debt and debt service (DTI and DSTI caps; see section V.4.1) also played a positive role in mitigating the negative impacts of the *Baseline Scenario*. In particular, the recommended limit on debt service prevented the default rate from rising sharply after many households faced a sudden drop in net income.

**…mostly low-income households and households with high debt service are exposed to an increased risk of default**

Under the *Baseline Scenario*, the risk of default on mortgage loans is higher for low-income households, which are more sensitive to unemployment growth than high-income households. On average, up to 20% of households whose main mortgage applicant has a net monthly income of less than CZK 20,000 default over the individual years (see Chart IV.16). The default rate in the CZK 20,000–CZK 25,000 category is also high, albeit roughly one-quarter of that in the previous category. However, banks' credit exposure to these risk groups is low and has long been below 10% of the total mortgage portfolio. By contrast, the default rate is almost zero for high-income households, which account for the bulk of mortgage loans (see Chart II.26 CB). This is reflected in the sector's aggregate resilience. As regards debt service and total debt, much higher default risk can be observed for households that had a DSTI ratio of over 40% on taking out the loan (see Chart IV.17). The high concentration of mortgage loans for which debt service exceeds 40% of net income thus increases banks' vulnerability. The probability of default is spread more evenly across categories for the DTI. This notwithstanding, a higher level of default is apparent for mortgage loans that had a DTI ratio of more than eight times the applicant's net annual income when the loan agreement was concluded (see Chart IV.17)

**The situation of Czech households should not worsen significantly even if the unemployment rate or interest rates rise sharply**

The stress test also involved a sensitivity analysis simulating an additional increase in the unemployment rate and mortgage interest rates beyond the *Baseline Scenario*.[132] The simulated rise in the unemployment rate of 5 pp compared to the *Baseline Scenario* would *ceteris paribus* increase the 12-month default rate by around 0.4 pp (see Chart IV.18). However, the impacts of the rise in unemployment might be greater in the longer run, as labour market hysteresis might

129 The household stress test is focused on households with a mortgage loan. The stress testing methodology is described on the CNB website (see Stress testing: Household sector).

130 The 12-month default rate is a forward-looking indicator defined as the inflow of non-performing loans at time *t+1* divided by the total stock of loans at time *t*.

131 The default rate arising from the household stress test may not be equal to the 12-month default rate on housing loans as presented in section II (satellite model; see Chart II.37), the values of which enter the stress test of the banking sector (see section IV.1.1).

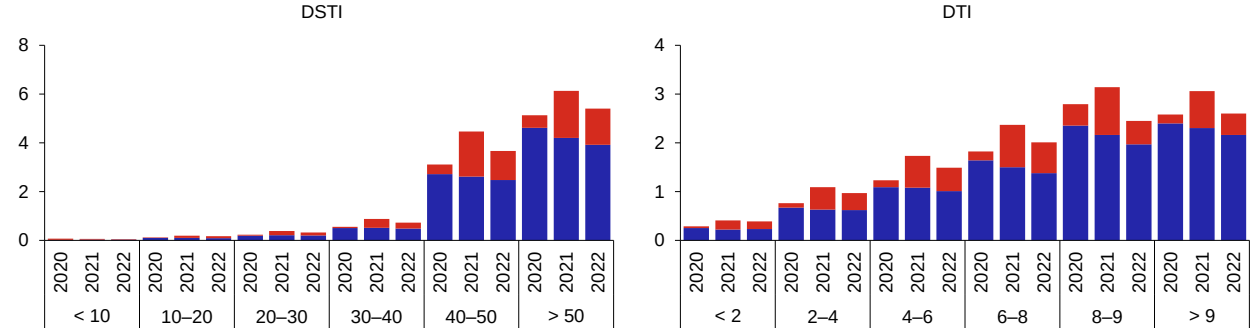
132 The unemployment rate and mortgage rates were chosen for the sensitivity analysis, as they strongly affect the estimated default rate in the stress test.

materialise, preventing a renewed decline in the unemployment rate. The same applies to an increase in mortgage rates, for which the impact of a shock to the default rate is only moderate and delayed due to long interest rate fixation periods (see Chart IV.18).[133] Only an increase in interest rates of 5 pp would have a visible impact on the inflow of non-performing loans over the horizon of this analysis. However, this would imply an average mortgage rate of 8% (see Chart IV.4 CB). Despite this simulated shock, the default rate would remain at historical lows of around 1.5%.

**Chart IV.17**

**12M default rate on mortgage loans to households by DSTI and DTI ratios**

(% of loans in given DSTI/DTI category; x-axis: DSTI ratio in %, DTI ratio in number of net annual incomes)



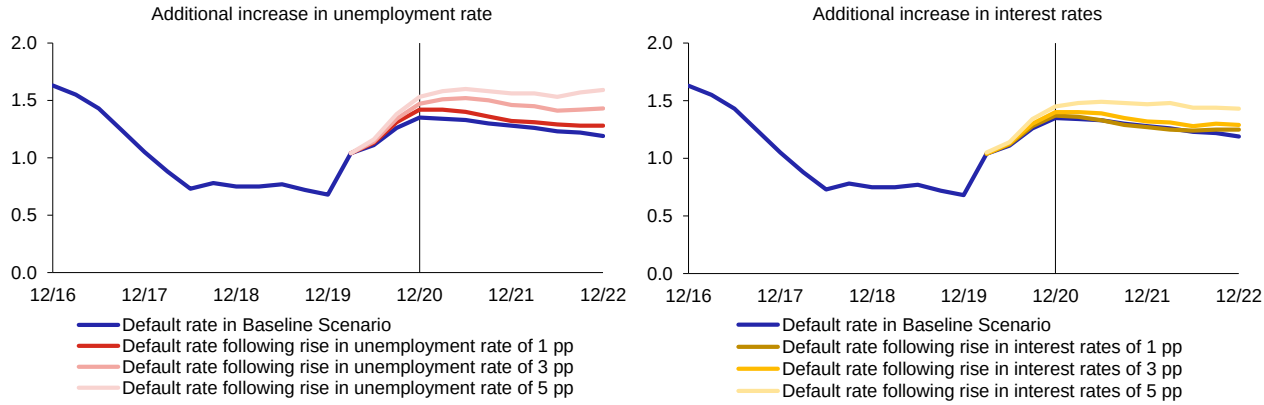

Source: CNB

Note: The share of the flow of non-performing loans in the *Baseline Scenario* is shown in blue and the additional share of the flow of non-performing loans in the *Adverse Scenario* is shown in red. DSTI and DTI intervals are closed from the right. DSTI/DTI categories are based on the ratio on the day the mortgage loan was taken out.

**Chart IV.18**

**12M default rate on mortgage loans to households given an additional rise in the unemployment rate and interest rates**

(%)




Source: CNB

Note: The simulated increase in the unemployment rate and interest rates is shown in Chart IV.4 CB.

**Developments under the *Adverse Scenario* confirm the sector's low credit risk**

If the *Adverse Scenario* were to materialise, the 12-month default rate would increase even after the first year of the test (unlike in the *Baseline Scenario)*, exceeding 2% in the middle of the second year (see Chart IV.15). In this situation, the inflow of non-performing loans would increase for low-income households. On average, up to 26% of households whose main mortgage applicant has a net monthly income of CZK 20,000 and 6% of households whose main mortgage applicant has a net monthly income of CZK 20,000–CZK 25,000 would experience repayment problems over the years of the scenario (see Chart IV.16). However, the rise in credit risk for households as a whole would still be relatively modest and should not significantly jeopardise the banking sector's stability. The *Adverse Scenario* also emphasises a non-linear relationship between the 12-month default rate and the DSTI ratio. While the increase in the default rate would be negligible for DSTI ratios of below 40%, the default rate would rise by almost 2 pp for DSTI ratios of over 40% (see Chart IV.17). In the case of the DTI ratio, by contrast, the 12-month default rate would be relatively even across all categories (see Chart IV.17). Even relatively low debt-to-net income ratios may therefore be risky at inappropriate debt service levels.

133 Maintenance of fixed-rate terms is assumed in the event of a change in interest rates. A rise in interest rates will thus only affect borrowers who refixed their loans in the given period.

## IV.5 PUBLIC FINANCE STRESS TEST

**The CNB reviews and evaluates the risks of concentration of sovereign exposures**

Since 2015, based on its internal methodology, the CNB has been annually reviewing and evaluating the risks of concentration of exposures to sovereign issuers in the balance sheets of credit institutions based in the Czech Republic (hereinafter "banks"). In its *Financial Stability Reports* it informs the market about which sovereign exposures it has identified as systemically important and whether it will require relevant banks to meet an additional capital requirement to cover the risk of concentration of these exposures at a three-year horizon. The methodology defines an important sovereign exposure as an exposure to a sovereign issuer with a minimum ratio of 100% to the bank's eligible capital. It becomes systemic if the assets of banks with important sovereign exposures exceed 5% of the total assets of all the banks operating in the Czech Republic, including branches of foreign banks. It is indicated that an additional capital requirement must be met if the three-year outlook for the sovereign risk indicator (ISR) in the *Adverse Scenario* exceeds one of its thresholds.[134] The CNB requires additional capital where the bank holds exposures in excess of the limit and this above-limit exposure is not already sufficiently covered by capital.[135]

**Exposures to Czech government debt were assessed as systemically important…**

The CNB assessed the investments of banks based in the Czech Republic in Czech government bonds as a systemically important sovereign exposure. The value of these exposures rose by CZK 276 billion year on year to CZK 790 billion at the end of 2020, accounting for 10.9% of these banks' total assets. The assets of banks with above-limit exposures accounted for 66% of the banking sector's total assets, as against 62% a year earlier. Exposures to other governments, the EU and the EIB were not found to be systemically important.

**…but their riskiness did not exceed the thresholds, despite the current outlook**

The ISR was estimated for systemically important exposures. Over the three-year horizon of the *Adverse Scenario*, its value increases from a low 0.24% in 2021 to 1.54% in 2022 and 1.79% in 2023 (see Chart IV.19). Although this is the highest figure since the stress test was first conducted, the ISR is still below the supervisory thresholds of 5% and 8% over the test period. The CNB will therefore not require banks based in the Czech Republic to meet an additional capital requirement to cover the risk of concentration of exposures to the Czech government in the next three years.

**In the *Adverse Scenario* a number of variables determining the ISR would exceed their critical limit…**

Highly subdued domestic economic activity is assumed in the *Adverse Scenario*. Nonetheless, the year-on-year decline in real GDP growth over the horizon of this scenario would be smaller than in the starting year (see section II.1.3). Therefore, the economic activity indicator measured by the year-on-year difference would not exceed its critical limit (see Table IV.9). By contrast, the general government primary balance would significantly exceed its critical limit. This would be due to a high primary deficit in the starting year and a further widening of that deficit in the *Adverse Scenario*. General government revenues, already severely affected by lower tax collection following a change in income taxation that took effect in 2021, would record an additional cyclical decrease in the *Adverse Scenario*, mainly in the area of tax revenues. By contrast, expenditure would increase somewhat due to expected expansionary government measures designed to continue stabilising the crisis-hit economy. In view of the stabilising role of fiscal policy, this would be justified and can be expected to occur against the background of a further easing of the Czech budgetary rules.[136] However, the adverse fiscal developments in the *Adverse Scenario* would cause a gradual rise in the credit risk premium on government bonds (see Chart II.23F), which for ten-year maturity would exceed their critical limit in the second and third years of stress (see Table IV.9). The current account would also exceed its critical limit in the same years. The critical limits for the variables monitoring rule of law and the share of foreign holders of government debt, the levels of which are already regarded as risky in terms of the ISR, would be exceeded over the entire forecast horizon.

**…government debt would also newly exceed the critical limit**

Coupled with subdued economic activity, the general government deficit would foster continued growth in government debt as a percentage of GDP over the entire stress horizon (see Chart IV.20). By comparison with the end-2019 pre-pandemic level (30.8%), the debt would more than double by 2023 (to 64.5%). The indicator would exceed the 55% debt brake In the second year of the scenario and the critical ISR limit at the end of the scenario (see Table IV.9).

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134 The CNB primarily monitors two ISR thresholds: a soft threshold of 5% indicating the creation of an additional capital requirement where an additional expert analysis proves this to be necessary, and a hard threshold of 8% indicating unconditional creation of an additional capital requirement.

135 The above-limit part of a sovereign exposure is determined using the ISR where the latter exceeds its thresholds. The ISR provides a simplified assessment of the risk of default on a sovereign exposure. The threshold separating the limit and above-limit parts of a sovereign exposure gradually falls as this indicator increases. As a result, the above-limit part rises. The highest effective limit is 222% and the lowest is 0%.

136 The option of making active use of fiscal policy for macroeconomic stabilisation may be substantially limited by measures brought about by the activation of the debt brake as specified in Article 14 of Act No. 23/2017 Coll., on Budget Responsibility. However, these measures are not activated if the economy is in a recession or post-crisis recovery (Article 15), which is what is assumed in the *Adverse Scenario*.

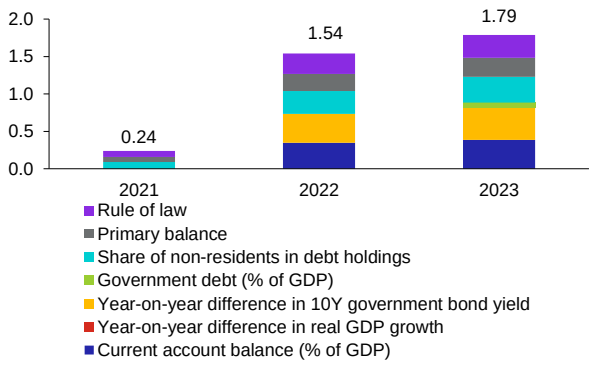
**Table IV.9**
**Czech public finance stress test**

| | Actual value# | *Adverse Scenario* | | | | Critical limit |
|---|---|---|---|---|---|---|
| | 2020 | 2021 | 2022 | 2023 | | |
| **Macroeconomic variables** | | | | | | |
| Year-on-year difference in real GDP growth (pp) | -8.0 | 2.3 | 3.2 | 0.3 | < | -1.0 |
| Current account balance (% of GDP) | 0.0 | -0.9 | -2.8 | -3.0 | < | -1.4 |
| Gross national savings (% of GDP)* | 26.5 | 26.5 | 26.5 | 26.5 | < | 19.3 |
| External debt (% of GDP)* | 61.6 | 61.6 | 61.6 | 61.6 | > | 113.5 |
| Difference between real 10Y GB yield and real GDP growth (pp) | 4.4 | 3.4 | 1.0 | 2.1 | > | 6.4 |
| **Fiscal variables** | | | | | | |
| Government debt (% of GDP) | 38.4 | 47.4 | 56.3 | 64.5 | > | 61.4 |
| General government primary balance (% of GDP) | -5.4 | -7.7 | -8.9 | -8.2 | < | -2.4 |
| Year-on-year difference in 10Y government bond yield (pp) | -0.3 | 0.5 | 0.5 | 1.8 | > | 0.5 |
| Government debt maturing within one year (% of GDP) | 4.2 | 6.1 | 7.2 | 6.9 | > | 15.1 |
| Share of government debt maturing within one year (%) | 11.0 | 12.8 | 12.8 | 10.7 | > | 33.2 |
| Share of foreign currency debt (%) | 10.3 | 4.6 | 1.4 | 1.1 | > | 29.0 |
| Share of non-residents in debt holdings (%)* | 33.9 | 33.9 | 33.9 | 33.9 | > | 25.9 |
| **Institutional variables** | | | | | | |
| Government effectiveness (WGI score)* | 0.9 | 0.9 | 0.9 | 0.9 | < | 0.7 |
| Political stability (WGI score)* | 1.0 | 1.0 | 1.0 | 1.0 | < | 0.8 |
| Rule of law (WGI score)* | 1.0 | 1.0 | 1.0 | 1.0 | < | 1.2 |
| Banking crisis | 0 | 0 | 0 | 0 | = | 0.0 |
| Past sovereign defaults | 0 | 0 | 0 | 0 | = | 0.0 |
| **Sovereign risk indicator (ISR, %)** | - | **0.24** | **1.54** | **1.79** | | |

Source: CNB, CZSO, ECB, World Bank

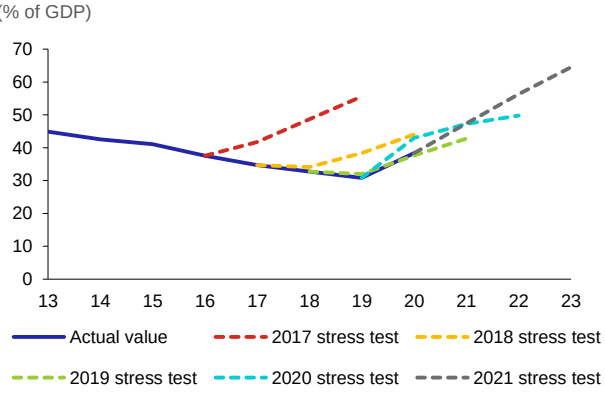
Note: The symbol > (< or =) denotes that a higher (lower or equal) value means a breach of the critical limit and indication of increased risk. The figures are rounded. Indications of a breach of the critical limit are based on unrounded figures. Where the limit is breached, the relevant variables are further indicated in red. * Variable not modelled; last known value assumed in projection. # Values known when Monetary Policy Report – Spring 2021 was being prepared.

**Chart IV.19**
**Decomposition of the sovereign risk indicator in the *Adverse Scenario***




Source: CNB, World Bank

**Chart IV.20**
**Comparison of the paths of public debt in the public finance stress tests**




Source: CNB

Note: Year-end data.

**However, debt service costs would not rise markedly as a result**

In the *Adverse Scenario*, debt service costs would not rise markedly as a result of these developments even though Czech government bond yields do go up (see Chart II.23F). This is because a large proportion of the interest costs over the scenario horizon are due to instruments issued in the past and thus do not give rise a need to refinance maturing debt at higher yields. Moreover, the average yield on newly issued debt instruments to finance future borrowing requirements would still be relatively low in historical terms in the *Adverse Scenario* and the effective interest rate would be lower than at the end of 2019 over the entire horizon (2.33% at the end of 2019 versus 1.5% at the end of 2023).

**A reassessment of the sustainability of government debt by foreign investors poses a medium-term risk**

Confidence in the sustainability of Czech public finances has been robust so far. Rating agencies rate the relatively low government and private debt favourably. Along with other financial institutions and non-residents, the sound and resilient domestic banking sector is generating demand for government bond issues, ensuring solid access to cheap financing of the Czech government's borrowing requirements (see section II.2.1). However, a sharp rise in government debt followed by a moderate public finance consolidation could foster a rating downgrade,[137] adverse sentiment on the bond market and portfolio reallocation mainly by non-residents, resulting in higher interest costs for new issues of Czech government bonds. The impact of higher debt service costs, however, would be simultaneously moderated in the test by still relatively low government debt and a dominant proportion of funding in the domestic currency.[138] The share of non-residents in Czech government debt holdings was 33.9% at the end of 2020, still high above the critical limit despite falling by almost 6 pp.

137 For example, when affirming the Czech Republic's rating at Aa3, Moody's cited a slowdown in government debt through sensitive fiscal consolidation as a condition for this rating to be maintained in subsequent years.

138 The low share of government debt issued in foreign currencies (10.3%) means that the domestic government sector is facing low exchange rate risk.

# V. MACROPRUDENTIAL POLICY

*Pursuant to Article 2 of the Act on the CNB, the CNB maintains financial stability and sees to the sound operation of the financial system in the Czech Republic. To achieve these objectives, it conducts macroprudential policy. To this end, it uses a set of macroprudential instruments focused mainly on the banking sector, which is the largest sector in the domestic financial system. This section evaluates the current position of the Czech economy in the financial cycle, the resilience of the domestic financial sector to the risks identified, and the tasks and recommendations arising from analyses for the settings of the CNB's macroprudential policy instruments.*

## V.1 THE CNB'S MACROPRUDENTIAL POLICY OBJECTIVES AND INSTRUMENTS

**Macroprudential policy responds to changes in systemic risk on an ongoing basis…**

The CNB sets macroprudential policy instruments on the basis of an assessment of the intensity of systemic risks. In conformity with an ESRB recommendation, it focuses on the fulfilment of intermediate objectives (see Table V.1) reflecting the existence of several sources of systemic risk and their own transmission mechanisms. Among the most important macroprudential instruments in the current regulatory framework are capital buffers, which are applied on top of the 8% minimum capital requirement (Pillar 1), and the Pillar 2 requirements (see section III.2.1). The CNB currently applies three capital buffers to strengthen the resilience of the banking sector (see Table V.2). The buffer rates reflect the current and expected cyclical and structural characteristics of the Czech banking sector. The exception is the capital conservation buffer, whose rate is constant over time.

**Table V.1**
**Summary of intermediate objectives and macroprudential instruments and evolution of specific risks**

| Intermediate objectives | Specific risk | Existence of specific risk in CZ | Key instruments | Applied in CZ | Detailed information |
|---|---|---|---|---|---|
| Mitigate excessive credit growth and leverage | Stronger credit recovery accompanied by easing of lending standards | Partly persists in housing loan area | Countercyclical capital buffer | 0.5% from 1 July 2020 to 30 June 2022<br>1.0% from1 July 2022 | V.3 |
| | Rising leverage, rising off-balance-sheet risk | No | Macroprudential leverage ratio | No | - |
| | Low risk weights of significant credit portfolios | Potential | Macroprudential tool to mitigate systemic risk at Member State level (Article 458 CRR) | No | V.2 |
| | Elevated growth in loans and risks in specific sector | Potential | Sectoral capital requirements (in particular real estate exposures) | Not as yet, CNB reacts to property exposure risks with other instruments | - |
| | Risk of spiral between property prices and property financing loans | Yes | LTV caps | Yes, eased on 1 April 2020 | V.4 |
| | Risk of excessive household indebtedness and debt service | Potential | LTI, DTI, LSTI, DSTI caps | No, DTI abolished from 1 April 2020, DSTI abolished from 1 July 2020 | V.4 |
| Mitigate excessive maturity mismatch and illiquidity | Long-term liquidity risk | No | Macroprudential NSFR | Microprudential minimum standard since 28 June 2021 | III.2.3 |
| | Short-term liquidity risk | No | Macroprudential LCR | Microprudential minimum standard since 2015 | III.2.3 |
| Limit exposure concentrations | Property exposure concentration | Yes | Systemic risk buffer | Not as yet, CNB reacts to property exposure risks with other instruments | V.2 |
| | Sovereign exposure concentration | Yes | Public finance stress test | Yes, option of additional capital requirements in event of elevated sovereign risk, since 2015 | IV.4 |
| Limit misaligned incentives | Potential impacts of problems in SIFIs on financial market stability and real economy | Yes | SIFI capital surcharges (G-SII and O-SII buffer) | No, O-SIIs identified, different instrument applied | V.2 |
| | | Yes | Systemic risk buffer | Yes, since 2017 for five banks | V.2 |
| Strengthen resilience of financial infrastructures | Counterparty default risk, interconnectedness of financial infrastructures | No | Margin and haircut requirements on CCP clearing | No | - |
| | | | Increased disclosure | No | - |
| | | | Systemic risk buffer | No | - |

Source: CNB

Note: The main goal of these instruments is to strengthen the resilience of the banking sector, not to mitigate systemic risk. The classification of intermediate objectives and instruments is based on Recommendation of the ESRB of 4 April 2013 on intermediate objectives and instruments of macro-prudential policy (ESRB/2013/1).

**…the macroprudential space created has strengthened the resilience of banks and their capacity to lend to the real economy in the current adverse economic conditions…**

The macroprudential policy applied in the expansionary phase of the financial cycle (2015–2019) created considerable macroprudential space for the domestic banking sector to respond to an adverse economic situation like the one which arose last year as a result of the coronavirus pandemic. In line with its macroprudential policy strategy,[139] the CNB in previous years actively and conservatively managed the regulatory capital buffer levels and applied macroprudential recommendations on the provision of mortgage loans, which have become the banking sector's key loan portfolio and loan product. At the end of 2019, the CCyB rate in the domestic banking sector was 1.75% (0.2% on average in the euro area),[140] while other capital buffers stood at 4.4% of the entire sector's risk-weighted exposures (3.4% on average in the euro area). With the onset of the coronavirus pandemic, the CNB lowered the CCyB rate to 0.5% with effect from 1 July 2020. This led to an increase in the capital surplus of banks, a decrease in the capital intensity of new loans and a greater capacity of banks to lend to the economy (the spare lending capacity created by partially releasing the CCyB is CZK 460 billion), even in the event of rising credit losses. Given the expected macroeconomic developments, the CNB later opted to return the CCyB rate to 1%, i.e. the rate covering the usual level of risks, with effect from 1 July 2022. The CCoB has applied to all banks in the Czech Republic since 2014 at a rate of 2.5%. Since 2017, five systemically important banks have been required to maintain a systemic risk buffer, with rates ranging between 1% and 3%. The sum of the capital buffers – the combined capital buffer – currently ranges between 3% and 6% for individual banks depending on their systemic importance.

**Table V.2**

**Summary of macroprudential capital buffers in the Czech Republic**

(%)

| Capital buffer | Rate | Date of effect |
|---|---|---|
| Capital conservation buffer (CCoB) | 2.50 | 2014 |
| Countercyclical capital buffer (CCyB) | 0.50 | 1 July 2020–30 June 2022 |
| | 1.00 | 1 July 2022 |
| Systemic risk buffer (SRB) | 1.00–3.00 | 2014 |
| Buffer for other systemically important institutions (O-SIIs) | - | - |

Source: CNB

**…and the CNB considers it natural for banks to use it if necessary…**

The CNB has long emphasised that it considers it natural for banks to use their combined capital buffer to cover credit losses in the event of adverse economic developments. This supports their ability to finance the real economy without interruption, even in bad times. This approach is fully in line with the regulatory changes which occurred after the global financial crisis. The CNB is also aware that the process of rebuilding macroprudential buffers in accordance with the regulations is usually gradual and can take some time depending on economic developments and banks' financial results.[141]

**…though this may be limited by the unintended behaviour of banks as discussed in international fora**

The regulations relating to capital buffers, except for the CCyB, do not allow macroprudential authorities to reduce buffer rates in adverse economic situations. They assume that banks will use the capital contained in the relevant buffers to cover losses and that their regulatory capital will temporarily be lower than the sum of the Pillar 1, Pillar 2 and combined capital buffer requirements. If this were to happen, bank owners must expect their profits to be used temporarily to a large extent to restore the regulatory buffer levels. Some analyses suggest[142] that concerns about restrictions on profit distributions may weaken the incentive for banks to use capital buffers and could have a negative impact on banks' market valuation and hence on their ability to obtain own funds on the capital market. For these reasons, despite the existence of capital buffers, banks may limit lending and, in doing so, exacerbate adverse economic situations. The CNB is generally aware of the risk of this behaviour by banks. However, it believes that the legislative framework clearly defines the function and role of capital buffers and feels that macroprudential authorities should play an increased role in communicating with banks to support their role as envisaged in the legislation. It also considers it very unlikely that this risk will materialise this year.

139 For details see https://www.cnb.cz/export/sites/cnb/en/financial-stability/.galleries/macroprudential_policy/cnb_macroprudential_policy_strategy.pdf.

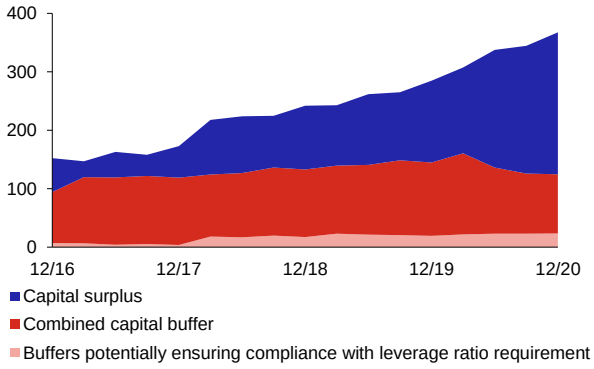
140 For details see https://www.ecb.europa.eu/press/key/date/2021/html/ecb.sp210301~207a2ecf7e.en.html.

141 Having breached the combined capital buffer, the bank submits a capital conservation plan and temporarily restricts the distribution of its profits until the reserve is replenished. The specific conditions of the restrictions on profit distributions are set out in Article 141 of CRD V.

142 For details see Chapter 1, International Monetary Fund, April 2021 Global Financial Stability Report.

**The limited usability of capital buffers may also be of a regulatory nature due to the leverage ratio requirement…**
A leverage ratio requirement of 3% of total exposures will be binding on banks from 28 June 2021. Banks that are supposed to maintain a higher level of capital under the leverage ratio requirement compared to the Pillar 1 and Pillar 2 capital requirements will use capital ensuring compliance with the capital buffers to meet the leverage ratio requirement as well. In some extreme situations, such banks may not be able to make full use of their capital buffers to cover their losses, as such use would simultaneously give rise to a breach of the leverage ratio requirement. The above situation pertains to a relatively small proportion of the total capital buffers in the domestic banking sector and is thus not currently systemic (19% of the combined capital buffer, or 6% of the buffer including the capital surplus; see Chart V.1).[143]

**Chart V.1**
**Capital reserves and their potential overlap with the leverage ratio requirement**
(CZK billions)




Source: CNB
Note: The light red part of the chart illustrates the amount of buffers that would have been used to meet the leverage ratio requirement had it been binding before 28 June 2021.

**…and may become even more important because of the phase-in of the minimum requirement for own funds and eligible liabilities (MREL)…**
Since 2020, the CNB has been setting the minimum requirement for own funds and eligible liabilities (MREL) in terms of risk-weighted exposures ($MREL_{TREA}$). In February 2021, it published a revision of its General Approach to MREL adding a requirement expressed in relation to total exposures ($MREL_{TEM}$). Banks will be required to maintain enough eligible liabilities to satisfy both requirements by the start of 2024; they are obliged to meet the binding intermediate objective at the start of 2022 at the latest. While the eligible liabilities for compliance with the $MREL_{TREA}$ may only include potential capital surpluses, the $MREL_{TEM}$ may additionally include capital buffers. In this context, the CNB had previously stated that, especially in the period of adapting to the new requirement, compliance with the MREL predominantly using capital could weaken banks' ability to respond to changing economic conditions and limit the use of capital buffers as a potential source to cover losses and lend to the economy (see section 3.2, FSR 2018/2019).

**…depending on the structure of the sources used to cover it**
The structure of the sources used to cover the MREL (the ratio of own funds to other eligible liabilities) will determine the degree of potential limited usability of capital buffers. Generally speaking, a high share of own funds used as a source to cover the MREL may reduce the usability of the regulatory and voluntary buffers for macroprudential policy purposes while simultaneously reducing the stabilisation function of the capital surplus on top of the MREL for the purposes of the resolution framework.[144] The data available as of the end of 2020 suggest that the banks concerned would temporarily use a large proportion of their capital surpluses – and also a small part of their own funds used to meet the combined capital buffer – to comply with the interim MREL. The current situation thus indicates potentially strongly limited usability of capital surpluses and moderately limited usability of regulatory capital buffers. However, banks will optimise the structure of their MREL coverage sources on an ongoing basis, and a majority of them are indicating a gradually rising share of debt instruments.[145] This should lead to the release of part of their capital surpluses and buffers for macroprudential purposes.

143 For details see Pfeifer, L. (2020): Usability of Capital Buffers under a Binding Leverage Ratio Requirement. Thematic Article on Financial Stability 6/2020, CNB.
144 In times of stress, it may be difficult to renew debt instruments with shorter maturity, and this may result in a need to use capital to meet the MREL.
145 This is likely to occur to a greater extent after the restrictions on dividend distributions are eased.

However, banks can be expected to simultaneously reduce their current capital surpluses in order to optimise the cost-effectiveness of their resolution framework sources.

**The approach to compliance with the MREL and its effects on the effectiveness of macroprudential instruments will be a subject of ongoing analyses**

The overlap of the requirements of the macroprudential framework and the resolution framework may lead to similar dilemmas as signalled by the ongoing debate about the behavioural and regulatory limits on the usability of capital buffers. The CNB will thus analyse banks' approaches to compliance with the MREL on an ongoing basis. In particular, it will examine the risks associated with the structure of MREL coverage sources for the usability of voluntary and regulatory capital buffers and their implications for the effectiveness of macroprudential policy capital instruments and the resolution framework. The institutions concerned are currently indicating a shortfall in eligible liabilities to meet the targets applicable from 2022/2024. This, along with the expected larger role of debt instruments in covering the MREL, suggests that an increased rate of issuance of eligible liabilities and similar internal instruments can be expected, which may affect banks' profitability.

**In response to the coronavirus pandemic, the CNB eased its credit ratio caps mitigating mortgage market risks**

Since 2015, the CNB has been applying credit ratio caps in the form of a Recommendation to mitigate risks associated with the provision of retail loans secured by residential property. These include, or have included, LTV, DTI and DSTI caps. In setting these caps, the CNB reacted in a growth phase of the financial cycle to a spiral of rising amounts of mortgages and property prices related to relaxed credit standards and over-optimistic expectations of economic agents. In response to the coronavirus pandemic, the DTI and DSTI caps were abolished and the LTV caps was eased, mainly as a result of expectations of more cautious behaviour by clients and mortgage lenders and more conservative expectations by them about future economic developments. Section V.4 provides a more detailed description of the risks associated with the residential property market and mortgage lending and of the reasons for the settings of the instruments used to mitigate these risks.

## V.2 STRUCTURAL CAPITAL BUFFERS

### V.2.1 Risks associated with the systemic importance of institutions

**After the transposition of CRD V into Czech law, the CNB will start to apply the O-SII buffer to mitigate the risks of systemically important institutions…**

According to the CNB's evaluation, the Czech financial sector still has six other systemically important institutions (O-SIIs), so the list of O-SIIs for 2021 is unchanged.[146] The CNB, like several other national macroprudential authorities in Europe,[147] currently applies the SRB to mitigate risks associated with the systemic importance of institutions.[148] After the transposition of CRD V, it will only be possible to use the O-SII buffer. The highest rate will be 3%. In the case of domestic institutions that are subsidiaries of foreign institutions identified by their domestic regulators as nationally or globally systemically important (O-SIIs or G-SIIs), the CNB will be able to set the upper limit no more than 1 pp above the foreign parent institution's O-SII or G-SII buffer rate as set by its domestic regulator, or at 3%, whichever is the lower. The transposition will also allow the CNB to set the sum of the structural buffers (the O-SII buffer and the SRB) at a maximum level of 5% without consulting the European Commission.

**…the CNB will apply the bucketing approach to calibrate the O-SII buffer**

The CNB will calibrate the O-SII buffer using a methodology based on the bucketing approach with supervisory assessments, which will use systemic importance scores calculated according to EBA guidelines.[149] The calculated systemic importance score will classify institutions into score buckets, with a specific O-SII buffer rate assigned to each bucket. This approach seems appropriate mainly because of its transparency and its use as best practice by EU Member States and in the EBA's methodological guidelines. This facilitates communication with the relevant authorities in this area. The highest rate for the calibration of the buffer in the highest-score bucket will correspond to the legislative limit of 3%. It will thus be equal to the highest SRB rate the CNB is currently using to mitigate systemic importance risks.

### V.2.2 Structural risks associated with the concentration of property financing loans

**The concentration of property financing loans rose in 2020…**

The CNB regularly assesses structural systemic risks to financial stability.[150] One of the most important in the domestic banking sector is the steadily rising concentration of loans associated with the financing (purchase and construction) of property (see section 5.1 in FSR 2016/2017; section 4.2.3 in Risks to financial stability and their indicators 2019). Their share in loans to the private non-financial sector stood at 65.5% at the end of 2020, up by 1.8 pp year on year (see Chart V.2). Available comparable data as of the end of 2020 show that the concentration of loans in the domestic banking sector is above-average compared with other EU countries (see Chart V.3).

**…and the largest component is retail loans secured by residential property**

The share of housing loans in loans to the private non-financial sector rose by 1.7 pp year on year to 48.1%. This portfolio accounts for the largest share of real estate loans in the Czech Republic (see section V.4). This share – and hence the related concentration – could increase further amid subdued demand for loans to non-financial corporations and persisting high demand for housing loans.

146 As of 28 June 2021, PPF Financial Holdings B.V. (relevant entity: PPF banka) will be excluded from the O-SIIs list for a transitional period owing to the changes to the regulatory framework for O-SIIs in CRR II.

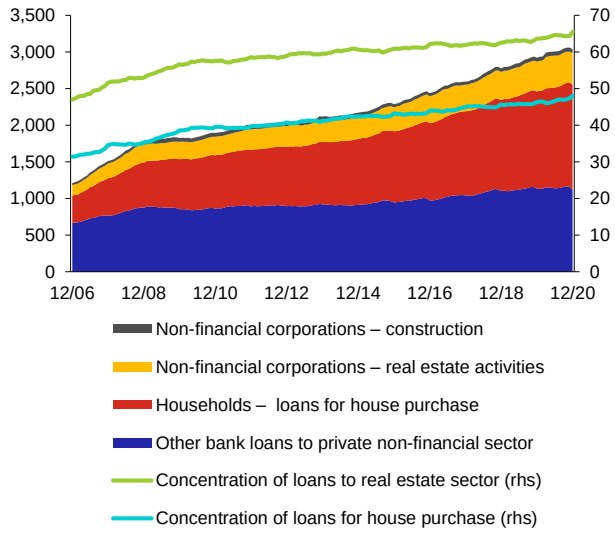
147 Until CRD V is transposed into their national legislation.

148 This is mainly because, under the current regulations, the buffer rate for other systemically important institutions has so far been limited to just 2%. In the case of subsidiaries, it has been limited by the O-SII or G-SII buffer rate of the parent institution or 1%, whichever is the higher.

149 This involves a switch from setting SRB buffer rates based on evaluating the systemic importance of individual banks (Skořepa and Seidler, 2013) to assessing systemic importance at the highest level of regulatory consolidation of the institution at the domestic level. For details on the calculation of scores, see EBA (EBA/GL/2014/10: https://eba.europa.eu/eba-publishes-criteria-to-assess-other-systemically-important-institutions-o-siis-).

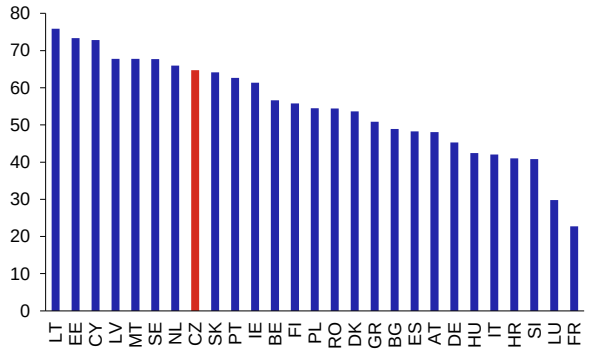
150 In line with the CNB's Macroprudential Policy Strategy, a systemic risk to financial stability is defined as a risk of a serious failure occurring in the entire financial system or a part thereof, with undesirable impacts on the current and future development of the economy as a whole. For details see https://www.cnb.cz/export/sites/cnb/en/financial-stability/.galleries/macroprudential_policy/cnb_macroprudential_policy_strategy.pdf. In line with the definition in Recommendation ESRB/2013/1, structural systemic risks are risks distributed across the financial sector at a given time. The nature of the definition of systemic risks thus implies that their potential materialisation can lead to a serious failure with undesirable impacts on the current and future development of the economy as a whole.

**Chart V.2**
**Concentration of bank loans in the property segment**
(CZK billions; right-hand scale: %)




Source: CNB

**Chart V.3**
**Comparison of the concentration of bank loans in the property segment in the EU as of 31 December 2020**
(%)




Source: EBA
Note: The chart shows data for mortgage loans and commercial property financing loans.

**The concentration of loans in the residential property segment may be creating potential for higher losses in bad times…**

The risk of concentration of loans for financing the purchase and construction of property consists in the fact that the more similar the exposures a bank holds at a given time, the more likely it is that a long-lasting adverse shock to the property market (collateral value) and/or to the income used to repay these exposures will lead to a substantial decline in the quality of its loan portfolio. Given the systemic dimension of loans in the real estate area, the importance of property in the economy, and the interconnectedness of banks, significantly higher losses may be incurred in the banking sector as a whole[151] than those considered by individual banks in their credit risk models.

**…especially if accompanied by other structural risks…**

The impact on the banking sector of adverse developments in the property market may be exacerbated by interactions with other structural characteristics of the financial sector, relevant exposures and the macroeconomic environment. In particular, there is significant concentration of the business models of systemically important Czech institutions on loans for house purchase, and income on these loans is a key source of profit. An environment of potentially sustained low interest rates and continued rising demand for relatively profitable safe assets, including among the public and residential property investors, may also play a role. Last but not least, the potentially low risk weights for mortgages in some institutions fail to take the systemic risk of concentration fully into account. The debt of Czech households has been relatively stable in recent years and low by international comparison (see Box 1). This limits the Czech banking sector's structural vulnerability associated with mortgage lending in the event of shocks to borrowers' incomes.

**…or by the simultaneous action of cyclical factors represented in the domestic economy by growth in loans for house purchase**

The structural component of systemic risk associated with concentration of loans in the property sector has been gaining momentum since 2014 (see Chart V.2). Year-on-year growth in housing loans has long outpaced that in loans for household consumption and loans to non-financial corporations (see Chart V.6). Accompanying factors increasing the risk of a stronger impact of a potential adverse shock on banks' financial results and capital include (i) residential property prices and their overvaluation (see section II.1.2), (ii) a continued downward trend in mortgage risk weights set using internal models (see section III.2) and (iii) relatively moderate provisioning during the coronavirus pandemic thus far due to stabilisation measures (see section III.2.2). Since the start of the expansionary phase of the financial cycle, the CNB has been reacting to cyclical risks using the relevant macroprudential instruments (CCyB, LTV, DSTI, DTI).

151 Possibly also in other sectors which grant similar loans.

**The CNB has other macroprudential instruments at its disposal to mitigate potential structural risks**

The CNB indicated previously that it is ready to apply macroprudential tools to mitigate the risk of concentration in housing loans if necessary. They include the SRB (section 5.1 in FSR 2016/2017; section 4.2.3 in Risks to financial stability and their indicators 2019). Additionally, a sectoral SRB (sSRB) will be available after the transposition of CRD V into Czech law. It is possible to react to the risk associated with low mortgage loan risk weights using Article 458 of the CRR (i.e. to set the minimum risk weights for major credit portfolios) or Article 164 of the CRR (to set a minimum LGD value for IRB banks). In practice, it is also possible to react using a combination of these tools. For example, Norway currently uses both the SRB and Article 458 of the CRR to mitigate the risks in the area of housing loans.[152] Nonetheless, the use of these instruments in the Czech Republic has not been found to be justified or effective in the past (section 4.3.2 in FSR 2015/2016; Box 3.1 in FSR 2018/2019). However, the CNB will continue to assess the need to use them in the event of an increase in systemic risks.

**The banking sector's resilience to concentration risk can be assessed using the results of the *Adverse Scenario* of the macro stress test**

To assess the degree of risk associated with the concentration of housing loans in the banking sector, the impact of their potential materialisation on profitability and capital stability is analysed. The results of the *Adverse Scenario* of the solvency macro stress test (section IV.1) are used for this purpose. In the scenario, year-on-year housing loan growth averages 4.7% and household debt rises moderately by 2 pp to 33% of GDP at the test horizon. The scenario can be considered sufficiently stressful even in a situation involving the potential combination and interaction of structural and not fully materialised cyclical risks in an environment of significant concentration. The 12-month PD of the housing loan portfolio rises as high as 4.4% from an initial level of 0.6% in 2020. LGD goes up from 15% in 2020 to 30.4%, and the cumulative drop in residential property prices at the test horizon is 19.8%. The scenario works with similar levels of key risk variables as the risk analyses of countries providing notification of the application of Article 458 of the CRR (Sweden and Finland) in order to mitigate banks' structural risks on the housing loan market (see Box 3.1, FSR 2018/2019).

**The expected credit losses on housing loans during the *Adverse Scenario* of the test are covered by the income on such loans…**

Average quarterly provisioning at the sector level totals around CZK 4.7 billion. Conversely, the net interest margin on housing loans is around CZK 5.3 billion. Therefore, during the test, the total provisions do not exceed the income on this portfolio, nor do they result in a loss which could weaken the sector's capital position. This indicates that the potential risk of portfolio losses in the *Adverse Scenario* at the current level of concentration does not require a macroprudential response in the form of using the structural capital buffer to enhance the sector's loss-absorption capacity.

**…rising risk weights in the *Adverse Scenario* increase the amount of regulatory capital…**

The deterioration in the housing loan portfolio in the *Adverse Scenario* will cause risk weights to rise by 3.7 pp over the test period compared to the initial level as of 2020 Q4. The absolute value of the risk-weighted capital requirement increases by CZK 4.8 billion. This enhances the sector's ability to absorb unexpected credit losses even though, other things being equal, there is a decline in capital surplus/ratio (reallocation of the capital surplus to the regulatory regime). The fall in the capital ratio due to the growth in risk weights does not impair the sector's systemic capital stability, which is also supported by the initial level of capital buffers. The *Baseline Scenario* signals a potential structural risk of low risk weights. Here, the risk weights decrease by 3.3 pp over the test horizon, reducing the absolute capital requirement.

**…the sector's ability to absorb unexpected losses is also enhanced by a positive CCyB rate and other buffers**

The conceptual approach to setting the CCyB rate[153] also assumes coverage of unexpected credit losses arising from the possible model risk of underestimating the true risk weights. The application of a positive CCyB rate (currently 0.5%, or around CZK 13 billion) and the fact that its released part is now included in the capital surplus (1.25%, or CZK 30 billion), combined with the other capital buffers (2.5%–5.5% depending on the institution's systemic importance, or CZK 112 billion) thus enhance the sector's ability to absorb potential losses on housing loans. However, one should bear in mind the implicit structural risk that unexpected or large losses in other portfolios may undermine the sector's true ability to absorb losses on a particular portfolio using capital buffers. A risk assessment of all the main credit portfolios and their interactions is therefore also relevant.[154] However, the announced return to a neutral CCyB rate (see section V.3; a 1% rate implies an absolute CCyB of around CZK 30 billion) will further enhance the banking sector's ability to absorb unexpected losses.

152 See https://www.regjeringen.no/en/aktuelt/reciprocation-request-to-the-esrb-on-capital-requirements/id2831149/.

153 See https://www.cnb.cz/export/sites/cnb/en/financial-stability/.galleries/macroprudential_policy/countercyclical_capital_buffer/ccyb_methodology.pdf.

154 The possible need to apply the sectoral SRB to the risks of the portfolio of loans to non-financial corporations or the portfolio of loans to households for consumption may suggest a situation in which the *Adverse Scenario* of the stress test indicates provisioning significantly exceeding the net interest rate margin and the available capital buffers. In the *Adverse Scenario*, provisioning for loans to non-financial corporations is averaging around CZK 6.9 billion per quarter at present, as against a net interest rate margin of CZK 4.8 billion. The opposite applies to consumer credit – the net interest rate margin is CZK 5.2 billion, whereas provisioning is around CZK 3.8 billion.

## V.3 THE COUNTERCYCLICAL CAPITAL BUFFER

The CNB has been setting the countercyclical capital buffer (CCyB) since 2014 with the aim of limiting the negative impacts of the financial cycle on the banking sector and thus preventing the transmission of negative shocks to the real economy. Given the wide range of manifestations of the financial cycle in the real economy and the financial sector, the CNB estimates the appropriate CCyB rate on the basis of a comprehensive assessment of a set of macrofinancial and bank-specific indicators. The CNB regards as appropriate a CCyB rate that is sufficient to cover the potential losses stemming from the materialisation of cyclical risks while maintaining banks' capital capacity for lending at a sufficient level.[155]

**The CNB increased the CCyB rate to 1% with effect from 1 July 2022**

The CNB Bank Board decided at its meeting on 27 May 2021 to increase the CCyB rate to 1% (see Chart V.4). In taking this decision, the Bank Board took into account the standard rate concept,[156] which the CNB applies after the acute phase of an economic downturn has faded away. The Bank Board also considered the indicators and analyses presented below assessing the position of the domestic economy in the financial cycle and the degree of vulnerability of the banking sector. They showed that the economy had come through the acute phase of the economic and credit downturn and the taking on of new risks against the backdrop of favourable financial conditions had intensified, due mainly to the situation in the household sector.[157] Owing to low materialisation during the pandemic, the previously accepted aggregate cyclical risks in the banking sector's balance sheet meanwhile remained elevated. The Bank Board agreed that it was desirable to respond to this in good time by increasing the CCyB rate to the standard level, as this would enable the banking sector to maintain its resilience to this type of risk.

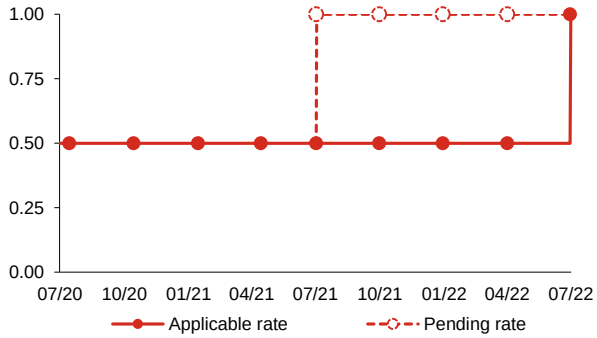
**Debt financing of property purchases resulted in a year-on-year increase in the financial cycle indicator**

The financial cycle indicator (FCI) serves as a starting point for assessing the position of the economy in the financial cycle. It stood at 0.145 in 2020 Q4 (see Chart V.5), which represents a pronounced year-on-year increase. The increase in the FCI was driven solely by developments in the household sector, especially strong growth in housing loans and a related rise in residential property prices. That the trends are mixed across credit segments is confirmed by a higher negative contribution of the correlation between the components of the FCI, which led to a slight quarter-on-quarter decline in the aggregate indicator despite substantial increases in the other components.

**Chart V.4**

**Applicable and pending CCyB rate in the Czech Republic**

(% of total risk exposure)

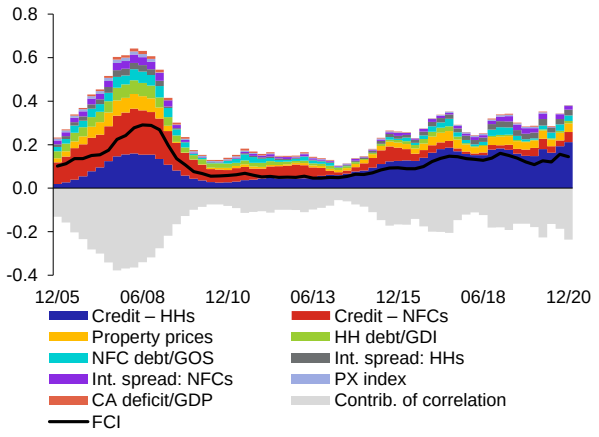



Source: CNB

**Chart V.5**

**Financial cycle indicator**

(0 minimum, 1 maximum)




Source: CNB, CZSO

Note: The interest spread is the difference between the client rate on new loans and the 3M PRIBOR. The negative contribution of the cross-correlation structure to the FCI value (the loss due to imperfect correlation of the subindicators) is the difference between the current FCI value and the upper bound, which assumes perfect correlation between all indicators. Weak correlation between the subindicators is reflected in growth in the negative contribution to the overall FCI value.

155 For more details on the setting of the CCyB rate see the methodological document The CNB's approach to setting the countercyclical capital buffer, which can be found on the CNB website.

156 For details see The countercyclical capital buffer rate for covering the usual level of cyclical risks in the Czech Republic.

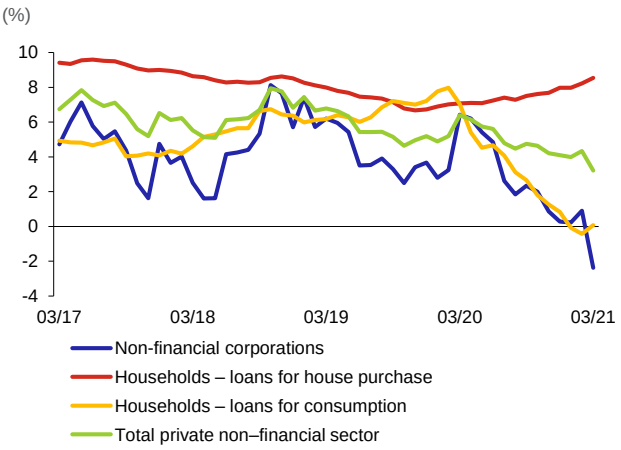
157 The return of the CISS indicator expressing systemic stress from financial markets to pre-pandemic levels also indicates a calming of financial market tensions (see Chart II.7 CB).

**Growth in bank loans slowed slightly amid mixed trends across the loan segments**

Year-on-year credit growth in the private non-financial sector slowed in 2020 and 2021 Q1 amid very mixed growth across the loan segments. Credit growth accelerated in the case of loans to households for house purchase (see Chart V.6), exceeding the short-term and long-term historical averages (see Chart V.7). Strong growth was also recorded by genuinely new loans to households, which were also driven mainly by loans for house purchase (see Chart V.8). Growth in consumer credit to households and loans to non-financial corporations turned negative in Q1.[158] The growth in both segments was significantly below the historical average. Under the *Baseline Scenario*, they are expected to return to their long-term averages roughly in the second half of 2022 (see Chart II.35 and Chart II.36). Despite slowing growth in the stock of loans, positive growth could be observed for genuinely new bank loans in the non-financial corporations segment in late 2020 and early 2021. This is expected to intensify gradually as investment activity recovers (see section II.2.2). Deferred demand could have a major impact on the subdued activity in consumer credit provided to households for consumption. Realisation of this demand in the coming periods may foster a significant upswing in credit growth in this segment.

**Chart V.6**

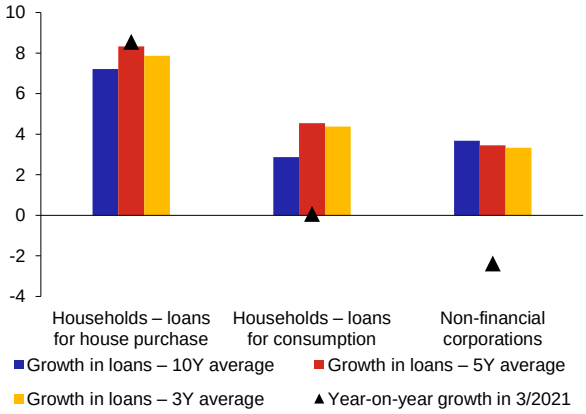
**Year-on-year growth in bank loans to the private non-financial sector**




Source: CNB

**Chart V.7**

**Average and current growth in bank loans to the private non-financial sector**




Source: CNB

**The cyclical risks in the banking sector's balance sheet grew further**

Despite the strong negative shock caused by the pandemic, the accumulated risks in the banking sector's balance sheet did not materialise to any great extent, due in part to fiscal measures. At the same time, the relaxed financial conditions, banks' easing credit standards (see section V.4.1, Chart V.23 and Chart V.25) and positive investment sentiment of households, combined with a series of measures in the economic policy area, fostered new cyclical risk-taking. The aggregate cyclical risks in the banking sector's balance sheet grew further, albeit more slowly than in previous years.[159] The continued accumulation of risks is creating potential for higher credit losses in the future. The prudential estimate of potential losses beyond the expectations in the *Baseline Scenario* is currently around CZK 15.5 billion.

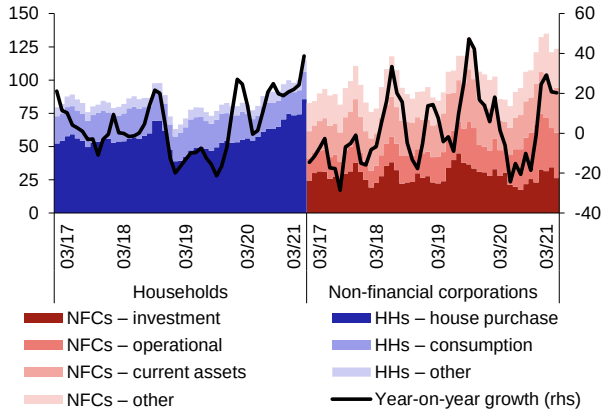
**Banks increased their provisioning in 2020**

Expecting higher credit losses, banks started to increase their loan provisioning in a forward-looking manner in March 2020. This was reflected in an increase in impairment losses (see Chart V.9). When this indicator is adjusted for claims on the CNB and the government, it is clear that although credit risk costs did not reach the 2009–2010 levels, they were approaching these levels despite the absence of large credit losses, even though banks reduced their provisioning in early 2021. The BPI, which expresses the ratio of the margin on the stock of loans to provisions per unit of credit, decreased considerably in 2020 (see Chart V.10), suggesting an increased degree of prudence on the part of banks. By contrast, a slight increase in the sector's vulnerability may signal a loosening of lending standards, especially for various types of loans to households (see Chart V.1 CB).

158 The decline in credit growth to negative levels in the case of non-financial corporations in March 2021 was partly due to base effects caused by depreciation of the euro against the koruna in March 2020 and a resulting increase in the total stock of loans in koruna terms.

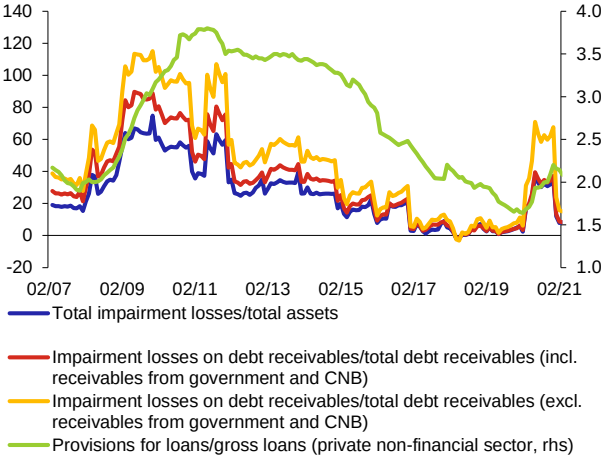
159 One of the consequences of the sectoral divergence is a gradual increase in the share of loans to households in total loans to the domestic private non-financial sector. Loans to households currently account for more than 60% of these loans.

**Chart V.8**
**Amounts of genuinely new bank loans to the private non-financial sector**
(three-month totals in CZK billions; right-hand scale: %)



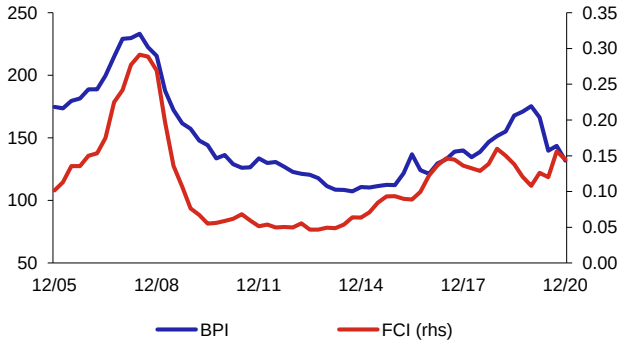

Source: CNB
Note: Genuinely new loans comprise increases in existing loans and are adjusted for refinanced and refixed loans. The growth rate is calculated using three-month totals.

**Chart V.9**
**Impairment losses and the provisioning ratio in the banking sector**
(bp; right-hand scale: %)



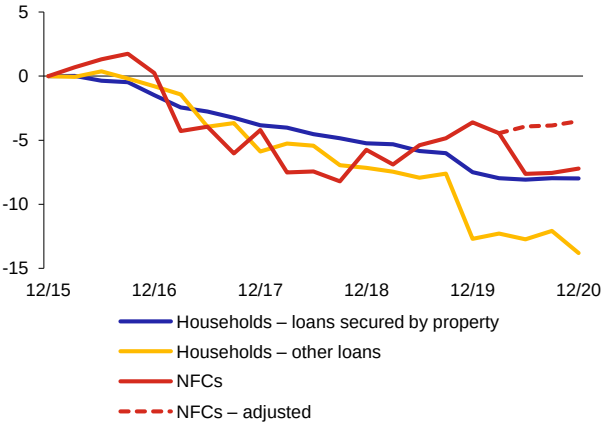

Source: CNB
Note: Impairment losses are annualised for the sake of comparability in individual months. Debt receivables are defined as the sum of loans and debt securities designated at fair value through OCI and at amortised cost.

**Chart V.10**
**BPI and FCI**
(%; right-hand scale: 0 minimum, 1 maximum)




Source: CNB
Note: The BPI expresses the ratio of the margin on the stock of loans to provisions per unit of credit. The margin on the stock of loans is the difference between the client lending rate and the client deposit rate.

**Chart V.11**
**Change in risk weights compared with the start of the strongly expansionary phase of the financial cycle**
(pp)




Source: CNB
Note: According to the CNB's analyses, the strongly expansionary phase of the financial cycle started in 2015 Q4. For non-financial corporations, the chart also shows the figures adjusted for a regulatory change that in 2020 Q2 broadened the range of corporate exposures to which the risk weight-lowering SME supporting factor can be applied.

**Risk weights on credit portfolios under the IRB approach did not respond to the economic downturn and remain low**
Risk weights on credit portfolios under the IRB approach ("risk weights") are one of the key indicators of the banking sector's vulnerability over the financial cycle. The CNB derives the CCyB rate necessary to cover the banking sector's increased vulnerability caused by the cyclicality of risk weights from the difference between the actual and the hypothetical capital requirement.[160] Following several years of decline, the risk weights stabilised during the expansionary phase of the financial cycle (or decreased further in the segment of other loans to households; see Chart V.11). Given the absence of

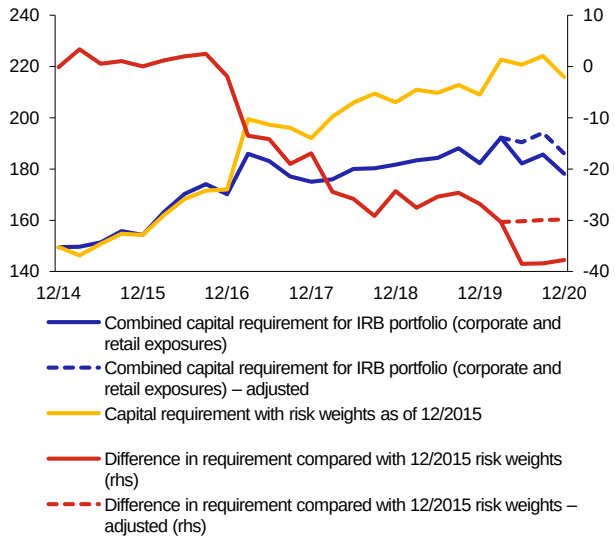
160 Specifically, the CNB monitors the difference between the combined capital requirement with risk weights fixed at the levels observed at the start of the strongly expansionary phase of the financial cycle, and the combined capital requirement in the current period.

credit losses and the generally low probability of default, however, the worst parameter values have yet to enter banks' models, which may lead to an increase in risk weights in the future. When adjusted for regulatory change,[161] the difference between the actual and the hypothetical capital requirement assuming fixation of the risk weights as of the start of the latest strongly expansionary phase of the financial cycle[162] stabilised close to CZK 30 billion (see Chart V.12).

**Chart V.12**

**Actual and hypothetical capital requirements based on the application of the risk weights as of 12/2015**

(CZK billions)



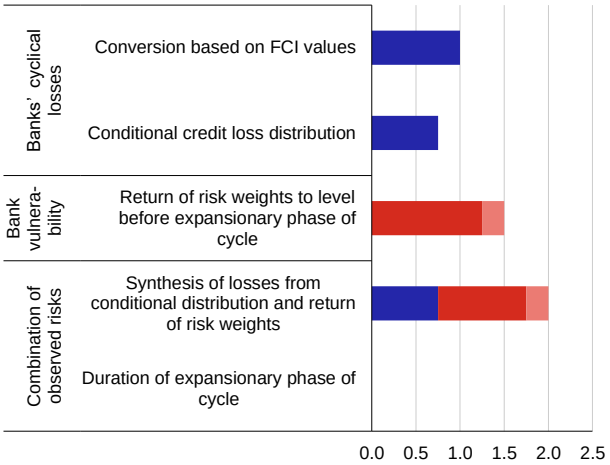

Source: CNB

Note: The chart shows the capital requirement for the following IRB portfolios reported in the given period: retail exposures – non-SME exposures secured by property, and retail exposures – other non-SME and corporate exposures. The actual capital requirement is based on the actually observed risk weights and exposures. The hypothetical capital requirement is calculated on the basis of the risk weights as of the beginning of the expansionary phase of the financial cycle (12/2015) and the actually observed exposures. The chart also shows the figures adjusted for a regulatory change that in 2020 Q2 broadened the range of corporate exposures to which the risk weight-lowering SME supporting factor can be applied.

**Chart V.13**

**CCyB rate covering financial cycle effects monitored**

(% of total risk exposure)




Source: CNB

Note: The lighter shade denotes adjustment for a regulatory change that in 2020 Q2 broadened the range of corporate exposures to which the risk weight-lowering SME supporting factor can be applied.

**Given the expected macroeconomic developments, the CNB opted to return the CCyB rate to the level covering the usual level of risks…**

The prudential estimate of unexpected losses[163] (see Chart V.13, line: *Conditional credit loss distribution*) of around CZK 15.5 billion would be covered by a CCyB rate of 0.75%. The FCI-based approach indicates a slightly higher need of 1% (corresponding to the usual level of cyclical risks based on the standard rate concept[164]) for unexpected losses (see Chart V.13 and Table V.1 CB). The additional capital needed to cover both the potential unexpected losses and the potential increase in the capital requirement due to the return of risk weights to the levels observed before the start of the strongly expansionary phase of the financial cycle thus amounts to CZK 45.4 billion and implies a CCyB rate of 1.75% (see Chart V.13). A quantitative assessment shows that the CCyB rate should be well above the current level of 0.5%. However, the existing macroeconomic and epidemiological uncertainties, which may slow the economic recovery (see section II.1.2), should also be taken into account. Owing to this uncertainty, the CNB opted for an approach consisting in increasing the CCyB rate to 1%, covering the usual level of cyclical risks. Given the current strong capitalisation of the domestic banking sector, increasing the CCyB rate by 0.50 pp will not have a negative effect on lending to the real economy (spare lending

161 Loans to non-financial corporations saw a regulatory change that in 2020 Q2 broadened the range of corporate exposures to which the risk weight-lowering SME supporting factor can be applied. This phenomenon is not cyclical and must therefore be excluded when setting the CCyB rate. The impact of the regulatory change is around 3.5 pp of the risk weight, or CZK 8 billion of capital.

162 According to CNB analyses, the Czech economy entered the latest strongly expansionary phase of the financial cycle in the second half of 2015.

163 The CNB estimates potential unexpected losses using the conditional probability distribution of credit losses. This is one of the quantitative approaches used by the CNB as a guide to setting the CCyB rate. More detailed information about the construction can be found in Appendix 3 of https://www.cnb.cz/export/sites/cnb/en/financial-stability/.galleries/macroprudential_policy/countercyclical_capital_buffer/ccyb_methodology.pdf.

164 The usual level of cyclical risks in banks' balance sheets corresponds to the historical medians of the sub-indicators entering the FCI calculation. According to the conversion table, a CCyB rate close to 1% corresponds to cyclical risks at the usual levels (see Table V.1 CB).

capacity amounted to around CZK 3.5 trillion of additional loans at the end of 2020; for details see section III.2 and Table III.1 CB). This change in the rate will increase the absolute capital requirement by approximately CZK 13 billion. The rate increase will take effect after one year, i.e. on 1 July 2022. This gives the CNB room to take a flexible approach in the event of unexpected adverse shocks.

**…and remains ready to react flexibly to changes in economic conditions**

In the event of continued rapid growth in lending to the household sector, renewed growth in loans to non-financial corporations and faster taking on of risks in the banking sector's balance sheet, the Bank Board is ready to increase this rate further. By contrast, should the economic situation worsen again, for example due to another wave of the pandemic, the Bank Board will be ready to abolish the announced increase in the countercyclical capital buffer rate or to release the buffer immediately and fully, in order to support banks' ability to lend to non-financial corporations and households without interruption. The decisive signal for this step would be a significant worsening of the economic situation, the materialisation of cyclical risks accepted earlier as credit losses and an increase in risk weights on IRB loan portfolios. However, the probability of this occurring has decreased.

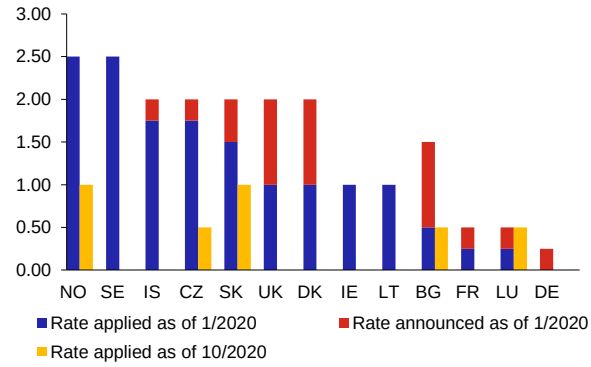
**CCyB rates declined in other European countries in 2020**

In an effort to ease conditions and maintain a sufficient supply of credit, other European countries also lowered their CCyB rates in 2020 (see Chart IV.14). Most countries also fully released their applicable CCyBs, albeit from lower rates than in the Czech Republic or with generally lower capital surpluses in their banking systems. Higher rates than in the Czech Republic were applied in Norway and Slovakia.

**Chart V.14**

**CCyB rates in European countries**

(% of total risk exposure)




Source: ESRB, data as of 30 April 2021

**Deviations of the credit-to-GDP ratio from its trend do not provide a suitable guide to increasing or releasing the CCyB for the Czech Republic**

In accordance with an ESRB recommendation,[165] the CNB should take into account the credit-to-GDP ratio and its deviation from the long-term trend when determining the position in the financial cycle and deciding on the CCyB rate. In 2020 Q4, the ratio was 91.3% and the relevant gap -1.3 pp. The CNB has long maintained that this approach is not a suitable tool for assessing cyclical risks in the Czech economy and is subject to a range of shortcomings which reduce its reliability.[166] The additional gap (the expansionary credit gap), which uses an alternative approach to determining the long-term trend and partially eliminates the problems associated with the recommended methodology, was 4.7 pp and implies a rate of 1% (see Chart V.2 CB). However, this indicator must also be viewed as only a simplified way of assessing the position in the financial cycle, with limited direct usefulness as regards deciding on the CCyB rate.

165 European Systemic Risk Board (ESRB, 2014): *Recommendation (ESRB/2014/1) on guidance for setting countercyclical buffer rates.*

166 A critique of this approach is presented in *The CNB's Approach to Setting the Countercyclical Capital Buffer* (Appendix 1).

## V.4 RISKS ASSOCIATED WITH PROPERTY MARKETS

### V.4.1 Risks associated with residential property markets

**The CNB thoroughly evaluates risks associated with the residential property market**

The CNB's recommended caps on borrower-based measures (BBM) were gradually eased (the LTV ratio) or abolished (the DSTI and the DTI ratios) in April and June 2020 in expectation that this measure would not result in imprudent mortgage lending by banks during the pandemic. Even so, the CNB closely monitored and continuously assessed risks arising in the residential property market. The main source of information for its aggregate analyses in this field is the semi-annual *Survey of loans secured by residential property* (the "Survey"). Its scope is being gradually expanded and its content methodologically revised. The evaluation of risks associated with new housing loans is based, among other things, on regular stress testing of households (see section IV.4). The test results are reflected in the formulation of the BBM limits recommended in the Official Information *Recommendation on the management of risks associated with the provision of retail loans secured by residential property* (the "Recommendation"). The CNB identifies loans with a DSTI ratio of over 40% or a DTI ratio of over eight times net yearly income as highly risky. It recommends that lenders should provide such loans with an increased degree of prudence and only to applicants who are highly likely to repay without problems.

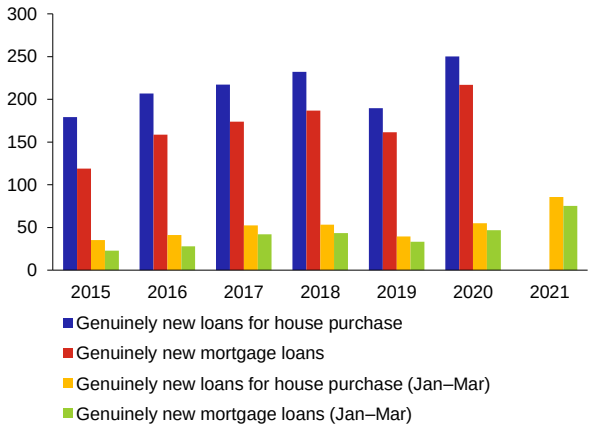
**New loans increased significantly in the second half of 2020 and the first quarter of 2021…**

New loans for house purchase reached elevated levels in the first few months of 2020. Their growth accelerated further after the outbreak of the pandemic, which was accompanied by a further decrease in mortgage rates and an easing of the recommended limits. The volume of genuinely new housing loans and mortgage loans reached record highs in 2020 and the first three months of 2021 (see Chart V.15). This primarily reflected growth in the average mortgage loan size (see Chart V.16), mirroring growth in property prices, and an only partial increase in the number of clients (see Chart V.17), who used debt financing to buy property in an environment of low interest rates and low yields on alternative assets (see section II.1.2). Following a temporary increase in other renegotiations in 2020 Q2 and Q3 due to the introduction of a loan moratorium, this type of new loan contract fell markedly again, although it remained slightly higher than in previous years (see Chart V.18). By contrast, expected growth in interest rates on loans for house purchase in 2021 led to a significant rise in clients refinancing in an effort to obtain the currently low interest rates; even many conservative households apparently changed their bank after fixed-rate periods ended. The volume of refinanced loans has more than doubled over the last year (due mainly to growth in 2020 Q4 and 2021 Q1).

**Chart V.15**

**Bank loans for house purchase and mortgage loans**

(CZK billions)



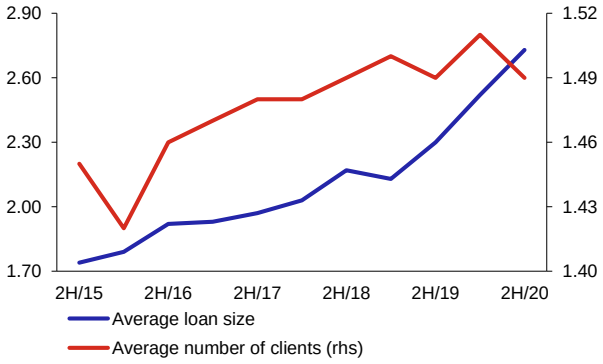

Source: CNB

Note: All series also include loan increases.

**Chart V.16**

**Average mortgage loan size and number of declared incomes**

(CZK millions; right-hand scale: number of persons)

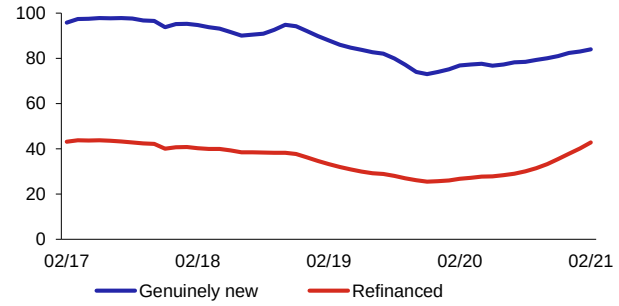



Source: CNB

**…which led to a stronger spiral of rising property prices and increased debt financing of property purchases**

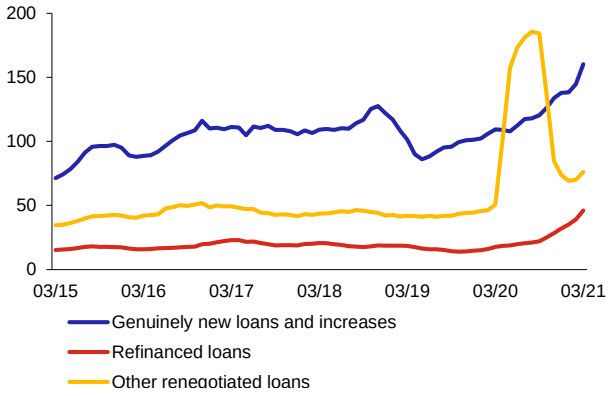
The feedback loop amplifying the effect of expected property price growth on loans used for property purchases started to intensify again (see Chart V.19). Market participants' statements reveal mounting optimistic expectations of continued growth in house prices. This is being accompanied by a growing incentive for some households to combine their free funds with debt financing to secure an acceptable return. The continuation of this trend is increasing the risks associated with the property market, either through the potential for a major price correction in the future (see section II.1.2) or through excessive growth in total debt and related debt service in the household sector (see section IV.4).

**Chart V.17**
**New loans secured by residential property**
(annual moving totals in thousands of loans)




Source: CNB

**Chart V.18**
**Six-month totals of components of new bank loans for house purchase**
(CZK billions; moving six-month totals)

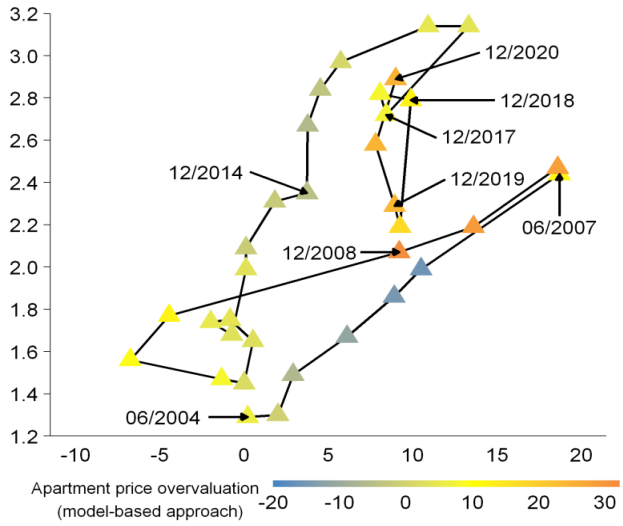



Source: CNB

**Households adjusted to the rising property prices through multiple channels**

Growth in the average housing loan size (18% year on year) exceeded income growth and property transaction price growth at the end of 2020. In the medium term, households are adjusting to the growing loan size mainly through a gradual increase in the average repayment term, which is leading to lower monthly instalments (see Chart V.20). More frequent loan applications by a higher number of clients are another medium-term channel; however, the use of this form of adjustment weakened in the second half of 2020 (see Chart V.16). Some households thus adjusted through growth in debt service or by taking on a higher total debt in relation to income after the cancellation of the recommended DSTI and DTI limits.

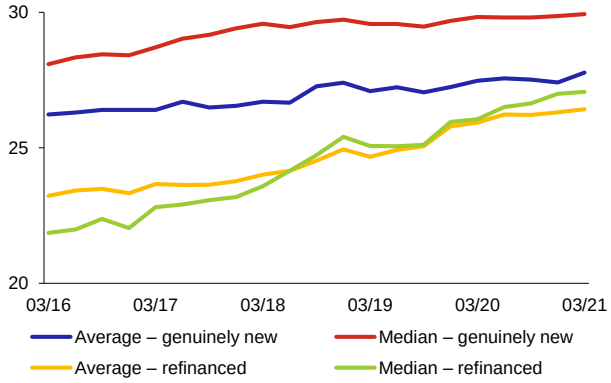
**Chart V.19**
**Spiral between apartment price growth and new loans for house purchase in relation to the level of wages**
(x-axis: y-o-y growth in apartment transaction prices in %; y-axis: new loans in relation to wages)




Source: CNB

Note: The spiral is derived on the basis of apartment price growth and the amount of new loans for house purchase in relation to the level of wages. The value of new loans for house purchase was adjusted for legislative and non-legislative moratoria.

**Chart V.20**
**Repayment term of loans secured by residential property**
(years; averages weighted by loan amount)




Source: CNB

Note: The actual repayment term is probably shorter, as the date when the loan was actually drawn is not known (only the date of approval is known). The figure for 2021 Q1 is based only on the data for January and February.

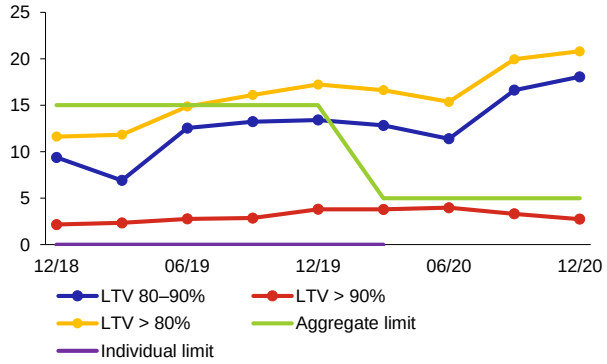
**The recommended LTV limits were met…**

Under the CNB's Recommendation, in the second half of 2020 mortgage lenders were supposed to comply with an LTV limit of 90%, to be exceeded only by loans representing a maximum of 5% of the reference volume (the average for the previous two quarters). All the institutions concerned complied with this volume exemption. Their loans exceeding the 90% limit represented less than 3% of the reference volume (see Chart V.21). The share of loans with LTVs of 80%–90% increased significantly to 18% of the volume provided in the last quarter of 2020. Loans with such LTVs were provided mainly by larger institutions in the second half of 2020 and the first few months of this year. Despite the COVID-19 pandemic, the LTV distribution remains relatively stable, except for the fact that no loans with an LTV above 100% were granted in the second half of 2020 and the first few months of this year (see Chart V.22). The relative LTV stability is contributing to the resilience of the Czech banking system, although mainly in terms of limited losses given default (low LGD), because the positive correlation between the LTV ratio and probability of default (PD) is empirically weak.

**Chart V.21**

**Fulfilment of the recommended LTV limits**

(share of loans in reference volume in %)



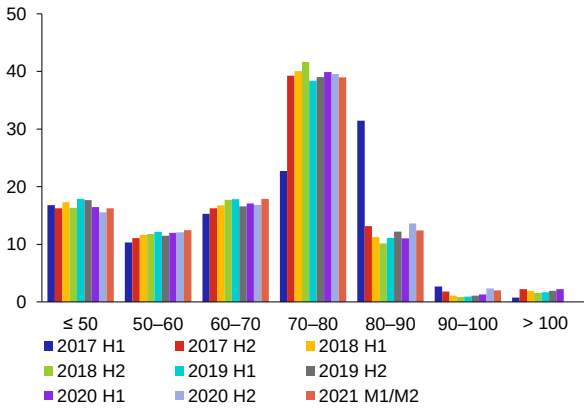

Source: CNB

Note: An LTV limit of 90% with a 5% volume exemption for reference volume has applied since 1 April 2020. The values for the LTV 80–90% and LTV > 80% series are for information only as from the same date. An individual limit applied until the end of 2020 Q1. Until then, it was recommended that no loans for house purchase with LTVs of over 90% be provided. Reference volume means that applicable in the given quarter.

**Chart V.22**

**LTV distribution of new loans**

(share of loans in volume provided in %; x-axis: LTV in %)




Source: CNB

Note: Interval closed from the right.

**…but the CNB will continue to monitor some risky tendencies**

Although mortgage lenders are compliant with the recommended LTV limits, some less positive tendencies persist. They include a natural tendency of lenders to value collateral on the basis of current market prices without taking much account of the potential risk of collateral overvaluation. According to the CNB's analyses, the ratio of the estimated value to the purchase price of collateral has long been around one, and this was also the case in the second half of 2020 onwards (see Chart V.14 CB). Property price growth leads to growth in collateral value and, as a result, applicants can obtain acceptable LTV values even in the event of a significant increase in the size of the loan sought. The CNB will monitor the prudential collateral valuation process.[167]

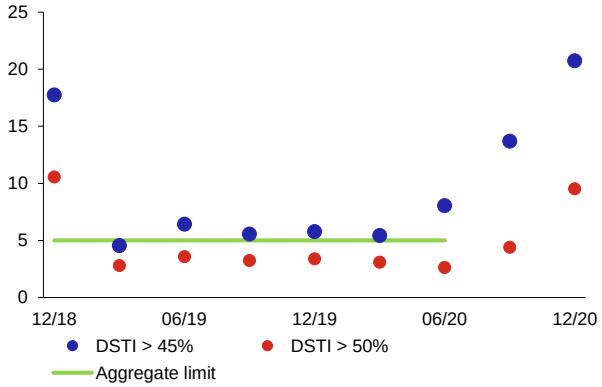
**Most lenders started to take on increased risks after the DSTI and DTI limits were cancelled…**

No DTI and DSTI limits have applied since mid-2020. In the second half of 2020, this relaxation of regulation started to be gradually reflected in less tight credit standards. Based on the conclusions of its analyses and stress tests, the CNB usually regards mortgage loans with a DSTI of over 40% of net income as very risky (see section IV.4). The share of such loans increased in the second half of 2020, and banks provided over 30% of the reference amount of loans with a DSTI of over 40%, 20% of loans with a DSTI of over 45% and 10% of loans with a DSTI of over 50% in 2020 Q4. The volume exemptions for the previous limits were thus markedly exceeded (see Chart V.23). This trend intensified in the first two months of 2021 (see Chart V.24). This particularly true of second and subsequent mortgage loans (see Chart V.27), whose share in genuinely new loans is stable at around one-third (see Chart V.28). Similar trends could also be observed for the DTI ratio (see Chart V.25 and Chart V.26).[168] Here, the CNB considers a DTI of eight times net annual income as the threshold of increased riskiness. In 2020 Q4, loans with DTIs of over 8 accounted for 35% and loans with DTIs of over 9 for almost 17% of the reference volume of loans.

167 A potential risk to financial stability would arise if institutions did not take consistent and systematic account of cyclical developments in the property market when valuing collateral.

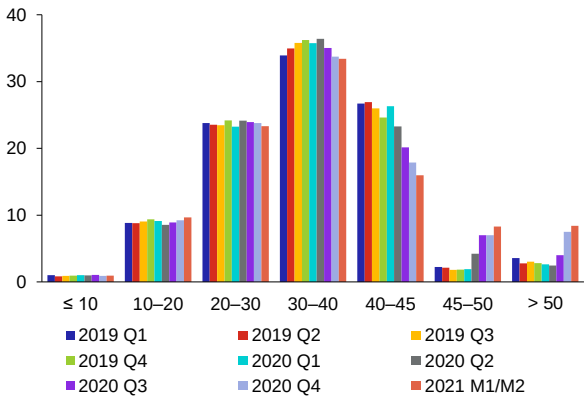
168 The trends in the LSTI and LTI ratios were similar (see Chart V.6 CB and Chart V.7 CB).

## Chart V.23
### Fulfilment of the recommended DSTI limits
(share of loans in reference volume in %)



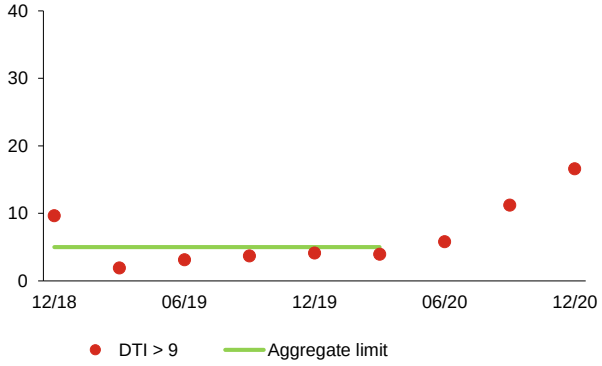

Source: CNB
Note: Reference volume means that applicable in the given quarter.

## Chart V.24
### DSTI distribution of new loans
(share of loans in volume provided in %; x-axis: DSTI in %)



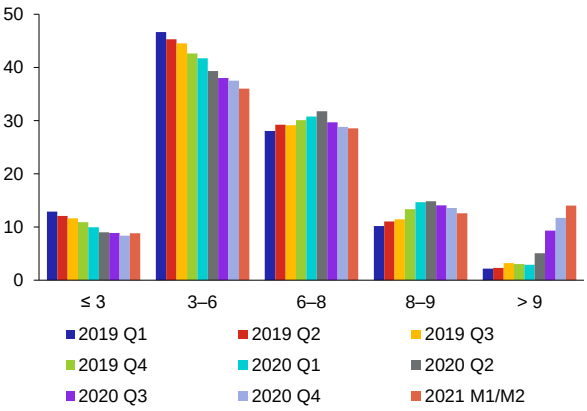

Source: CNB
Note: Interval closed from the right.

## Chart V.25
### Fulfilment of the recommended DTI limits
(share of loans in reference volume in %)



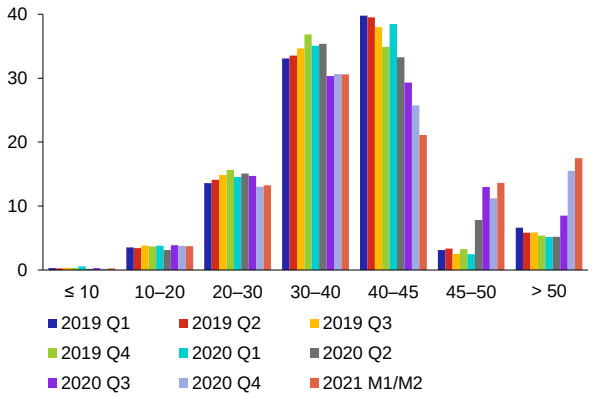

Source: CNB
Note: Reference volume means that applicable in the given quarter.

## Chart V.26
### DTI distribution of new loans
(share of loans in volume provided in %; x-axis: DTI in years)



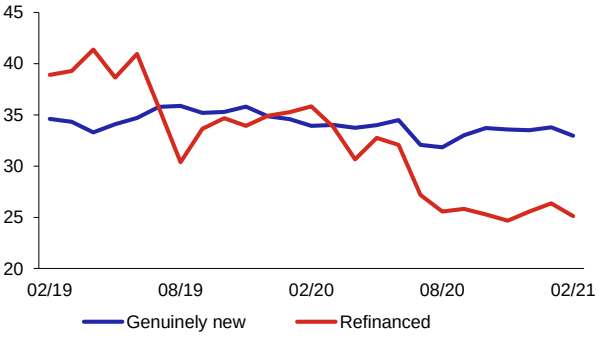

Source: CNB
Note: Interval closed from the right.

## Chart V.27
### DSTI distribution of second and subsequent genuinely new mortgage loans
(share of loans in volume in %; x-axis: DSTI in %)




Source: CNB
Note: Interval closed from the right.

## Chart V.28
### Share of second and subsequent mortgage loans
(% of monthly volume)




Source: CNB
Note: Estimate based on the value of the total additional debt.

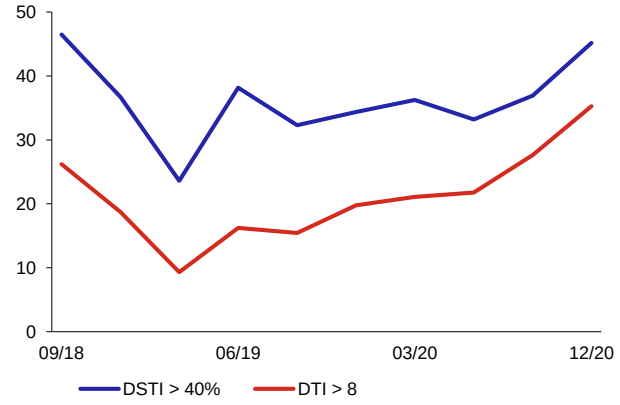
**…due to a combination of continued growth in property purchase prices and weaker income growth**

In terms of credit standards expressed as DTI and DSTI ratios, the banking sector has returned in recent months to conditions resembling the situation in the second half of 2018, when caps on these ratios were first introduced (see Chart V.29). There were significant differences among individual lenders. Unlike with LTV, smaller banks and building societies also contributed significantly to the acceptance of loans with high DSTIs and DTIs (see Chart V.30). This is creating a risk of more conservative lenders reacting to a potential loss of market share by relaxing their standards to the levels of their less conservative competitors. Mutually enforced relaxing of credit standards would give rise to systemic risks.

**Chart V.29**

**Loans secured by residential property with a high DSTI or DTI**

(% of reference volume)



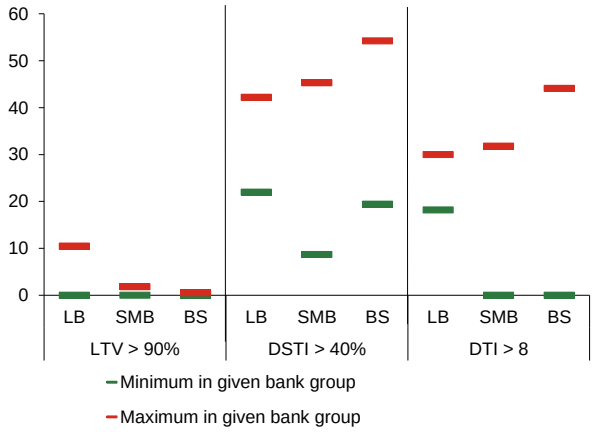

Source: CNB

Note: Reference volume means that applicable in the given quarter.

**Chart V.30**

**Shares of loans exceeding risky LTV, DSTI and DTI levels by bank group**

(% of portfolio of loans for house purchase of given institution; 2020 H2)




Source: CNB

Note: SMB = small and medium-sized banks. LB = large banks. BS = building societies.

**For the period ahead, the CNB confirms the LTV limit at 90% and is not setting DTI and DSTI limits; the other parameters of the Recommendation are also unchanged**

Despite the easy credit standards, the spiral between debt financing of property purchases and optimistic expectations regarding future property price growth, as well as the persisting overvaluation of housing prices, the Bank Board decided in the current situation to keep the LTV limit unchanged at 90%, with the option of applying a 5% exemption. At the same time, it does not currently deem it necessary to set DTI and DSTI limits or to tighten the other parameters of the existing Recommendation. However, it points out to lenders that it considers the credit standards to be as relaxed as acceptable. The CNB regards the high and increasing share of loans with a DTI ratio of over 8 and a DSTI ratio of over 40% of net income as highly risky and a potential source of systemic risk. Lenders should therefore take measures to ensure that such loans are provided only to applicants who are highly likely to repay without problems. The CNB will respond to the fact that the share of new loans with high DTI and DSTI ratios has increased markedly for some lenders using instruments of microprudential supervision, especially an additional Pillar 2 capital requirement for risk management systems. The CNB would have to react using macroprudential policy tools to any further easing of credit standards and taking on of additional risks.

**Risky tendencies are emerging for both genuinely new and refinanced loans, and especially loans to the self-employed in sectors most jeopardised by the coronavirus pandemic**

Banks have provided record-high amounts of refinanced loans in the last few quarters. It is therefore also necessary to monitor risks undertaken for refinanced loans separately from genuinely new ones. A tendency to provide refinanced loans with DSTIs of over 40% could be observed in the first half of 2020. In the second half of 2020 and the first two months of 2021, however, new volumes also started to grow for loans with DSTIs of over 45% or even 50% regardless of whether they were genuinely new or refinanced mortgage loans (see Chart V.3 CB). If this trend were to continue, the default rate at which the previous DSTI limits were targeted could increase in the future. However, this effect could be limited at least for the time being, as the significant growth in the refinanced loans with a high DSTI is to some extent “optical” due to the above spillover of some loans from the refixed category.[169] Moreover, their volumes are not high relative to the total stock

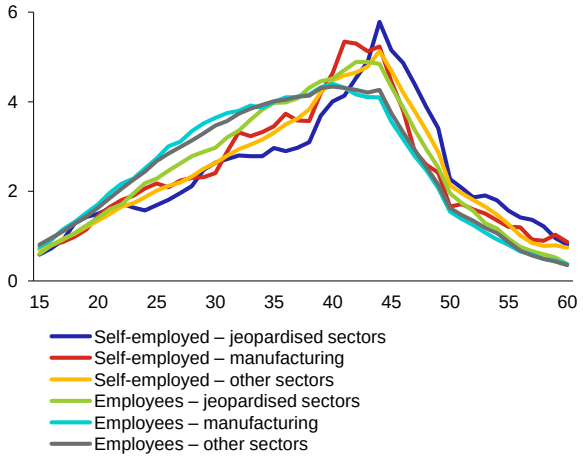
169 Refixed loans (i.e. loans refinanced by the same bank) are not included in the CNB Survey, as they do not represent new loans for any economic agent.

of mortgage loans in the Czech Republic. The CNB's Survey now also contains the CZ-NACE classification of the economic activity of the principal borrower's employer (or the activity of the self-employed person where that person is the principal borrower). For the purposes of conducting a more detailed analysis of the DSTI distribution for new loans provided during the coronavirus pandemic, the individual CZ-NACE sectors were divided into three groups: (i) jeopardised sectors where close contact between the customer and the service provider is necessary (and which have thus been hardest hit by the pandemic), such as food services, accommodation, retail and culture, (ii) manufacturing, which forms the traditional backbone of the Czech economy, and (iii) other sectors. The analysis was complemented by the source of income of the principal borrower – a self-employed person or an employee. A tendency towards higher DSTIs for loans to the self-employed and borrowers linked with jeopardised sectors can generally be observed (see Chart V.31), although these differences are not particularly large. If these sectors were to face another sharp drop in sales under the *Adverse Scenario* or due to a permanent pandemic-induced change in customers' behaviour, the risks associated with the provision of loans with high DSTIs would very likely materialise. The DSTI distribution also shows that a significant proportion of loans with threshold DSTI ratios of 40%, 45% and 50% are provided to the self-employed. This may signal some "optimising" behaviour in income reporting by the self-employed and income assessment by banks.

**Chart V.31**

**DSTI distribution by sector and source of income**

(share in volume in %; x-axis: DSTI in %)



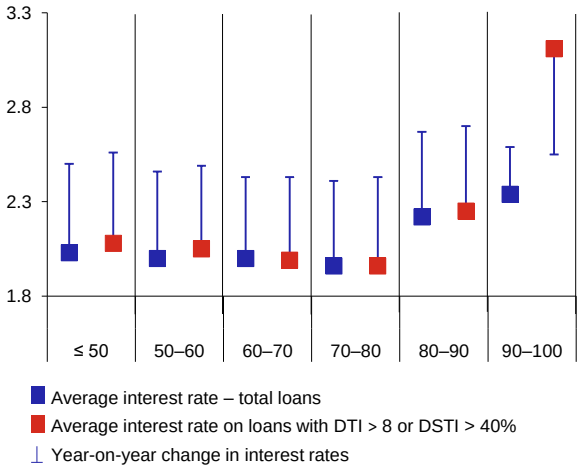

Source: CNB

Note: New loans provided between 1 July 2020 and 28 February 2021. The sectors jeopardised by the COVID-19 pandemic are accommodation and food services, transport, storage, cultural, entertainment and recreational activities and retail.

**Chart V.32**

**Average interest rates by loan characteristics**

(average interest rate in %; x-axis: LTV in %)




Source: CNB

Note: Data for 2020 H2. Weighted average interest rates with the sizes of individual loans as weights. Interval closed from the right. No loans with LTVs of over 100% were provided in 2020 H2.

**Lenders took account of the level of risk undertaken when setting interest rates**

Interest rates on mortgage loans provided in the second half of 2020 mostly fell on average year on year. There was again a clear effort by banks to differentiate loan rates based on the LTV ratio in the second half of 2020. The level of risk was reflected above all in rates on loans with LTVs of over 80% (see Chart V.32). In addition to elevated loan riskiness, the higher interest rates in this category may reflect clients' high demand for this type of loan and limited supply thereof by lenders. Banks applied an additional interest mark-up in the category of loans with LTVs of 80%–90% regardless of whether the loan also had a DTI of over 8 or a DSTI of over 40%. However, they enforced parallel high DSTIs or DTIs for loans with LTVs of over 90% in their interest mark-ups all the more significantly (no loans with an LTV of over 100% were provided in the second half of 2020). This again indicates efforts to reflect higher credit risk in the level of interest rates.

**The immediate growth in credit risk postponed by the introduction of the moratorium has started to materialise, albeit to a limited extent**

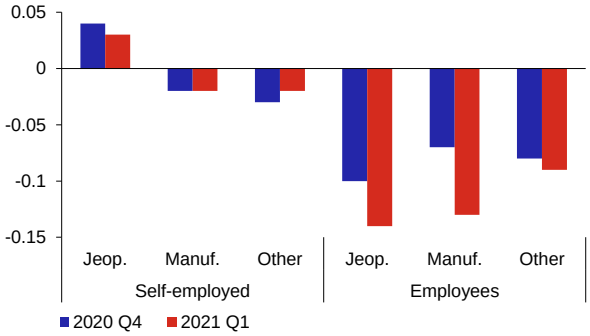
Banks started to adjust their risk management models when the pandemic broke out. However, these changes cannot be implemented immediately, so they can be expected to manifest themselves in the second half or at the end of 2020. Compared with 2020 Q3, banks in 2020 Q4 and the first few months of 2021 increased the estimated probability of default (PD) for loans to the self-employed in sectors most jeopardised by the coronavirus pandemic, such as food services and accommodation. In other cases, by contrast, financial institutions lowered the PD, probably due to the unexpectedly still only slightly growing unemployment rate and its favourable path assumed in the *Baseline Scenario* (see Chart V.33). The trend in the share of loans turning non-performing under the statutory loan moratorium or due to non-legislative postponement of payments indicates that the risks associated with these loans first materialised in the case of the self-

employed, as generally expected. The materialisation of these risks was fastest in January 2021 but later started to slow sharply for both the self-employed and employees (see Chart V.34). Assuming that the *Baseline Scenario* materialises, this trend will probably continue, especially in the case of employees.

**Chart V.33**

**Change in the probability of default by sector and source of income**

(pp; change in median 12M PD compared to 2020 Q3)



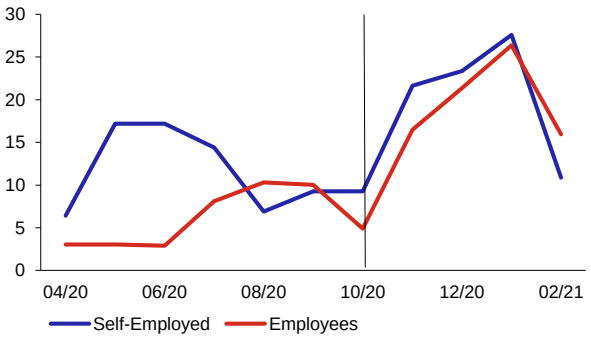

Source: CNB

Note: The probability of default at the 12-month horizon as estimated by the bank when providing the loan. The sectors jeopardised by the COVID-19 pandemic are accommodation and food services, transport, storage, cultural, entertainment and recreational activities and retail. 2021 Q1 only includes January and February.

**Chart V.34**

**Share of loans turning non-performing under the loan moratorium**

(% of volume of loans)




Source: CNB

Note: Loans that turned non-performing in the given month. Moratoria include both statutory moratoria and non-legislative postponement of payments. The vertical line represents the end of the statutory moratoria.

## V.4.2 Risks associated with commercial property markets

**New bank loans secured by commercial property returned to their usual levels in the second half of 2020…**

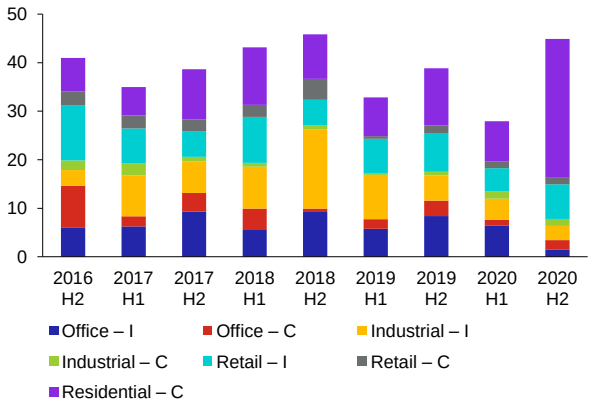
New loans secured by commercial property amounted to CZK 45 billion in the second half of 2020. Following a weaker first half of the year affected by heightened market uncertainty (see section II.1.2), they thus returned to their stable half-year volumes of CZK 40–50 billion observed over the entire duration of the Survey (see Chart V.35).[170] However, the return to the usual levels was due to unusually high growth in funding of new residential construction, which may be a one-off fluctuation given the relatively small size of the market. It will thus take time before it becomes possible to identify the actual size of the impacts of the coronavirus pandemic on banks' willingness to finance commercial property projects.

**…and the risks associated with commercial property markets continue to be largely exported**

The total exposures secured by commercial property in Czech banks' balance sheets have long been marginal, and the rapid growth in house purchase loans has caused their relative importance to decrease further. The current observed tightness in the market (see section II.1.2) should thus not pose a systemic risk to financial stability even if the situation were to worsen significantly further. However, the commercial property market could be an aggravating factor in the event of a further economic decline and subsequent significant materialisation of accumulated risks. Even under such a scenario, though, a majority of the risks would be transferred to the foreign investors who hold key shares in the market.

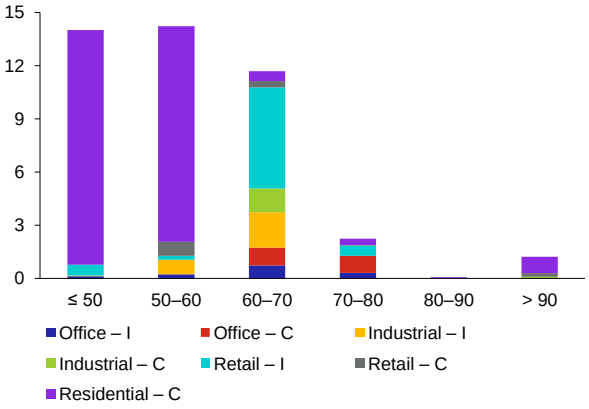
170 The results are based on a semi-annual survey of loans secured by commercial property among eight banks covering around 70% of the market.

**Chart V.35**
**Amount of new loans secured by commercial property**
(CZK billions)




Source: CNB
Note: I: investment in existing property, C: construction.

**Chart V.36**
**LTV distribution of new loans in 2020 H2**
(CZK billions; x-axis: LTV in %)

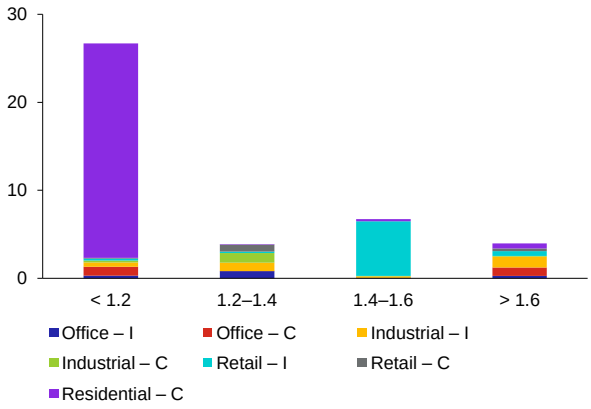



Source: CNB
Note: I: investment in existing property, C: construction. Interval closed from the right.

**Banks are more cautious about financing commercial property**

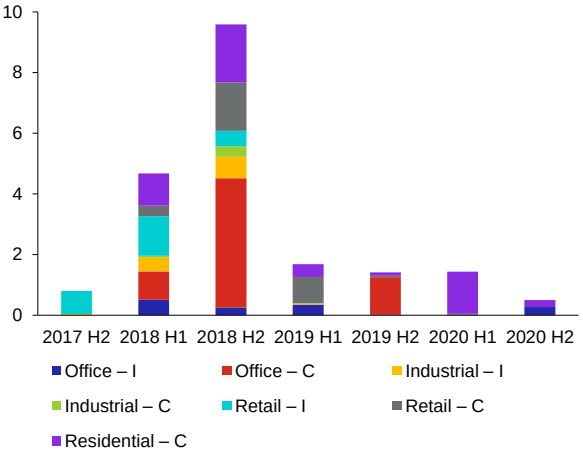
Lenders are well aware of the increased uncertainty associated with developments on the commercial property market and have significantly increased their collateral requirements compared with previous years. Loans provided with LTVs of 50%–60%, or even below 50%, were most strongly represented in the second half of 2020 (see Chart V.36 and Chart V.8 CB) compared to the previous rounds of the Survey, when most new loans had LTVs of 60%–70%. Reassessment of future property income and the current uncertainty were reflected in growth in new loans with lower DSCRs (see Chart V.37), mostly in the category of a DSCR below 1.2. However, the shift to a riskier category was offset by higher collateral requirements, and the total amount of risky loans with low DSCRs and high LTVs dropped to a record low in the second half of 2020 (see Chart V.38).

**Chart V.37**
**DSCR distribution of new loans in 2020 H2**
(CZK billions; x-axis: DSCR)




Source: CNB
Note: I: investment in commercial property, C: construction.

**Chart V.38**
**Amount of new loans with an LTV of more than 70% and a DSCR of less than 1.2**
(CZK billions)



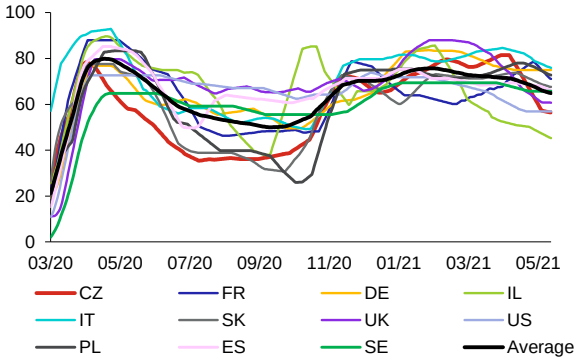

Source: CNB
Note: I: investment in commercial property, C: construction.

# VI. CHARTBOOK

## SECTION II

### Chart II.1 CB
### Stringency index for anti-COVID-19 measures

(points, 0 = minimum stringency, 100 = maximum stringency)

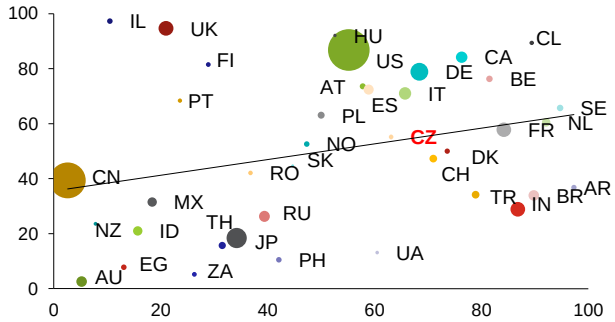



Source: Our World in Data – Stringency Index

Note: 28-day moving averages. The time series of the average is calculated as the simple average of the other time series in the chart.

### Chart II.2 CB
### New cases of COVID-19 and vaccination coverage

(percentile of vaccination coverage as of 17 May 2021; x-axis: percentile of new cases per million inhabitants in 14 days; size of bubbles: GDP)

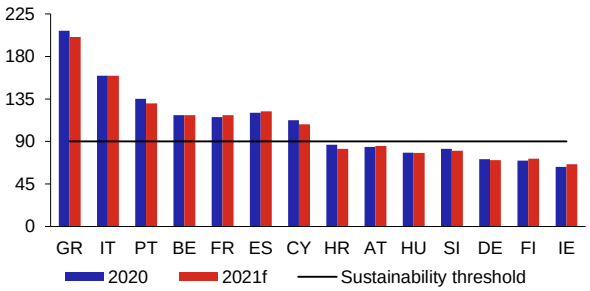



Source: Our World in Data

Note: Includes people who have only received the first dose of a double-dose vaccine. The chart covers 39 countries accounting for about 86% of global GDP.

### Chart II.3 CB
### EU countries with high debt service levels

(% of GDP)

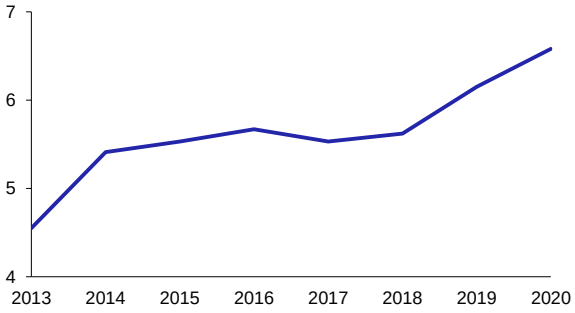



Source: Eurostat, EC Economic Forecast (November 2020)

Note: The horizontal line illustrates the general government debt sustainability threshold. According to the literature, the sustainability threshold is 90%.

### Chart II.4 CB
### Exposures of financial institutions to general government in EMU countries

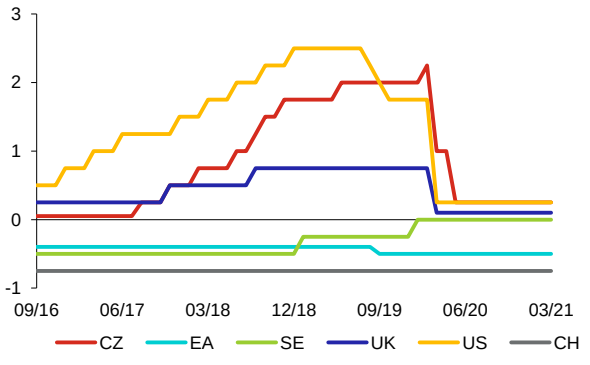
(EUR trillions)




Source: ECB

### Chart II.5 CB
### Main monetary policy rates of selected central banks

(%)

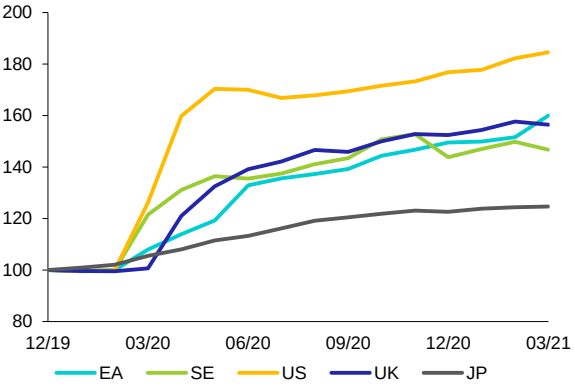



Source: Refinitiv

Note: In the case of EA, the chart shows the deposit rate.

### Chart II.6 CB
### Total assets of selected central banks

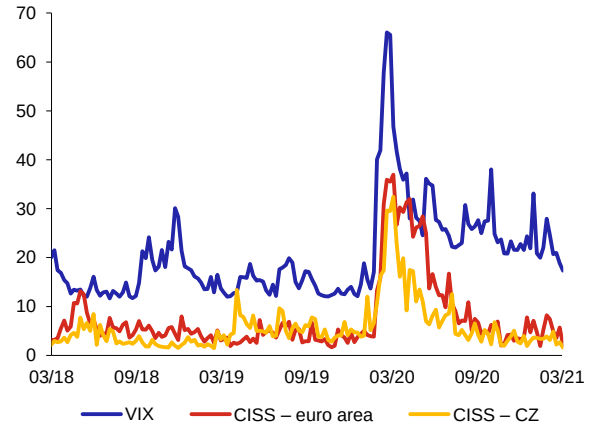
(% of total assets as of 31 December 2019)




Source: Bloomberg, BoE

## Chart II.7 CB
## VIX and CISS indices

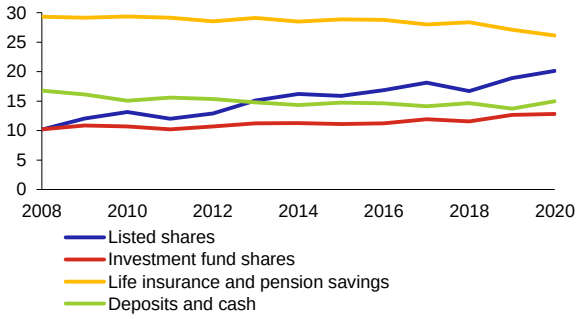
(points)




Source: Bloomberg, CNB

## Chart II.8 CB
## Shares of selected asset classes in the total financial assets of households

(%)




Source: OECD

Note: Year-end data. The chart is based on countries for which end-2020 data were available (BE, CA, ES, FI, NO, PT, SE, SK, UK and US). As of 31 December 2018, the assets of households in these countries accounted for 65% of total household assets included in the OECD database.

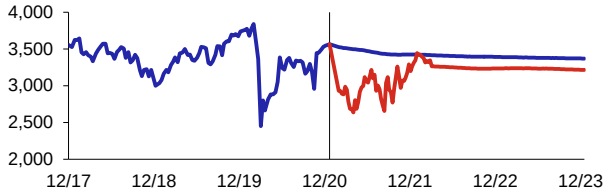
## Chart II.9 CB
## Government bond yields for selected economies

(columns: yields for individual maturities in years)

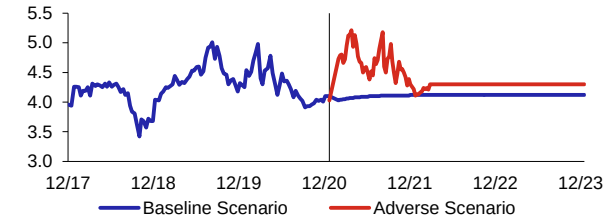

Source: Bloomberg

## Chart II.10 CB
## Scenarios for the Euro Stoxx 50 and its risk premium

(Euro Stoxx 50 in points)



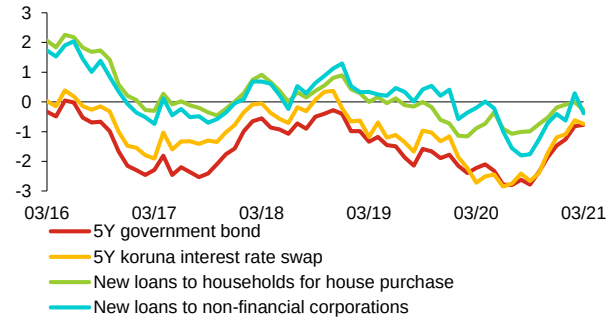

(risk premium in %)




Source: Bloomberg, CNB

## Chart II.11 CB
## Real interest rates and yields in the Czech Republic

(%)

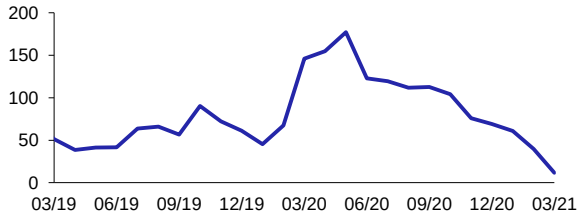



Source: CNB

Note: Month-end values are used, except for client rates, where monthly averages are used instead. The calculation is performed ex post, i.e. the observed inflation rate in each period is subtracted from the nominal figures to obtain the real yields.

## Chart II.12 CB
## Yield spread between domestic corporate and government bonds

(bp)

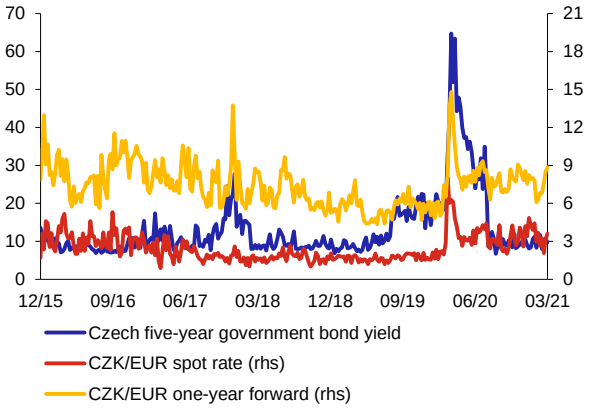



Source: CNB

Note: The spread is calculated as the difference between the indices of yields on domestic corporate bonds and Czech government bonds. The indices are calculated as a weighted average of yields on bonds issued by domestic entities and actively traded or listed. The face value of the issue is used as the weight.

## Chart II.13 CB
## Bid-ask spreads on selected financial instruments

(yield spread in bp; right-hand scale: exchange rate spreads in hellers)

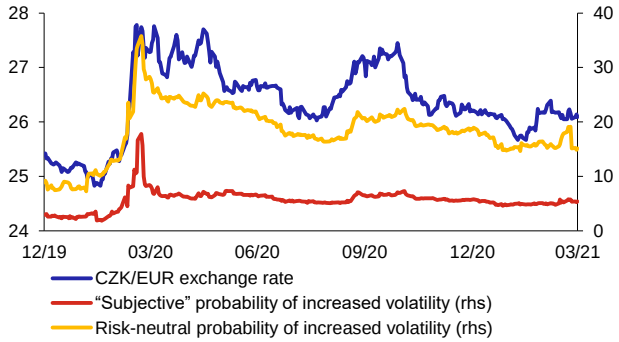



Source: Refinitiv

Note: The yield spread is the difference between bid and ask quotations for the benchmark five-year Czech government bond (CZ5YT=RR).

## Chart II.14 CB
## CZK/EUR exchange rate and the risk of increased volatility

(CZK/EUR exchange rate; right-hand scale: %)

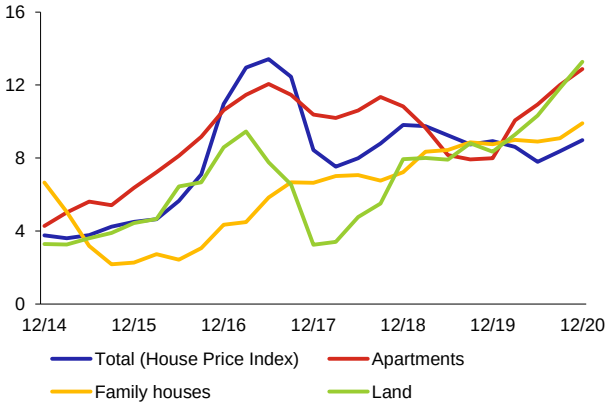



Source: Refinitiv, CNB

Note: The probability of increased volatility expresses whether the exchange rate will move by more than 10% (in either direction). It is derived from an estimate of the probability distribution of exchange rate movements.

## Chart II.15 CB
## Property transaction prices by type

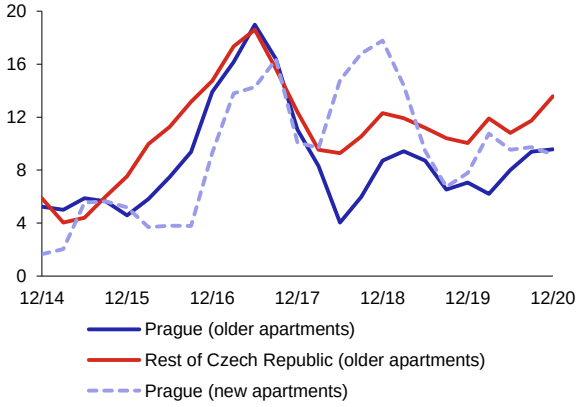
(year-on-year growth in %)




Source: CZSO, HB Index

## Chart II.16 CB
## Apartment transaction prices by region

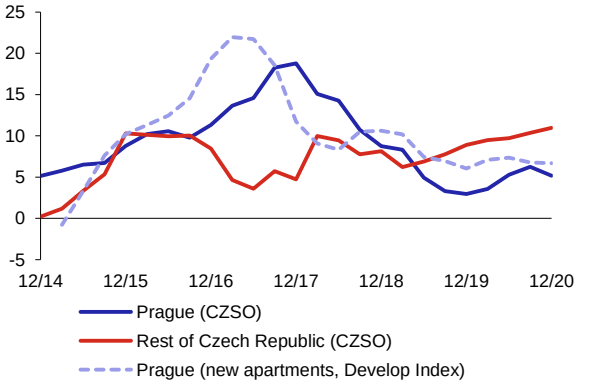
(year-on-year growth in %)




Source: CZSO

## Chart II.17 CB
## Apartment asking prices by region

(year-on-year growth in %)

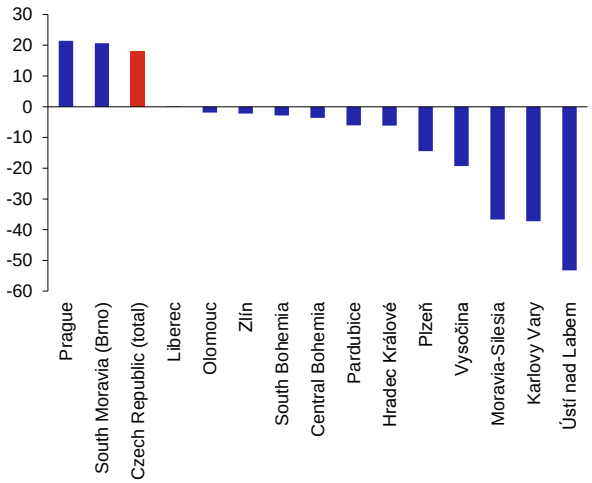



Source: CZSO, Společnost pro cenové mapy ČR, s.r.o.

Note: As the Develop Index is published every two months, the figures for March and September were obtained as the average of the year-on-year growth rates in February and April and in August and October respectively.

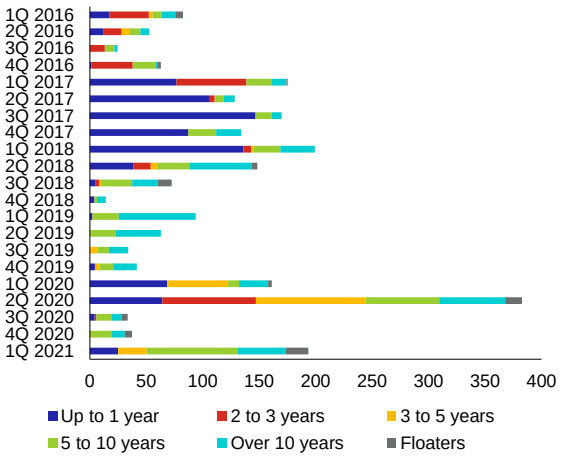
## Chart II.18 CB
## Estimated apartment price overvaluation by region

(%; as of 31 December 2020)



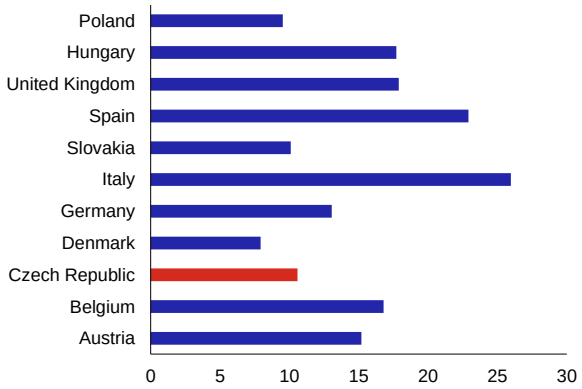

Source: CNB

## Chart II.19 CB
## Czech government security issue volumes
(CZK billions)




Source: CNB

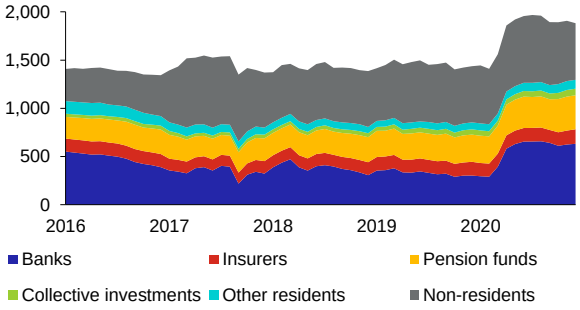
## Chart II.20 CB
## Borrowing requirements of selected countries in 2021
(% of GDP)




Source: CNB, IMF (Fiscal Monitor)

Note: The figure for the Czech Republic is based on the assumptions of the *Baseline Scenario*. The borrowing requirement is the primary cash deficit plus debt repayments including outstanding principal.

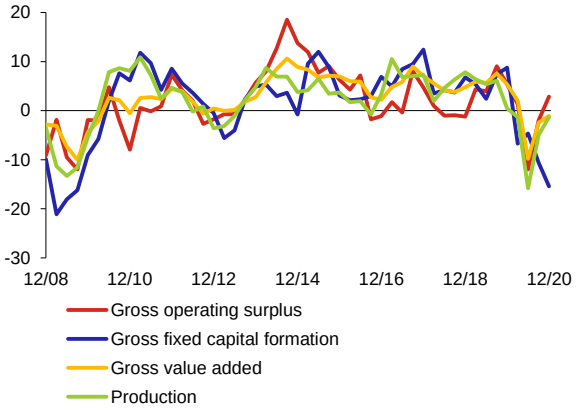
## Chart II.21 CB
## Holdings of koruna-denominated Czech government securities
(CZK billions)




Source: Ministry of Finance of the Czech Republic, debt statistics

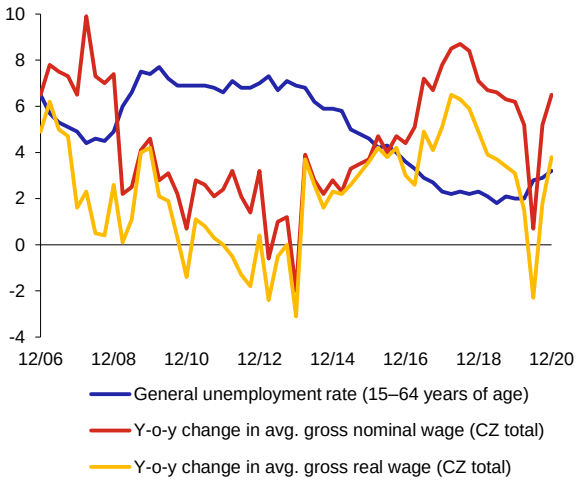
Note: The Ministry of Finance debt statistics use a different classification of transactions secured by a government security than the CNB data source used, for example, in Chart II.26.

## Chart II.22 CB
## Selected indicators of the NFC sector
(annual percentage changes)



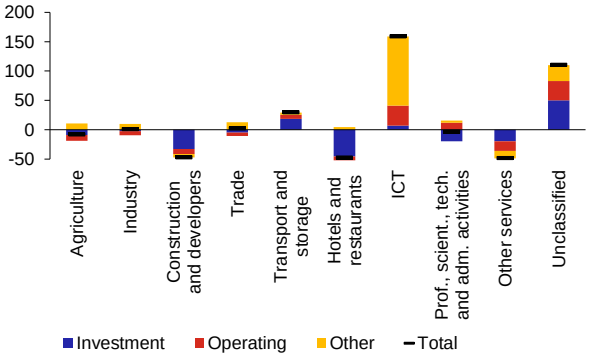

Source: CZSO

## Chart II.23 CB
## Labour market indicators
(%)




Source: CNB, CZSO

## Chart II.24 CB
## Change in the average monthly volume of new loans by sub-sector and loan type
(%)

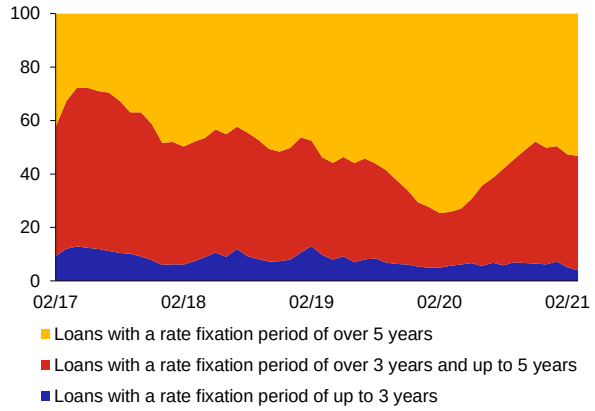



Source: CNB

Note: The chart shows the percentage change in the average monthly volume of loans drawn between 12/2016–02/2020 and 04/2021–09/2020. Operating loans also include loans for current assets. Other loans also include bank overdrafts and loans for temporary shortages of funds.

## Chart II.25 CB
### Genuinely new mortgage loans, including loan increases, by interest rate fixation period

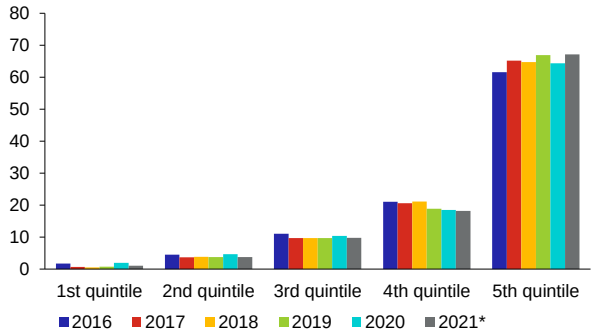
(%)




Source: CNB

## Chart II.26 CB
### Share of mortgage loans provided by income quintile of the principal applicant

(%)

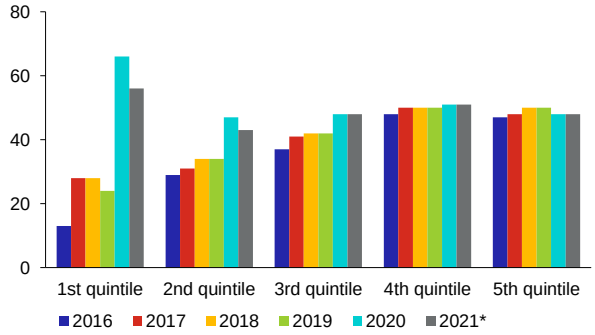



Source: CNB, CZSO

Note: Income quintiles are calculated using data from the Survey of Income and Living Conditions (SILC). The share of loans in 2021 is calculated using the available data for January and February.

## Chart II.27 CB
### Share of two or more mortgage loan applicants by income quintile of the principal applicant

(%)

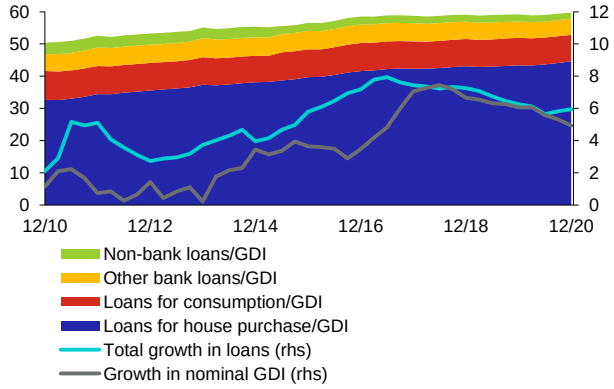



Source: CNB, CZSO

Note: Income quintiles are calculated using data from the Survey of Income and Living Conditions (SILC). The share of two or more mortgage loan applicants in 2021 is calculated using the available data for January and February.

## Chart II.28 CB
### Household indebtedness and income indicators

(ratios in %; right-hand scale: year on year in %)

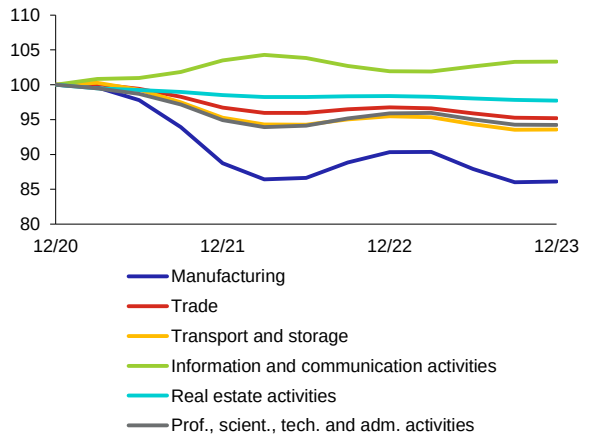



Source: CNB, CZSO

Note: Non-bank loans are loans provided by other financial institutions. GDI stands for gross disposable income. The household sector also includes data for NPISHs.

## Chart II.29 CB
### Change in employment in selected sub-sectors in the *Adverse Scenario*

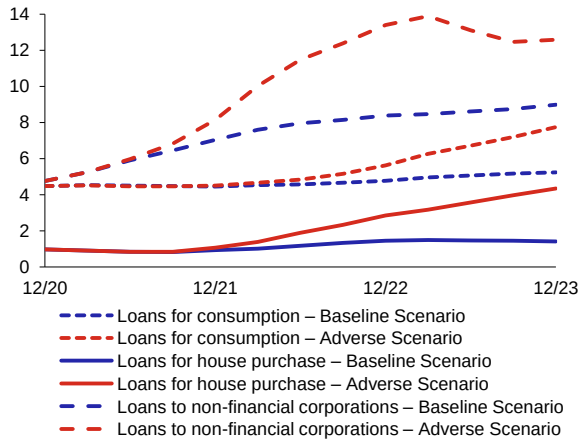
(index; 2020 Q4 = 100)




Source: CNB, CZSO

## Chart II.30 CB
### NPL ratios in the household and non-financial corporations sectors

(%)




Source: CNB

SECTION III

**Table III.1 CB**

**Available lending capacity by capital component as of 31 December 2020**

(CZK billions)

| Capital component | Volume | Available lending capacity |
|---|---|---|
| Capital surplus on top of regulatory requirements | 236 | 3,513 |
| Countercyclical capital buffer (CCyB) | 13 | 197 |
| Capital conservation buffer (CCoB) | 64 | 1,193 |
| Systemic risk buffer (SRB) | 47 | 875 |
| Total | 360 | 5,778 |

Source: CNB

**Table III.2 CB**

**Exposures, provisions and coverage ratios by risk stage and portfolio**

**Households**

| | | Exposures | | Provisions | | Coverage ratio | |
|---|---|---|---|---|---|---|---|
| **Stage** | Date | Volume (CZK billions) | Change (%) | Volume (CZK billions) | Change (%) | Ratio (%) | Change (p. b.) |
| **Total** | 12/19 | 1,845 | 6.7 | 26 | 25.9 | 1.40 | 0.25 |
| | 12/20 | 1,968 | | 33 | | 1.65 | |
| **S1** | 12/19 | 1,708 | 4.9 | 3 | 37.7 | 0.18 | 0.06 |
| | 12/20 | 1,791 | | 4 | | 0.24 | |
| **S2** | 12/19 | 106 | 34.0 | 4 | 120.3 | 3.96 | 2.54 |
| | 12/20 | 142 | | 9 | | 6.50 | |
| **S3** | 12/19 | 31 | 12.6 | 19 | 2.7 | 59.19 | -5.22 |
| | 12/20 | 35 | | 19 | | 53.97 | |

**NFC**

| | | Exposures | | Provisions | | Coverage ratio | |
|---|---|---|---|---|---|---|---|
| **Stage** | Date | Volume (CZK billions) | Change (%) | Volume (CZK billions) | Change (%) | Ratio (%) | Change (p. b.) |
| **Total** | 12/19 | 1,358 | -0.5 | 32 | 41.6 | 2.34 | 0.99 |
| | 12/20 | 1,350 | | 45 | | 3.33 | |
| **S1** | 12/19 | 1,207 | -10.1 | 3 | 49.1 | 0.29 | 0.19 |
| | 12/20 | 1,085 | | 5 | | 0.47 | |
| **S2** | 12/19 | 106 | 97.3 | 3 | 254.5 | 2.77 | 2.21 |
| | 12/20 | 209 | | 10 | | 4.98 | |
| **S3** | 12/19 | 45 | 26.8 | 25 | 15.9 | 56.69 | -4.88 |
| | 12/20 | 57 | | 29 | | 51.81 | |

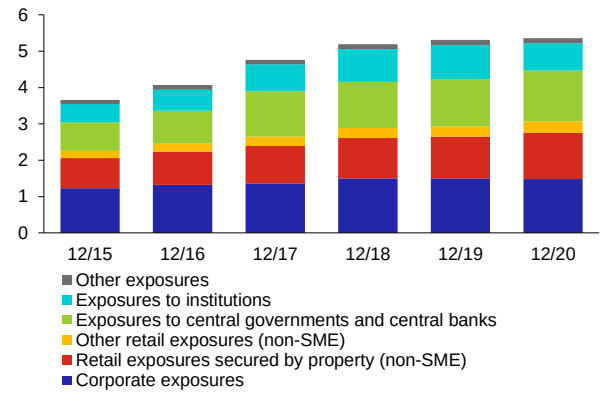
Source: CNB

Note: S1 and S2 comprise performing loans; S3 can be considered identical to non-performing loans.

**Chart III.1 CB**

**Size of the main categories of exposures under the IRB approach**

(CZK trillions)

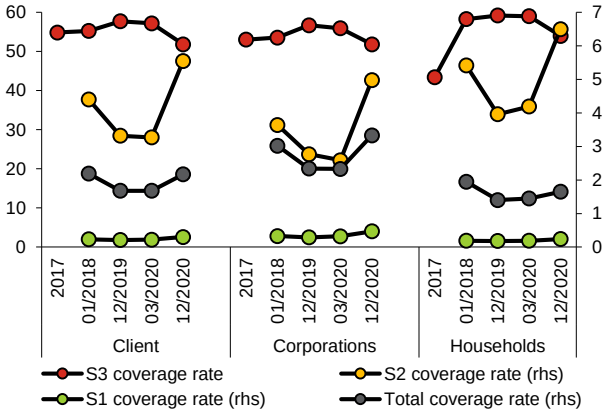



Source: CNB

**Chart III.2 CB**

**Loan coverage by portfolio**

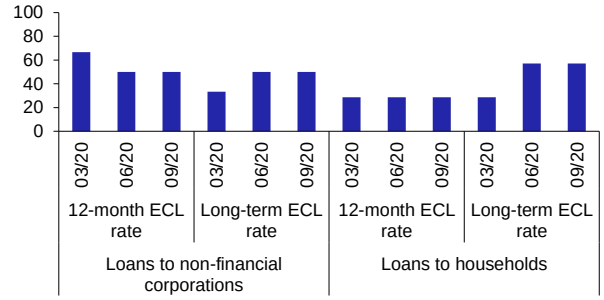
(%)




Source: CNB

## Chart III.3 CB
### Rate of success in estimating changes in expected credit losses

(%)

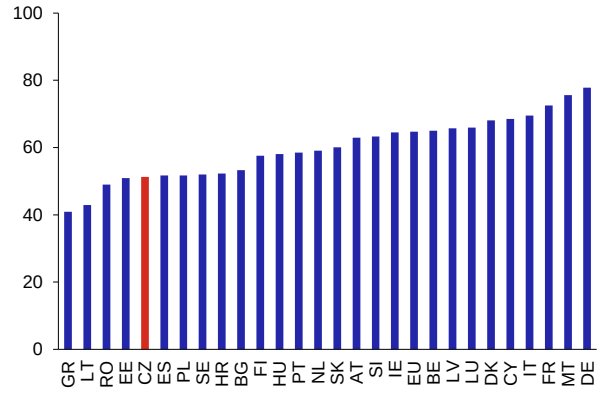



Source: CNB

Note: ECLs = expected credit losses. The actual ECL rate is compared with an estimate of the ECL rate based on banks' answers in the Bank Lending Survey, where they report their expectations regarding the direction of change in the ECL rate in the quarter ahead (up, down, no change), i.e. the 09/20 data relate to 2020 Q4.

## Chart III.4 CB
### International comparison of the cost-to-income ratio

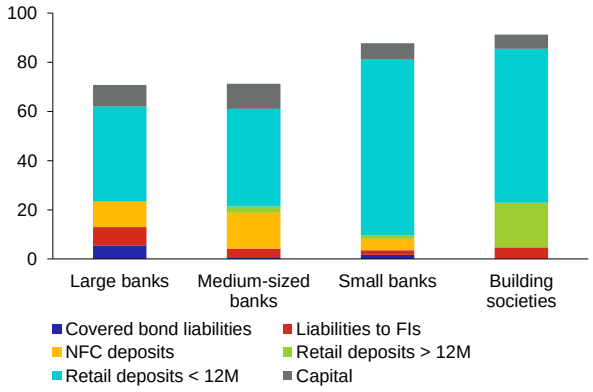
(%)




Source: EBA

## Chart III.5 CB
### Structure and amount of items ensuring stable funding

(% of balance sheet as of 31 December 2020)

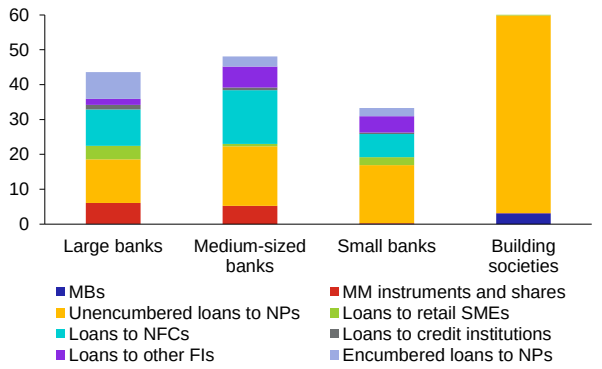



Source: CNB

Note: M = month, FIs = financial institutions, NFCs = non-financial corporations.

## Chart III.6 CB
### Structure and amount of items requiring stable funding

(% of balance sheet as of 31 December 2020)

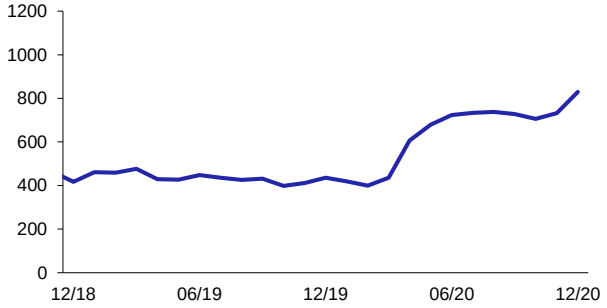



Source: CNB

Note: MBs = mortgage bonds, NPs = natural persons, NFCs = non-financial corporations, MM = money market, FIs = financial institutions, SMEs = small and medium-sized enterprises.

## Chart III.7 CB
### Claims on central governments included in liquid assets

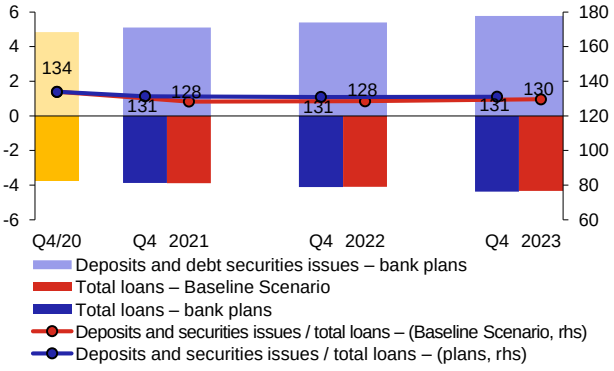
(CZK billions)




Source: CNB

## Chart III.8 CB
### Funding plans of domestic institutions

(CZK trillions; right-hand scale: %)

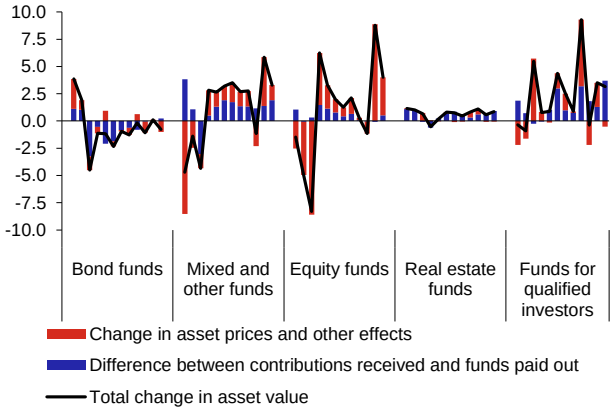



Source: CNB

Note: Includes loans and deposits to the private sector defined as households, non-financial corporations and financial institutions. Also includes debt securities with maturities equal to or more than three years. The yellow columns denote the position as of 2020 Q4; positive values are deposits and securities issues and negative values are loans.

## Chart III.9 CB
### Decomposition of the change in the value of investment funds' assets by investment orientation in 2020

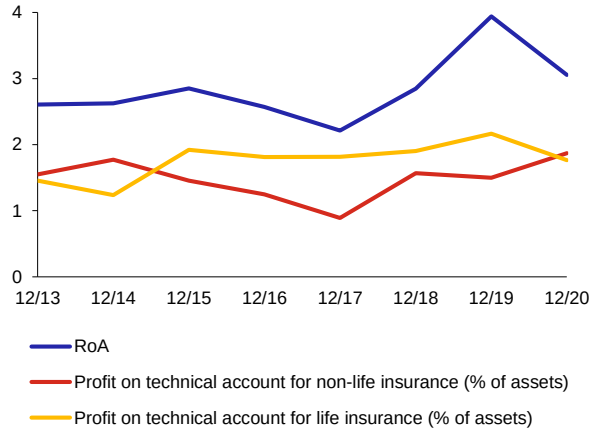
(CZK billions; x-axis: individual months of 2020)




Source: CNB

## Chart III.10 CB
### Insurance sector profitability

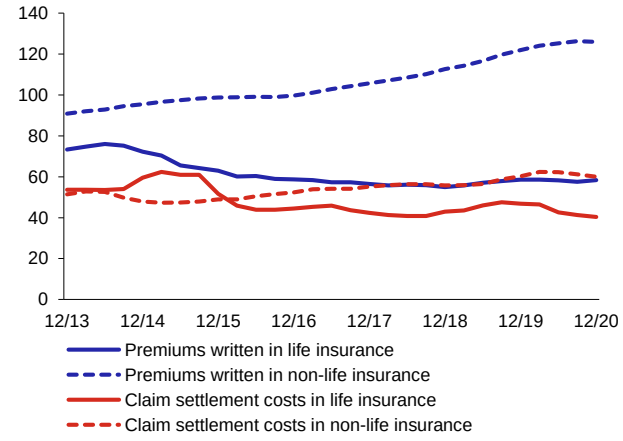
(%)




Source: CNB

## Chart III.11 CB
### Developments in the insurance sector

(CZK billions)

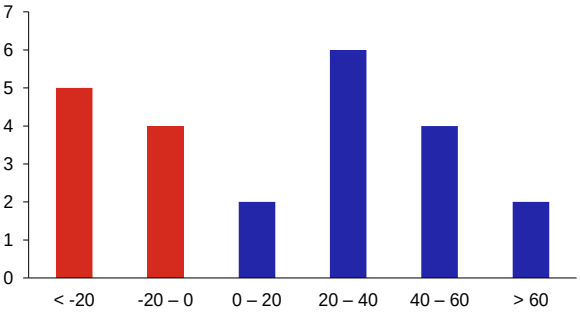



Source: CNB

Note: The chart shows the moving sum of the values for four quarters in gross terms, i.e. unadjusted for reinsurers' share.

## Chart III.12 CB
### Year-on-year change in the ratio of eligible own funds to the solvency capital requirement

(number of insurance companies; x-axis: year-on-year change as of 31 December 2020 in pp)

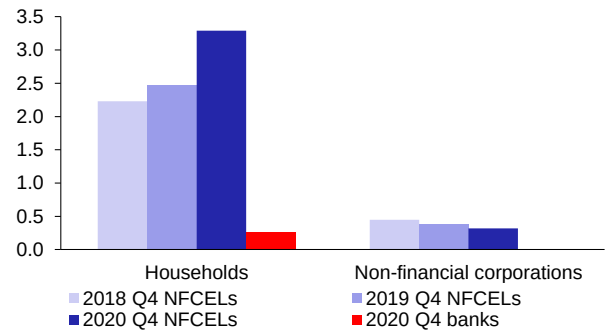



Source: CNB

Note: Branches of foreign insurance companies, the Export Guarantee and Insurance Corporation and insurance companies for which the results were affected by mergers are excluded from the calculation.

## Chart III.13 CB
### 3M default rate on loans provided by credit institutions

(%)

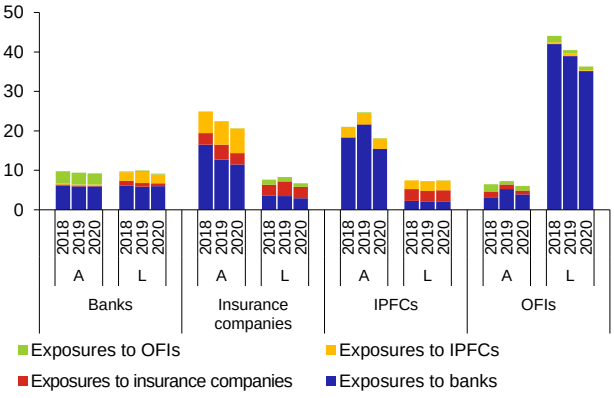



Source: CBCB, CNCB, SOLUS, CNB

Note: The default rate on loans provided to households by NFCELs is calculated as the average of the data from the NRCI and SOLUS. Only the NRCI is used for non-bank loans to non-financial corporations. Loans for consumption in the case of households.

## Chart III.14 CB
### Share of exposures to domestic financial counterparties

(% of financial assets and liabilities of segments)




Source: CNB

Note: A = assets, L = liabilities. IPFCs = investment and pension funds and companies. Other financial intermediaries (OFIs) primarily comprise NFCELs and non-bank investment firms. Year-end values.

## SECTION IV

### Table IV.1 CB
### Credit portfolios by stage

(loans in CZK billions; S1 to S3 in % of total loans)

| | Actual value | | *Baseline Scenario* | | | *Adverse Scenario* | | |
|---|---|---|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2022 | 2023 | 2021 | 2022 | 2023 |
| **Non-financial corporations** | | | | | | | | |
| Loan volume | | 1,452 | 1,381 | 1,417 | 1,493 | 1,369 | 1,253 | 1,285 |
| S1 | 87.4 | 79.1 | 71.9 | 70.9 | 71.2 | 68.2 | 59.8 | 62.7 |
| S2 | 8.3 | 16.2 | 21.1 | 20.7 | 19.8 | 23.7 | 26.8 | 24.7 |
| S3 | 4.3 | 4.8 | 7.0 | 8.4 | 9.0 | 8.1 | 13.4 | 12.6 |
| **Loans for house purchase** | | | | | | | | |
| Loan volume | | 1,430 | 1,565 | 1,682 | 1,790 | 1,563 | 1,632 | 1,662 |
| S1 | 93.2 | 92.0 | 93.0 | 91.3 | 91.9 | 92.5 | 87.9 | 85.4 |
| S2 | 5.8 | 7.1 | 6.1 | 7.2 | 6.7 | 6.5 | 9.3 | 10.2 |
| S3 | 0.9 | 1.0 | 0.9 | 1.4 | 1.4 | 1.1 | 2.9 | 4.3 |
| **Consumer credit** | | | | | | | | |
| Loan volume | | 466 | 471 | 488 | 514 | 473 | 473 | 466 |
| S1 | 90.6 | 87.9 | 87.0 | 86.1 | 85.2 | 86.9 | 84.1 | 80.4 |
| S2 | 5.6 | 7.7 | 8.5 | 9.2 | 9.6 | 8.6 | 10.3 | 11.8 |
| S3 | 3.9 | 4.5 | 4.4 | 4.8 | 5.2 | 4.5 | 5.6 | 7.7 |

Source: CNB

Note: The loan volume pertains to the end of the given period.

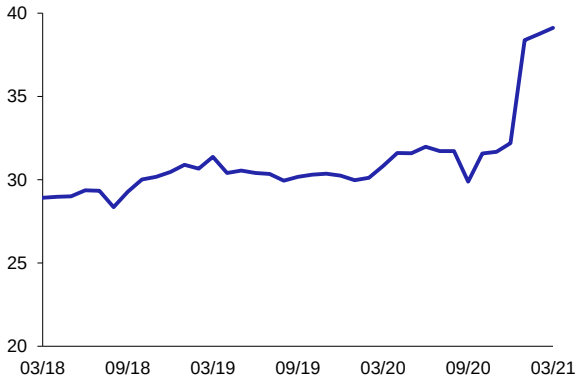
### Table IV.2 CB
### Liquidity stress test scenario

| **Outflow items, rate of outflow in %:** | **1M** | **2M and 3M** | **over 3M** |
|---|---|---|---|
| Stable retail deposits | 2% | 1% | 1% |
| Other retail deposits | 3% | 2% | 1% |
| Operating deposits | 10% | 7% | 5% |
| Non-operating deposits of credit institutions | 100% | 100% | 100% |
| Non-operating deposits of other financial customers | 25% | 25% | 25% |
| Non-operating deposits of central banks | 0% | 0% | 0% |
| Non-operating deposits of non-financial corporations | 10% | 7% | 5% |
| Non-operating deposits of other counterparties | 15% | 10% | 5% |
| Liabilities from secured loans | | 100% | |
| Liabilities from securities issued | | 100% | |
| Maturity of derivatives | | 100% | |
| Other outflows | | 100% | |
| Increase in NFC loans | | 10% per 6M (1.6% per M) | |
| Retail credit lines | 5% | 5% | 5% |
| NFC credit lines | 15% | 15% | 15% |
| **Inflow items, inflow haircut in %:** | | **for each month** | |
| Retail loans (due to moratorium) | | 50% | |
| Corporate loans (due to moratorium) | | 50% | |
| Loans to other non-financial counterparties other than NFCs and retail | | 50% | |
| Loans to and receivables from credit institutions and financial customers | | 0% | |
| Other inflows | | 100% | |
| Inflows from secured operations | | 0% | |
| **Liquid assets, haircut on liquid assets in %:** | | **for each month** | |
| Corporate bonds | | 10–100% depending on quality | |
| Covered bonds | | 10–100% depending on quality | |
| Shares | | 40–100% depending on quality | |
| Central government | | 10–20% depending on quality | |
| Cash, T-bills, government bonds | | 0% | |

Source: CNB

### Chart IV.1 CB
### Share of transformed funds' portfolio at amortised cost

(% of TFs' total assets)

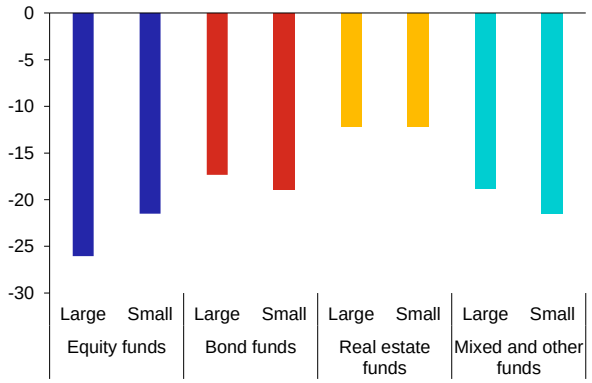



Source: CNB

Note: Data from portfolio held to maturity before 2021. Compared with TF assets.

## Chart IV.2 CB
### Change in the assets of collective investment funds after three years in the *Adverse Scenario*

(%)

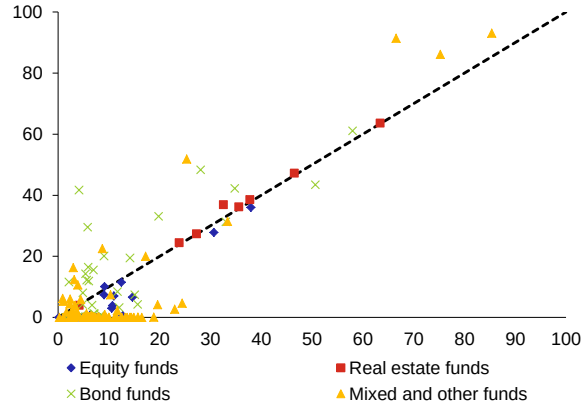



Source: CNB

Note: The chart shows the change in total assets in relation to the fund's size and type. Large funds are those with an initial asset value of more than CZK 2 billion.

## Chart IV.3 CB
### Change in the liquid assets on the balance sheet of collective investment funds after the first year in the *Adverse Scenario*

(% of total assets)

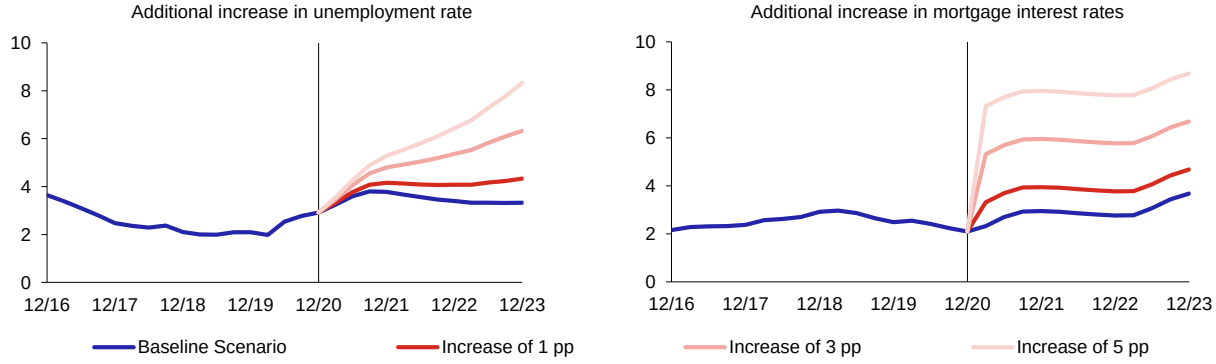



Source: CNB

Note: The x-axis shows the original value of the liquid assets and the y-axis shows the value of the liquid assets after the first year.

## Chart IV.4 CB
### Additional increase in the unemployment rate and mortgage interest rates

(%)

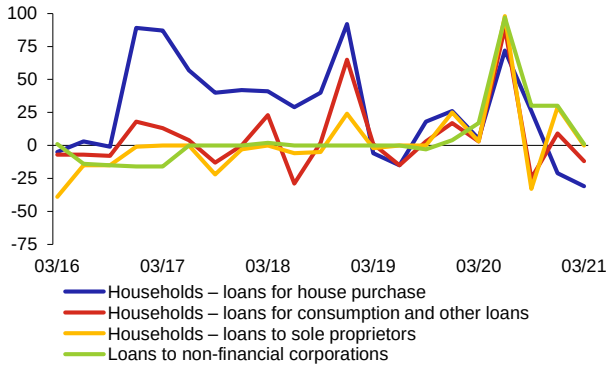



Source: CNB

## SECTION V

### Chart V.1 CB
### Credit standards in the Czech Republic

(net percentages)

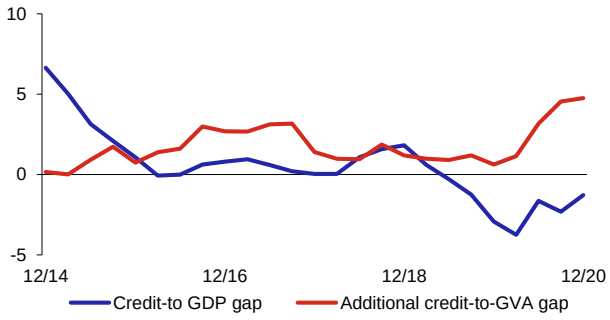



Source: Bank Lending Survey, CNB

Note: The data represent the difference between the market share of banks that reported a tightening of lending standards and banks that reported an easing of lending standards in the past three months. More information on the indicator methodology can be found on the CNB website.

### Chart V.2 CB
### Standardised credit-to-GDP gap and additional gap

(pp)




Source: CNB, CZSO

Note: The trend in the standardised gap is estimated using the HP filter (lambda = 400,000) over the entire time series. The additional gap – the expansionary credit gap – is calculated as the difference between the ratio of bank loans to the gross value added (GVA) of the private sector and the minimum level of this ratio over the past eight quarters.

### Table V.1 CB
### Conversion of FCI values into the countercyclical capital buffer rate

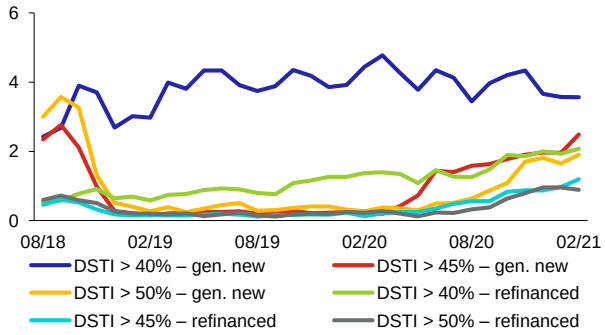
| Range of FCI values | | CCyB rate |
|---|---|---|
| from | to | |
| 0.00 | 0.09 | 0.00% |
| 0.09 | 0.10 | 0.25% |
| 0.10 | 0.12 | 0.50% |
| 0.12 | 0.14 | 0.75% |
| 0.14 | 0.16 | 1.00% |
| 0.16 | 0.18 | 1.25% |
| 0.18 | 0.20 | 1.50% |
| 0.20 | 0.23 | 1.75% |
| 0.23 | 0.26 | 2.00% |
| 0.26 | 0.29 | 2.25% |
| 0.29 | 1.00 | 2.50% |

Source: CNB

Note: The interval containing the current FCI value is indicated in red.

### Chart V.3 CB
### Volumes of genuinely new and refinanced mortgage loans with a high DSTI

(in CZK billions)

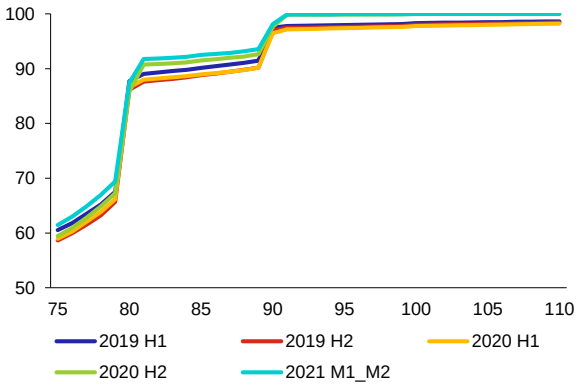



Source: CNB

Note: Flows of new loans in the given months.

### Chart V.4 CB
### Empirical cumulative distribution function of loans by LTV

(accumulated percentage of loans; x-axis: LTV in %)

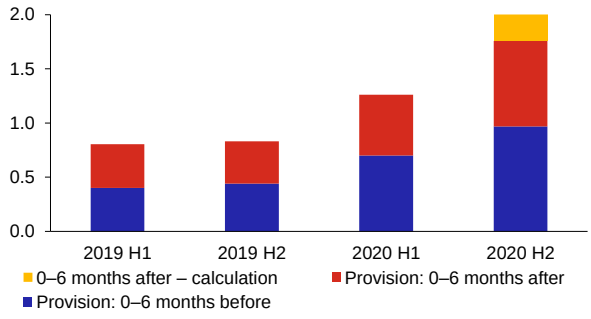



Source: CNB

Note: The curves plot the percentage share of loans with the given or lower LTVs.

### Chart V.5 CB
### Concurrent provision of unsecured and mortgage loans

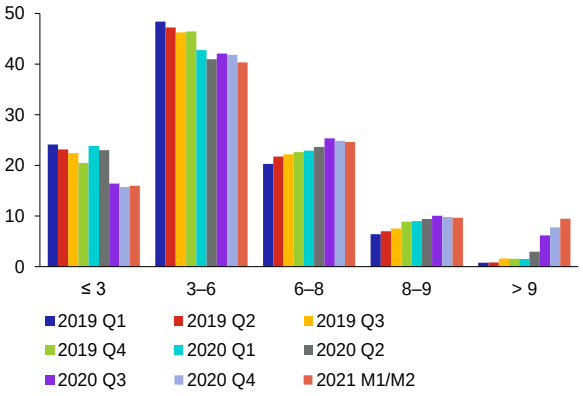
(unsecured loans in CZK billions; x-axis: half-year in which mortgage loan was provided)




Source: CNB

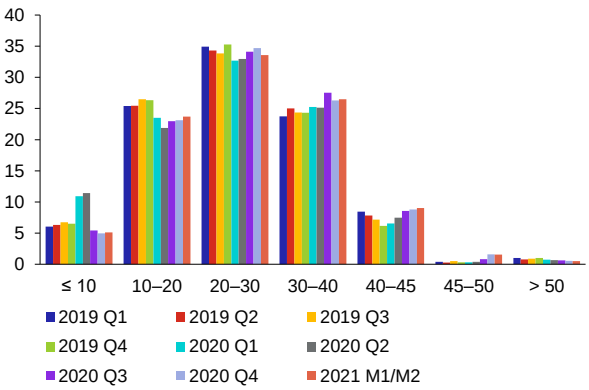
Note: “Before” and “after” relate to the time of provision of the mortgage loan. For the first and last monitored period, the data are calculated to add up to the whole, as the known data do not cover the entire six months. Data for the period of one year before the provision of the mortgage loan and one year after it provide a similar picture.

## Chart V.6 CB
## LTI distribution of new loans
(share of loans in volume in %; x-axis: LTI in years)



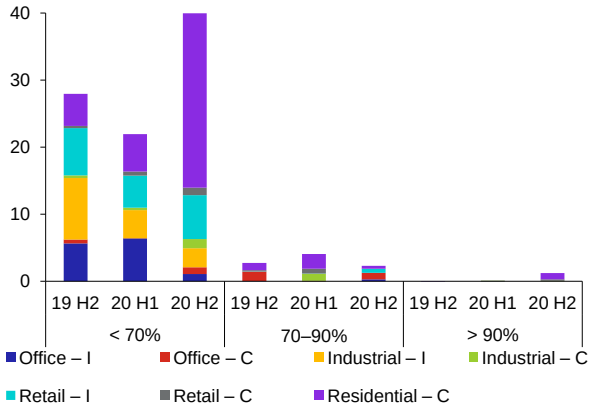

Source: CNB
Note: Interval closed from the right.

## Chart V.7 CB
## LSTI distribution of new loans
(share of loans in volume in %; x-axis: LSTI in %)



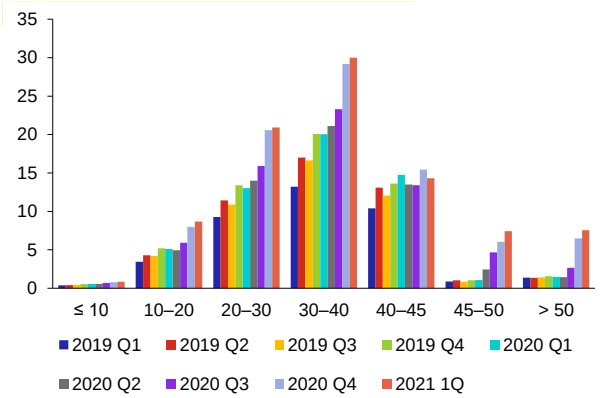

Source: CNB
Note: Interval closed from the right.

## Chart V.8 CB
## LTV distribution of new loans over time
(CZK billions; x-axis: LTV in %)



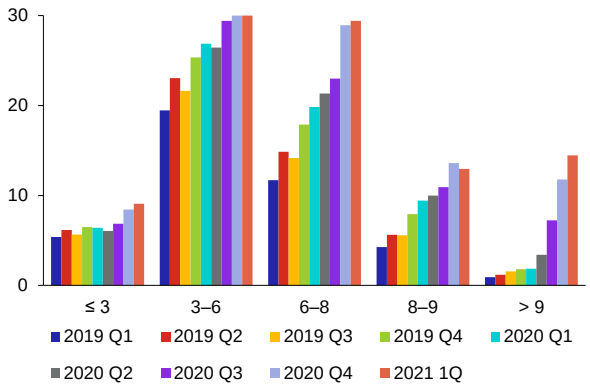

Source: CNB
Note: I: investment in commercial property, C: construction.

## Chart V.9 CB
## DSTI distribution of new loans
(volume of loans in CZK billions; x-axis: DSTI in %)



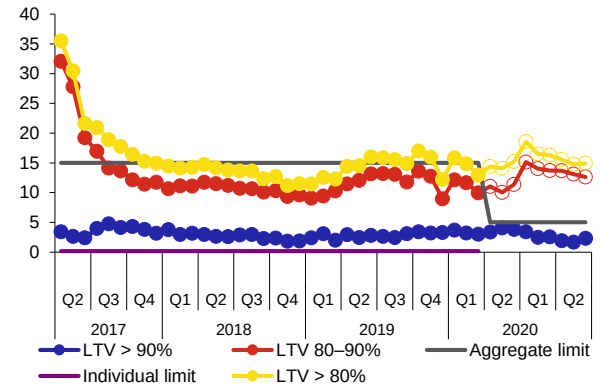

Source: CNB
Note: Interval closed from the right. Preliminary estimate for 2021 Q1.

## Chart V.10 CB
## DTI distribution of new loans
(volume of loans in CZK billions; x-axis: DTI in years)




Source: CNB
Note: Interval closed from the right. Preliminary estimate for 2021 Q1.

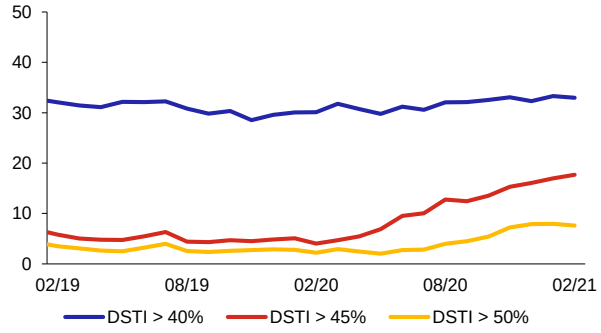
## Chart V.11 CB
## Share of loans with a high LTV
(share of loans in volume provided in %)




Source: CNB
Note: An LTV limit of 90% with a 5% volume exemption for total loans has applied since 1 April 2020. The values for the LTV 80–90% and LTV > 80% series are for information only as from the same date. An individual limit applied until the end of 2020 Q1. Until then, it was recommended that no loans for house purchase with LTVs of over 90% be provided.

## Chart V.12 CB
## Share of loans with a high DSTI

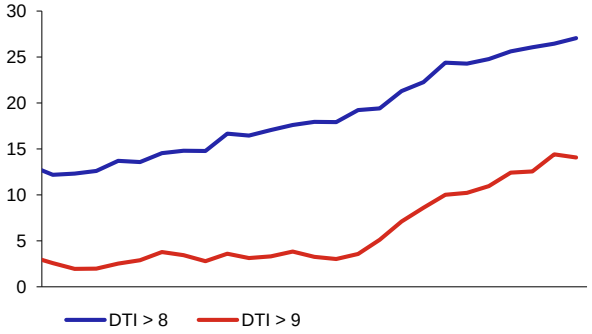
(share of loans in monthly volume provided in %)




Source: CNB

## Chart V.13 CB
## Share of loans with a high DTI

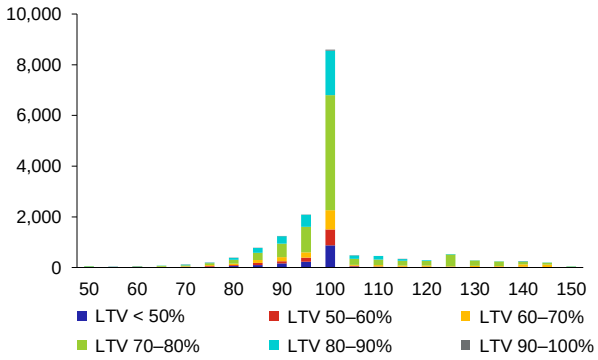
(share of loans in monthly volume provided in %)




Source: CNB

## Chart V.14 CB
## Distribution of loans for house purchase by ratio of estimated value to purchase price

(number of loans; x-axis: ratio of estimated value to purchase price of property in %)

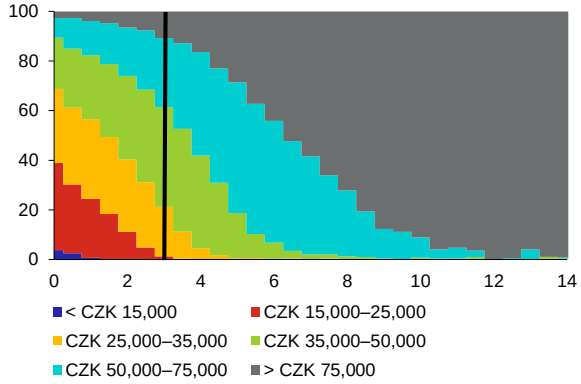



Source: CNB

Note: Data for 1 July 2020–28 February 2021. Loans with a ratio of the estimated value to the purchase price below 50% and above 150% are not included, but they are very low in number.

## Chart V.15 CB
## Total debt distribution by declared income

(% of given category; x-axis: CZK millions)

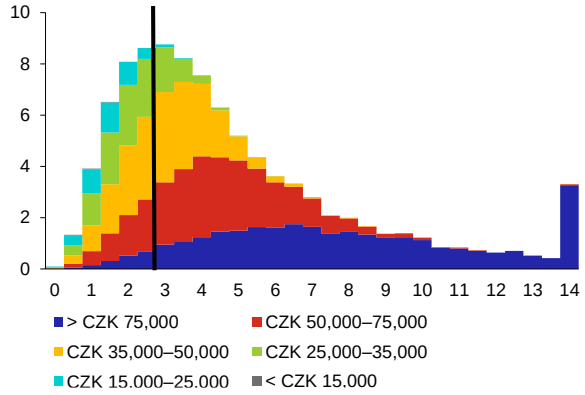



Source: CNB

Note: The vertical line represents the median debt. Data for 1 July 2020–28 February 2021.

## Chart V.16 CB
## Total debt distribution by declared income

(% of total debt; x-axis: CZK millions)




Source: CNB

Note: The vertical line represents the median debt. Data for 1 July 2020–28 February 2021. The sharp jump for the highest debt category is due to the fact that the highest categories of income and debt are limited only from the left.

# Glossary

**Bank Lending Survey (BLS):** A survey of bank lending conditions for non-financial corporations and households in the Czech Republic, the pilot round of which took place in 2012 Q1. The survey aims to obtain qualitative information on current perceptions of the situation on both the supply and demand side of the credit market.

**Basel III:** A regulatory framework issued by the Basel Committee on Banking Supervision in 2010 which sets standards for capital adequacy of banks and now also for their liquidity. Overall, Basel III introduces stricter rules than the previous framework and came into existence mainly as a reaction to the financial crisis.

**Breakdown of banks by total assets:** In some charts and tables in the FSR, banks are assigned to groups based on the amount of their total assets. The breakdown of banks into groups is revised at the end of each calendar year. In 2007 and 2008, banks having total assets of over CZK 150 billion were regarded as large banks, banks having total assets of over CZK 50 billion and up to CZK 150 billion were regarded as medium-sized banks and banks having total assets of less than CZK 50 billion were regarded as small banks. In 2009 the total amount of assets necessary for inclusion in the group of large banks was increased to CZK 200 billion and the range for medium-sized banks was changed to CZK 50 billion–CZK 200 billion. The range for small banks was unchanged. As from 2012, the breakdown of banks by total assets is as follows: large banks have total assets of over CZK 250 billion, medium-sized banks have total assets of over CZK 50 billion and up to CZK 250 billion and small banks have total assets of less than CZK 50 billion.

**Capital ratio:** The ratio of regulatory capital to total risk-weighted assets. The Tier 1 capital ratio is the ratio of Tier 1 capital to total risk-weighted assets (see also Tier 1).

**Capital requirement:** The capital requirement is the amount of capital a bank has to hold so as to cover all the risks it undertakes.

**Collective investment funds (CIFs):** Mutual and investment funds whose sole business activity is collective investment, i.e. collecting funds from investors and investing them. CIFs are broken down by investor type into funds intended for the public (dominated by open-ended mutual funds) and funds for qualified investors, and by asset risk into money market, bond, equity, mixed and real estate funds and funds of funds. Sometimes the category of funds of funds is not listed separately, but is included in the other categories according to the type of funds in which they invest.

**Common Reporting Framework (COREP):** A common reporting framework in the EU, prepared by the European Banking Authority (EBA) for data reporting in accordance with prudential requirements (under CRR). It covers the areas of capital, capital adequacy, risk exposures, operational risk, market risk and credit risk.

**Consumer credit:** Credit used to finance household consumption. It also includes bank overdrafts and debit balances and credit card credit.

**Countercyclical capital buffer:** A macroprudential tool designed to increase the banking sector's resilience to cyclical risks associated with fluctuations in lending.

**Debt service-to-income (DSTI):** The ratio of total debt service to the net income of the loan applicant.

**Debt-to-income:** The ratio of debt to the net income of the loan applicant.

**Default:** Default is defined as a breach of the debtor's payment discipline. The debtor is in default at the moment when it is probable that he will not be able to repay his obligations in a proper and timely manner, without recourse by the creditor to settlement of the claim from the security, or when at least one repayment (the amount of which deemed by the creditor to be significant) is more than 90 days past due.

**ESG factors:** Environmental, social and governance factors. Sustainability factors in the environmental field include measures to combat climate change, reducing carbon footprints, ensuring the protection of water resources, and applying responsible waste management policies. Factors in the social area include data handling and protection, working conditions and human rights protection. Governance factors include lobbying and whistleblowing.

**IFRS 9:** The financial reporting standard IFRS 9 *Financial instruments*, the final version of which was introduced in July 2014 by the International Accounting Standards Board (IASB), took effect on 1 January 2018 pursuant to Commission Regulation (EU) 2016/2067, replacing the previously valid IAS 39 standard. IFRS 9 lays down requirements for the recognition, valuation, impairment and derecognition of financial assets and financial liabilities and general hedge accounting. It aims to provide financial statement users with relevant information for assessing the size, timing and uncertainty of an entity's future cash flows.

**Institutional investor:** Either (a) a bank executing trades in investment instruments on its own account on the capital market, a management company, an investment fund, a pension fund or an insurance company, or (b) a foreign entity authorised to carry on business in the same fields in the Czech Republic as the entities listed under (a).

**Interest margin:** The difference between a bank's loan rate and its deposit rate.

**Interest rate spread:** Also interest rate differential; the spread between the interest rate on a contract (deposit, security) and a reference interest rate.

**Leverage:** See Leverage ratio.

**Leverage ratio:** The CRD IV/CRR rules define the leverage ratio as capital to risk-weighted assets. The term leverage is also often used in financial economics. There, however, capital is the denominator in the ratio (e.g. assets/capital or debt/capital). When we say that a bank has high leverage, we generally refer to the definition consistent with the assets/capital ratio. However, such a bank has a low leverage ratio.

**Liquidity coverage ratio:** A requirement to cover net liquidity outflows over a 30-day time horizon with liquid assets. It is calculated as the ratio of the liquidity buffer to the net liquidity outflow.

**Loan for house purchase:** Consumer credit (a) secured with real property or a lien on real property; (b) the purpose of which is (1) to acquire, settle or maintain rights to real property or part of real property; (2) to build real property or part of real property; (3) to pay for a transfer of a share in a housing cooperative or to acquire a share in another legal entity in order to acquire the right to use a flat or a house, (4) to change a building in accordance with the Building Act or to connect it to public networks; (5) to cover costs related to obtaining a cash loan, credit or other similar financial service with the purpose referred to in (1)–(4), or (6) to repay credit, a cash loan or other similar financial service provided for purposes referred to in (1)–(6); or (c) provided by a building society in accordance with the act regulating building savings schemes.

**Loan service-to-income:** The ratio of loan-related debt service to the net income of the loan applicant.

**Loan-to-income (LTI):** The ratio of the amount of a loan to the net income of the loan applicant.

**Loan-to-value (LTV):** The ratio of the amount of a loan to the value of collateral.

**Loss given default (LGD):** The ratio of the loss on an exposure in the event of counterparty default to the amount owed at the time of default.

**Macroprudential policy:** A key component of financial stability policy. It focuses on the stability of the financial system as a whole. Its main objective is to help prevent systemic risk.

**Market liquidity:** The ability of market participants to carry out financial transactions in assets of a given volume without causing a pronounced change in their prices.

**Minimum Requirement for Own Funds and Eligible Liabilities (MREL):** A sufficient volume of eligible liabilities is necessary for a failed bank to be recapitalised using internal funds (bail-in). In the event of a crisis, the CNB writes off or converts these liabilities. A sufficient MREL together with the application of a suitable combination of resolution tools thus enables a failed institution to be resolved without the use of public money.

**Mortgage loan:** A loan which is at least partly secured with a lien on property.

**Mortgage loan refinancing:** The process whereby a mortgage debtor accepts a new loan from a different lender than the one from which he received the original loan and uses it to repay the original loan. He thus becomes a debtor of the other lender, but usually under more favourable conditions. This is usually possible only at the end of the original loan's fixation period.

**Mortgage loan refixation:** The process whereby at the end of the fixation period of a mortgage loan the debtor selects the length of the new fixation period and negotiates new conditions for this period with the creditor. In this case, the identity of the creditor does not change.

**Net financial assets:** The difference between the sum of financial assets and the sum of liabilities.

**Net stable funding ratio (NSFR):** A structural liquidity requirement monitored over a one-year time horizon. It is defined as the ratio of available stable funding to required stable funding.

**Non-performing loans:** A loan is non-performing if at least one of the following two situations occurs: a) the debtor is unlikely to pay its credit obligations in full without recourse to actions such as realising security, b) the debtor is past due more than 90 days on a credit obligation. For details, see Article 178 of Regulation (EU) No 575/2013 of the European Parliament and of the Council.

**Output floor**: A lower limit on the total risk-weighted exposures of IRB banks set at 72.5% of the total risk-weighted exposures calculated using the STA approach. The output floor is currently scheduled to be phased in between January 2023 and January 2028, increasing each year from an initial level of 50% to the target of 72.5%.

**Pension funds:** In the Czech environment, pension funds are transformed and participation funds which are managed by pension management companies. Participation funds are further classed into obligatory conservative funds and other funds. Obligatory conservative funds are only allowed to invest in a significantly restricted group of assets.

**Pillar 1:** The first part of the CRD directive, focused on the determination of minimum capital requirements for all credit institutions to cover credit, market and operational risks.

**Pillar 2:** The second part of the CRD directive, requiring credit institutions to assess whether the Pillar 1 capital requirement is sufficient to cover all the risks to which they are exposed. This assessment process is reviewed by the supervisory authority under the supervisory review and evaluation process (SREP). The supervisory authority then can apply a wide range of instruments, including setting an additional capital requirement, for example to cover concentration risk.

**Prague InterBank Offered Rate (PRIBOR):** The reference interest rate on the interbank deposit market for deposit sales. Reference banks quoting the PRIBOR must be important participants in the interbank market.

**Price-to-income (PTI):** A housing affordability indicator calculated as the ratio of the property price to the annual income of the household or loan applicant.

**Price-to-rent (PR):** The ratio of the price of an apartment to the annual rent. The price-to-rent ratio is the inverse of the rental return.

**Property asking prices:** Property sale asking prices in estate agencies. Asking prices should be higher than transaction prices. Property asking prices in the Czech Republic are published, for example, by the CZSO and the Institute for Regional Information (which also publishes data on market rent supply prices).

**Property developers/developments:** Companies/projects whose aim is to build a complex of residential and commercial property. Property developers' work includes choosing an appropriate site, setting up a project, obtaining the necessary permits, building the necessary infrastructure, constructing the buildings and selling the property. Developers also often organise purchase financing for clients and frequently lease or manage the property once it is built (especially in the case of commercial property). Given the combination of construction activity and speculative property purchases, developers' results are strongly dependent on movements in property prices.

**Property price gap:** The deviation of the price of property from its estimated fundamental value.

**Property transaction prices:** Prices of actual transactions on the property market, which should be the closest to actual market prices. The CZSO has been publishing two types of data on property transaction prices since 2011. Prices based on Ministry of Finance statistics from property transfer tax returns and published by the CZSO are the older source. These data contain time series from 1998 and are available in a relatively detailed breakdown (by region, degree of wear and tear and type of property). On the other hand, they do not include transactions which are not subject to property transfer tax (i.e. primarily transactions in new property) and the index is published with a lag of at least half a year. The second, new source of data on property transaction prices is data from CZSO surveys in estate agencies. They cover new property, but are not available in such a long time series and such a detailed breakdown.

**Rehypothecation:** Re-use of an asset accepted as collateral in a secured loan.

**Return on assets (RoA):** The ratio of pre-tax profit and interest to total assets of a firm.

**Return on equity (RoE):** The ratio of net profit to equity of a firm.

**Risk premium:** The risk premium an investor demands on investments in riskier financial instruments.

**Saving rate (households):** A flow indicator showing the ratio of savings to gross disposable income of households. In simplified terms, savings are the part of income not spent on consumption in a given period.

**Search for yield:** A situation where economic agents attempt to make up for generally low asset yields by seeking riskier-than-usual investments that yield a premium in return for the increased risk. Such behaviour may increase the future risks to the financial system.

**Solvency (insurance companies):** Solvency in the insurance sector is the ability of an insurer to meet its insurance obligations, i.e. to settle eligible insurance claims arising from insured losses.

**Solvency II:** A European regulatory framework (directive) for European insurance companies and reinsurers laying down quantitative and qualitative requirements and prudential rules, including requirements to comply with market discipline and disclosure duties. It entered into force in 2016, when it replaced the Solvency I regulatory framework.

**Sovereign risk:** The risk that a government will default on its obligations, leading to national bankruptcy or restructuring of government debt.

**Systemic risk:** The risk of the entire financial system or market collapsing.

**Tier 1:** The highest quality and, for banks in the Czech Republic, also the most significant part of regulatory capital. The dominant components of Tier 1 are equity capital, retained earnings and mandatory reserve funds.

**VIX:** An index of expected 30-day volatility of US stocks (S&P 500 index), derived from market prices of options traded at the Chicago Board Options Exchange. A higher value indicates higher expected volatility of the stock index, and therefore higher market uncertainty.

**Yield spread:** Also yield differential; the spread between the yield on a bond and the yield on a reference (“benchmark”) bond.

# Abbreviations

| | |
|---|---|
| AEs | advanced economies |
| BCBS | Basel Committee on Banking Supervision |
| BEA | Bureau of economic analysis (U.S. Department of commerce) |
| BIS | Bank for International Settlements |
| bp | basis point |
| BRCI | Bank Register of Client Information operated by Czech Credit Banking Bureau |
| C | construction |
| CB | central bank |
| CBCB | Czech Banking Credit Bureau |
| CCoB | capital conservation buffer |
| CCyB | countercyclical capital buffer |
| CDS | credit default swap |
| CEB | Czech Export Bank |
| CEE | Central and Eastern Europe |
| CET1 | common equity Tier 1 |
| CF | Consensus Forecast |
| CISS | Composite Indicator of Systemic Risk |
| CI | credit institution |
| CLO | collateralised loan obligation |
| ČMZRB | Českomoravská záruční a rozvojová banka |
| CNB | Czech National Bank |
| CNCB | Czech Non-Banking Credit Bureau |
| COREP | The Common Reporting Framework |
| Coll. | collection |
| CPI | Consumer Price Index |
| CRD | Capital Requirements Directive |
| CRR | Capital Requirements Regulation |
| CSDB | Centralised Securities Database |
| CZK | Czech koruna |
| CZSO | Czech Statistical Office |
| DSCR | debt service coverage ratio |
| DSTI | debt service-to-income |
| DTI | debt-to-income |
| EA | euro area |
| EAD | exposure at default |
| EBA | European Banking Authority |
| EC | European Commission |
| ECB | European Central Bank |
| ECL | expected credit loss |
| EGAP | Export Guarantee and Insurance Company |
| EIB | European Investment Bank |
| EIOPA | European Insurance and Occupational Pensions Authority |
| EL | expected loss |
| EMs | emerging market economies |
| EMIR | Regulation on OTC derivatives, central counterparties and trade repositories |
| EMU | European Monetary Union |
| ESA | Joint Committee of European Supervisory Authorities |
| ESFS | European System of Financial Supervision |
| ESG | environmental, social and governance (factors) |
| ESMA | European Securities and Markets Authority |
| ESRB | European Systemic Risk Board |
| EU | European Union |
| EUR | euro |
| EURIBOR | Euro InterBank Offered Rate (reference interest rate on the interbank market) |
| FCI | financial cycle indicator |
| Fed | Federal Reserve System |
| FI | financial institution |
| FINREP | Financial Reporting |
| FSR | Financial Stability Report |
| G20 | Group of Twenty |
| GB | government bond |
| GDI | gross disposable income |
| GDP | gross domestic product |
| GFSR | Global Financial Stability Report |
| GNI | gross national income |
| G-SII | Global systemically important institution |
| H | half-year |
| HBS | Household Budget Statistics |
| I | investment |
| IAS | International Accounting Standards |
| IFRS | International Financial Reporting Standards |
| ILO | International Labour Organization |
| IMF | International Monetary Fund |
| IPFCs | investment and pension funds and companies |
| IR | Inflation Report |
| IRB | Internal Rating Based Approach, an approach within the Basel II framework for capital adequacy of banks |
| IRI | Institute for Regional Information |
| IRS | interest rate swap |

| | |
|---|---|
| ISR | sovereign risk indicator |
| IT | information technology |
| LCR | liquidity coverage ratio |
| LGD | loss given default |
| LLP | loan loss provision |
| LSTI | loan service-to-income |
| LTI | loan-to-income |
| LTV | loan-to-value |
| M | month |
| MBs | mortgage bonds |
| MF CR | Ministry of Finance of the Czech Republic |
| MIT | Ministry of Industry and Trade |
| MM | money market |
| MPR | Monetary Policy Report |
| MREL | minimum requirement for own funds and eligible liabilities |
| $MREL_{TEM}$ | Minimum requirement for own funds and eligible liabilities – total exposure measure |
| $MREL_{TREA}$ | Minimum requirement for own funds and eligible liabilities – total risk exposure amount |
| MSCI | Morgan Stanley Capital International |
| NACE | General Industrial Classification of Economic Activities |
| NBER | The National Bureau of Economic Research |
| NFC | non-financial corporation |
| NFCEL | non-bank financial corporations engaged in lending |
| NP | natural person |
| NPISH | non-profit institutions serving households |
| NPL | non-performing loan |
| NRCI | Non-bank Register of Client Information |
| NSFR | net stable funding ratio |
| OCI | other comprehensive income |
| OECD | Organisation for Economic Cooperation and Development |
| OFIs | other financial intermediaries |
| O-SII | Other systemically important institutions |
| PD | probability of default |
| pp | percentage point |
| PRIBOR | Prague InterBank Offered Rate (reference interest rate on the interbank market) |
| PTI | price-to-income |
| Q | quarter |
| QA | quick assets |
| RoA | return on assets |
| RoE | return on equity |
| RPN | Research and Policy Notes |
| S&P | Standard & Poor´s |
| SCR | Solvency Capital Requirement |
| SHI | social and health insurance |
| SMEs | small and medium-sized enterprises |
| SOLUS | Sdružení na ochranu leasingu a úvěrů spotřebitelům (Association for the Protection of Leasing and Loans to Consumers) |
| SRB | systemic risk buffer |
| STA | standardised approach to credit risk |
| SFA | stock flow adjustments |
| TF | transformed fund |
| TLTRO | Targeted Longer-Term Refinancing Operations |
| TSCR | total supervisory review and evaluation process capital requirement |
| TTC | through the cycle |
| TP | technical provision |
| ULI | Unit Linked Insurance |
| VIX | Volatility index |
| WGI | Worldwide Governance Indicators |
| WP | Working Paper |
| Y | year |

# Country abbreviations

| | | | |
|---|---|---|---|
| AT | Austria | IS | Iceland |
| AU | Australia | IT | Italy |
| BE | Belgium | JP | Japan |
| BG | Bulgaria | KR | South Korea |
| BR | Brazil | LT | Lithuania |
| CA | Canada | LU | Luxembourg |
| CL | Chile | LV | Latvia |
| CN | China | MT | Malta |
| CY | Cyprus | MX | Mexico |
| CZ | Czech Republic | MY | Malaysia |
| DE | Germany | NL | Netherlands |
| DK | Denmark | NO | Norway |
| EA | euro area | NZ | New Zealand |
| EE | Estonia | PL | Poland |
| ES | Spain | PT | Portugal |
| FI | Finland | RO | Romania |
| FR | France | RU | Russia |
| GR | Greece | SE | Sweden |
| HK | Hongkong | SI | Slovenia |
| HR | Croatia | SK | Slovakia |
| HU | Hungary | TH | Thailand |
| CH | Switzerland | TR | Turkey |
| ID | Indonesia | UK | United Kingdom |
| IE | Ireland | US | United States |
| IL | Israel | ZA | Republic of South Africa |
| IN | India | | |

# Selected indicators

## FINANCIAL STABILITY INDICATORS – PART 1

| | | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 Jan. | 2021 Feb. | 2021 Mar. |
|---|---|---|---|---|---|---|---|---|---|---|
| **Macroeconomic environment** | | | | | | | | | | |
| ME.1 | Real GDP growth (year on year, %) | 5.5 | 2.4 | 5.4 | 3.2 | 2.3 | -5.6 | | | -2.1 |
| ME.2 | Consumer price inflation (average annual index growth, %) | 0.3 | 0.7 | 2.5 | 2.1 | 2.8 | 3.2 | 3.0 | 2.9 | 2.8 |
| ME.3 | General government balance / GDP (%) | -0.6 | 0.7 | 1.5 | 0.9 | 0.3 | -6.2 | | | -8.7 |
| ME.4 | General government debt / GDP (%) | 39.7 | 36.6 | 34.2 | 32.1 | 30.2 | 38.1 | | | |
| ME.5 | Trade balance / GDP (%) | 4.1 | 5.4 | 5.1 | 3.7 | 4.1 | 5.0 | | | |
| ME.6 | External debt in % of banking sector external assets | 133.7 | 120.2 | 114.0 | 113.7 | 112.2 | 108.4 | | | |
| ME.7 | Balance of payments current account / GDP (%) | 0.4 | 1.8 | 1.5 | 0.4 | -0.3 | 3.6 | | | |
| ME.8 | Monetary policy 2W repo rate (end of period, %) | 0.05 | 0.05 | 0.50 | 1.75 | 2.00 | 0.25 | 0.25 | 0.25 | 0.25 |
| **Non-financial corporations** | | | | | | | | | | |
| NC.1 | Return on equity (%) | 11.9 | 11.3 | 11.0 | 10.2 | 9.9 | 7.6 | | | |
| NC.2 | Debt (% of total liabilities) | 49.1 | 50.2 | 49.3 | 49.3 | 48.5 | 47.2 | | | |
| NC.3 | Credit indebtedness (% of GDP) | 48.8 | 50.0 | 50.3 | 53.1 | 50.1 | 51.2 | | | |
| NC.4 | – loans from Czech banks (% of GDP) | 19.9 | 20.3 | 20.0 | 20.0 | 19.5 | 19.9 | | | |
| NC.5 | – loans from Czech non-bank financial corporations (% of GDP) | 4.1 | 4.4 | 4.5 | 4.5 | 4.4 | 4.4 | | | |
| NC.6 | – other (including financing from abroad, % of GDP) | 24.7 | 25.3 | 25.8 | 28.6 | 26.3 | 26.8 | | | |
| NC.7 | Interest coverage (pre-tax profit + interest paid / interest paid, %) | 16.3 | 22.1 | 26.8 | 25.2 | 17.0 | 16.9 | | | |
| NC.8 | 12M default rate (%) | 1.4 | 1.1 | 1.2 | 1.0 | 1.6 | 2.7 | | | |
| **Households (including sole traders)** | | | | | | | | | | |
| H.1 | Total debt / gross disposable income (%) | 56.6 | 58.6 | 58.8 | 59.1 | 59.0 | 59.6 | | | |
| H.2 | Total debt / financial assets (%) | 25.7 | 25.9 | 26.3 | 24.6 | 24.0 | 22.9 | | | |
| H.3 | Net financial assets (total financial assets − total liabilities, % of GDP) | 81.7 | 83.9 | 80.8 | 90.5 | 93.3 | 107.3 | | | |
| H.4 | Debt / GDP (%) | 29.9 | 30.9 | 31.2 | 31.6 | 31.5 | 33.9 | | | |
| H.5 | – loans from Czech banks to households (% of GDP) | 26.7 | 27.7 | 28.1 | 28.7 | 28.7 | 31.2 | | | |
| H.6 | – loans from Czech non-bank fin. corporations to households (% of GDP) | 1.3 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | | | |
| H.7 | – loans from Czech banks to sole traders (% of GDP) | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | | | |
| H.8 | – loans from Czech non-bank fin. corporations to sole traders (% of GDP) | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 | | | |
| H.9 | – other (including financing from abroad, % of GDP) | 1.1 | 1.1 | 1.0 | 0.9 | 0.8 | 0.8 | | | |
| H.10 | Net interest expenses / gross disposable income (%) | 2.8 | 2.6 | 2.3 | 2.2 | 2.1 | 2.0 | | | |
| H.11 | 12M default rate (%, excluding sole traders) | 2.9 | 2.2 | 1.8 | 1.5 | 1.3 | 1.2 | | | |
| **Financial markets** | | | | | | | | | | |
| FM.1 | 3M PRIBOR (average for period, %) | 0.3 | 0.3 | 0.4 | 1.3 | 2.1 | 0.9 | 0.4 | 0.4 | 0.4 |
| FM.2 | 1Y PRIBOR (average for period, %) | 0.5 | 0.5 | 0.6 | 1.5 | 2.2 | 0.9 | 0.5 | 0.5 | 0.6 |
| FM.3 | 10Y government bond yield (average for period, %) | 0.6 | 0.4 | 1.0 | 2.0 | 1.5 | 1.1 | 1.3 | 1.5 | 1.9 |
| FM.4 | CZK / EUR exchange rate (average for period, %) | 27.3 | 27.0 | 26.3 | 25.6 | 25.7 | 26.5 | 26.1 | 25.9 | 26.2 |
| FM.5 | Change in PX stock index (% year on year, end of period) | 1.0 | -3.6 | 17.0 | -8.5 | 13.1 | -7.9 | 0.5 | 0.5 | 0.6 |
| **Property market** | | | | | | | | | | |
| PM.1 | Total change in residential property prices (transaction prices, % year on year) | 4.5 | 11.0 | 8.4 | 9.8 | 8.9 | 9.0 | | | |
| PM.2 | Change in apartment prices (asking prices according to CZSO, % year on year) | 4.3 | 15.1 | 11.6 | 6.5 | 10.8 | 16.4 | | | |
| PM.3 | Apartment price / average annual wage | 8.9 | 9.8 | 10.3 | 10.1 | 10.5 | 11.7 | | | |
| PM.4 | Apartment price / annual rent (according to IRI) | 24.5 | 26.9 | 27.8 | 26.1 | 25.9 | 31.3 | | | |

Note: Owing to data revisions, some historical values of the indicators may not be comparable to those published in previous FSRs. Also, owing to the later date of table update, the values of the indicators may not be the same as those referred in the text of the document *Risks to financial stability and their indicators*. Missing values were unavailable at the time of preparation of the table.

# FINANCIAL STABILITY INDICATORS – PART 2

| | | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 Jan. | 2021 Feb. | 2021 Mar. |
|---|---|---|---|---|---|---|---|---|---|---|
| **Financial sector** | | | | | | | | | | |
| FS.1 | Financial sector assets / GDP (%) | 152.6 | 160.3 | 175.4 | 173.0 | 181.5 | 178.6 | | | |
| FS.2 | Shares of individual segments in financial sector assets (%) | | | | | | | | | |
| FS.3 | banks | 77.4 | 77.4 | 78.7 | 78.7 | 78.4 | 78.6 | | | |
| FS.4 | credit unions | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | | | |
| FS.5 | insurance companies | 6.8 | 6.4 | 5.7 | 5.6 | 5.1 | 4.9 | | | |
| FS.6 | pension management companies and funds | 5.3 | 5.2 | 5.0 | 5.1 | 5.3 | 5.4 | | | |
| FS.7 | investment funds* | 4.8 | 5.3 | 5.4 | 5.5 | 6.3 | 6.7 | | | |
| FS.8 | non-bank financial corporations engaged in lending | 5.0 | 5.0 | 4.6 | 4.6 | 4.6 | 4.1 | | | |
| FS.9 | investment firms | 0.5 | 0.4 | 0.3 | 0.2 | 0.1 | 0.1 | | | |
| **Banking sector** | | | | | | | | | | |
| BS.1 | Bank assets / GDP (%) | 116.6 | 123.4 | 136.4 | 133.9 | 130.8 | 140.3 | | | |
| BS.2 | Assets structure (%, end of period) | | | | | | | | | |
| BS.3 | loans to central bank | 15.7 | 21.6 | 32.9 | 31.7 | 31.9 | 29.0 | | | 31.2 |
| BS.4 | interbank loans | 4.4 | 3.7 | 3.6 | 3.4 | 2.9 | 2.9 | | | 3.2 |
| BS.5 | client loans | 51.9 | 50.7 | 45.1 | 46.5 | 46.8 | 46.2 | | | 44.5 |
| BS.6 | bond holdings | 21.2 | 18.3 | 13.6 | 13.6 | 13.0 | 16.1 | | | 16.2 |
| BS.7 | – government bonds | 14.3 | 11.5 | 7.9 | 8.2 | 7.5 | 10.9 | | | 10.7 |
| BS.8 | – Czech government bonds | 12.6 | 10.0 | 7.0 | 7.4 | 6.9 | 10.3 | | | 10.7 |
| BS.9 | other | 6.7 | 5.8 | 4.8 | 4.7 | 5.4 | 5.9 | | | 4.9 |
| BS.10 | Liabilities structure (%, end of period) | | | | | | | | | |
| BS.11 | liabilities to central bank | 0.2 | 0.2 | 0.3 | 0.2 | 0.1 | 0.5 | | | 0.5 |
| BS.12 | interbank deposits | 7.4 | 10.3 | 16.3 | 15.1 | 12.7 | 8.0 | | | 8.6 |
| BS.13 | client deposits | 66.5 | 65.3 | 61.3 | 62.9 | 64.4 | 66.7 | | | 69.6 |
| BS.14 | bonds issued | 11.9 | 11.3 | 10.9 | 10.7 | 11.1 | 12.5 | | | 10.3 |
| BS.15 | other | 13.9 | 12.9 | 11.2 | 11.0 | 11.6 | 12.4 | | | 11.0 |
| BS.16 | Client loans / client deposits (%) | 78.1 | 77.5 | 73.6 | 74.0 | 72.7 | 69.3 | | | 63.9 |
| BS.17 | Sectoral breakdown of total loans (%) | | | | | | | | | |
| BS.18 | non-financial corporations | 33.1 | 33.1 | 33.1 | 32.7 | 32.5 | 30.2 | | | |
| BS.19 | households | 44.4 | 45.1 | 46.6 | 46.9 | 47.8 | 47.7 | | | |
| BS.20 | sole traders | 1.3 | 1.2 | 1.3 | 1.3 | 1.3 | 1.2 | | | |
| BS.21 | others (including non-residents) | 21.3 | 20.6 | 19.0 | 19.1 | 18.4 | 20.9 | | | |
| BS.22 | Growth in loans (%, end of period, year on year): | | | | | | | | | |
| BS.23 | total | 5.6 | 6.0 | 4.6 | 7.2 | 4.4 | 4.2 | | | |
| BS.24 | non-financial corporations | 5.3 | 5.9 | 4.8 | 5.7 | 3.7 | 0.3 | | | |
| BS.25 | – real estate activity (NACE L) | 5.6 | 12.1 | -1.7 | 5.2 | 7.5 | 4.8 | | | |
| BS.26 | households | 8.2 | 7.7 | 8.0 | 7.9 | 6.4 | 6.9 | | | |
| BS.27 | – loans for house purchase | 8.0 | 8.4 | 9.0 | 8.5 | 6.7 | 8.0 | | | |
| BS.28 | – loans for consumption | 8.9 | 4.5 | 4.1 | 6.4 | 7.2 | 0.8 | | | |
| BS.29 | sole traders | 0.0 | 4.4 | 10.1 | 5.6 | 8.1 | 2.2 | | | |
| BS.30 | Non-performing loans / total loans (%): | | | | | | | | | |
| BS.31 | total | 5.8 | 4.8 | 4.0 | 3.3 | 2.5 | 2.7 | | | |
| BS.32 | non-financial corporations | 5.7 | 5.2 | 4.2 | 3.6 | 3.2 | 4.2 | | | |
| BS.33 | households | 4.0 | 3.2 | 2.5 | 2.1 | 1.6 | 1.7 | | | |
| BS.34 | – loans for house purchase | 2.6 | 2.0 | 1.8 | 1.5 | 1.2 | 1.1 | | | |
| BS.35 | – loans for consumption | 11.1 | 8.9 | 6.0 | 5.1 | 4.0 | 5.1 | | | |
| BS.36 | sole traders | 11.0 | 8.6 | 6.7 | 5.0 | 4.3 | 6.1 | | | |
| BS.37 | Coverage of non-performing loans by provisions (%) | 54.9 | 57.2 | 54.8 | 58.2 | 57.8 | 52.0 | | | |
| BS.38 | Capital ratio (%) | 18.4 | 18.5 | 19.3 | 19.7 | 21.3 | 24.4 | | | 24.1 |
| BS.39 | Tier 1 capital ratio (%) | 18.0 | 17.9 | 18.7 | 19.1 | 20.8 | 23.7 | | | 23.4 |
| BS.40 | Leverage (assets as a multiple of Tier 1) | 13.2 | 13.9 | 15.3 | 15.1 | 14.3 | 13.0 | | | 14.2 |
| BS.41 | Leverage ratio (Tier 1 capital / total exposures) | n.a. | 7.1 | 6.6 | 6.6 | 7.0 | 7.7 | | | |
| BS.42 | Return on assets (%) | 1.2 | 1.3 | 1.1 | 1.1 | 1.2 | 0.6 | | | 0.5 |
| BS.43 | Return on Tier 1 (%) | 16.8 | 17.8 | 17.0 | 17.5 | 18.2 | 8.2 | | | 7.1 |
| BS.44 | Quick assets / total assets (%) | 31.8 | 34.4 | 42.0 | 41.2 | 40.7 | 41.2 | | | |
| BS.45 | Quick assets / client deposits (%) | 47.1 | 52.1 | 68.0 | 65.1 | 62.8 | 61.5 | | | |
| BS.46 | Net external position of banking sector (% of GDP) | -2.2 | -7.8 | -21.4 | -20.2 | -18.2 | -15.8 | | | |
| BS.47 | Banking sector external debt / banking sector total assets (%) | 16.4 | 19.1 | 26.1 | 25.0 | 23.3 | 20.6 | | | |

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## FINANCIAL STABILITY INDICATORS – PART 3

| | | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 Jan. | 2021 Feb. | 2021 Mar. |
|---|---|---|---|---|---|---|---|---|---|---|
| **Non-bank financial corporations** | | | | | | | | | | |
| NI.1 | Share in financial sector assets (%) | 22.0 | 22.0 | 20.9 | 20.9 | 21.3 | 21.1 | | | |
| | **Insurance companies** | | | | | | | | | |
| NI.2 | Premiums written / GDP (%) | 3.3 | 3.1 | 3.0 | 2.9 | 2.9 | 3.0 | | | |
| NI.3 | Ratio of eligible own funds to the solvency capital requirement (in %) | n.a. | 238.1 | 230.0 | 243.6 | 202.4 | 251.3 | | | |
| NI.4 | Change in financial investment of insurance companies (%, year on year) | -1.6 | 0.9 | 4.2 | 1.4 | -6.7 | 0.6 | | | |
| NI.5 | Return on equity of insurance companies (%) | 17.0 | 15.7 | 14.7 | 15.8 | 24.1 | 18.4 | | | |
| NI.6 | Claim settlement costs / net technical provisions (life, %) | 17.8 | 15.1 | 14.4 | 15.3 | 16.6 | 14.2 | | | |
| NI.7 | Claim settlement costs / net technical provisions (non-life, %) | 55.6 | 58.1 | 59.4 | 57.8 | 62.7 | 58.4 | | | |
| | **Pension management companies (PMCs) and PMC funds** | | | | | | | | | |
| NI.8 | Change in assets of funds managed by PMCs (%) | 10.0 | 7.8 | 10.8 | 5.6 | 8.0 | 6.8 | | | |
| NI.9 | Nominal change in value of assets of PMC funds | 1.0 | 0.3 | 3.6 | -1.7 | 0.9 | 0.1 | | | |
| | **Investment funds** | | | | | | | | | |
| NI.10 | Growth in net assets (= equity; year on year, %) | 18.5 | 17.7 | 20.9 | 6.3 | 21.0 | 8.7 | 9.2 | 11.7 | |
| | **Non-bank financial corporations engaged in lending** | | | | | | | | | |
| NI.11 | Growth in loans from non-bank financial corporations engaged in lending (%): | | | | | | | | | |
| NI.12 | total | 0.8 | 8.9 | 8.2 | 4.7 | 4.3 | -2.3 | | | |
| NI.13 | households | -26.4 | 7.0 | 0.7 | -1.6 | -1.2 | -9.1 | | | |
| NI.14 | non-financial corporations | 11.4 | 10.1 | 10.0 | 6.3 | 2.6 | 0.0 | | | |

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## ADDITIONAL INFORMATION ON THE INDICATORS

| | |
|---|---|
| ME.6 | Total external debt in % of external assets held by MFIs and the CNB. |
| PM.1 | Property prices based on the House Price Index, source: CZSO |
| PM.2 | Apartment prices based on data from Společnost pro cenové mapy, s.r.o., apartment size 68 $m^2$. |
| FS.7 | Act No. 240/2013 Coll., on Management Companies and Pension funds, was adopted in 2013, introducing the term "investment funds". Investment funds comprise collective investment funds and funds for qualified investors. |
| BS.25 | Real estate activities (NACE L) comprise above all the activities of lessors, agents or brokers in the area of selling or purchasing property, renting property and the provision of other services related to property. |
| BS.37 | Loans provided by the Czech Export Bank and the Czech-Moravian Guarantee and Development Bank were excluded from the calculation. |
| BS.44 – BS.45 | Assets readily available to cover liabilities. They comprise cash and claims on central banks, claims on credit institutions and other clients payable on demand and bonds issued by central banks and general government. |
| NI.2 – NI.7 | These indicators comprise domestic insurance companies (excluding the EGAP) and branches of foreign insurance companies. |
| NI.2 | Premiums written include total gross premiums written for 12 months by domestic insurance companies including branches of foreign insurance companies (excluding EGAP). |
| NI.9 | Change in the assets of pension funds adjusted for contributions and benefits. |
| NI.13 | The change in the amount of loans provided to households by non-bank financial corporations engaged in lending in 2015 was due to the conversion of one of these lenders into a foreign bank branch. |

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