

Financial Stability Report

2022:1



The Riksbank's Financial Stability Report

The Riksbank's Financial Stability Report is published twice a year. In the report, the Riksbank presents its overall assessment of the risks and threats to the financial system and evaluates the system's resilience to them. The work on the stability analysis is therefore directly linked to the Riksbank's task of promoting a safe and efficient payment system. By publishing the results of its analysis, the Riksbank wishes to draw attention to, and warn of, risks and events that might pose a threat to the financial system, and to contribute to the debate on this subject.

The Executive Board of the Riksbank has discussed the report on two occasions – on 11 May and 23 May 2022. The report is available on the Riksbank's website, www.riksbank.se. The report takes into account developments up to and including 17 May 2022.

The Riksbank and financial stability

A prerequisite for the economy to function and grow is that the financial system is stable and functioning well.¹ However, the system is sensitive, as its central parts are vulnerable. For example, banks finance their operations at short maturities, but lend at longer maturities, making them dependent on public and market confidence. If this is lost, serious problems can arise rapidly. Moreover, the participants in the financial system are interconnected. For example, trade between banks and other market participants is extensive. In addition, banks have similar operations. Problems that arise at one participant in a market, or in a system, can therefore quickly spread throughout the system, both directly and via concerns that similar participants might also have problems.

A crisis in the financial system risks leading to considerable economic and social costs. The significance of the financial system, combined with its vulnerability, means that the state has a particular interest in preventing threats to financial stability. This is because banks and other market participants do not have an incentive themselves to give full consideration to the risks to financial stability they may cause. If a crisis occurs, the state also might need to intervene. At the same time, this should be done at as low a cost as possible.

The Sveriges Riksbank Act states that the Riksbank shall promote a safe and efficient payment system.² In practice, this task means that the Riksbank is responsible for promoting financial stability. This has been defined by the Riksbank as being able to convey payments, convert savings into financing, and manage risks. In addition, the system shall have resilience to disruptions that threaten these functions.

The Riksbank can provide liquidity support to individual institutions if problems arise that threaten financial stability. This means that the Riksbank needs to be well prepared for crises by having an efficient crisis organisation with good information channels and tools for analysis, as well as well-developed cooperation with other authorities.

Therefore, the Riksbank regularly analyses the stability of the financial system so that changes and vulnerabilities that could negatively affect the functioning of the system can be detected and pointed out at an early stage.³ In some cases the Riksbank recommends specific measures to counteract risks and increase resilience. The recommendations can be aimed at banks and other market participants, as well as at legislators and other authorities.

¹ The financial system refers to banks and other financial agents, as well as the financial markets and the financial infrastructure in the form of the technical systems required to make payments and exchange securities. The system also includes the financial regulatory framework in the form of legislation, regulation and other standards.

² The Sveriges Riksbank Act (1988:1385).

³ The main focus of the analysis is on the five major banks in Sweden, Danske Bank, Handelsbanken, Nordea, SEB and Swedbank, and on the markets and infrastructure that are important for their funding and risk management.

The Riksbank shares responsibility for promoting financial stability with Finansinspektionen (the Swedish financial supervisory authority, FI), the Ministry of Finance and the Swedish National Debt Office. The interaction between the authorities is important both in the work on prevention and in the event of crisis management. The same also applies internationally, as financial companies operate across national borders.

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IN BRIEF – The Riksbank’s stability assessment



Growth in Sweden and abroad was strong last year but is expected to enter a more moderate phase this year. Russia's invasion of Ukraine has contributed to further increases in energy and food prices. Lockdowns in China and the invasion have also led to renewed problems in global supply chains. This has made the already high inflation rise even further. In response to this, central banks around the world have begun to conduct a less expansionary monetary policy. Taken together, this has made yields for government bonds and other fixed-income securities rise.



The Swedish financial system is working well, but the financial stability risks have increased. The risk outlook is characterised both by the impact on economic agents and asset markets of higher interest rates and the high inflation, as well as by the geopolitical situation and its economic effects. Property companies' debt and interest-rate sensitivity have increased. The large and increasing exposures of the Swedish major banks to these companies therefore entails a risk. In addition, Swedish household debt has continued to increase more rapidly than their disposable income. Higher interest rates will have a tangible impact on highly indebted households and companies. There is also a risk of major price falls on real and financial assets in the light of higher interest rates and subdued growth prospects.



The need for reforms in housing and tax policy remains and, if these are not implemented to the extent necessary, the need for macroprudential measures increases. To improve the resilience of the banking system, the Riksbank supports FI's ambition to continue to raise the value of the countercyclical capital buffer in the near term to at least the neutral level of 2 per cent. It is also important that globally agreed standards, such as Basel III, are implemented in a full, timely, and consistent way.



To promote transparency and liquidity in the Swedish corporate bond market, larger Swedish companies should apply the new Swedish benchmark standard. In addition, the Riksbank supports FI's proposals for amendments to fund legislation with regard to, among other things, liquidity management tools and redemption frequency. The Riksbank also calls on market participants to use fully transaction-based reference rates, such as SWESTR, in financial contracts to avoid falling behind the international community in the use of such rates.



It is also important to continue international cooperation and coordination to create a common view of how the risks linked to cryptoassets are to be managed. The regulatory work being done within the EU is a step on the way. The Riksbank supports the proposals by FI and the Swedish Environmental Protection Agency for the EU to investigate a ban on 'proof of work', an energy-intensive method for mining cryptoassets, and for Sweden to counteract the widespread establishment of the mining of cryptoassets using the method.



The ability to prevent, detect and manage cyber threats needs to be strengthened, and coordination between public authorities and between public authorities and the private sector needs to be increased. That is why the work of the authorities to strengthen cyber security in the financial sector is an important initiative. The Riksbank also considers it important that financial agents incorporate climate-related risks into their risk analyses. The banks also need to report their exposures to climate risks.

1 Summary of the stability assessment

The geopolitical situation is slowing down otherwise strong growth

The Swedish financial system is working well. The major Swedish banks are deemed to be resilient, since they have a margin over the capital requirements, good liquidity and profitability, and low loan losses. The banks' funding situation is also favourable and they have good opportunities to provide credit to companies and households. Companies can finance their operations both through bank loans and through the capital market, albeit now at somewhat higher interest rates. The availability of the Swedish financial infrastructure systems is good.

The global economy is still affected by the major disruption caused by the pandemic. For example, inflation has risen rapidly, partly due to disruptions in global supply chains and rising energy and commodity prices. Russia's invasion of Ukraine and subsequent sanctions have contributed to further increases in energy, goods and food prices. It has increased the inflation even more and has weakened growth prospects particularly in the euro area, but also in Sweden. The rise in inflation is broad and is now making a clear impact on several consumer prices. In response to the high inflation, central banks around the world have begun to conduct a less expansionary monetary policy. Taken together, this development has made yields for government bonds and other fixed-income securities rise. Overall, the financial conditions are tighter compared to 2021.

There are still few bankruptcies among companies in Sweden and the rest of Europe. However, the lockdowns in China and the Russian invasion have reinforced the shortage of input goods and the problems of high freight costs that have marked the business sector since the outbreak of the pandemic. The high prices for energy and commodities have mainly affected the manufacturing and transport sectors. At the same time, households have faced even higher prices for electricity, fuel and food. Companies and households' costs are also being affected by interest rates, which have begun to rise, albeit from low levels. Tax relief, subsidies and other fiscal measures to some extent compensate many households and companies for the higher costs.

The threats to financial stability have increased

The global risk outlook is characterised both by the impact on economic agents and asset markets of higher interest rates in the light of the high inflation, as well as by the geopolitical situation and its economic effects.

There is uncertainty regarding how far the central banks need to raise their policy rates to tame the high inflation, and what consequences the tighter monetary policy will have for the real economy. After many years of low inflation and very low interest rates, rising asset prices and increasing indebtedness, it is uncertain how economic agents will manage a rapid rise in inflation and interest rates. Rising interest rates also

contribute to increasing the risk of large price falls on real and financial assets, and to increased turbulence and uncertainty in the financial markets. In an unfavourable scenario, functionality in the financial markets may be impaired.

Although the importance of Russia and Ukraine for the world economy is limited, the war had had a significant impact on developments in many countries, not least in the euro area. Russia, for example, is a major exporter of important commodities such as oil, natural gas and fertilisers, and Ukraine is one of the world's largest grain producers. Both countries also export important input goods for the manufacturing industry. If prices for energy, goods and food rise even more, for example as a result of the invasion being prolonged or escalating, more sanctions or a total embargo being introduced on energy from Russia, then the risk of a stagflation scenario characterised by high inflation and low growth increases. This also amplifies the risk for banks, for example in the form of increased loan losses.

Existing vulnerabilities in Sweden have continued to increase

The last few years have shown that the economic situation can change rapidly and unexpectedly, with major consequences. The Swedish economy is in some respects in a good position to cope with stress, partly because public debt is low and the export sector is relatively strong. However, already existing vulnerabilities in the Swedish economy have continued to increase.

The Swedish banks' large and increasing lending to commercial property companies poses a significant risk. These companies also account for a large share of the issuances on the Swedish corporate bond market. Their large debts make them interest-rate sensitive. The Riksbank's calculations show that a scenario with rapidly rising interest rates may take up a large part of property companies' operating profit. Moreover, if credit conditions are tightened and economic activity is weakened, the risk of large price falls on their properties increases, which can have major consequences for both property companies and lenders.

Household debt and housing prices have been rising faster than disposable income over a long period of time. In addition, the proportion of new mortgagors with a high loan-to-income ratio has increased in recent years.⁴ For a long time, the Riksbank has been pointing out that high household indebtedness is making the Swedish economy vulnerable. We are now in a situation where the economic conditions for many households are changing in the form of higher interest expenditure and living costs. The household sector as a whole is deemed to be able to cope with rising interest rates.⁵ But, as there is no up-to-date microdata on households' assets, liabilities and savings, it is difficult to assess how households will adapt their consumption and savings to the new circumstances.⁶ It is likely that many highly indebted households may

⁴ See *The Swedish mortgage market*, April 2022, Finansinspektionen.

⁵ Here we assume the same interest rate development in the coming years as in the April Monetary Policy Report.

⁶ See *Monetary Policy Report*, April 2022, Sveriges Riksbank.

need to make significant adjustments in their personal finances. Tenant-owner housing associations may also need to increase their fees to deal with rising interest expenditure, which in turn will affect tenant-owners. Rising interest rates will also affect households with consumer loans. Although these loans are often smaller, borrowers generally have a poorer debt-servicing ability than mortgagors to begin with.

If the cost of living and interest rates were to be higher than expected and housing prices also fell sharply, this could lead to a more significant decrease in household consumption, especially among the highly indebted households. In an unfavourable scenario, this could reduce the profitability of companies and increase the banks' loan losses, thereby creating problems for financial stability. The Riksbank's stress tests in previous Financial Stability Reports have shown that if there are major problems in the housing market and the commercial property market, the banks may find it difficult to maintain credit supply without support measures.⁷

Wide-ranging reforms are needed in housing and tax policy

To improve the functioning of the housing market and manage the risks of household indebtedness, broad reforms in housing and tax policy are primarily required, such as a review of tax relief on interest expenditure, property tax and the regulatory framework for new housing production. If such reforms had been carried out earlier, it could have helped to slow down the build-up of debt and reduce risks. Instead, the need for reforms remains and, if they are not implemented to the extent necessary, further macroprudential measures may need to be taken. Although the economic outlook has changed, it is important that policy focuses on taking the structural measures required to create long-term sustainable debt development and a better-functioning housing market.

The high cost associated with early repayment of mortgage loans needs to be reduced. This would give households greater incentives to choose loans with a longer fixed interest term and could thus contribute to a less interest rate sensitive household sector. Like the Swedish National Debt Office, the Riksbank thus supports the proposal from FI that the regulation of interest rate differential compensation should be changed.⁸

To better assess households' resilience to disturbances, it is important to have data on both assets and liabilities at household level. Since 2007, these statistics are no longer collected in Sweden. It is important that this shortcoming is remedied and it is therefore positive that the Government appointed an inquiry into this matter in January 2021. The Riksbank also supports the initiatives that have been taken to investi-

⁷ See *Financial Stability Report 2020:2*, Sveriges Riksbank.

⁸ See *Hemställan om ändring av reglerna om ränteskillnadsersättning* [*Petition for a change in the rules on interest rate differential compensation*], February 2022, Finansinspektionen.

gate a national debt register that makes all loans by borrowers visible. It is also positive there is an inquiry to investigate how a central register of tenant-owned apartment mortgages can be introduced.

Resilience needs to be strengthened in the banking system...

In view of the increased risks in the financial system, it is also important to continue to reduce the risk of disruptions and increase resilience in several parts of the financial system. For example, resilience in the banking sector needs to be strengthened. The Riksbank therefore supports FI's ambition to continue to raise the countercyclical capital buffer value in the near term at least to the neutral level of 2 per cent. Since systemic risks have increased over a long period of time and are at an elevated level, FI should also shorten the long implementation period regarding future decisions on buffer value increases.

The banks need to have buffers to handle unforeseen events. Given the geopolitical situation and the great uncertainty as to how economic agents and asset markets can manage a rapid rise in interest rates, banks should be restrictive with regard to large dividends and share buybacks to enable greater financial room for manoeuvre.

It is important to continue to reduce the risk of disruptions and to increase the resilience of the banking system in the EU. In October 2021, the European Commission presented a proposal for the implementation of the final parts of Basel III in the EU (known as the Banking Package 2021), which now forms the basis for negotiations in the European Parliament and the Council.⁹ The Riksbank advocates that the EU implements Basel III in a full, timely and consistent way. Harmonised global regulations benefit the economy and financial stability in the countries concerned. Another important measure is for the EU to strengthen its framework to combat money laundering and terrorist financing. The European Commission's proposal, presented in July 2021, is a step in the right direction.¹⁰

... and in other parts of the financial system

The Riksbank has long pointed out shortcomings in the Swedish market for corporate bonds. Above all, the market needs to become more transparent and liquid. Larger and more homogeneous bond issues can contribute to this. The Riksbank has therefore supported the development of a Swedish benchmark standard and calls on major Swedish companies and banks that support companies in the issue process to commit

⁹ Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) No 575/2013 on prudential requirements for credit institutions as regards requirements for credit risk, credit valuation adjustment risk, operational risk, market risk and the output floor, COM/2021/664 final, October 2021.

¹⁰ The aim of the proposal is to improve the detection of suspicious transactions and activities, among other means by harmonising EU regulations and improving cooperation between financial intelligence units. The aim is also to close loopholes resulting from technological innovations and more integrated global flows. COM(2021) 421 final, COM(2021) 420 final, COM(2021) 423 final and COM(2021) 422 final.

themselves to issuing bonds in accordance with the standard. The issuers should also contribute by using credit ratings to a greater extent.

The increased risk of price falls in financial markets, among other things as a result of lower risk appetite due to the uncertain geopolitical situation, makes it urgent to manage liquidity risks in those funds that invest to a large extent in relatively illiquid assets, such as corporate bonds. Since several funds had to close temporarily for trading in March 2020, investment funds have not significantly increased their cash reserves or changed the redemption conditions. Corporate bond funds must make it clear to the unit holders that their holdings are not liquid in all market situations and that it therefore may not always be possible to make immediate redemptions. In addition, the possibility of redeeming from the funds needs to be restricted to correspond better to the liquidity in the holdings. The Riksbank supports FI's proposed amendments to fund legislation to facilitate the use of more liquidity management tools, to make it possible to offer a lower frequency of redemptions than is now the case and to allow notice periods.¹¹ The Riksbank also urges the funds to comply with ESMA's guidelines for liquidity stress tests as soon as possible.¹²

The Riksbank considers quote-based reference rates, known as interbank rates (IBORs) to be insufficiently reliable. Reference rates based entirely on actual transactions therefore contribute to strengthening the stability of the financial system. Internationally, transaction-based reference rates are being used increasingly, while the use of traditional reference rates (such as LIBOR and Eonia) is decreasing and, in some cases, will completely cease.¹³ Sweden is behind the international community in the use of transaction-based reference rates. It is therefore important that Sweden too develops a more concrete plan for an orderly transition from IBOR rates to transaction-based rates. A recent survey by the Riksbank indicates that market participants want Sweden to follow international developments, as it would be costly for Swedish players with a global presence to deviate from the rest of the world.¹⁴ In order to create the conditions for using a fully transaction-based reference rate, the Riksbank has been publishing SWESTR since last year. In addition, the Riksbank will convene market participants to a forum to promote increased use of transaction-based reference rates.

As geopolitical uncertainty rises, the need for a well-functioning cash supply chain increases. After Russia's invasion of Ukraine, cash withdrawals from ATMs increased by up to 100 per cent on certain individual days, and if Sweden were to fall into crisis or be exposed to a serious threat, demand could increase even more (see the fact box "Access to cash is important for confidence in the financial system"). It is therefore important that the banks are prepared to meet a greater demand for cash and are able to handle disruptions in the ATM system, which could lead to insufficient ATM capacity. In order not to risk compromising confidence in the financial system, it is

¹¹ See *Likviditetsverktyg i värdepappersfonder och specialfonder* [Liquidity management tools in UCITS and special funds], June 2021, Finansinspektionen.

¹² See *Guidelines on liquidity stress testing in UCITS and AIFs*, June 2020, European Securities and Markets Authority.

¹³ See Chart A.1 in the Chart Appendix.

¹⁴ See the memorandum "Summary of the Riksbank's survey on SWESTR", April 2022, Sveriges Riksbank.

also important that the banks have plans for how to deal with customers who need manual service in a crisis or crisis-like situation.

Global challenges are affecting the Swedish financial system

Cyber threats abroad and in Sweden – one of the biggest threats to financial stability – have increased as a result of Russia’s invasion of Ukraine. This highlights the importance of continuing to strengthen the ability to prevent, detect and manage cyber threats against Sweden. This presupposes that Sweden increases coordination both between authorities and between authorities and the private sector. One important initiative is therefore the work on strengthening cyber security in the Swedish financial sector that FI, the Swedish National Debt Office and the Riksbank are doing within the framework of the Financial Stability Council. The work includes proposing a structure for coordination in the financial sector so that information on cyber incidents can be shared with each other. In addition, the work can help to clarify the role and tasks of the National Cybersecurity Centre in the financial sector. The Riksbank also considers it important to strengthen the financial sector’s resilience to cyberattacks and supports the proposed measures that FI has presented on behalf of the government. For example, the Riksbank agrees with FI that a new crisis management forum, in the context of systemic operational disturbances such as cyberattacks on the financial sector, needs to be introduced, and that an authority should be given the role of coordinator. The Riksbank’s work with TIBER-SE is also an important contribution to the financial agents’ efforts to strengthen their resilience to cyber threats.¹⁵

The market for cryptoassets currently poses a limited risk to the Swedish financial system (see the article “Cryptoassets and their impact on financial stability”). However, developments are moving fast and financial regulation work therefore needs to be speeded up. Comparable financial activities should be regulated in the same way, regardless of who conducts the activities, so that the risks they may pose to financial stability can be managed. It is therefore also important with continued international cooperation and coordination in order to create a common view of how issuers of cryptoassets are to be classified and how the risks these give rise to are to be managed. The proposed EU Regulation Markets in Crypto Assets (MiCA) is a step in the right direction and should therefore be introduced as soon as possible.¹⁶ In order to improve the possibilities for monitoring developments in this area and the exposures that exist, the Riksbank considers reporting requirements to be needed for issuers of cryptoassets and cryptoasset service providers. The Riksbank supports the proposals by FI and the Swedish Environmental Protection Agency for the EU to investigate a ban on ‘proof of work’, an energy-intensive method of mining cryptoassets, and for Sweden to counteract the widespread establishment of mining using this method.¹⁷

¹⁵ TIBER-SE is explained in more detail in the glossary at the back of this report.

¹⁶ See Proposal for a regulation of the European Parliament and of the Council on markets in the field of crypto assets and amending Directive (EU) 2019/1937, COM/2020/593 final, September 2020.

¹⁷ See debate article by E. Thedéen and B. Risinger (2021), 5 November, FI and the Swedish Environmental Protection Agency. [Cryptoassets are a threat to the climate transition – energy-intensive mining should be banned | Finansinspektionen](#).

The Riksbank does not consider it appropriate for the renewable energy needed for the climate transition in Sweden, for example, to be used for mining cryptoassets.

The need to rapidly reduce the use of fossil fuels has become even clearer during the spring. On the one hand, it has been shown that global warming is occurring more rapidly than previously estimated and, on the other hand, the Russian invasion of Ukraine has highlighted the risks of dependence on fossil fuels from Russia. It has therefore become even more important for the financial sector to contribute to the climate transition. A precondition for this is for financial agents to be able to include climate-related risks in their risk analyses and to take these into account in the risk premiums reflected in bond yields and the price of assets and natural resources. Credit rating agencies need to do the same in their rating of companies. This, in turn, presupposes that there is access to fair and comparable climate-related information. It is therefore positive that a global standard for sustainability reporting is now being developed at a rapid pace, and that new EU regulations are introducing requirements for greater transparency.^{18, 19} The Riksbank considers that the Swedish banks should already report their exposures to climate risks in accordance with TCFD recommendations.²⁰ The focus should be on standardised metrics for climate-related risks in the balance sheets and the indirect emissions from lending and other operations. The banks should therefore, for example with the support of the Swedish Bankers' Association, develop joint definitions and calculation methods for standardised metrics.²¹

¹⁸ See the IFRS Foundation's work on sustainability reporting. Accessed 5 May 2022. [IFRS - Sustainability-related Reporting](#).

¹⁹ See, for example, the Disclosure Regulation (Regulation [EU] 2019/2088), and the Taxonomy Regulation (Regulation [EU] 2020/852).

²⁰ See *Final Report Recommendations of the Task Force on Climate-related Financial Disclosures*, June 2017, Task Force on Climate Related Financial Disclosures.

²¹ To develop and report metrics such as "the amount and percentage of carbon-related assets relative to total assets" and "weighted average carbon intensity" related to asset management.

FACT BOX – Access to cash is important for confidence in the financial system

Since January 2021, there has been a legal requirement for banks with deposits in excess of SEK 70 billion to provide, to some extent, places for cash withdrawals for private individuals and deposits of daily takings. It is important that these cash services have a good geographical spread.

The banks that are obliged to offer cash services do so through the bank-owned company Bankomat. Before the entry into force of this legal requirement, Bankomat needed to set up in a total of twelve locations that had previously lacked ATMs. At the same time, these banks have phased out all their manual cash management. At present, only certain savings banks handle cash and there are no bank offices with cash handling in any of the major Swedish cities.²²

The Riksbank considers that all banks that offer payment accounts with basic functions should be obliged to offer cash services. The law should also require these banks to offer private individuals places to deposit cash.²³

Access to cash is an important mainstay for confidence in the financial system. If Sweden were to enter a crisis or be exposed to a serious threat, demand could increase sharply. It is the responsibility of the banks to ensure that their customers have access to the cash they need. This responsibility applies regardless of the legal minimum level of access to cash services.

²² See The Swedish Agency for Economic and Regional Growth, Pupos Serviceanalys, and Handelsbanken.

²³ See the Riksbank's consultation response to Secure access to cash, October 2018. [Consultation response on Secure access to cash \(riksbank.se\)](https://www.riksbank.se/consultation-response-on-secure-access-to-cash)

2 Vulnerabilities and risks in the financial system

In this chapter, the Riksbank presents developments in the financial system and analyses the risks and vulnerabilities that could threaten financial stability. The chapter is divided into six sections and underpins the overall stability assessment in Chapter 1.



Sweden is a small and open economy with considerable foreign trade and other cross-border operations. Swedish banks and companies obtain their funding in global financial markets and rely on free capital flows. Developments **abroad** are therefore of considerable significance for the real economy and financial stability in Sweden. Global circumstances such as cyber threats and climate change also entail risks.



If the **corporate sector** were to develop weakly while simultaneously facing high and rising interest rates, financial stability could be affected as a result of banks' loan losses rising. This is underlined by the fact that Swedish banks are particularly exposed to property companies that are sensitive to both falling revenues and rising interest rates.



The banks' largest borrower group is **households** and their indebtedness has increased in parallel with rising housing prices. Developments in the household sector and the housing market are therefore significant for both the real economy and financial stability.



The Swedish **banking system** is large, concentrated, interconnected, cross-border and uses global financial markets for its funding. This makes it sensitive to shocks. In addition, it plays a decisive role with regard to credit supply and other important functions in the financial system.



Other financial agents, including mutual funds and insurance companies, manage assets that are almost as large as those of the entire Swedish banking sector. Their actions can amplify market movements and spread risks to other asset types and agents.



The financial infrastructure refers to systems in which payments and transactions with financial instruments are made. These systems being stable and accessible is a necessary condition for it to be possible to make payments safely and efficiently.

2.1 Vulnerabilities and risks linked to international developments



Inflation and rising interest rates have affected the global economy and growth is expected to enter a calmer phase this year. Russia's invasion and lockdowns in China have increased inflation even more. Several central banks have needed to tighten monetary policy earlier than was expected last autumn, which has also affected prices of risky assets. The geopolitical and security policy situation means that the risks of cyberattacks have increased. At the same time, it is increasing the pressure on the financial system to contribute to the climate transition in order to reduce dependence on fossil fuels imported from Russia.

Supply limitations are boosting inflation and holding back growth in the global economy

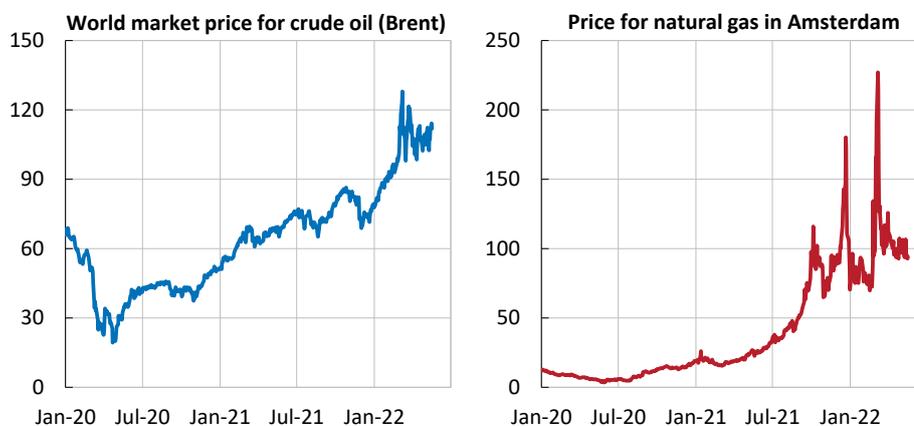
The economic growth rate was strong during the second half of last year and, at the turn of the year, GDP was back at the same levels as before the pandemic broke out, both in Sweden and abroad.²⁴ At the same time, inflation rose gradually during the year. The upturn was driven by, among other things, pandemic-related supply limitations, strong economic development in the United States, and rising energy prices, not least in Europe (see Chart 1). Further supply limitations, for example linked to pandemic-related lockdowns in China and the Russian invasion of Ukraine, have thereafter contributed to a further increase in global inflation. Inflation also shows signs of becoming more generally widespread in that goods and services with normally stable prices have become more expensive. This is causing a decline in real disposable income, which is expected to dampen consumption and growth.²⁵

²⁴ See Chart A.2 in the Chart Appendix.

²⁵ See, for example, *Monetary Policy Report*, April 2022, Sveriges Riksbank.

Chart 1. The development of prices for oil and natural gas

US dollar per barrel (left figure), euro per MWh (right figure)



Source: Bloomberg.

As a reaction to the Russian invasion of Ukraine, the western world has imposed extensive sanctions on Russia, which, among other things, are aimed at restricting Russia’s access to international financial markets. For example, several Russian banks have been excluded from SWIFT in order to hamper their ability to make payments inside and outside Russia (see fact box “This is SWIFT”). Sanctions can also affect other countries’ economies by further increasing the problems of bottlenecks in global production chains.

Supply disruption problems are also increasing as a result of continued pandemic-related lockdowns in China. At the end of March, for instance, the whole of Shanghai was in lockdown. This is the location of China’s largest harbour, which is also one of the world’s most heavily trafficked and an important hub in the global delivery chains. Economic growth in China is thus slowing down and is expected to grow at a slower rate than last year. There will also continue to be considerable uncertainty in the property sector, where demand has declined and several property companies are suffering major financial problems.

FACT BOX – This is SWIFT

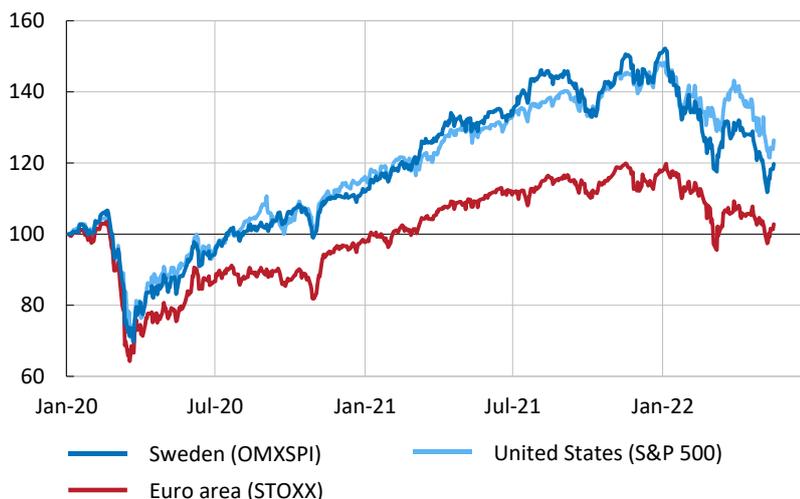
SWIFT, the Society for Worldwide Interbank Financial Telecommunication, makes it possible for financial corporations to communicate securely and exchange standardised messages reliably around the world. Today, the SWIFT system is used by over 11,000 banks and other financial agents in 200 countries. On a normal day, around 40 million messages are sent via SWIFT. As SWIFT’s systems and services are globally important, there exists a global oversight committee, of which the Riksbank is a member. The organisation is subject to Belgian law and therefore to EU law and rules.

Volatility in financial markets

At the start of the year, financial markets around the world were affected by concerns that inflation would rise further. The invasion of Ukraine then led to further uncertainty and unease on the markets. The Moscow Exchange closed at the same time as Russian government bonds fell heavily in value and Russian CDS premiums soared. It quickly became difficult or impossible for investors to sell their Russian holdings. However, foreign investors generally have relatively small Russian holdings. It was established at an early stage that the EU banking system overall did not have any major direct exposures either. All in all, the invasion nevertheless led to increased stress in the form of higher volatility, increased risk premiums and less risk-taking among investors in both European and American markets.^{26, 27} Increased volatility has since remained in many cases, and the prices of certain risky assets, such as equities, have not recovered (see Chart 2). Cryptoassets have also fallen sharply recently. The focus in the markets is now primarily on inflation and market participants' expectations of tighter monetary policy.²⁸

Chart 2. Stock market movements in domestic currency

Index, 3 January 2020 = 100



Source: Macrobond.

Highly indebted agents are sensitive to rising interest rates

With the rapid economic recovery in the autumn and the rise in inflation, the major central banks began to communicate, as early as autumn last year, that they would reduce or end their asset purchases and raise policy rates. How quickly this was expected to happen varied from country to country. As inflation has risen further and more broadly since then, monetary policy tightening is now expected to take place at a faster pace than was predicted last autumn.

²⁶ Investor surveys, such as ZEW and Sentix, showed relatively large falls between February and March 2022 for both the euro area and the United States.

²⁷ See Charts A.3, A.4 and A.5 in the Chart Appendix.

²⁸ See, for example, *Financial Markets Survey Spring 2022*, May 2022, Sveriges Riksbank.

The Federal Reserve and the Bank of England were among the first to adjust monetary policy to the high rate of inflation. Both central banks have begun to raise their policy rates and have decided to reduce their balance sheets going forward. The European Central Bank (ECB) is expected to end net purchases (that is, to stop expanding its balance sheet) under the Asset Purchase Programme (APP) in the third quarter of 2022 and has announced that its policy rate will gradually be raised some time after net purchases have ended. The persistence of high inflation and the extent to which the central banks may need to raise their policy rates will affect the rate at which interest rates faced by households and companies will rise in the future.

Rapidly rising interest rates may pose a stability risk, especially for highly indebted countries, companies and households, putting their resilience to the test. The support measures taken in recent years to counter the economic consequences of the pandemic have led many governments to increase their indebtedness. In addition, many companies have had to increase their indebtedness to survive the pandemic. In the short term, increased interest expenditure may lead to both a reduction in investment and lower consumption. Reduced economic activity, combined with rising interest rates, also risks leading to a deterioration in companies' debt-servicing ability, which may lead to more bankruptcies in the long run.

However, since the start of the pandemic, bankruptcies of European companies have remained low from a historical perspective, partly due to support measures.²⁹ The amount of bank loans covered by public guarantees remains large.³⁰ Public guarantees are mainly concentrated in Italy, France and Spain, which together account for about 90 per cent of them.³¹ The proportion of non-performing loans among loans covered by public guarantees or previously subject to a moratorium has increased, which is increasing uncertainty over the banks' future loan losses. If loan losses increase, there is a risk that interest rates on government debt will rise further, as governments have to bear part of the losses linked to the banks' lending (see Chart 3).

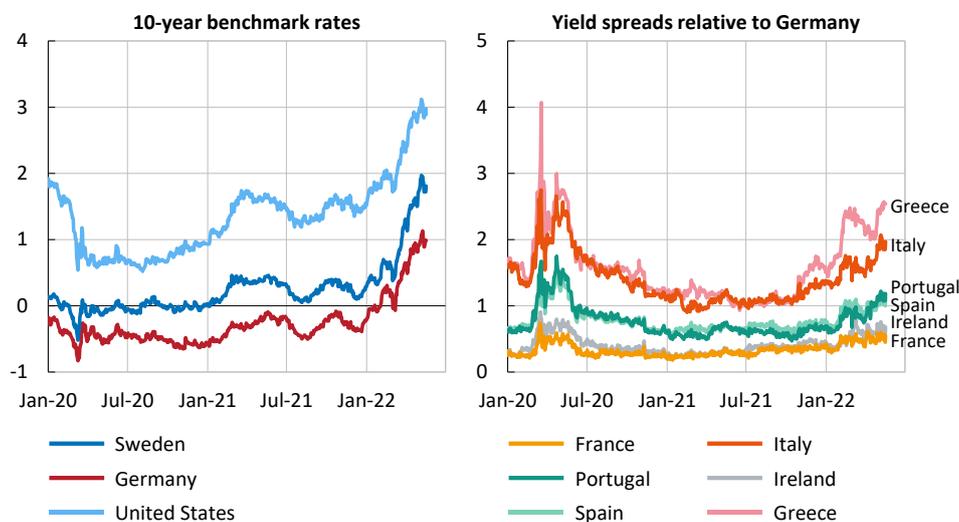
²⁹ See Chart A.6 in the Chart Appendix.

³⁰ See Chart A.7 in the Chart Appendix.

³¹ See *Risk Dashboard*, Q4 2021, EBA.

Chart 3. Government bond yields

Per cent (left figure), percentage points (right figure)



Sources: Macrobond and US Treasury.

High asset values increase the risk of price falls when interest rates rise rapidly

Despite price declines and volatile developments so far during the year, some assets are still relatively highly valued, viewed in historical terms. This applies both to real assets, such as housing and property, and to financial assets, for example US and European equities.^{32, 33} The US equity market remains highly valued in a historical perspective whether or not the level of interest rates is considered (see Chart 4).³⁴ The former is indicated by a high cyclically adjusted P/E (CAPE) figure in the left-hand part of the chart, while the latter is indicated by a decreasing excess CAPE yield (ECY) in the right-hand part of the chart. When the excess yield relative to the real government bond rate is depressed, this indicates high risk appetite among investors, which may also indicate that valuations are high considering the level of interest rates.³⁵ High valuations can generally increase the risk of major asset price falls, which, in turn, can lead to significant losses for some participants and additional stress on the markets if, for example, initial margin requirements increase. One risk factor for asset price falls is rising interest rates, especially if interest rates increase more steeply or more rapidly than market participants have expected.

³² See Chart A.8 in the Chart Appendix.

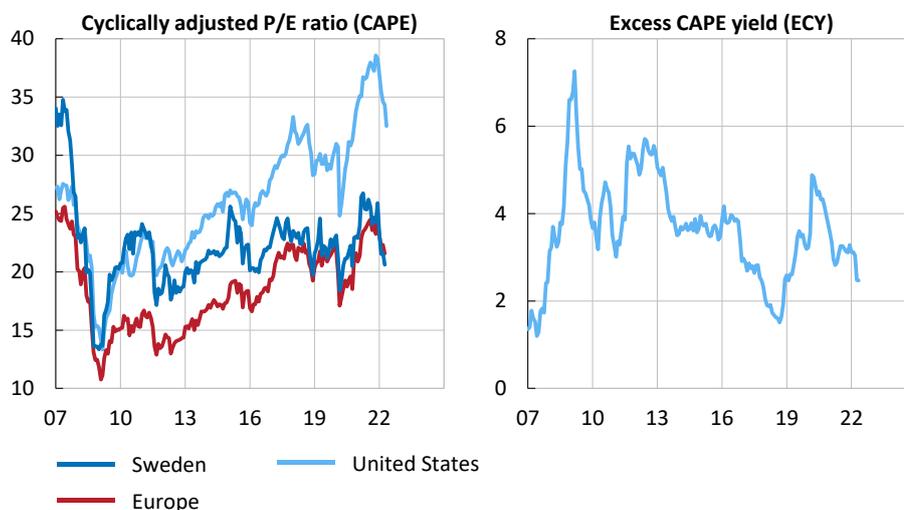
³³ See, for example, *Vulnerabilities in the residential real estate sectors of the EEA countries*, February 2022, ESRB.

³⁴ The right-hand figure in Chart 3 shows ECY only for the US, where the results from regressions show that ECY is good at explaining the variation in stock price developments in the long term, which was not the case for Sweden and Germany. For more information, see, for example, Ceh, A. M., Manfredini, J., Melander, O. and S. Wollert, "Equity market valuation in light of low interest rates", *Staff Memo*, November 2021, Sveriges Riksbank.

³⁵ Conversely, a high excess yield relative to the real government bond rate would indicate a lack of interest on the part of investors in the asset class, a low risk appetite, and would indicate that the valuations are not as high.

Chart 4. Cyclically adjusted equity valuation measures

Ratio (left figure), percentage points (right figure)



Note. Normal P/E (Price-to-Earnings) ratios show the price of a share in relation to the company’s earnings per share at a certain point in time. The CAPE ratio is a cyclically adjusted P/E ratio in which the 10-year average earnings per share is used in the denominator. ECY is calculated as the inverse of CAPE, so-called earnings yield, minus the 10-year real government bond rate. For the euro area and Sweden, these figures are based on the region and country-specific MSCI stock index, while the US figures are based on the S&P 500.

Sources: Barclays, Macrobond and R. Shiller’s website.

Russia’s invasion of Ukraine has increased the risk of cyberattacks

In recent years, cyber risks have been assessed as one of the greatest threats to financial stability, for example among market participants.³⁶ The general level of cyber threats abroad and in Sweden has increased as a result of Russia’s invasion of Ukraine. The Swedish Armed Forces have pointed out that the risk of cyberattacks is the greatest threat to Sweden at the moment and the Swedish Security Service also note that this risk has increased.³⁷ The Security Service has also noted that there are shortcomings in the protection of sensitive information among some agents conducting vital societal functions.³⁸ There have been a number of cyberattacks in recent months. For example, several Ukrainian banks and authorities have been subjected to so-called Distributed Denial of Service (DDoS) attacks. In addition, the Swedish Computer Emergency Response Team (CERT-SE) has noted an increasing number of IT incidents, including DDoS attacks.³⁹ The risk of cyberattacks in the form of ransomware

³⁶ For example, see *Financial Stability Report*, May 2022, Federal Reserve System, and *Systemic Risk Survey Results*, March 2022, Bank of England.

³⁷ See *Swedish Security Service 2021*, Swedish Security Service, and press release “Cyberangrepp största hotet just nu [Cyberattacks greatest threat right now]”, Swedish Armed Forces, last updated 17 March 2022. Accessed 25 March 2022, [Cyberangrepp största hotet just nu - Försvarmakten \(forsvarsmakten.se\)](https://forsvarsmakten.se/nyheter/cyberangrepp-storsta-hotet-just-nu)

³⁸ TT (2022), “Säpo: Säkerhetsbrister har skadat Sverige [Security Service: security flaws have damaged Sweden]”, 30 March 2022, Svenska dagbladet.

³⁹ See press release “CERT-SE uppmanar alla organisationer att skärpa uppmärksamhet kring nätfiske och DDoS [CERT-SE urges all organisations to raise awareness of phishing and DDoS attacks]”, CERT-SE, last updated 18 March 2022. Accessed 25 March 2022, [CERT-SE uppmanar alla organisationer att skärpa uppmärksamheten kring nätfiske och DDoS – www.cert.se.](https://www.cert.se/nyheter/cert-se-uppmanar-alla-organisationer-att-skarpa-uppmark-samheten-kring-natfiske-och-ddos)

also remains high.⁴⁰ Although the attacks that have taken place so far have not had any consequences for stability, they show that participants in the financial sector need to be alert to possible further cyberattacks and to continue to strengthen their resilience.

Financial agents can also be affected by cyberattacks, even if they, or Swedish interests, are not the primary target. The financial sector is highly digitalised and often uses third-party suppliers, for example for IT operations or cloud services. In addition, the agents are dependent on electricity and telecommunications. If one of these suppliers is exposed to a cyberattack, this may have consequences for the financial agents using that supplier. In cloud services, for example, there is also a large concentration of suppliers. An attack on a service provider could therefore affect several financial agents simultaneously.

In the area of cybersecurity, the main focus has previously been on protecting against intrusions. In recent years, however, this focus has shifted somewhat. Many organisations are now assuming that intrusions will occur. This means that not only do they have to work on detecting, but also rebuffing and recovering from, cyberattacks. To maintain and improve such a capability, it is important for private operators, organisations and authorities alike to carry out tests and exercises on a regular basis.⁴¹ On behalf of the government, FI has also proposed measures to strengthen the financial sector's resilience.⁴² These include the introduction of a new crisis management structure in the context of systemic operational disturbances such as cyberattacks on the financial sector. In addition, FI, the Swedish National Debt Office and the Riksbank are working to strengthen cyber security in the financial sector. The work aims, among other things, to clarify the role and responsibilities of cyber security and to improve cooperation between the private and public sectors.

High energy prices and the geopolitical situation could both slow down and accelerate the climate transition

During the spring, the IPCC has published two reports that once again show how important it is for climate change to be addressed immediately.^{43, 44} This will increase the pressure on the financial system to contribute as much as possible to the climate transition.

⁴⁰ See ENISA Threat Landscape, 2021, European Union Agency for Cybersecurity.

⁴¹ The Riksbank's work on TIBER-SE is a way for agents to improve their cyber security (see Glossary for more information on TIBER-SE). In addition, the Stability Council authorities conducted an exercise in autumn 2021 in which they practised their ability to cooperate and communicate in the event of a cyberattack. The Financial Sector Private-Public Partnership Forum (FSPOS) also carries out regular exercises, including those focused on tackling cyber attacks in society.

⁴² See "Förstärkt digital motståndskraft hos företag i den finansiella sektorn [Strengthening digital resilience of financial sector companies]", May 2022, in Swedish, Finansinspektionen.

⁴³ See "Summary for Policymakers of IPCC Report AR6 Climate Change 2022: Impacts, Adaptations and Vulnerability", February 2022, IPCC.

⁴⁴ See "Summary for Policymakers of IPCC Report AR6 Climate Change 2022: Mitigation of Climate Change", April 2022, IPCC.

At present, there are major shortcomings in how banks report climate-related information. This data reporting is needed for financial agents to include climate-related risks in their risk analyses and to take the risks into account in the risk premiums reflected in bond yields and the price of assets and natural resources. In March, the ECB published an assessment of how well banks in the EU report climate-related information related to their operations. Virtually none of the banks concerned fully complied with the ECB guidelines on climate-related data reporting.⁴⁵ This can in turn contribute to transition risks because it leaves investors insufficiently prepared to make an adequate climate-related risk analysis.

Other financial agents also need to consider climate-related risks in their operations. For this reason, FI is now proposing amendments to its regulations on mutual funds and will thereby implement two EU directives in Sweden.⁴⁶ These changes mean that fund managers, managers of alternative investment funds, and securities institutions must also take sustainability factors into account and integrate sustainability risks into their operations. FI has also begun to examine how well the funds marketed as sustainable meet the requirements of the Disclosure Regulation.⁴⁷

In April, FI and the Riksbank published results from the application of the PACTA method.^{48, 49} PACTA is a method for analysing how well companies will meet climate targets in different climate scenarios in five years' time. The results can be used to support the analysis of transition risks associated with banks' lending to non-financial corporations. Although the underlying data only covers a small part of the banks' lending, about SEK 80 billion, it can be noted that the banks are exposed to transition risks. Of this SEK 80 billion, more than half goes to companies that currently conduct operations that are directly harmful to the environment and which, moreover, will not meet the climate targets in five years' time.

Russia's invasion of Ukraine has an impact on the climate transition through its impact on energy prices and the energy market, particularly the gas and oil markets. In the short term, coal-fired power plants may have to be used to a greater extent to dampen price developments and meet the demand for energy. In the longer term, there is also a risk that some countries will see the availability of coal energy as more secure compared to other types of energy. This may prolong the climate transition. In this case, there will be an increased risk of major price adjustments in the future when

⁴⁵ See "Supervisory assessment of institutions' climate-related and environmental risks disclosures", ECB report on banks' progress towards transparent disclosure of their climate-related and environmental risk profiles, March 2022, European Central Bank.

⁴⁶ See the news item "FI föreslår nya regler om att fondbolag, förvaltningsbolag och värdepappersinstitut ska beakta hållbarhetsfaktorer och integrera hållbarhetsrisker [FI proposes new rules for fund managers, investment companies, and securities institutions to take sustainability factors into account and integrate sustainability risks]". 28 March 2022, Finansinspektionen. Last updated 28 March 2022. Accessed 17 May 2022, [FI föreslår nya regler om att fondbolag, förvaltningsbolag och värdepappersinstitut ska beakta hållbarhetsfaktorer och integrera hållbarhetsrisker | Finansinspektionen](#).

⁴⁷ See the news item "FI reviews sustainable funds", 12 April 2022, Finansinspektionen. Last updated 12 April 2022. Accessed 4 May 2022, [FI reviews sustainable funds | Finansinspektionen](#).

⁴⁸ PACTA stands for the Paris Agreement Capital Transition Assessment Tool.

⁴⁹ See "Transition risks in the banks' loan portfolios – an application of PACTA", April 2022, Finansinspektionen and Sveriges Riksbank.

the rate of transition needs to be accelerated, which could have a negative impact on financial stability. On the other hand, incentives to switch to more sustainable and secure energy sources have increased as more countries now want to reduce dependence on Russian oil and gas, which may reduce transition risks in the longer term.

One example of the willingness to accelerate the phasing out of Russian gas and accelerate the expansion of sustainable energy sources is the REPowerEU-plan, launched by the European Commission in May.⁵⁰ According to the plan, the EU shall become independent of fossil fuels imported from Russia well ahead of 2030. In reality, however, developments in recent weeks indicate that, to a large extent, the changeover will have to take place significantly more rapidly. In such a process, it is important to identify which banks, industries and companies are particularly exposed to capital-intensive investments in fossil fuel-dependent technology.

⁵⁰ See press release “REPowerEU: A plan to rapidly reduce dependence on Russian fossil fuels and fast forward the green transition”, May 2022, European Commission. Last updated 18 May 2022. Accessed 22 May 2022, [A plan to rapidly reduce dependence on Russian fossil fuels and fast forward the green transition \(Europa.eu\)](https://ec.europa.eu/energy/en/press-releases/2022/05/18).

2.2 Vulnerabilities and risks in the corporate sector



Russia's invasion of Ukraine and China's pandemic-related lockdowns have increased uncertainty and exacerbated the production problems lingering after the pandemic. If cost pressures increase, debt-servicing ability for certain companies may be impaired. In addition, loans have become more expensive. In general, companies can manage this, but if interest rates rise rapidly, highly indebted companies, especially in the property sector, may have to make major adjustments. Moreover, corporate debt is growing faster and faster, mainly in the form of bank loans. Property companies' increasingly large loans and increased interest-rate sensitivity have contributed to higher risks.

Economic consequences of the invasion vary from sector to sector

The tourism industry and other contact-intensive sectors that were severely affected by the pandemic continued to recover in 2021. At the start of 2022, earnings and the funding situation looked relatively good for the business sector as a whole. On the other hand, there remained output restrictions such as a shortage of components and disruptions in freight and supply chains, which mainly affected companies in the manufacturing industry.⁵¹ Furthermore, higher energy and commodity prices persisted.

Russia's invasion of Ukraine has once again increased uncertainty for many companies and exacerbated the production restrictions remaining from the pandemic. However, the direct effects on the Swedish economy are limited, as trade with Russia only accounts for about one per cent of Swedish exports and imports, and trade with Ukraine is even smaller. However, several major Swedish companies operating in Russia and Ukraine have chosen to stop or suspend their operations there. This is having a negative effect on the cash flows of these companies and may make it necessary for them to make write-downs. Indirect effects due to the economic sanctions and rising world market prices on energy and many raw materials have also affected many companies in Sweden, including in the form of increased cost pressures. In addition, companies are being affected by economic developments in nearby countries, which are also being affected by higher cost pressures, supply and production restrictions and the invasion of Ukraine.

China's ongoing management of the spread of COVID-19 in the form of lockdowns is also affecting many companies in the form of lower earnings and problems in production and supply chains. Together with the indirect effects of the geopolitical situation, this may have relatively large effects on the global and Swedish economies.

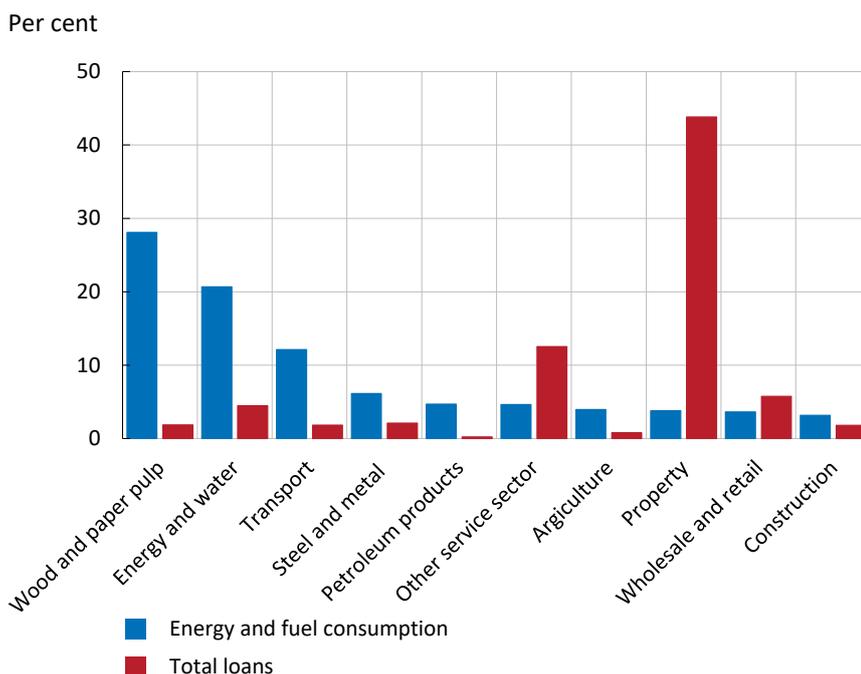
⁵¹ See "I've never before experienced customers accepting price increases so easily", *The Riksbank's Business Survey*, February 2022, Sveriges Riksbank.

High energy and fuel prices may increase credit risks

How much companies are affected by rising prices for energy, fuel and raw materials depends on how much they use in production or other operations. It also depends on the level of competition in their respective sectors and how quickly they can compensate for cost increases by increasing their prices for customers. Those who are unable in the short term to pass on cost increases will be adversely affected by the higher prices in the form of lower cash flows.

Transport companies and companies operating in the wood and steel industries are more dependent than others on energy and fuel in their operations and will therefore probably be affected most when prices rise (see Chart 5). In comparison to companies in household-related sectors, manufacturing companies generally have more opportunities to raise their sales prices, since they are more active in specialised and less competitive markets. In addition, some wood and paper companies, for example, may be compensated for rising energy prices by the rising prices for goods they sell, such as building materials and wood pulp. The use of energy in the property sector is mainly related to use by tenants. It is therefore tenants, such as service companies, who are primarily being affected by the higher energy prices.

Chart 5. Energy and fuel-intensive sectors and their share of total loans



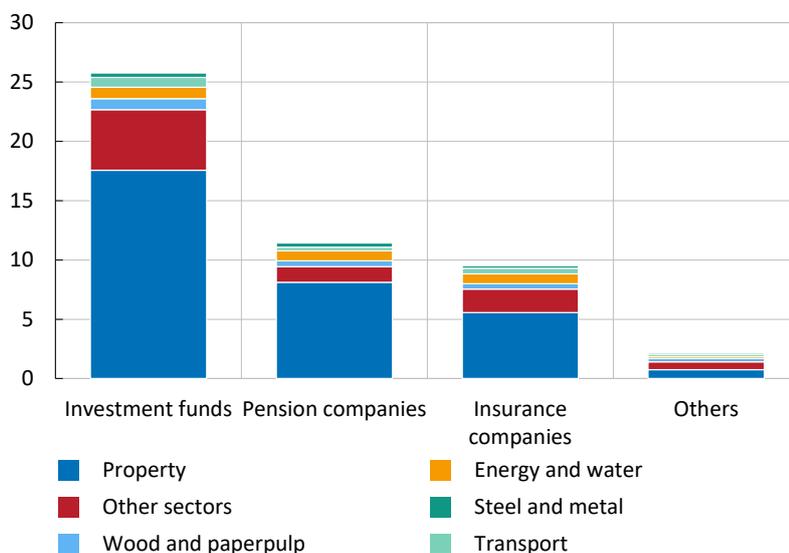
Note. Proportions of fuel and energy consumption in a sample of sectors with non-financial corporations and their share of total loans. “Total loans” refers to loans from Swedish MFIs and capital market financing. As they refer to a sample of sectors, the columns do not add up to 100 per cent. “Energy and fuel consumption” refers to 2019. The fuel consumption of companies is converted from terajoules to GWh. “Other service sector” refers to SNI 69-98 (excl. 84) such as IT and telecommunication companies.

Source: Statistics Sweden.

The banks have relatively small exposures to companies in the sectors with the highest energy and fuel consumption. The manufacturing sector as a whole has relatively large loans, but mainly via the capital market, where investors in corporate bonds and commercial paper account for about 70 per cent of their loans. If higher costs for manufacturing companies lead to difficulties in paying interest and amortisation, this may have a greater impact on lenders other than banks. Among investors in the bond market, it is investment funds that are primarily exposed to the most energy and fuel intensive sectors in terms of their total bond holdings (see Chart 6).

Chart 6. Holders of energy and fuel-intensive sectors' bonds

Per cent



Note. Refers to the bond exposures of four investor groups to the sectors that are most energy and fuel-intensive as a proportion of their total bond holdings globally in all currencies. The investor group “Other” refers to monetary financial institutions, the Riksbank, general government and households. Data on investors’ holdings refers to December 2021. “Other sectors” only refers to businesses in petroleum products, agriculture, trade, construction and other service sectors.

Sources: Statistics Sweden and the Riksbank.

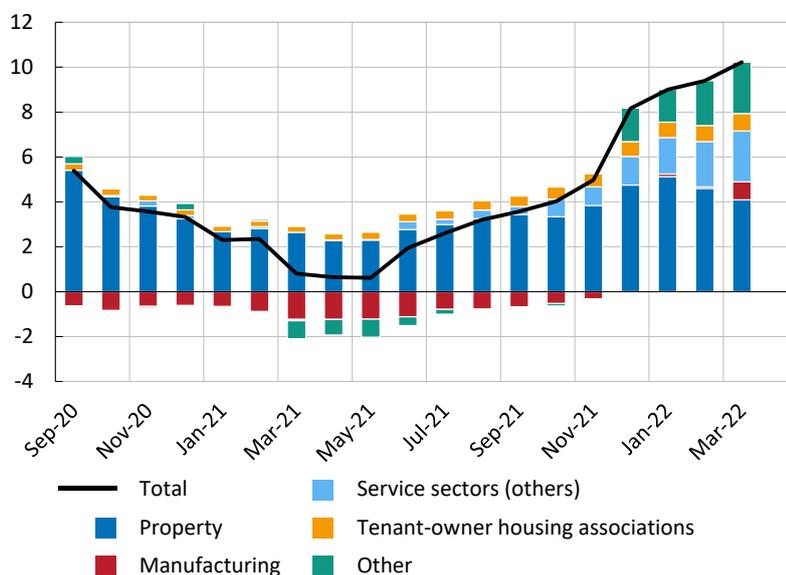
If the high prices persist and companies’ debt-servicing ability is weakened, they may be associated with a higher credit risk. Although the banks have relatively small exposures, they may have to increase their credit loss provisions in the period ahead. In the same way, bond investors may have to register lower bond values. The risks created by the geopolitical situation and the lockdowns in China should be seen in conjunction with the risks and challenges that have previously been linked to large loans taken by companies. A situation with high inflation, high and rapidly rising interest rates and weak economic development could affect more companies and materialise risks that have previously been built up in other sectors. This could lead to far more serious consequences for lenders and, by extension, for financial stability.

Corporate debt is growing rapidly

During the pandemic, corporate debt grew more and more slowly and the rate of growth was relatively low for a period of time. Property companies, on the other hand, continued to increase their loans and accounted for the majority of corporate debt growth. The economic recovery has contributed to an increase in the cash flows of companies and for some, cash flow is stronger than before the pandemic, which has resulted in a larger borrowing capacity. When the uncertainty surrounding the pandemic also declined, it led to companies – even in sectors other than the property sector – increasingly starting to demand more loans (see Chart 7).

Chart 7. Growth in corporate debt by sector

Annual percentage change



Note. The line refers to annual percentage change in companies’ total loans (loans from MFIs and corporate bonds and commercial paper issued). The columns represent each sector’s contribution to total debt growth. “Other” refers to the transport, hotel, restaurant, trade, construction and energy sectors. Sector definitions are derived from the KRITA database.

Source: Statistics Sweden.

The increased uncertainty caused by Russia’s invasion of Ukraine – combined with higher inflation expectations – has led to it becoming more expensive for companies to finance their operations using commercial paper and bonds. This applies in particular to long-term bonds and to companies with lower credit ratings. In particular, property companies have been affected by higher borrowing costs. However, interest rates on bank loans have not increased to the same extent. Rising funding costs may reduce companies’ willingness to make new investments and could lead to lower cash flows, as loans that mature are refinanced at a higher interest rate.

Despite this, total lending to companies has continued to grow more rapidly and, in March, the annual growth rate was just over 10 per cent (see Chart 7). Previously, lending was mainly driven by more and larger issues in the bond market. However, lending by the banks has recently grown at an increasing rate and now accounts for

the majority of the increase in corporate loans. Overall, debt has grown considerably faster than GDP. Total debts in the fourth quarter of 2021 amounted to nearly 79 per cent of GDP, which is 4 percentage points higher than before the pandemic. As companies' funding via the capital market is now large and is continuing to grow rapidly, companies' interconnections with the financial system have increased.⁵²

The fact that debts have grown more rapidly may be due to increasing willingness to invest during the recovery phase that the economy has been experiencing. However, more rapidly growing debt can create financial imbalances and greater systemic risks. This is particularly true if lending is carried out to sectors that already have large loans. As can be seen from Chart 7, lending has largely continued to be made to property companies, which has contributed systemic risks increasing somewhat.

Interest rate sensitivity among companies varies

Despite the fact that companies' total debt is growing increasingly rapidly, the loan-to-income ratio for the entire corporate sector is at about the same level as at the end of 2019.⁵³ This is due to the fact that companies' operating profits have generally recovered and, in some sectors, have increased compared to before the pandemic. However, the loan-to-income ratio has increased in the longer term, which indicates that companies have become more sensitive to higher interest rates.

Expectations of higher policy rates and the geopolitical uncertainty have contributed to an increase in market interest rates and risk premiums on companies' issued securities. Since December 2021, yields on corporate bonds in the secondary market have risen by around 220 basis points, of which about 50 basis points are due to higher risk premiums.⁵⁴ On the other hand, risk premiums linked to bank loans have generally not increased to the same extent so far, which has made it relatively more attractive to take bank loans than to issue corporate bonds. This may lead to an increase in corporate demand for bank loans. If, for example, the geopolitical situation were to worsen or risk appetite among investors were to continue to decline, risk premiums could continue to rise rapidly. This could also lead to a more rapid rise in risk premiums on bank loans. However, in general, it takes time for companies to be affected by higher interest rates, as these have an impact at the same rate as loans are refinanced and new loans are raised. This gives companies some opportunity to counter some of the cost increase by raising revenues.

⁵² Increased market funding means that credit risk is spread among more participants who together could have a better capacity to manage losses than if the same amount of loans had only been in the banks. At the same time, this development means that companies are now even more closely linked to a larger part of the financial system, and that problems in companies can therefore more easily spread to the financial sector.

⁵³ The loan-to-income ratio refers to companies' interest-bearing loans in relation to their operating profits.

⁵⁴ Refers to 5-year-old fixed-rate bonds issued by companies with the credit rate of investment grade, which corresponds to the higher category of credit ratings. The risk premium is based on the difference against a 5-year interest rate swap.

From a historical perspective, companies' interest-to-income ratio is low, although it has increased slightly since 2018 (see Chart 8).⁵⁵ In a scenario in which companies' average interest rates rise by 3 percentage points, while their revenues remain unchanged, this leads to an average increase in the interest-to-income ratio from just over 8 to 20 per cent. This is about the same level of the interest-to-income ratio as during the euro crisis of 2012 and indicates that companies are not generally sensitive to interest rates. There is, however, great variation among companies, as some companies do not have any loans, while others have very large loans.⁵⁶

Chart 8. The relationship between companies' interest expenses and operating profit



Note. Refers to interest-to-income ratio, i.e. interest expenses after tax relief in relation to operating profit, for all non-financial corporations, regardless of whether they have loans. The square and the triangle refer to companies' interest-to-income ratios if the general level of interest rates had been at a higher level after tax relief. P.p. refers to percentage point.

Sources: Statistics Sweden and the Riksbank.

Property companies are most sensitive to interest rates

A sector that stands out is the commercial property sector. It has considerably larger loans and higher interest-to-income ratios than other corporate segments. Since property companies have large loans in relation to their operating profit, they are more sensitive to interest rates than other companies. Between 2010 and 2021, property companies' net liabilities as a proportion of operating profit increased from 10 to slightly more than 16.⁵⁷ In a scenario where the average interest rate rises by 3 percentage points, the average interest-to-income ratio for a sample of major commercial property companies would rise from 25 to 60 per cent.

⁵⁵ Interest-to-income ratio refers to interest expense after tax relief in relation to operating profit.

⁵⁶ Over 16 per cent of all limited liability companies had at least one bank loan in 2018. Among larger companies, the proportion is higher, between 55 and 65 per cent. See Aranki et al. (2021) "Non-financial firms and financial stability: A description of vulnerabilities", *FI Analysis* 27, January 2021, Finansinspektionen.

⁵⁷ Refers to a sample of 30 major commercial property companies.

As some of the property companies' loans have fixed interest rates or are hedged through interest rate swaps, the higher interest rates would not have an immediate impact.⁵⁸ However, as property companies refinance their loans, a higher interest rate will result in many property companies having to utilise a larger share of their earnings. At the same time, as long as they do not have high vacancies, their revenues may increase slightly, as most rents are adjusted upwards every year in line with the consumer price index.⁵⁹ Despite somewhat higher revenues, the higher interest expense may reduce their financial key ratios. In the long run, this may lead to some property companies running the risk of violating the financial conditions of their credit agreements or of having their credit ratings reduced. Rapidly rising and higher interest rates may thus result in larger credit loss provisions for banks and other lenders.

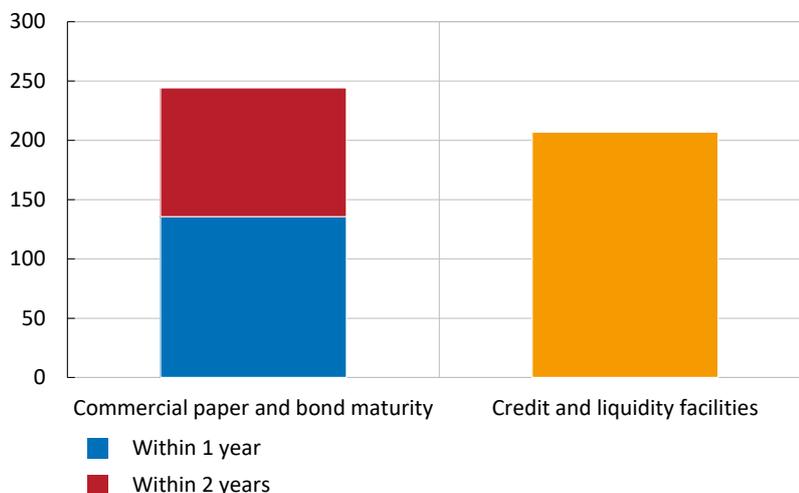
Twenty per cent of property companies' certificates and bonds will mature by March 2023 (see blue column in Chart 9). If property companies are unable to refinance their loans on the capital market, the risks associated with their large loans may materialise. In an unfavourable scenario, they may be forced to sell properties to repay their loans, which could create a negative spiral of falling property values. However, in the short term, they can use their already agreed and unutilised credit and liquidity facilities at banks to secure their funding. This would mean that banks' already high exposure to the property sector would increase. As Chart 9 shows, the credit and liquidity facilities of property companies will exceed their current maturities of commercial paper and bonds over the coming year. At the same time, it is not possible to rule out the need for banks to impose higher demands on property companies – for example by requiring additional collateral – in order to allow them to use or retain these facilities.

⁵⁸ Considering that property companies' interest rate derivatives (net position) are about half of their total variable rate loans as of March 2022. More than half of these interest derivatives have a remaining time to maturity of 10 years or more.

⁵⁹ If the average interest expense of property companies rises rapidly, it is likely that the increase in revenues from rent indexation will be unable to compensate for this fully. This would impair property companies' profits and, by extension, their funding conditions.

Chart 9. The future maturities and agreed facilities of property companies

SEK billion



Note. Refers to the future maturities of property companies' commercial paper and bonds as of March 2022 and their credit and liquidity facilities with the seven largest banks as of Q4 2020, nominal amounts. The credit and liquidity facilities are agreed and unutilised. In addition, some of the facilities are also secured.

Sources: FI and Statistics Sweden.

Higher interest rates may lead to challenges for property companies and lenders

In 2021, property values in different segments increased by between 10 and 20 per cent, even though the vacancy rate for offices, for example, continued to increase. The increase in value is mainly due to lower yield requirements. In addition, cross-ownership among property companies has continued to increase, for example through the sale and placement of properties in so-called joint ventures. In connection with this, properties have had their values written up, without any significant change in the properties or their earning capacity. As expectations of future revenues affect property values, too much optimism may lead to transactions taking place at prices that turn out to be unrealistic. If interest rates rise and remain high, credit terms become tighter and economic activity weakens, this may have major consequences in the form of falling property values and lower income from property management.

Despite ever larger loans in relation to their operating profits, the loan-to-value ratio of property companies has remained relatively unchanged in recent years. Among other things, successively lower interest rates have allowed property companies to reduce their yield requirements, which has resulted in ever higher property values. The interaction of high optimism, falling interest rates, larger loans and rising property values has been self-reinforcing. It has been going on for several years and has increased the risks in the financial system. However, the somewhat tougher credit terms imposed by banks in connection with the pandemic have remained and, to some extent, have counteracted the accumulation of risk in the commercial property sector over the last two years.

The fact that property companies now have to pay higher interest rates on bond loans means, in particular, that the positive reinforcing factors between loans and property values are now breaking down. However, if the higher bond rates persist, and if interest rates on bank loans also start to rise rapidly, this may instead lead to higher yield requirements and falling property values. In such a situation, there is a risk that the self-reinforcing effects will instead act in the opposite direction, which may have serious consequences for individual lenders and for financial stability.

In the longer term, there are also other factors that could affect property values. One of these is whether demand for office space will fall as more people work remotely. Calculations indicate that this could reduce the value of office buildings by between 5 and 18 per cent. This may pose an additional challenge for both property companies and lenders.⁶⁰

⁶⁰ For more information on how reduced demand for office space alone could affect the value of office properties and, by extension, financial stability, see Alfelt et al. (2022) "Financial stability risks following reduced demand for offices", *Economic Commentaries* No. 6, Sveriges Riksbank.

2.3 Vulnerabilities and risks in the household sector



The strong development of the labour market and higher housing prices have contributed to an increase in household sector income and asset values. At the same time, however, mortgages have continued to grow more rapidly than incomes, both among new mortgagors and for the household sector as a whole. Consumer loans have also continued to grow. The risk outlook is characterised by rising debt but also by higher living costs and interest rates, which are reducing households' margins. Debt-servicing ability among households is good, but an unfavourable scenario, such as one in which the cost of living and mortgage rates were higher than expected and housing prices fell sharply, could lead to a deterioration in macroeconomic developments and impact financial stability.

Strong development of the labour market but the future path of housing prices is uncertain

As there is a high demand for labour, the outlook on the labour market has continued to improve in 2022, and employment has risen while unemployment has fallen. Disposable household income has also grown rapidly. Saving remains historically high, although it decreased slightly during the final quarter of last year. Households' finances are also affected by fluctuations in the value of their assets. For many households, equities and funds are important financial assets, while housing often accounts for a large part of the real assets of households that own their housing.

The value of equities and equity funds has generally fallen in early 2022. Since the start of the pandemic in March 2020 through March 2022, housing prices have increased by just over 24 per cent, which has contributed to an increase in the value of households' real assets. Prices have increased significantly faster than disposable income (see Chart 10). However, rising mortgage rates, high energy costs and weak growth in disposable income in 2023 and 2024 are expected to cause housing prices to fall somewhat over the next few years. The fact that prices remained unchanged in March and decreased in April may be an initial indication that prices may be about to fall in the period ahead.⁶¹

In turn, the fall in housing prices is expected to contribute to a decrease in housing construction in the future. The number of housing starts is currently at historically high levels and, in 2021, is expected to be in line with Statistics Sweden's population forecasts and the need for new housing estimated by the Swedish National Board of Housing, Building and Planning.⁶² In view of the fact that prices have risen so sharply

⁶¹ This refers to HOX Sweden which is published by Valueguard.

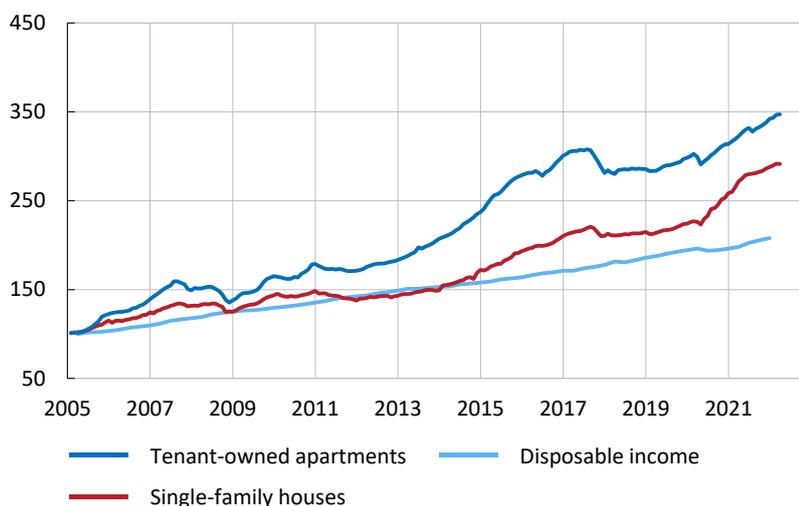
⁶² See Chart A.9 in the Chart Appendix.

over time, it is positive that the supply of housing has increased. However, in a situation where households' willingness to pay is falling, supply risks exceeding demand, which means that housing prices may fall.

The future development of housing prices is highly uncertain and there is a risk that the adjustment process will be more abrupt and that housing prices will fall significantly. For example, one uncertainty factor concerns how preferences for housing may change after the pandemic. During the pandemic, changes in preferences among households were considered to explain a large part of the rise in prices, so a partial reversal of this trend should lead to lower housing prices. If housing prices fall sharply, this may lead to reduced wealth among homeowners. Households that, for example, become hit by unemployment or illness and find it difficult to fulfil their debt payments may then be forced to realise capital losses.

Chart 10. Development of housing prices and disposable income in Sweden

Index, January 2005 = 100



Sources: Valueguard and the Riksbank.

Household debt continues to increase

Despite the high growth rate of disposable income, the debt-to-income ratio has continued to grow and is now historically high.⁶³ It currently stands at around 200 per cent, which is high even in an international comparison. If the debts of tenant-owner housing associations are included, the debt-to-income ratio is just over 220 per cent. The most recent mortgage survey by FI also shows that indebtedness among new mortgagors is increasing.⁶⁴ In 2021, these had an average debt-to-income

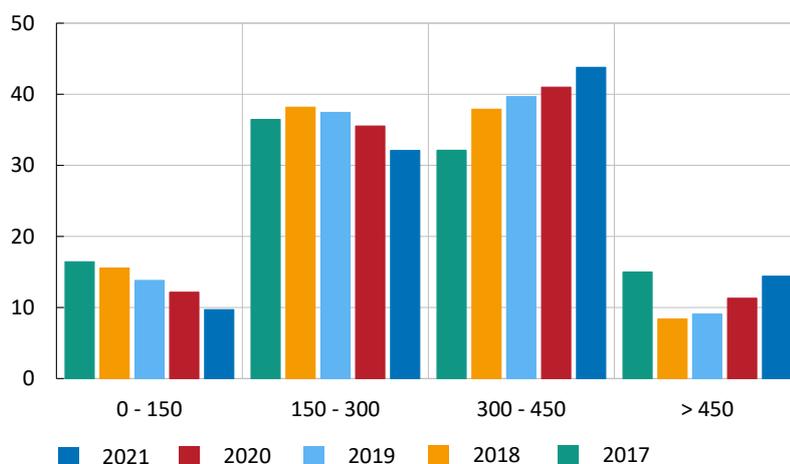
⁶³ The debt-to-income ratio refers to total household debt divided by annual disposable income. See Chart A.10 in the Chart Appendix.

⁶⁴ The mortgage survey consists of microdata on new mortgagors. This data is formed of random samples that cover all new mortgage agreements entered into over the periods 27 August–3 September 2021 and 27 September–4 October 2021. See *The Swedish mortgage market*, April 2022, Finansinspektionen.

ratio (calculated using gross income) of 327 per cent, compared with before the pandemic, when it was 296 per cent. In conjunction with the introduction of the stricter amortisation requirement in March 2018, the proportion of new mortgagors with a debt-to-income ratio of over 450 per cent decreased (see Chart 11).⁶⁵ Since then, the proportion of new mortgagors with a debt-to-income ratio of over 450 per cent has gradually increased.⁶⁶ Higher debt-to-income ratios among new mortgagors will in turn affect the development of debt in the stock with some delay.

Chart 11. New mortgagors by loan-to-income ratio

Percentage of new mortgagors



Note. Refers to new loans (mortgages for housing purchases, supplementary loans and after switching banks). The debt-to-income ratio is calculated using gross income.

Source: The Swedish Mortgage Market (2022), Finansinspektionen.

After being subdued during the pandemic, the growth rate for consumer loans has now risen again and, in March, the annual rate of increase was 6.8 per cent.⁶⁷ Consumer loans account for about 18 per cent of household debt to monetary financial institutions. However, due to the high interest rates on these loans, their share of total interest expenditure is considerably higher – just over 35 per cent. Since households often have variable interest rates on their consumer loans, this means that higher interest rates have a rapid impact on household interest expenditure. As consumer loans have grown, the number of applications for debt relief with the Swedish

⁶⁵ The first amortisation requirement means that new mortgagors have to amortise 1 per cent if their loans correspond to 50–70 per cent of the value of their homes. Mortgagors whose loans exceed 70 per cent of the value of their homes must amortise 2 per cent. The stricter amortisation requirement obliges new mortgagors to amortise a further 1 per cent if their loans exceed 4.5 times their gross income.

⁶⁶ During the pandemic, FI provided the possibility for banks to grant mortgagors an exemption from the amortisation requirements. This may have contributed to new mortgagors borrowing more, although this is uncertain as the banks' credit assessment did not become less tight due to the exemption. For an analysis, see M. K. Andersson and T. Aranki, "Temporary amortisation exemption led to new mortgagors borrowing more", *FI Analysis* 34, June 2021, Finansinspektionen.

⁶⁷ See Chart A.11 in the Chart Appendix.

Enforcement Authority have also increased. Since 2015, applications have almost tripled and, according to the Swedish Enforcement Authority, consumer debt is the most common type of debt.

Properly conducted credit assessments can prevent individuals from taking on too much debt and it is therefore problematic that lenders base their credit assessments using insufficient background information.⁶⁸ In the case of many smaller loans, there is often no extensive credit assessment and, since there is no system showing all the debts of borrowers, the credit assessment is often based on insufficient data. A number of initiatives have therefore been taken recently to provide lenders with a better basis for credit assessments and the government has set up an inquiry to investigate, among other things, the matter of a debt register.⁶⁹

Higher living costs are leading to reduced margins for many households...

While many households have benefited from the strong development of the labour market and the rise in housing prices, higher living costs have reduced their scope for consumption and saving. For example, many households have suffered from high electricity bills and higher fuel prices over the winter and spring. Even considering government support in the form of, inter alia, compensation for higher electricity and fuel prices, the increase in costs has been highly noticeable for many households. For households with relatively high electricity consumption in southern and central Sweden, where electricity prices have been highest, electricity bills in individual months may have increased by several thousand kronor compared to previous years.

If the cost of living remains at high levels, it risks reducing household resilience, partly because households find it more difficult to cope with other unforeseen expenditure increases and partly because households can choose to reduce their saving. For an average household in a single-family house, an increase in electricity bills of SEK 10,000-15,000 per year can correspond to about two to three per cent of their annual disposable income.

...and interest expenditure is also expected to rise in the period ahead

Since debts have grown faster than income for a long time, households have become increasingly sensitive to rising interest rates. However, since interest rates have been low, household interest expenses in relation to disposable income (the interest-to-income ratio) has remained at low levels (see Chart 12). The aggregate interest-to-income ratio includes households without loans. If, instead, only new mortgagors are considered, the interest-to-income ratio is higher, as illustrated in the right-hand part of the chart (see Chart 12).

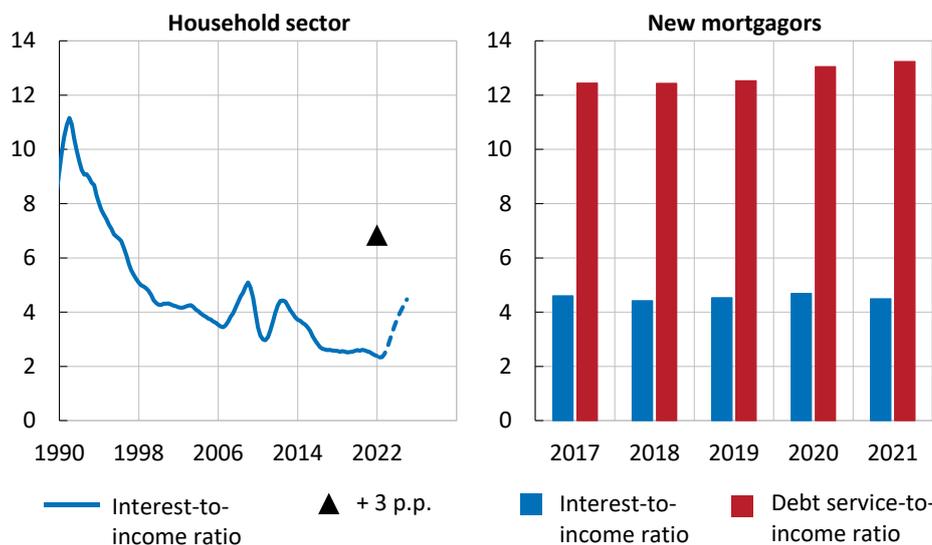
⁶⁸ See, for example, "Hemställan om utredning av förutsättningarna för ett system med uppgifter om konsumenters totala skuldsituation [Petition for an investigation into the prerequisites for a system with data on the total consumer debt]", 26 October 2021, Finansinspektionen and the Swedish Consumer Agency.

⁶⁹ See SOU Fi 2021:08 "Motverka riskfylld kreditgivning och överskuldssättning [Counteracting risky lending and over-indebtedness]".

Mortgage rates for loans with longer interest-rate fixation periods have risen over the start of 2022, while the variable mortgage rate has remained relatively unchanged.⁷⁰ As the Riksbank’s policy rate is expected to rise in the coming years, interest rates and, consequently, the interest-to-income ratio will increase. Just over 40 per cent of the total mortgage stock is tied to a variable interest rate that is renegotiated every third month. This means that rising interest rates have a rapid impact on households’ interest expenses and thus on their scope for consumption. As can be seen from Chart 12, an increase in interest rates of three percentage points could lead to an increase in the interest-to-income ratio to just over 6 per cent. Increased interest expenditure could to some extent be offset by higher deposit rates at banks, but since households’ debts are significantly larger than their bank deposits, disposable household income will be dampened by an increase in interest rates.

Chart 12. The interest-to-income ratio for the household sector and among new mortgagors

Per cent



Note. The interest-to-income ratio refers to interest expenses as a percentage of disposable income. Interest expenses have been adjusted for tax relief. The dashed line represents the Riksbank’s forecast. The triangle to the left illustrates the level of the interest-to-income ratio that has been calculated on the basis of the current debt-to-income ratio in a scenario in which the interest rate has risen by 3 percentage points from the current level. Right: the debt service-to-income ratio refers to interest payments and amortisation as a percentage of disposable income.

Sources: Finansinspektionen, Statistics Sweden and the Riksbank.

Good debt-servicing ability, but if interest rates were to rise more significantly, many highly indebted households may need to make considerable adjustments

FI’s mortgage survey carries out stress tests that are similar to the discretionary income calculations made by the banks in conjunction with credit assessments. FI’s

⁷⁰ See Chart A.12 in the Chart Appendix.

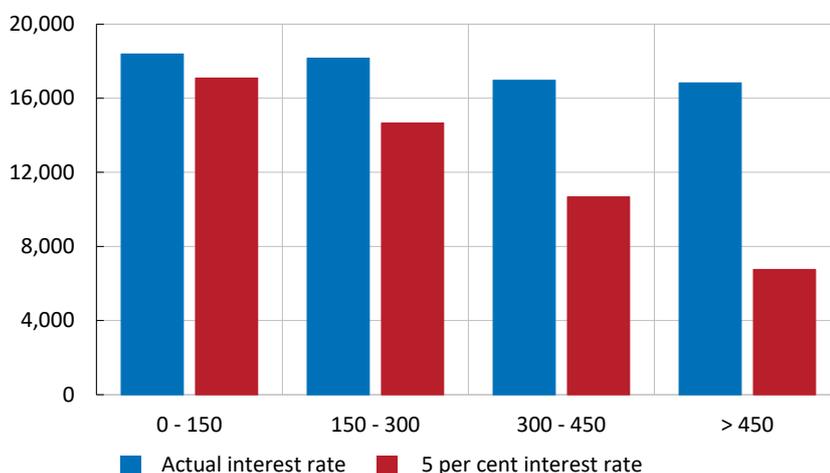
stress tests give an indication of the resilience of new mortgagors. These are based on household income, on the agreed interest rate and on standard values for living costs that are intended to represent the necessary expenditure for households in a stressed scenario. They then examine the ability of new mortgagors to fulfil their debt payments in various scenarios, for example in the event of a loss of income and higher interest rates.

The stress tests indicate the share of the new mortgagors that will have a deficit between income and expenditure if interest rates rise. The tests show that the debt-servicing ability seems to be good for the vast majority of new mortgagors. Even at an interest rate of 5 or 7 per cent, a large share of new mortgagors are able to pay interest and amortisations. However, the proportion that goes into deficit at an interest rate of 7 per cent has increased from 8 per cent to 11 per cent between 2020 and 2021. This is probably due to the fact that the banks reduced their stressed mortgage rates by and large from 6.5-7.5 to 6 per cent over the same period.

Even if only a small proportion of new mortgagors will face a deficit if interest rates were to rise, many households with high loan-to-income ratios still risk having little left of their income to use for saving and consumption. This becomes clear if we investigate the size of the monthly surpluses that new mortgagors have left if interest rates rise (see Chart 13). For households with a loan-to-income ratio above 450 per cent, the surplus would be more than halved at an interest rate of 5 per cent.

Chart 13. Surplus among new mortgagors at a higher level of interest rates

SEK



Note. The size of the columns shows the median of the monthly surplus in a discretionary income calculation at actual and 5-per cent mortgage rates for the total loans of new mortgagors. The calculations also include other loans, and the interest rate on these loans is then expected to increase to 8.5 per cent. The loans are allocated on the basis of the debt-to-income ratio. The debt-to-income ratio is calculated using gross income.

Sources: The Swedish Mortgage Market (2022), Finansinspektionen.

There is always uncertainty as to how accurate the standard values for living costs are. It is therefore uncertain how much new mortgagors can reduce their consumption in order to cover expenditure from rising interest rates. For many households, the cost

of living has risen faster than incomes over the last year, which means they may find it difficult to reduce their expenditure as much as the stress tests assume. Since rising interest rates may lead to an increase in tenant-owner housing association fees, tenant-owners may also be affected by higher fees. If expenditure exceeds income for a limited period of time, households can counter it if they have sufficient buffers. However, there are indications that many highly indebted households in Sweden may be short of liquid assets.⁷¹

Overall, both a higher cost of living and higher interest rates mean that many highly indebted households may have to make significant adjustments to their personal finances in the future. Households with consumer loans will also be affected. Although these loans are often smaller, these borrowers generally have a poorer debt-servicing ability than mortgagors to begin with.

An unfavourable scenario in which, for example, the cost of living and mortgage rates rise more than expected while housing prices also fall sharply could have a significant impact on many highly indebted households and could lead, for example, to a sharp adjustment of their consumption or saving.⁷² In turn, this could lead to a deterioration in macroeconomic developments and, ultimately, affect financial stability.

High housing prices contribute to substantial systemic risks

The large imbalances in the housing market are contributing to the continued high level of the Riksbank's indicator of financial risks and vulnerabilities. It has decreased somewhat in recent quarters, partly because the development of the real economy improved after the pandemic, both in Sweden and abroad (see Chart 14). However, as shown in the chart, the contribution from the property market has increased, reflecting the large imbalances in the housing market and high property values of commercial properties. However, the calculations are based on data for the period until the last quarter of 2021 and therefore do not take into account developments in 2022. Preliminary estimates for the first quarter of 2022 indicate that the sub-indices for both the external environment, property and households may increase. The indicator is not designed primarily to predict financial crises in the near future, but to reflect the fact that vulnerabilities are accumulating over time. If something occurs that causes the risks to materialise, the consequences can be more serious and more prolonged if vulnerabilities are heightened.

New estimates of the Riksbank's Growth-at-Risk indicator, which takes into account the level of risks and vulnerabilities in the financial system (systemic risk indicator) and GDP developments in previous quarters, also indicate that the risks of sharply negative outcomes in GDP growth (downside risks) remain high. The calculations are

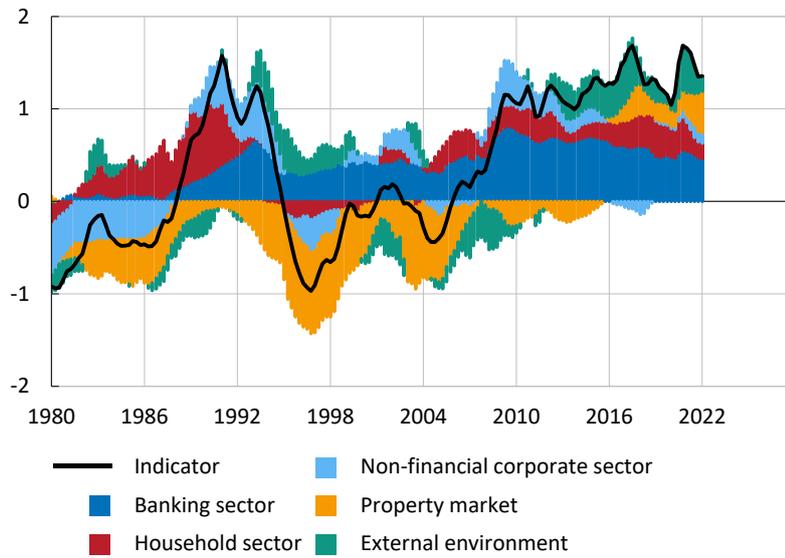
⁷¹ See M. K. Andersson and R. Vestman, "Liquid assets of Swedish households", *FI Analysis* 28, January 2021, Finansinspektionen.

⁷² How households react to various types of shocks such as falling housing prices and rising interest rates depends not only on indebtedness but also on other factors such as the size of liquid assets held by households. For a longer discussion of the relationship between household debt and consumption, see Relationship between household indebtedness and consumption during the financial crisis, 2007-2009. Fact box in Financial Stability Report 2019:2, Sveriges Riksbank. See also J. Almenberg, M. Kilström, V. Thell and R. Vestman, "Household debt and resilience", *FI Analysis* No. 33, June 2021, Finansinspektionen.

also based on data for the period until the last quarter of 2021 and do not take into account developments in 2022.

Chart 14. The Riksbank's indicator for risks and vulnerabilities in the financial system

Deviation from mean value



Note. A higher value means greater risks and vulnerabilities. For all series included, see D. Krygier and P. van Santen (2020), "A new indicator of risks and vulnerabilities in the Swedish financial system", Staff Memo, Sveriges Riksbank.

Source: The Riksbank.

2.4 Vulnerabilities and risks in the Swedish banking system



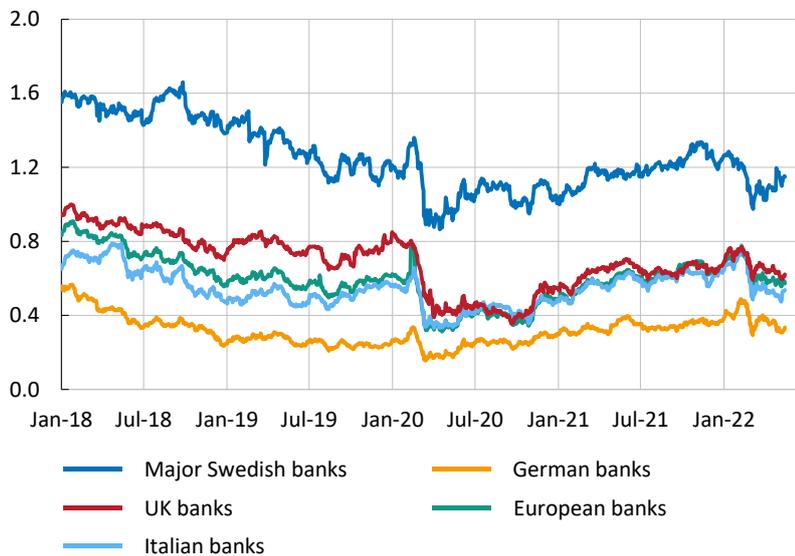
The major Swedish banks currently have relatively good resilience, but the risks have increased.⁷³ Poorer growth prospects and high inflation and higher interest rates may mean that the banks will need to increase their loan loss reserves going forward. The economic effects of Russia’s invasion of Ukraine and of the lockdowns in China also remain to be seen. Moreover, the risks associated with the major banks’ market funding and their lending to the commercial property sector remain. Sufficient capital levels in the banks form an important starting point for maintaining resilience and the supply of credit in the Swedish financial system.

Banks are in a favourable starting position...

The major Swedish banks continue to have margins over the capital requirements, while their financing situation is favourable. They also continue to have good earnings capacity, which is driven, for instance, by high cost-efficiency and low loan losses. They also have a high market valuation from an international perspective, as illustrated by the fact that the stock market value exceeds the book value of their equity (P/B value) (see Chart 15).

Chart 15. European banks’ price-to-book

Ratio



Note. The category “major Swedish banks” includes SEB, Handelsbanken and Swedbank.

Source: Bloomberg.

⁷³ The “major Swedish banks” are Handelsbanken, SEB and Swedbank. The “major banks in Sweden” are Danske Bank, Handelsbanken, Nordea, SEB and Swedbank.

...but the risks have increased

After many years of very low interest rates, rising asset prices and increasing indebtedness, it is uncertain how economic agents will manage rapidly increasing interest rates. In a bad scenario, the functioning of the financial markets may be affected and the banks' ability to obtain funding may be impeded. Neither is it possible to rule out a situation in which banks' loan losses increase.

In addition, Russia's invasion of Ukraine has increased economic uncertainty. However, the major banks' exposures to Russia and Ukraine are small, which means that the risk of banks suffering major direct loan losses is small. Nevertheless, the Swedish major banks have a high degree of cross-border activity and are thus affected by the impact of the invasion on other countries. For example, several Swedish banks have operations in the Baltic countries, which in turn have more trade with Russia.⁷⁴

The banks have a good funding situation, but are affected when volatility increases in the financial markets

The major banks in Sweden finance their lending with roughly equal parts deposits from households and companies and issuance of securities on the capital markets.⁷⁵ Around two thirds of the latter is in foreign currency. This means that the banks are dependent on both confidence from depositors and investors, as well as well-functioning domestic and international capital markets.

Deposits from households and companies have gradually increased since the first quarter of 2020. This is largely because the Riksbank has increased its holdings of securities, which has increased liquidity in the financial system.⁷⁶ Another reason is that households and companies have generally saved more in bank accounts in recent years, partly to attain the security offered by savings and liquidity buffers (see Chart 16). The increase in deposits has reduced the banks' need for market funding at longer maturities. However, banks have continued to be active in the markets, partly because they want to retain activity on the markets themselves and partly because they have to meet other requirements.

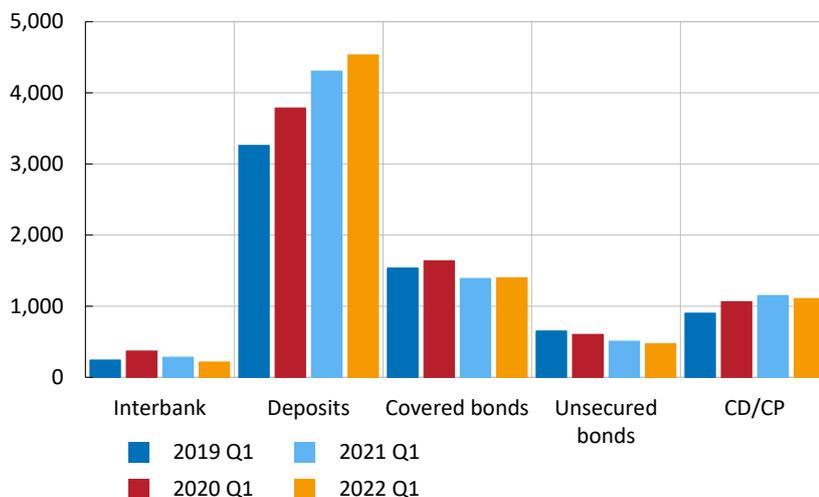
⁷⁴ See Chart A.13 in the Chart Appendix.

⁷⁵ See Chart A.14 in the Chart Appendix.

⁷⁶ See H. Armelius, C. Claussen and D. Vestin (2020), "Money and monetary policy in times of crisis", *Economic Commentaries* No. 4, Sveriges Riksbank.

Chart 16. The major Swedish banks' funding

SEK billion



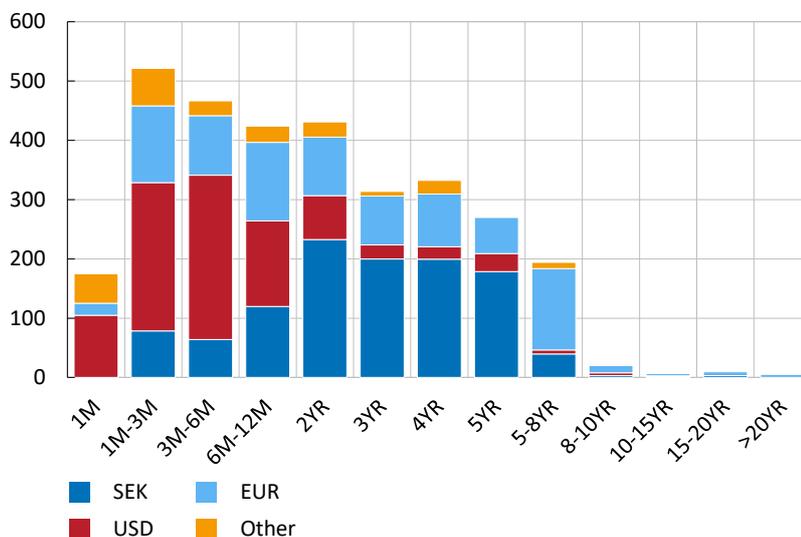
Note. Data refers to SEB, Handelsbanken and Swedbank.

Source: The banks' interim reports.

The short-term funding of the Swedish major banks consists largely of commercial paper issued in dollars (see Chart 17). In conjunction with Russia's invasion, uncertainty arose in the financial markets (see section "Vulnerabilities and risks linked to international developments"), including the dollar market. During this period, the Swedish banks still had good access to dollars at shorter maturities but, during a shorter period, they had more difficulty issuing commercial papers in dollars at longer maturities. In the case of a repeated and prolonged period, such a situation may cause some banks to have problems with their funding and also to have difficulties in meeting their US dollar liquidity requirements (LCR).

Chart 17. The banks' market funding by currency and maturity

SEK billion



Note. The data refer to the stock of market funding as of March 2022 and includes observations for SEB, Handelsbanken and Swedbank.

Source: The Riksbank.

Increased funding costs for the banks mean higher interest rates for their customers

Covered bonds account for a significant proportion of the banks' long-term funding. Since last September, and especially in recent months, the interest rates on these have increased (see the left-hand graph in Chart 18). This mainly affects mortgages that are tied to a longer fixation period as they are heavily influenced by longer term interest rates.⁷⁷

Since the beginning of the year, short-term market rates have also begun to increase, for example STIBOR at three months (see the right-hand graph in Chart 18). Short-term market interest rates in Sweden are to a large extent affected by Swedish monetary policy, through changes in the policy rate. As the policy rate is raised, mortgagors and companies with floating interest rates will thus face higher interest rates (see Chart 19). Most of the banks' lending has a short fixation period.⁷⁸

⁷⁷ See R. Eidstedt, D. Forsman and E. Ünlü (2020), "The funding of the major Swedish banks and its effect on household mortgage rates", *Economic Commentaries* No. 8, Sveriges Riksbank.

⁷⁸ See Chart A.15 in the Chart Appendix.

Chart 18. 5-year covered bond yield and STIBOR 3-months

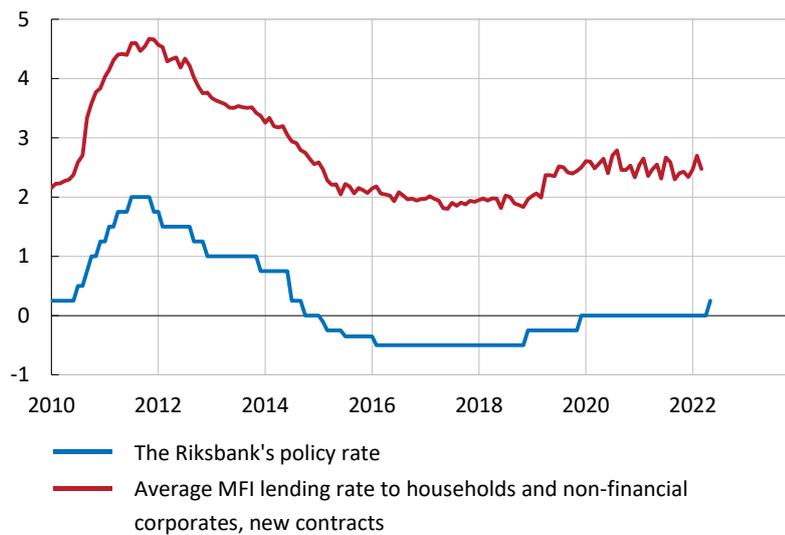
Per cent



Sources: Macrobond and the Riksbank.

Chart 19. Lending rate and the Riksbank's policy rate

Per cent



Sources: Macrobond and Statistics Sweden.

The liquidity situation is good, but market financing is sensitive in stressful situations

The major Swedish banks currently have a good liquidity situation. They meet by a good margin the requirements of liquidity buffers (LCR) in all currencies and in individual significant currencies, as well as the requirement of net stable funding (NSFR). These measures illustrate the banks' capacity to cover their stressed net outflows for

30 days respectively to hold a certain level of stable funding in relation to their illiquid assets in the slightly longer run.^{79, 80}

The Riksbank also carries out various stress tests on a regular basis to assess the resilience of the major banks to liquidity disruptions in other scenarios and time intervals. The stress tests are not forecasts, but reflect hypothetical, but possible, scenarios and are based on different assumptions regarding the banks' situation. In the scenarios, neither banks themselves nor authorities are assumed to take any measures to limit the effects of the liquidity shock. It is therefore important to interpret the results with caution. However, the stress tests provide an indication of the liquidity risks the banks may have.

In the Riksbank's stressed scenario, the Swedish major banks are capable of covering their cash outflows for up to a month, which indicates that the LCR requirement increases the banks' resilience in that time perspective.^{81, 82} But after two months there will be a liquidity need of approximately SEK 30 billion (see Chart 20). This need then gradually increases up to almost SEK 600 billion after six months, which corresponds to almost 6 per cent of the major banks' total assets. Just over half of these SEK 600 billion are comprised of US dollars. The results thus supplement the LCR and NSFR, as they give an indication of how large the liquidity need might be within six months under a stressed scenario, despite the LCR and NSFR requirements being met at the start of the scenario.

⁷⁹ LCR and NSFR can be supplemented by examining liquidity from other perspectives. The Riksbank has developed an alternative liquidity measure *Deposit Loss Capacity* (DLC). This measure illustrates the period in the future during which a bank's greatest liquidity risks arise, and how large a bank can cope with during that period. Read more about this measure in I. Hansson, and T. Lindqvist (2022), "Could the banks cope with large deposit outflows? Assessment according to new liquidity measure", *Economic Commentaries* No. 7, Sveriges Riksbank.

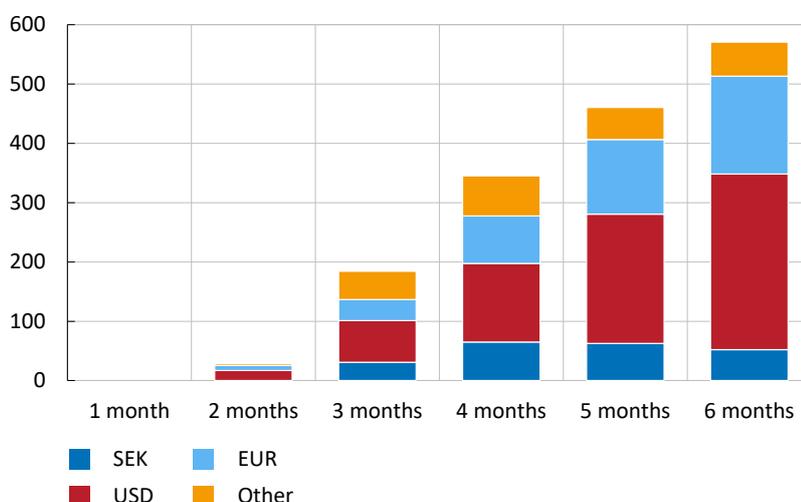
⁸⁰ See Charts A.16 and A.17 in the Chart Appendix.

⁸¹ In the Riksbank's system-wide scenario, the entire banking system is assumed to be suffering financial stress. The banks lose access to market funding in this scenario, the haircuts on their liquid assets become significantly higher and they have some outflow from deposits from the public. The banks are assumed to renew their FX swaps and thus continue to mediate foreign currency to counterparties in the Swedish financial system. Further, it is assumed that the banks cannot use the whole of their liquidity reserve to cover their outflows. The results of the stress test should be interpreted as the liquidity need that the banks are assumed to have after having used so much of their liquidity reserve to cover their outflows that they lack the ability to regain market confidence. In the stress test, this liquidity need arises when the banks' LCR falls below 75 per cent.

⁸² For more information on the method, see the article "Bank liquidity stress testing" in *Financial Stability Report*, 2019:2, Sveriges Riksbank, and M. Danielsson and J. Manfredini (2019), "The Riksbank's method for stress testing banks' liquidity, *Staff Memo*, November, Sveriges Riksbank.

Chart 20. The Riksbank’s stress tests of the banks’ liquidity needs

SEK billion



Note. The liquidity need refers to the major Swedish banks and is shown cumulative over the period of the stress test. The stress test is based on the banks’ reported data to the Riksbank and refers to March 2021-February 2022. The category “Other” includes DKK, NOK and GBP.

Source: The Riksbank.

Important with sufficient capital when uncertainty increases

The major Swedish banks currently have higher capital levels than before the pandemic, which is partly a result of the dividend restrictions introduced at that time, and of relatively good profitability. However, the banks’ leverage ratios have not increased to the corresponding extent (see Chart 21).

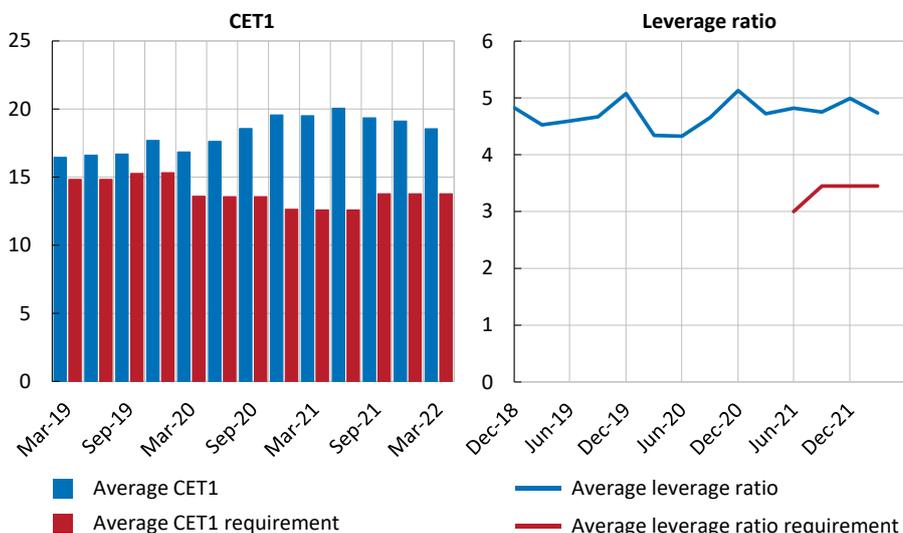
However, as previously described, the banks face several risks in the period ahead. A higher interest rate situation affects households’ scope for consumption, which in turn risks reducing the income of non-financial corporations. In a bad scenario, this may lead to increased loan losses for the banks. In addition, high energy and fuel prices can have a negative impact on companies’ ability to pay, and they may therefore be associated with a higher credit risk.

Another risk is the banks’ exposure to commercial properties (see section “Vulnerabilities and risks in the corporate sector”). If problems were to arise in the property sector, it could put considerable strain on the banking system, given the large share of property loans in the banks’ credit portfolios.⁸³ This may affect banks’ loan losses and, by extension, their capital levels.

⁸³ See Chart A.14 in the Chart Appendix.

Chart 21. Average CET1 ratio, leverage ratio and average capital requirement

Per cent



Note. Average for the major Swedish banks. The average leverage ratio requirement includes the Pillar 2 guidance of 0.45 per cent.

Sources: The banks' interim reports and Finansinspektionen.

If property companies find it difficult to refinance themselves in the capital market, this could affect the banking sector through increased demand for bank loans. If banks were to increase their lending to property companies, this would mean that the banks' current capital ratios would be pushed down. However, the banking sector is currently expected to be able to absorb property companies' maturing bonds over the coming year without the banks breaching their capital requirements.

There is also some uncertainty about the effects of the pandemic on bank loan losses when the final support measures are phased out. For example, during the pandemic, several companies were able postpone their tax payments, which will eventually have to be paid. It also remains to be seen what the effects of the current lockdowns in China are, and how Russia's invasion of Ukraine will develop.

The Riksbank's assessment is that the banks are currently in a good position to cope with a poorer development in the real economy, but there are several risks that can create problems for the banks. The Riksbank's stress tests in previous Financial Stability Reports have shown that if there are major problems in the housing market and the commercial property market, the banks may find it difficult to maintain credit supply without support measures.⁸⁴ Sufficient capital levels in the banks form an important starting point for maintaining resilience and the supply of credit in the Swedish financial system. It is therefore important that the banks have sufficient capacity to manage the existing risks, as well as the announced increases in the counter-cyclical capital buffer.

⁸⁴ See *Financial Stability Report 2020:2*, Sveriges Riksbank.

2.5 Vulnerabilities and risks among other financial agents



Other financial agents can, in particular, affect financial stability through their actions in financial markets, as they manage large assets. For example, Swedish funds account for a large proportion of the companies' market-based financing. At the same time, some funds, such as Swedish corporate bond funds, are sensitive to large redemptions from unit holders and can pass stress on to companies. Swedish insurance companies are interconnected with banks in particular. The way in which insurance companies choose to invest in different assets can therefore affect the way that disturbances in the financial system develop and spread. Swedish insurance companies are particularly sensitive to equity price falls.

Vulnerable funds can contribute to increased stress in financial markets

In the event of substantial turbulence in financial markets, there is a risk that some investment funds could reinforce the movements on the markets where they invest and thereby contribute to additional stress. This mainly concerns Swedish corporate bond funds, which has also been highlighted in several previous Financial Stability Reports. These funds are sensitive to major outflows, as they offer daily redemption opportunities to unit holders while investing in less liquid assets. This became particularly apparent when the coronavirus pandemic broke out in spring 2020. When redemptions are large, the funds may need to dispose of assets to manage them. This affects market pricing and, ultimately, the ability of companies to finance their operations.⁸⁵ Even smaller outflows from the funds affect their ability to participate in new issues on the primary market and thus also the financial conditions for companies. During the year to date, the corporate bond funds have mostly had small inflows. The exception was February where the outflow was relatively large, but still nowhere near the outflow that occurred at the start of the coronavirus pandemic (see Chart 22).

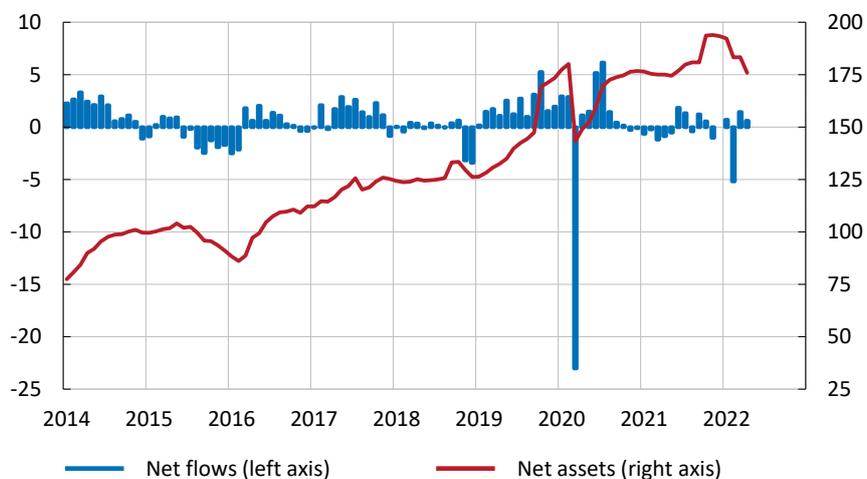
One way for the funds to increase their resilience to large outflows is to adapt the redemption possibilities for unit holders to the liquidity of the underlying assets. Another is to keep a sufficient amount of cash. It is difficult to say exactly how much cash is necessary, but it can be noted that the corporate bond funds have not significantly increased their share of cash in recent years (see Chart 23).⁸⁶

⁸⁵ Swedish funds account for just over one third of the holding of Swedish corporate bonds. In addition, foreign funds also account for a certain proportion. See, for example, "Towards a better functioning corporate bond market", Riksbank Study No. 3 2021.

⁸⁶ However, some other initiatives have been taken by the funds at the request of Finansinspektionen. For example, they have reviewed their controls and procedures so that the postponement of trade due to lack of liquidity is only to take place in exceptional cases and they have attempted to improve their liquidity analyses. FI has communicated that it intends to conduct an in-depth analysis of liquidity management in funds. See the news item "Fördjupad analys om god likviditetshantering i fonder [In-depth analysis of good liquidity management in funds]", April 2022, Finansinspektionen. Last updated 13 April 2022. Accessed 4 May 2022, [in-depth analysis of good liquidity management in funds | Finansinspektionen](#).

Chart 22. Net flows and fund wealth in Swedish corporate bond funds

SEK billion



Note. Net flows are the difference between deposits and redemptions from funds.

Source: Macrobond.

Chart 23. Share of cash among Swedish corporate bond funds

Percentage of the portfolios



Note. Unweighted averages.

Source: Morningstar.

When interest rates rise, this may trigger outflows from certain fixed income funds, such as corporate bond funds. However, the Swedish corporate bond funds are not as sensitive to interest rate increases that may result from the development of inflation. These funds invest primarily in floating rate notes (FRN), which entail lower interest rate risk than fixed coupons. The Swedish funds also have a duration that is lower than the average for European corporate bond funds.⁸⁷ This is partly due to the fact

⁸⁷ See Morningstar.

that maturities are shorter in the Swedish corporate bond market than in the European one.

Some Swedish funds had to close temporarily

When the Moscow Stock Exchange closed at the end of February 2022, a number of Swedish domiciled Russian and Eastern European funds also temporarily closed for trading. Some Eastern European funds have reopened, but it is still unclear how long the Russian funds will have to be kept closed.⁸⁸ The closures are intended to ensure that unit holders are treated equally, since the funds could neither sell nor value their Russian holdings, but they also limit the scope for action of the unit holders, since the capital is locked in the meantime. Only slightly over SEK 15 billion of the total fund wealth of more than SEK 6,400 billion, or about 0.2 per cent, was invested in Russian and Ukrainian securities when war broke out.⁸⁹ The holdings consisted almost exclusively of Russian shares, spread across some thirty funds. The closures are not expected to have any major effects on the Swedish financial system.

The insurance companies have continued to have a high share of risky assets

Insurance companies' investments are a balance between return and risk. The return is particularly important for life insurance companies which have guaranteed commitments to policyholders. The proportion of life insurance companies' portfolios invested in risky assets, such as equities and funds, is high compared to European equivalents.⁹⁰ The share continued to increase up to the end of the year, representing 58 per cent of total investment assets (see Chart 24).⁹¹ The risky assets are partly offset by fixed income assets with continued high credit ratings. More than 60 per cent of fixed income assets had the highest credit rating at the turn of the year (see Chart 25).

The large percentage of equities and funds means that companies are more affected by the development of equity markets than their European counterparts. Since the turn of the year, equity markets have fallen as a result of higher inflation, interest rate expectations and geopolitical unrest. Like the funds, insurance companies have small exposures to Russia and Ukraine.⁹² Life insurance and occupational pension companies are generally considered to have a high level of resilience to major falls in asset prices.⁹³ On the other hand, the returns of policyholders may suffer from a larger fall in asset prices.

⁸⁸ At least part of these funds will be wound up, i.e. closed permanently, as soon as possible.

⁸⁹ See Chart A.18 in the Chart Appendix.

⁹⁰ See *Financial Stability Report* – December 2021, EIOPA.

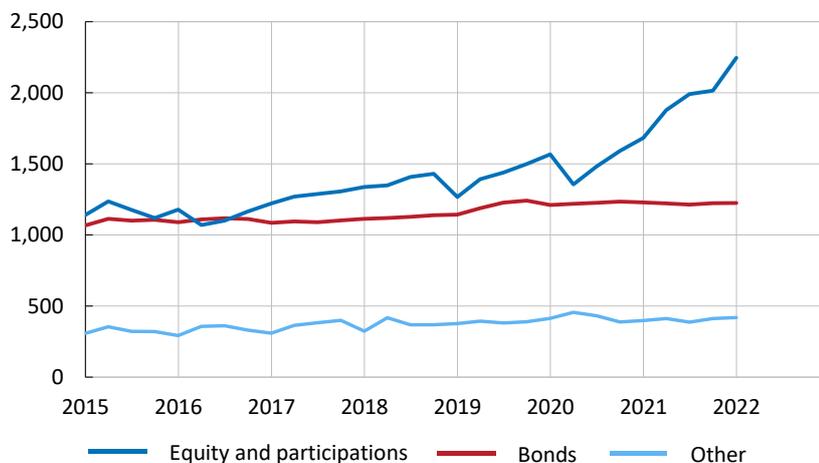
⁹¹ See Statistics Sweden. Excluding custodial and fund insurance.

⁹² Only five insurance companies at the turn of the year had direct investments in Russian and Ukrainian securities. The company with the largest exposure had investments corresponding to 0.01 per cent of the market value of their total securities holdings (The Riksbank (VINN)).

⁹³ See *Stability in the financial system 2021:2*, Finansinspektionen.

Chart 24. Life insurance companies' investment assets

SEK billion

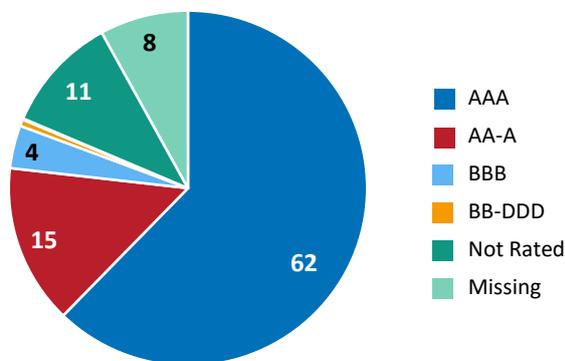


Note. Fund and deposit policies where the policyholder bears the risk are excluded. Equity and participations refers to quoted and not quoted equity, investment funds, options and other ownership shares. Other refers to, for instance, cash and bank balances, money market instruments, loans, buildings and land.

Source: Statistics Sweden.

Chart 25. Insurance companies' bond holdings

Per cent



Note. Shares of total market value per 31/12/2021. Refers to both insurance companies and AP funds.

Sources: Dealogic, Fitch, Statistics Sweden and the Riksbank.

Insurance companies are dependent on the foreign exchange market

In addition to their Swedish holdings, insurance companies are mainly exposed to the United States. Foreign investments are hedged to a large extent in order to manage the exchange rate risk inherent in the investment. When the value of the assets of insurance companies changes, it affects the demand for foreign currency for their hedging. In a scenario with a larger fall in asset prices, the need for foreign currency increases for insurance companies. The fall in asset prices may result in the initial cur-

rency hedge, the debt in foreign currency, becoming too large. To reduce the debt, insurance companies need to buy back foreign currency to repay the debt. The fall in asset prices can also result in increased initial margin requirements for existing investments where losses have occurred, which are often paid in foreign currency. All in all, this results in increased demand for foreign currency. The insurance companies are therefore dependent on a functioning foreign exchange market. In connection with Russia's invasion of Ukraine, liquidity in the foreign exchange market deteriorated but has subsequently improved again.⁹⁴

⁹⁴ This refers to worse liquidity in terms of greater differences between bid and ask prices.

2.6 Vulnerabilities and risks in the financial infrastructure



The availability of the Swedish financial infrastructure systems is good. However, the uncertain global situation has increased the risk of cyberattacks, for example. The continued high volatility in the electricity market has led to increased risk exposures for the Swedish central counterparty (CCP) and its participants. The European Commission has published a consultation which proposes tools that can reduce the dependence of EU participants on substantially systemically important CCPs in the UK. The Riksbank considers that dependence on CCPs from third countries does not need to be reduced if the supervision and legislation, in the jurisdictions in which they are domiciled, are deemed equivalent to those in the EU.

The uncertain global situation also entails increased risks for the financial infrastructure

During the first quarter of 2022, the Swedish financial infrastructure systems had good availability. Both payments and settlement of securities transactions have thus been implemented safely and efficiently.⁹⁵ The deterioration in the global situation has not so far had a significant impact on the infrastructure. However, this has meant that the risks of cyberattacks are elevated throughout society, including for financial market infrastructures (FMIs). A cyberattack does not need to be directly targeted at FMIs for them or their systems to be affected. They may also be indirectly affected if their participants, critical service providers or critical societal infrastructure are attacked. Since the FMIs have a central role in the financial system, it is important that all agents involved always maintain good preparedness and have proactive risk management, so that availability can be maintained.

Developments in the electricity market increase the risks for central counterparties and their participants

In the second half of 2021, European energy and electricity prices increased sharply and this trend has continued during the beginning of 2022. This has also affected Nordic electricity prices, as electricity grids in the Nordic countries and northern Europe are interconnected. Nordic electricity prices have therefore remained more volatile than normal and reached new record levels. This has increased the risk exposures for the Swedish CCP Nasdaq Clearing and its participants active in the Nordic commodity market. A large share of these CCP participants are non-financial companies in the form of electricity producers and consumers, which enter into financial derivative contracts to hedge their income and costs when spot prices for electricity are volatile.

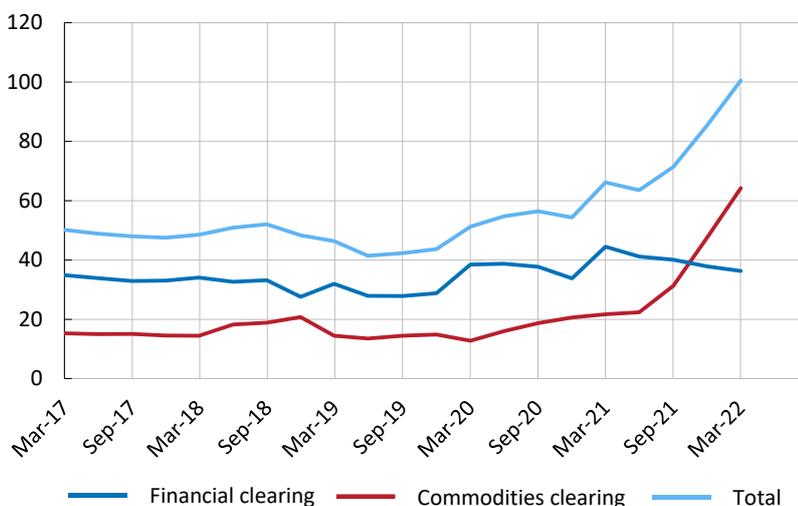
As the volatility and level of electricity prices increase, many participants' portfolios of derivative contracts may be adversely affected and burdened by large losses. This in turn means that Nasdaq Clearing's credit and liquidity risks increase as they take on

⁹⁵ See Chart A.19 in the Chart Appendix.

the counterparty risks in all derivative transactions into which their participants enter in the Nordic commodities market. Given the increased risk exposure, margin requirements have increased significantly during the past year for Nasdaq Clearing’s participants in commodities clearing.⁹⁶ The increase in margin requirements indicates that the potential losses that the CCP may incur in one (or more) participant defaults have increased. Chart 26 shows at aggregate level the development of the initial margins for Nasdaq Clearing’s around 40 participants in financial clearing and about 110 participants in commodities clearing.⁹⁷

Chart 26. Aggregate initial margin requirements for Nasdaq Clearing’s participants

SEK billion



Note. The collateral a participant has pledged to the CCP to cover its initial margins is intended to cover potential losses if the participant should default. The chart shows the sum of the respective margin requirements for Nasdaq Clearing’s participants in financial clearing and commodities clearing (including seafood clearing), as well as the total sum of these clearing services.

Source: Nasdaq Clearing.

Nasdaq Clearing's participants have so far managed to provide collateral that meets the higher requirements. However, it is probable that Nordic electricity prices will remain volatile and high periodically as they are affected by energy prices in Europe. This may further increase margin requirements. Therefore, Nasdaq Clearing’s participants need access to liquid assets that can be quickly pledged as collateral.

⁹⁶ This also applies to other CCPs that clear derivatives with commodities and/or energy as underlying assets. One example is the London Metal Exchange (LME), where extremely large increases in nickel prices in turn created large increases in margin requirements for market players active in the nickel derivatives market.

⁹⁷ The number of participants per clearing service refers to 31 March 2022. It should be noted that the number of participants at Nasdaq Clearing's clearing services varies over time.

Ambition to reduce the EU's dependence on third-country central counterparties

In December 2021, the European Securities and Markets Authority (ESMA) concluded that some of the clearing services of the UK CCPs, LCH Ltd and ICE Clear Europe Ltd were of substantial systemic importance for the financial stability of the EU.⁹⁸ If a clearing service is considered to be of substantial systemic importance, it means that it is of such substantial systemic importance for the EU, or an individual Member State, that it could be inappropriate from a financial stability perspective for clearing to take place outside the EU.⁹⁹ However, ESMA concluded that the risks currently outweigh the benefits of derecognising UK CCPs in the EU. In its assessment, ESMA instead emphasizes that exposures in euro and zloty need to be reduced in these clearing services. The aim of this is to reduce the dependence of EU participants on, and the risks associated with, these CCPs. This means that Swedish banks can be affected as they have, in addition to exposures in Swedish kronor, significant exposures in especially euros to the CCPs. However, exposures in Swedish kronor to these CCPs were not considered to be of substantial systemic importance and therefore do not need to be reduced.

In February, the European Commission extended the time-limited equivalence for UK CCPs until 30 June 2025, as a result of the excessive risk of not allowing them to operate in the EU.¹⁰⁰ It reflects the assessment that UK legislation and supervision are currently deemed equivalent to that in the EU. In connection with the decision, the European Commission also published a consultation aimed at gathering views from market participants and public authorities on how EU participants' dependence on the UK CCPs can be reduced and how clearing activity in the EU can be expanded.¹⁰¹ The consultation discusses, among other things, tools that can reduce EU participants' exposures in euro and zloty to the clearing services ESMA deemed to be of substantial systemic importance. A couple of examples are to increase capital requirements on banks regarding their exposure to these CCPs and to limit how much of the exposures are allowed to be cleared there.

The Riksbank notes that several of the tools mentioned in the consultation are not problem-free and could put EU participants at a disadvantage compared to other market players around the world. It is therefore important that any tools introduced clearly reduce the identified financial stability risks. The Riksbank does not consider that the geographical domicile of CCPs in themselves is a reason for taking action. The Riksbank considers that clearing at third-country CCPs should be permitted under the same conditions as those for CCPs in the EU, on condition that both supervision and legislation are deemed to be equivalent to those of the EU.

⁹⁸ See *ESMA publish results of its assessment of systemically important UK central parties*, December 2021, ESMA.

⁹⁹ For more information, see *Financial Stability Report*, November 2021.

¹⁰⁰ See *Capital markets Union: Commission extends time-limited equivalence for UK central counterparties and launches consultation to expand central clearing activities in the EU*, February 2022, European Commission.

¹⁰¹ See *Targeted consultation on the review of the central clearing framework in the EU*, February 2022, European Commission.

ARTICLE – Cryptoassets and their impact on financial stability

The market for cryptoassets has grown a lot in a short time.¹⁰² Between the beginning of 2018 and the end of April 2022, the market value of the world's total cryptoassets has increased from just over USD 600 billion to almost USD 1,300 billion. However, the market is generally unregulated in many countries, and the International Monetary Fund (IMF) and the Financial Stability Board (FSB) have assessed that the risks associated with cryptoassets may affect financial stability if the market continues to grow without the risks being managed.

In this article, we describe what cryptoassets are and focus on the most common ones.¹⁰³ We also examine the risks that cryptoassets can create and the regulatory initiatives that have been taken in this area in recent years. The article focuses mainly on the global development, but it also analyses developments in Sweden. The risk that shocks in the market for cryptoassets will threaten Swedish financial stability is currently considered to be small. However, these could jeopardise stability further ahead if, for example, the exposures of banks and institutional investors increase.

The market for cryptoassets has grown rapidly and consists of various kinds of assets

Digital assets without underlying collateral

Cryptoassets are a kind of digital asset. The largest cryptoassets, based on market value, are Bitcoin and Ethereum (also known as Ether). They are examples of a category of cryptoassets that are unbacked (i.e. have no underlying collateral) and do not have a central issuer (in this article called “unbacked cryptoassets”). This is a difference compared to ordinary currencies that have a central issuer in the form of a central bank. There is therefore nobody guaranteeing that they will retain their value over time, or that they can be exchanged for ordinary currencies. The value of these cryptoassets can therefore vary in an uncontrolled manner without any intervention,

¹⁰² For further information, see also H. Eklöf (2022), “An overview of fintech and cryptoassets”, *Staff Memo*, May, Sveriges Riksbank.

¹⁰³ Cryptoassets are also known as cryptocurrencies. The Riksbank deems cryptoassets to be a more appropriate term than cryptocurrencies. One reason for this is that cryptoassets lack the institutional and legal framework that ordinary currencies have.

as a central bank, for example, would intervene to maintain the monetary value of an ordinary currency.

Stablecoins try to maintain a stable value through a reserve of assets

However, there are cryptoassets that generally have underlying collateral and a central issuer. These are called stablecoins and are intended to maintain a stable asset value, often by following the price of an ordinary currency, such as the US dollar.¹⁰⁴ They therefore often have a reserve of assets that should correspond to the value of the stablecoins issued. The reserve may consist of anything from bank deposits to various financial instruments or other cryptoassets.

Three of the highest market value stablecoins – USD Tether, USD Coin, and Binance USD – are intended to follow the value of the US dollar. There are also stablecoins that are intended to follow, for example, the value of the euro, but the overall market value of these is still low. At present, there are no stablecoins linked to the Swedish krona that have any significant volumes.

The market for cryptoassets has grown rapidly

The market for cryptoassets has grown by around 150 per cent between 2018 and the middle of May 2022 (see Chart 27). There are around 10,000 different cryptoassets and their total market value was around SEK 12,700 billion (almost USD 1,300 billion) in the middle of May 2022. This is still only a fraction of the global financial system, for which the assets amounted to just under USD 470,000 billion at the end of 2020.¹⁰⁵

The price of unbacked cryptoassets is based on expectations that someone else will be willing to pay at least as much as what they have paid for them. An important reason why the value of the market for cryptoassets has increased is that the price of unbacked cryptoassets has increased. Stablecoins have, however, over time become an increasingly larger part of the market for cryptoassets. In the middle of May, the market value of three of the largest stablecoins accounted for just over a tenth of the total market value of cryptoassets.¹⁰⁶ Unlike other cryptoassets, the increase in value is due to an increase in the number of stablecoins in circulation. This is a consequence of the fact that the price of stablecoins, at least in theory, should not fluctuate. As the number of stablecoins in circulation has increased, the reserves for these have also increased.

Many unbacked cryptoassets, such as Bitcoin and Ethereum, have market values that fluctuate substantially. This is very much in line with the developments that have taken place so far in 2022. A clear illustration of Bitcoins' volatility, for example, is that

¹⁰⁴ There are several types of stablecoins, such as algorithmic stablecoins that do not have a reserve of assets that fully corresponds to their value. Instead, the supply is controlled by an algorithm, thus keeping the value stable. For a more schematic overview of how different kinds of stablecoins are constructed, see, for example, D. Bullmann, J. Klemm and A. Pinna (2019), "In search for stability in crypto-assets: are stablecoins the solution?", *Occasional Paper Series*, No. 230, European Central Bank.

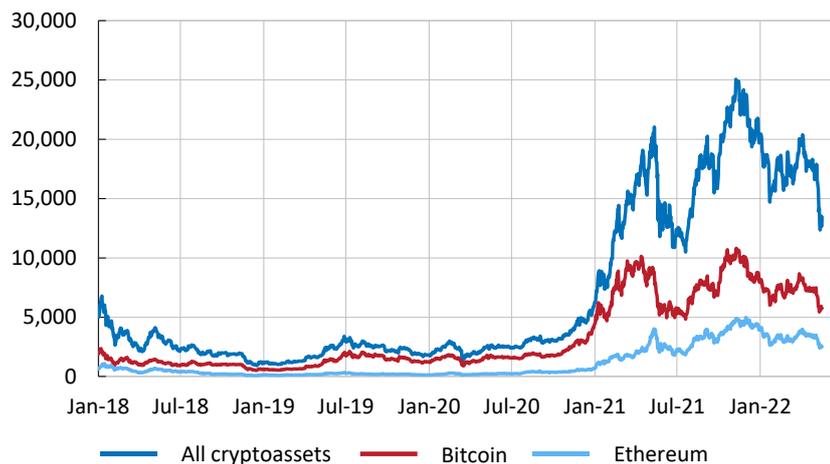
¹⁰⁵ See FSB (2021), "Global Monitoring Report on Non-Bank Financial Intermediation", December 2021, Financial Stability Board.

¹⁰⁶ See Chart A.20 in the Chart Appendix.

the price per Bitcoin on 17 May 2022 was just over SEK 300,000, while it was as much as around SEK 580,000 as recently as November 2021. Bitcoin and Ethereum have also had a significantly higher volatility than, for example, the S&P500 stock market index.¹⁰⁷

Chart 27. Market value of cryptoassets

SEK billion



Source: Macrobond.

Cryptoassets are energy-intensive

Several cryptoassets have over time become associated with high energy consumption. This is because the method they use to validate transactions and mine new cryptoassets (proof of work) requires considerable computer power.¹⁰⁸ Proof of work entails, in simplified terms, that so-called miners compete to solve a mathematical problem when a transaction is to be confirmed. The one who solves the problem the fastest will be rewarded with newly created cryptoassets. The higher the price of the cryptoassets, the more miners who want to compete for the newly created assets. As more miners compete to validate transactions, the problem becomes more difficult and requires more computer power to resolve it. This is why the energy consumption of Bitcoin, for example, has increased sharply in recent years. A clear example of the high energy consumption is that the Centre for Alternative Finance at Cambridge University estimates that the Bitcoin network has a higher energy consumption than Norway, for instance. A further comparison is that a Bitcoin transaction is estimated to require many thousands of times more energy than a card transaction with Visa or Mastercard.¹⁰⁹ Recently, some mining of cryptoassets has been established in northern

¹⁰⁷ See Chart A.21 in the Chart Appendix.

¹⁰⁸ See B. Segendorf (2014), "What is Bitcoin?" *Economic Review*, 2014:2, Sveriges Riksbank.

¹⁰⁹ See M. Laboure (2021), "The Future of Payments: Part II. When digital currencies become mainstream", February 2021, Deutsche Bank Research.

Sweden, and consumes as much electricity as that for 200,000 households on an annual basis.¹¹⁰ As a result of the high energy consumption, FI and the Swedish Environmental Protection Agency have argued, among other things, that the proof-of-work method should be banned in the EU in favour of other, less energy-intensive methods and that Sweden should work to prevent the method from becoming even more established. The Riksbank agrees with these proposals.

Cryptoassets have several areas of use

Cryptoassets are often used for speculation...

To date, unbacked cryptoassets have primarily acted as speculative investments. A sign that cryptoassets are being used in this way, rather than as a means of payment, is that more than 50 per cent of the Bitcoin supply is held for a year or longer.¹¹¹

The traditional way of investing in cryptoassets has been to buy the cryptoasset itself. In recent years, however, many different financial instruments have emerged that have cryptoassets as underlying assets, such as tracker certificates, which are a financial instrument that exactly follows the underlying asset. There are also options and various derivative products. There are also funds specifically targeted at cryptoassets and related activities. Some of these are Exchange Traded Funds (ETF). Investing in financial products with cryptoassets as underlying assets differs from investing directly in cryptoassets. This is because the markets where the instruments are traded are regulated, while the underlying cryptoassets are often not. However, issuers of these tracker certificates are not under the supervision of FI.

Some trading platforms allow a high leverage for these financial instruments. This means that you only have to invest a small amount of equity as collateral for your position and then you can borrow the rest. For example, if a person has SEK 100 in equity to invest and does not use leverage, the loss can at most be SEK 100, if the investment loses 100 per cent in value. If, on the other hand, you invest with leverage of tenfold, this means that the total investment will be SEK 1,000. In the event of a price change of 100 per cent, the profit or loss amounts to SEK 1,000, that is, more than the equity.

Various trading platforms for cryptoassets also offer other financial services, such as loans with cryptoassets as collateral.

The data available, for example, to authorities regarding cryptoassets is limited and there are few reporting requirements for operators who provide services related to

¹¹⁰ See debate article by E. Thedéen and B. Risinger (2021), 5 November, FI and the Swedish Environmental Protection Agency. [Crypto-assets are a threat to the climate transition – energy-intensive mining should be banned | Finansinspektionen.](#)

¹¹¹ See “Bitcoin: At the Tipping Point”, *Citi GPS: Global Perspectives & Solutions*, March 2021, Citibank.

cryptoassets. However, the data that is available suggests that it is mainly private individuals who have so far invested in cryptoassets.¹¹² As a global comparison, there are large holdings by private individuals in emerging market economies such as Vietnam, according to an index developed by the company Chainalysis.¹¹³ In the United States, too, the holding is relatively large, while in Sweden it is considerably smaller. FI has also made a thematic review of the Swedish market for tracker certificates, and this showed that at most about 35,000 Swedes have invested in the certificates.¹¹⁴ Banks' exposure to the market for cryptoassets is judged to be limited so far, both in Sweden and internationally.¹¹⁵ At an international level, several traditional institutional investors have increased their exposure to cryptoassets in different ways, although these are still small exposures in relation to their total assets. Interest among institutional investors in Asia and Europe is particularly great.¹¹⁶

...and to a relatively small extent for payments

In most countries, cryptoassets have generally rarely been used as a means of payment. In fact, cryptoassets, especially those that are unbacked, lack many of the characteristics that we associate with traditional means of payment – that they should be easy and quick to use and have a stable value. As a comparison, a transaction with, for example, Swish takes only a few seconds, while on average it takes about 10 minutes to complete a Bitcoin transaction. Prices are generally not set in Bitcoin, but in ordinary currency. Stablecoins have so far been used for the most part as a means of facilitating trade in other cryptoassets, rather than as a traditional means of payment.

Recently, the payment service providers Mastercard and Visa, among others, have initiated collaboration with several trading platforms for cryptoassets and have developed payment cards that enable payment with cryptoassets. When you make a purchase using these cards, the cryptoassets are exchanged into ordinary currency. The payment then goes through the usual card networks.¹¹⁷ However, prices are still set in ordinary currencies. This could mean that in the future, cryptoassets will be used more frequently for payments.

¹¹² A. Blandin et al. (2020), "3rd Global Cryptoasset Benchmarking Study", September 2020, Cambridge Centre for Alternative Finance.

¹¹³ For more information, see Chainalysis (2021), "The 2021 Geography of Cryptocurrency Report: Analysis of Geographic Trends in Cryptocurrency Adoption and Usage", October 2021, Chainalysis.

¹¹⁴ See "Financial instruments with cryptoassets as underlying assets", *FI supervision* No. 21, February 2021, Finansinspektionen.

¹¹⁵ See consultation paper from the Bank for International Settlements, June 2021. [Prudential treatment of cryptoasset exposures \(bis.org\)](https://www.bis.org/prudential/cryptocurrency-exposures).

¹¹⁶ J. Neureuter (2021), "The Institutional Investor Digital Assets Study", September 2021, Fidelity Digital Assets.

¹¹⁷ For more information, see *Payments Report*, 2021, Sveriges Riksbank.

Cryptoassets can entail various types of risk

Cryptoassets as a tool in illegal transactions

Several authorities have concerns about the use of cryptoassets for various types of criminal activity, such as money laundering or terrorist financing. In 2021, the total value of cryptoassets that can be linked to criminal activities is estimated at approximately USD 14 billion or 0.15 per cent of the total transaction volume of cryptoassets.¹¹⁸ This largely concerns stolen cryptoassets and fraud.

To reduce these problems, the EU has taken the initiative of drawing up a regulatory framework aimed at increasing customer awareness (KYC) and preventing the use of cryptoassets for illegal transactions.¹¹⁹ Authorities already have certain conditions for tracing transactions with cryptoassets that can be linked to criminal activities. This applies, for example, to the exchange of cryptoassets to different national currencies, as the traditional financial system is generally more regulated.

Few links to the traditional financial system at present

So far, data suggest that it is mainly private individuals who have exposed themselves to cryptoassets, which means that any price fall primarily creates risks for the individual consumer. Consumer protection for most cryptoassets is also low, or non-existent, which makes it difficult for consumers to make claims in the event of problems arising.

If, for example, institutional investors, such as funds, were to have large exposures to cryptoassets that decline in value, they could find it difficult to fulfil other financial obligations. This is particularly true if the exposures have a high leverage. Such problems can spill over to other participants in the financial system, as well as other markets and types of assets. However, so far there are few links to the traditional financial system, although if they increase this could create risks to financial stability.

Liquidity risks for stablecoins can spread to the traditional financial system

The term stablecoins may be misleading as they are not necessarily stable. Their stability can depend, among other things, on which assets the stablecoin's reserve consists of.¹²⁰ If the value is to be stable and it is to be redeemable without disruption, the reserve must be invested in assets that are both stable and liquid and have a size equivalent to the number of stablecoins issued, something that has not always been the case.

In May 2022, there were large sales of a relatively large stablecoin, TerraUSD, over a short period of time. Several factors are believed to have been behind this, and all in

¹¹⁸ Chainalysis (2021), "The 2022 Crypto Crime Report", February 2022, Chainalysis.

¹¹⁹ Regulation of the European Parliament and of the Council on the prevention of the use of the financial system for the purposes of money-laundering or terrorist financing, COM(2021) 420 final, July 2021.

¹²⁰ For further information, see FSB (2022), "Assessment of Risks to Financial Stability from Crypto-Assets", February 2022, Financial Stability Board.

all these have led to a fall in the value of TerraUSD of almost 90 per cent, from one dollar to around 13 cents. This shows how difficult it can be for stablecoins to maintain a stable value if they do not have a reserve of stable assets that fully corresponds to the number of stablecoins issued. In connection with the TerraUSD fall, USD Tether, for example, also had difficulty in maintaining its intended value of one dollar. Prices of other cryptoassets also fell.

In the autumn of 2021, a US authority sentenced the company responsible for the USD Tether stablecoin to a fine of USD 41 million, among other reasons for the claim that Tether was fully backed by assets in ordinary currency.¹²¹ However, it turned out that the reserve's assets were not always sufficient to correspond to the number of stablecoins issued, and that the reserve included, among other things, various types of unsecured receivables. In addition, the reserve's assets had to some extent been held by unregulated operators or in other jurisdictions and had not been audited regularly. All in all, these factors could have led to USD Tether owners not being able to redeem them at the intended value of one dollar. As a comparison, the assets in the reserve for another stablecoin, USD Coin, according to their audit report, are fully denominated in US dollars held by regulated US financial institutions.

Depending on the assets in the stablecoins' reserve, there may also be a more direct link between the market for cryptoassets and the traditional financial system. If many holders of stablecoins want to redeem them at the same time, this may mean that the assets in the reserve will have to be sold off quickly. This may in turn lead to disturbances for example to the issuers of the assets that make up the reserve, which may also affect other participants in the financial system. The larger a stablecoin is, the greater the impact any sale of the reserve's assets may have on the financial system.

Cryptoassets have gained a larger role in some emerging markets

The use of cryptoassets has been increasing, especially in some emerging market countries. This means that it is not impossible for cryptoassets, in whole or in part, to replace the ordinary currencies of these economies. This is often referred to as cryptoisation or digital dollarisation. This means, for example, that the consequences of large price falls in cryptoassets can spread more widely in these economies. If this happens, the central bank has little opportunity to implement measures and conduct monetary policy, because its tools are linked to the currency it issues. At present, the degree of cryptoisation in the world is small.¹²²

¹²¹ See press release, "CFTC orders Tether and Bitfinex to Pay Fines Totaling \$42.5 Million", Commodity Futures Trading Commission, October 2021. Last updated 15 October 2021. Accessed 13 April 2022, [CFTC Orders Tether and Bitfinex to Pay Fines Totaling \\$42.5 Million | CFTC](#).

¹²² See *BIS Quarterly Review*, March 2022, Bank for International Settlements.

Cryptoassets are unregulated in many countries, but regulations are planned in several areas

Cryptoassets are mostly unregulated in many countries, including Sweden.¹²³ But regulations are being planned in several areas, for example in the United States and the EU.¹²⁴ However, some aspects of cryptoassets are regulated, for example, legislation aimed at preventing money laundering and terrorist financing may often include cryptoassets.¹²⁵ Some countries, such as China, have banned cryptoassets and related activities. However, this can lead to the activities moving to other countries with more lenient legislation, which has already happened to some extent.

As cryptoassets are often unregulated, there is a risk that issuers of cryptoassets and service providers will circumvent regulation in other areas, by providing similar services but with the new technology. This is commonly referred to as ‘regulatory arbitrage’. One example of this is that some stablecoins have a reserve that largely consists of short-term assets such as commercial paper, similar to money market funds, for example.¹²⁶ However, these stablecoins do not meet the same requirements as money market funds do. It is also possible to argue that stablecoins conduct banking-like activities, while not complying with the requirements of the banking regulations. To avoid regulatory arbitrage, it is necessary for similar types of financial activities to be subject to the same requirements, regardless of the operator. This can then form the basis for how different agents are regulated so that the risks they give rise to can be managed.

In addition to the various regulatory initiatives that have been taken, work is also being carried out on a broad front within several international standard-setting bodies such as the Committee on Payments and Market Infrastructures (CPMI), the International Organization of Securities Commissions (IOSCO), the Financial Stability Board (FSB) and the Basel Committee on Banking Supervision (BCBS).¹²⁷ Their work covers various aspects linked to cryptoassets and providers of such services. Among other things, it focuses on the development of standards that allow the risks associated with them to be adequately addressed.

¹²³ See *Regulation of Cryptocurrency Around the World: November 2021 Update*, November 2021, Global Legal Research Directorate.

¹²⁴ For more information on US regulation, see for example the press release “President’s Working Group on Financial Markets Releases Report and Recommendations on Stablecoins”, November 2021, U.S. Department of the Treasury. Last updated 1 November 2021. Accessed 4 March 2022, [President’s Working Group on Financial Markets Releases Report and Recommendations on Stablecoins | U.S. Department of the Treasury](#).

¹²⁵ See, for example, Proposal for a regulation of the European Parliament and of the Council on the prevention of the use of the financial system for the purposes of money-laundering or terrorist financing, COM(2021) 420 final, July 2021.

¹²⁶ See Chart A.22 in the Chart Appendix.

¹²⁷ For example, see CPMI-IOSCO (2021), “Application of the Principles for Financial Market Infrastructures to stablecoin arrangements”, October 2021, Bank for International Settlements, FSB (2021), “Regulation, supervision and oversight of ‘global stablecoin’ arrangements: Progress report on the implementation of the FSB high-level recommendations”, October 2021, Financial Stability Board and the consultation paper from the Bank for International Settlements, June 2021. [Prudential treatment of cryptoasset exposures \(bis.org\)](#).

Future regulation of cryptoassets and service providers in the EU

Work is currently under way in the EU on a new regulation on cryptoassets, the so-called Markets in Crypto-Assets (MiCA), which was proposed by the European Commission in September 2020. This regulation focuses, among other things, on consumer and investor protection. MiCA is intended to impose requirements on both issuers of cryptoassets and providers of cryptoasset services, such as trading platforms. The European Commission has proposed that issuers of stablecoins should be authorised by the competent authority in their home country and that, among other things, the issuer should be required to have good governance and control and an available reserve of assets. It is proposed that reserve assets may be invested only in highly liquid financial instruments with minimal market and credit risk.

Additional requirements are proposed for stablecoins considered to be “of significant size”. They concern, for example, that issuers are to monitor their liquidity needs, including by having a liquidity management policy, to be able to meet the requirements for redemption of stablecoins.

Limited Swedish stability risks at present

The market for cryptoassets has grown substantially in a short time, but is still relatively small. Overall, the risk that shocks in the market for cryptoassets will threaten financial stability in Sweden is currently considered to be limited. The IMF has made a similar assessment for the global financial system.¹²⁸ However, cryptoassets may threaten financial stability if, for example, the exposure of banks and institutional investors increases.¹²⁹ There is also a link between the reserve assets for stablecoins and the financial system, which can lead to greater risks as stablecoins grow. The proposed MiCA Regulation is a step in the right direction, above all, to increased consumer protection and control over cryptoasset service providers. Reporting requirements for the agents that will comply with the MiCA Regulation would improve the ability to monitor developments in this field.

However, there is a risk that the MiCA Regulation will not be sufficient, partly because activities linked to cryptoassets are largely cross-border. This underlines the importance of international cooperation. Cryptoassets have been a prioritised area in many international forums in recent years and it is important that this work continues going forward. The Riksbank is continuing to monitor developments in this field and is involved in the work of standard-setting bodies.

Continued work on a Swedish digital central bank currency – the e-krona

In addition to the work regarding cryptoassets in many standard-setting bodies, the Riksbank is investigating whether it is possible to issue a digital complement to cash, a so-called e-krona. One reason for the Riksbank’s work on the e-krona is that cash is

¹²⁸ See the chapter “The Crypto Ecosystem and Financial Stability Challenges” in *the Global Financial Stability Report*, October 2021, International Monetary Fund.

¹²⁹ See, for instance, FSB (2022), “Assessment of Risks to Financial Stability from Crypto-Assets”, February 2022, Financial Stability Board.

being used less and less often in Sweden. The e-krona would be what in the international discussion is known as a “Central Bank Digital Currency” (CBDC). CBDCs can be similar to cryptoassets through their digital format. However, they differ from these, for example, in that they are issued by a central bank and appear as a liability on the central bank’s balance sheet. A CBDC is not a new currency, but is expressed in the national currency and should therefore be usable in the same way. This also means that the e-krona, in the same way as the ordinary Swedish krona, benefits from the underlying confidence that the Swedish economy and the Swedish financial system are stable, with well-managed institutions. In addition, the e-krona would be covered by the Riksbank’s statutory obligation to maintain price stability. There is no similar underlying trust for cryptoassets. This is also an explanation of the major price changes that characterise a large part of the market for cryptoassets.

Since 2020, the Riksbank has entered a more practical phase of the e-krona project in order, among other things, to examine various technical aspects of the e-krona.¹³⁰ However, no decision has yet been taken as to whether an e-krona should be issued.

¹³⁰ For more information, see, for example, the report “E-krona Pilot Stage 2”, *E-krona Report*, April 2022, Sveriges Riksbank.

Glossary

Capital market: Covers the market for commercial paper and corporate bonds.

Capital requirements: Rules for the minimum amount of loss-absorbing capital a financial undertaking must hold to cover its risks.

CCP, central counterparty: An intermediary in financial transactions that goes in as buyer to all sellers and seller to all buyers, respectively. The original parties in a transaction then have a claim on, or debt to, the central counterparty instead of each other.

CDS, Credit Default Swap: Contract between participants in the credit market aimed at transferring the credit risk in an underlying asset from one participant to another.

Climate-related risks: Risks associated with not only the effects of global warming but also of the transition itself.

Commercial paper: Securities issued by non-financial corporations in order to borrow money. The maturity is usually shorter than one year.

Commercial property: Commercial property is real estate owned in order to generate income via letting.

Common Equity Tier 1 (CET 1) capital: Tier 1 capital with a deduction for capital contributions and reserves that may be included in the capital base as Tier 1 capital in accordance with the Capital Adequacy Directive.

Common Equity Tier 1 (CET 1) capital ratio: Common Equity Tier 1 in relation to risk-weighted assets.

Corporate bond: Securities issued by non-financial corporations in order to borrow money. The original maturity is usually longer than one year.

Countercyclical capital buffer: A time-varying capital requirement with the primary purpose of increasing resilience in good times so the banks can bear losses in bad times.

Covered bond: A bond whose holder has a special benefit right in the event of a bankruptcy. Covered bonds normally entail a lower credit risk than unsecured bonds, which means that the borrowing costs are lower.

Credit facility: An agreed borrowing limit with credit up to a specific amount, for which the borrowing company normally pays a fee.

Credit risk: The risk of a borrower failing to meet commitments.

Currency swap: An agreement to buy or sell a currency at the daily rate and then sell or buy back the same currency on a later date at a pre-determined rate.

Cyber risk: Combination of the probability of cyber incidents and their consequences, where a cyber incident is an event in an information system that jeopardises security in the information system or contravenes security policies.

Debt-to-income ratio: Total household loans in relation to disposable income.

Disposable income: A person's or household's total income less taxes and charges.

Equity: Item in a company's balance sheet showing the difference between assets and liabilities, including, for example, capital provided by owners, retained profits and reserves.

IFRS, International Financial Reporting Standard: Global accounting standard that has been developed by the International Accounting Standards Board (IASB), and which all listed companies in the EU are obliged to apply.

IFRS Foundation, International Financial Reporting Standards Foundation: A non-profit accounting organisation with the primary objective of developing and promoting IFRS through the International Accounting Standards Board (IASB), which it oversees.

Interbank rate: The interest rate on unsecured loans between larger banks. STIBOR (Stockholm Interbank Offered Rate) is to reflect the interest rate on such loans and is today the dominant reference rate in Swedish kronor. STIBOR is used as a reference for loans, interest-bearing securities and derivative contracts.

LCR, Liquidity Coverage Ratio: Liquidity measurement defined by the Basel Committee that measures a bank's ability to deal with a stressed net cash outflow for 30 days.

Leverage ratio: A measure that specifies a bank's Tier 1 capital in relation to its total exposures (calculated on the basis of total assets and off-balance sheet commitments).

Liquidity buffer: Funds an institution holds to ensure its short-term debt-servicing ability.

Liquidity risk: The risk of not being able to meet payment commitments due to a lack of liquidity.

Loan loss: Loss made by credit institutions and banks when borrowers cannot pay interest or amortisation on their loans.

Loan-to-value ratio: A borrower's debt in relation to the market value of the collateral for the loan. For a household with a loan where the home is pledged as collateral, the loan-to-value ratio corresponds to the debt divided by the market value of the home.

Marginal collateral requirement: Requirement imposed on a counterparty in a derivative contract to pledge additional collateral because the value of the underlying assets has changed.

Money market: Market consisting of banks and other financial institutions that receive short-term deposits and grant short-term loans, from one day up to one year.

Money market fund: Fund that invests in short fixed-income instruments, that is instruments with a remaining maturity shorter than one year.

Moratorium: A decision by an authority that the borrower no longer has to pay interest or amortisations for a limited period. Payments are postponed and must be paid later on.

NSFR, Net Stable Funding Ratio: Measure of how much stable funding a bank has in relation to its illiquid assets.

Risk premium: The additional return an investor requires as compensation for an additional risk.

Risk weight: Determined on the basis of how likely it is that the borrower will be unable to fulfil its loan obligations and varies from borrower to borrower – a high risk weight implies a greater risk than a low one. In simplified terms, to calculate a bank's risk-weighted assets, the amount lent is multiplied by a risk weight.

Risk-weighted exposures or risk-weighted assets: Assets on the balance sheet and off-balance sheet commitments valued in terms of credit risk, market risk and operational risk in accordance with the capital adequacy regulations.

Share buy-back: When a company buys back its own shares from investors, which can be seen as an alternative way of giving dividends to shareholders.

Solvency: Financial measure of a company's ability to fulfil its commitments. Also a measure of an insurance company's financial position that gauges the size of the companies' assets in relation to its debts, which mainly consist of their total commitments.

Systemic risk: The risk that a shock will occur in the financial system that could lead to substantial costs for society.

TCFD, Task Force on Climate-related Financial Disclosures: Created in 2015 by the Financial Stability Board for the purpose of developing recommendations for voluntary and consistent reporting of climate-related financial risks and opportunities.

TIBER-SE: The Swedish adaptation of the European Central Bank's TIBER-EU framework. The framework enables the standardised testing of resilience to cyber risks among critical participants in the financial system.

Tier 1 capital: Equity less proposed dividends, deferred tax assets and intangible assets, such as goodwill. Tier 1 Equity may also include some types of subordinated loan.



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