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Bank of Finland's Financial Stability Assessment

One of the Bank of Finland's core tasks is to contribute to the reliable, efficient and stable functioning of the financial markets. The Bank conducts regular analyses of the vulnerabilities and risks related to the financial system that could trigger or exacerbate economic disruptions. These are not forecasts, but analyses of potential financial market developments.

The financial stability analysis published on the Bank of Finland website is intended for financial market participants, other authorities and the general public to provide information and promote discussion on financial stability. The objective is to ensure that these parties take the current condition of and future outlook for the financial system into consideration in their operations. In addition to the stability analysis, the publication features articles of topical interest.

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EDITORIAL

Resilience of borrowers, banks and payment systems must be strengthened

4 May 2022 – Bank of Finland Bulletin 1/2022 – Financial stability

The Russian invasion of Ukraine is causing an immeasurable amount of human suffering and destruction. The military actions will have extensive and long-term impacts on Finland's and the world's economy, politics and financial stability risks. In view of the uncertain operating environment and the structural vulnerabilities of the Finnish financial system, it is important to further strengthen the resilience of borrowers, banks and payment systems in Finland. More effective instruments are required to rein in the excessive indebtedness of Finnish households.



The Russian invasion of Ukraine in February 2022 is causing a devastating humanitarian and economic catastrophe for Ukraine. The war will weaken the entire European economy and is already driving higher inflation. As a neighbour and trading partner of Russia, Finland is strongly impacted by the effects of the war. But freedom and human life are beyond price. We must do all we can to end the war.

The financial markets reacted strongly to the outbreak of the war. Despite the heightened uncertainty, the financial system has remained operational, and so far there has been no need for new policy initiatives to support financial stability. Macroprudential policy, which regulates, among other things, capital buffer requirements on the banks, is still light in the wake of the pandemic.

The weakened economic outlook, higher energy prices, expected rise in interest rates and possible difficulties in accessing finance all serve to increase the risks to financial stability. From this perspective, it is to be hoped that households assess their loan-servicing capacity to take into account a weakening in their purchasing power and the possibility of rising interest rates allied to uncertainty on the labour market. The cyber risks faced by financial institutions and the financial infrastructure have grown with deepening digitalisation and the extension of Russia's war into the data networks. The materialisation of cyber risks may spread uncertainty broadly through the financial system.

In Finland, the financial system's key vulnerabilities relate to heavy household indebtedness and the structure of the banking sector. Over time, household debt has gradually become considerable and is still growing. Most of the debt is in the form of housing loans, which have over a prolonged period become significantly longer and larger. The banking sector is large and centralised, and its lending and own funding are very strongly linked to the real estate market. The Finnish banking sector also has close interlinkages with other Nordic banking sectors.

At present, the Finnish banks, like the other Nordic banks, enjoy strong confidence among investors – for good reason. Retaining this confidence is essential to the stability of our financial system. The existing structural vulnerabilities and the financial stability risks growing in the present aggravated operating environment reveal how important it is to strengthen the resilience of borrowers, banks and payment systems alike.

Financial system stability has already been improved in a number of ways, but not yet sufficiently. Implementation of Basel III is incomplete, as is the Banking Union, and the Capital Markets Union is only on the starting blocks. Moreover, Finland's macroprudential tools are still incomplete.

In January 2022, the Ministry of Finance published a draft Government proposal on measures that could more effectively than at present rein in household indebtedness. The proposed reforms are welcome. In addition to these, there is also a need for tools that could be used to subdue growth in the number of households that are strongly indebted relative to their income; this would enhance households' ability to cope with their loans. Macroprudential authorities should also be given powers to impose on banks such capital buffer requirements as would when necessary during serious economic turbulence enable them to free up capital to support financial intermediation.

The objective of the macroprudential authorities is to ensure that the financial system is able to intermediate finance to businesses and households as well as carry out their other tasks of importance to society under all circumstances. This also means that the continuity of payment systems is secured during serious disruptions and states of emergency. The design, construction and testing of functional back-up systems in cooperation between the financial sector and the authorities will require even more determined work than before.

The war will have extensive and far-reaching impacts on the structures of the economy that will also be reflected in the financial system. For example, the structural changes on the energy markets may accelerate the Green transition and at the same time increase

transitional risks for the financial sector. The changes will require many sorts of adaptations, but human beings are astonishingly good at that sort of thing. Consumers, businesses and the economy as a whole will in time adapt to the changes, and policies can be deployed to smooth out the most serious turbulence. There are, however, some things we should not adapt to. We cannot allow ourselves to become accustomed to war in Europe.

Helsinki 4 May 2022

Marja Nykänen
Deputy Governor

Tags

[household indebtedness](#), [financial stability](#), [systemic risks](#), [macroprudential policy](#)

FINANCIAL STABILITY ASSESSMENT

Weakening economy and tightening financing conditions pose a challenge to financial stability

Today – Bank of Finland Bulletin 1/2022 – Financial stability

Russia's war on Ukraine has caused immeasurable human suffering and destruction for the people of Ukraine. Russia's attack weakened the economic outlook rapidly in spring 2022, and financial stability risks increased in Finland. To ensure financial stability, the resilience of borrowers and banks must be strengthened. More effective measures are needed for curbing excessive household indebtedness. More determined action must be taken to prepare for financial sector cyber risks and vulnerabilities in the payment and settlement systems.



The financial stability outlook weakened in spring 2022 as Russia launched its invasion of Ukraine. The Finnish financial system's direct exposures to Russia and Ukraine are small, but the war will increase financial stability risks via several indirect channels. Sudden turns in the war may increase uncertainty and cause risk-aversion by investors. This may raise the cost of financing and weaken its availability on the international financial markets. Financial sector cyber risks have also increased. The weakening economy and rising interest rates, reflecting higher inflation risks, may in the longer term increase the credit risks from household and corporate loans.

The Finnish banking sector is sound, and it has a solid foundation for maintaining the

provision of credit and for facing the possible increase in risks caused by the weakening operating environment. The good solvency position of Finnish life and non-life insurance companies as well as employee pension institutions will help them withstand a possible decrease in the value of and return on investments.

Unforeseen crises which shake the financial system from outside, like the COVID-19 pandemic and the war in Ukraine, highlight how important it is to strengthen the resilience of the financial system. The structural vulnerabilities of Finland's financial system are considerable and relate to household indebtedness and the banking system's substantial size, concentration and interconnectedness. Bank funding in Finland is reliant on international investors' confidence in the stability of the Nordic financial system. It is therefore essential that the banks have sufficient capital to counterbalance the structural vulnerabilities of the sector.

The authorities should have greater scope for imposing capital buffer requirements on banks under normal cyclical conditions, and these requirements could then be lifted during severe economic disruptions if necessary. In disruptive situations, easing the requirements would support the ability of banks to grant loans despite a weakening of their capital position caused by possible credit losses.

Resilience must also be improved by curbing the growth in household indebtedness. In January 2022, the Ministry of Finance published a draft Government proposal for measures to curb household indebtedness more effectively than at present. The proposal would, among other things, limit the length of housing loans and loans to housing companies, and would set up a loan cap and repayment obligation for housing company loans taken to finance new construction.

In addition to the proposed measures, Finland should limit the total debt or the cost of servicing the borrower's total debt relative to the loan applicant's income. Macroprudential instruments limiting the debt-to-income or debt-servicing-to-income ratio have become more common in Europe. The European Systemic Risk Board and the International Monetary Fund's evaluation group for the Finnish economy have repeatedly recommended the introduction of such instruments also in Finland.

The EU is reviewing its macroprudential regulatory framework in order to improve and harmonise the range and usability of macroprudential instruments in Europe. The aim of the reforms should be to ensure that all EU Member States have more effective instruments at their disposal to address housing market risks and excessive growth in household indebtedness.

In addition to the traditional business risks of the financial sector, cyber threats also pose a substantial risk to economic actors and call for more decisive preparedness and contingency planning. Key banking and payment services are an important part of national security of supply and critical infrastructure, the functioning of which must be secured under all circumstances. Work on contingency planning in Finland must continue in cooperation between the authorities and the financial sector.

The war is expected to bring far-reaching changes to the international economy, and these will impact the financial system as well. In terms of energy and climate policies,

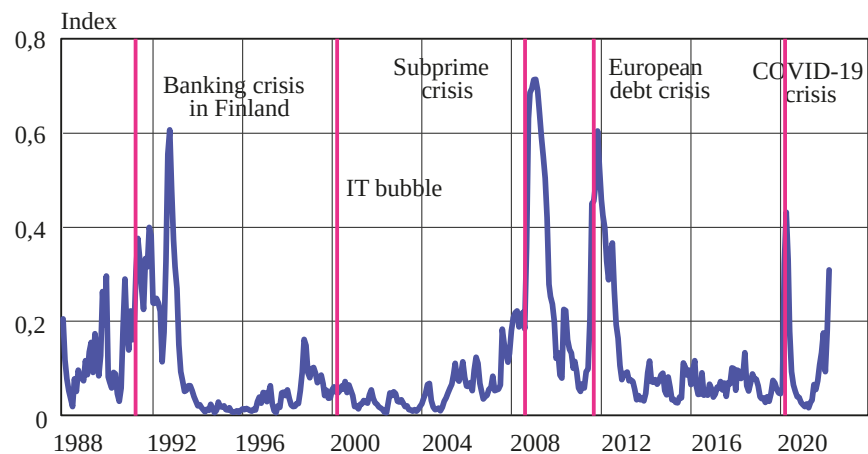
there is a need for a new road map to achieve the set objectives. Development of the Banking and Capital Markets Union and full implementation of the latest Basel III standards on banks' capital adequacy requirements into EU legislation would contribute to the stability of the financial system.

Financial markets have operated without disruptions, but risks have increased

The international financial markets reacted strongly to the war Russia launched in Ukraine in February 2022. The financial market shock caused by the war was, however, significantly more local than the COVID-19 pandemic. It hit particularly Europe and companies, banks and countries with links to Russia, including Finland (Chart 1). Tighter than average economic ties to Russia and Finland's geographic location were reflected in the pricing of various Finnish securities, particularly in the early phase of the war. The interest rate spread between Finnish government bonds and those of the largest euro area economy, Germany, widened slightly in the first weeks of the war, but it has since returned close to the pre-war level.

Chart 1.

Financial market stress indicator for Finland



Sources: Bloomberg, Datastream and calculations by the Bank of Finland.

4.5.2022

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Despite the strong growth in uncertainty related to the economic impacts of the war, the international financial markets have operated smoothly and there has been no need for new financial support measures thus far.^[1] The increase in uncertainty has been contained partly by the fact that the international financial system's direct links to Russia

1. Financial stability authorities have enhanced their cooperation and the monitoring of various supervisory and regulatory policy measures. In addition, EU countries have agreed on common sanctions.

are limited^[2] and known to investors. The Finnish financial system's direct exposures to Russia are also small.^[3] The decrease in links is due to for example the sanctions introduced in 2014 in response to the Russian annexation of Crimea.

The war will increase financial stability risks indirectly via the weakening operating environment. The impacts of the war may turn out to be long-lasting. The economic outlook has dampened, particularly in Europe.^[4] The war has aggravated production bottlenecks and caused a strong rise in energy prices and the prices of many raw materials, which is pushing up inflation.^[5] The higher rate of inflation has increased expectations for a more-rapid-than-expected pace of tightening in monetary policy in the main economic regions, particularly in the euro area and the United States. In addition to the war, the COVID-19 pandemic continues to weigh on the outlook for the global economy. The containment measures imposed in response to the pandemic may weaken growth particularly in China, where the risks are increased also by the large vulnerabilities in the real estate sector.

Russia's invasion of Ukraine will weaken the economic outlook in Finland. Before the outbreak of the war, the Finnish economy had just passed the deepest dip caused by the pandemic. The Bank of Finland's [scenarios show](#) that in the current year, Finland's GDP growth will slow to a range of 0.5–2%.^[6] Economic forecasts are subject to elevated uncertainty, as the impacts of the war will be reflected in statistical data only after several months.

Even though the initial financial market shock caused by the war has faded, market risks related to the future developments in securities prices are clearly elevated. Financing conditions have tightened, and companies' and governments' market-based funding has become more expensive. Stock prices have fallen and price volatility has been high, particularly in Europe. In addition to the uncertainty related to the progression of the war, investors' risk appetite and asset allocation decisions are affected by expectations on economic developments and the pace of monetary policy normalisation. Negative surprises may increase fluctuations in securities prices, and the possibility of a wider shock cannot be ruled out. The possible sources of disruptions include the increase in cyber risks and the growing instability on the energy markets (see Infobox 1 below).

A tightening of financing conditions in response to a sudden increase in risk aversion by

2. According to the EU's Single Supervisory Mechanism (SSM), the euro area financial system's exposures to Russia are manageable, see [Invasion of Ukraine: euro area banks so far resilient to a second exogenous shock \(europa.eu\)](#).

3. Only less than 0.1% of the banking sector's assets, and only 0.3% of the total assets of insurance companies are subject to direct Russia exposures. Domestic investors' direct exposures to Russian counterparties are small as well. Domestic investment funds account for the majority of the investments in Russia (0.4% of the total amount of investments by investment funds) and the majority of the investments were in funds specialising in Russia.

4. See [Sota näkyy euroalueella jo luottamusilmapiirissä ja energiahinnoissa – uhkaako hidas kasvu ja nopea inflaatio? – \(The war is reflected already in euro area confidence and energy prices – is there a threat of slow growth and rapid inflation? Bank of Finland Bulletin\)](#).

5. See <https://www.eurojatalous.fi/fi/2022/artikkelit/venajan-hyokkays-ukrainaan-nostaa-energian-hintaa-ja-pitkittaa-nopean-inflaation-jaksoa/> (Russia's attack on Ukraine pushes up energy prices and prolongs the period of rapid inflation), Bank of Finland Bulletin.

6. The Bank of Finland will publish its next forecast on 21 June 2022.

investors could raise risk premia and hence interest rates in relative terms more in the case of countries and companies with a high credit risk. As a consequence of the war, this has indeed already happened to some extent. In the euro area, this could increase fragmentation. For example, in the Mediterranean countries, the vulnerabilities of public finances and the banking sector are larger than in other countries, and they have suffered from the pandemic relatively more than other countries.



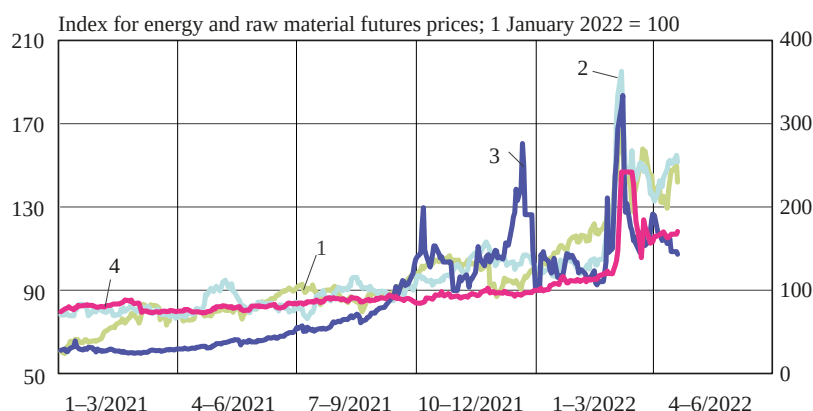
Energy markets may create financial stability risks

The strong rise in energy and raw material prices has been one of the major consequences of Russia's invasion of Ukraine (Chart 2). The war has far-reaching implications for the energy markets, which will create risks to financial stability. If economic sanctions were imposed on Russia's energy exports, on which some EU countries are highly dependent, it would have an impact on the availability and price of energy, increase uncertainty on the financial markets and push up inflation.

Chart 2.

Strong movements in energy and raw material futures prices have increased energy industry companies' liquidity needs

- 1. Oil
- 2. Wheat
- 3. Gas (right-hand scale)
- 4. Nickel



Source: Bloomberg.

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Another short-term risk relates to energy companies, as they are sensitive to fluctuations in energy prices. Many energy companies have sought to decrease the risk associated with price fluctuations by hedging their sales revenues on the derivatives markets. The contracts include a margin requirement that protects the buyer against the failure of the seller to deliver energy in accordance with the terms of the contract. Margin requirements increase in the event of rising energy prices and price fluctuations. In the current circumstances, the margin requirements may have increased as much as tenfold.

A significant growth in margin requirements raises energy companies' liquidity risks and increases their need for financing, which will tie the energy industry's

risks tightly to banks and other financial entities. The higher margin requirements have increased demand for finance also by domestic credit institutions (See [From crisis to crisis – companies are once again facing a challenging operating environment](#)).

If the energy company delivers energy as agreed, the margin payment is refunded in full. If the company is unable to deliver energy due to, for example, sanctions, the liquidity problem may, in the worst case, jeopardise the energy company's capital adequacy and cause losses also to the financial sector. The higher counterparty risks on the markets may decrease banks' willingness to operate on the capital markets and hence weaken market liquidity and access to finance.

Strong capital position of banks and insurance companies helps withstand increase in risks

Insurance companies are particularly sensitive to a rise in market risks. In the investment assets of non-life insurance companies and in life insurance companies' investment assets other than those held to cover unit-linked policies, the largest weight is on fixed-income investments. Interest rate risk is associated also with the technical provisions of life and non-life insurance. The good solvency position of Finnish life and non-life insurance companies as well as employee pension institutions helps them withstand higher market risks. Life and non-life insurance companies posted good results in 2021. The solvency ratio continued to rise following the dip in spring 2020 amid COVID-19 and has reached 136.3%. Employee pension companies' solvency ratio in 2021 was at its highest level in a decade.

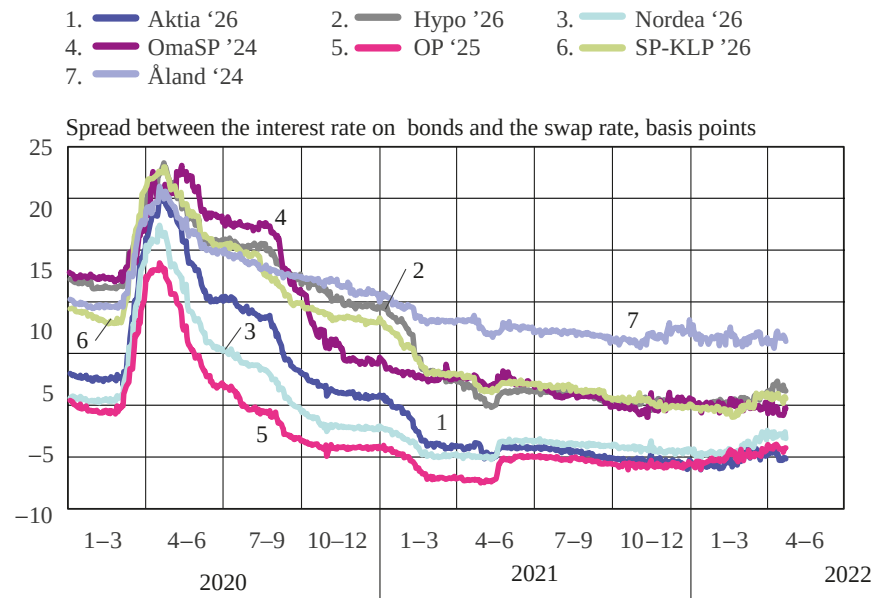
Market risks play a significantly smaller role in banking than in insurance. Rising interest rates may also improve the profitability of banks' core activity. The increase in market risks may burden banks' profitability particularly via funding. Finnish banks use a lot of market-based funding to finance their lending activities, and an increase in investors' risk aversion could push up the price of banks' funding. Finnish banks' funding is based largely on mortgage-backed covered bonds. The required returns on these bonds have not increased in spring 2022 (Chart 3).

The Finnish credit institution sector's Common Equity Tier 1 (CET1) ratio has in recent years remained stable, at around 18%, and banks' profitability improved significantly in 2021. The wave of credit losses feared at the start of the pandemic did not materialise, because extensive support measures and interest-only-periods helped companies and businesses cope with the loss of income caused by the pandemic. The share of nonperforming loans in banks' credit stock remained almost unchanged and is among the lowest in Europe. A weakening economy, high inflation and rising interest rates could

in the immediate years ahead increase the credit risks related to corporate and household loans. This may weaken banks' profitability and create an additional need for capital buffers.

Chart 3.

Finnish banks' funding did not become more expensive following the outbreak of war



Source: Bloomberg.

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Vulnerabilities in the financial market infrastructure require decisive work

The heightened geopolitical uncertainty and the sanctions imposed on the financial sector increase banks' operational risks. Russia's invasion has triggered an increase in cyber attacks, particularly in Ukraine and Russia. Some Finnish banks have been subject to denial-of-service attacks in spring 2022. Even though the individual incidents did not cause significant damage, the risk of cyber attacks against banks and the entire financial sector has increased notably.

There is a risk that the operational problems of one financial institution could spread wider and cause a lack of confidence in the financial sector. Authorities have warned the industry of the risk of cyber attacks and urged entities to ensure their capabilities to take action in the event of a cyber attack.

The threats to the operational environment of the financial sector have changed in recent years (see [Financial sector also facing new kinds of threats](#)). In addition to cyber threats, Russia's invasion of Ukraine has increased the likelihood of other types of influencing. The financial sector is an important part of the supply chain security for critical infrastructure, which must function under all circumstances.

The financial sector vulnerabilities have been identified in preparedness exercises. Many financial sector companies have a statutory obligation to prepare for emergency conditions. However, current legislation does not specify clearly enough how the preparedness obligation must be fulfilled. The level of national preparedness on the financial markets has been under examination already for several years, but mutual understanding has not been reached on the need for and means of preparedness. The preparedness work must continue, which requires smooth cooperation and a common stance between the industry and authorities.

Weakening economic environment may bring tighter financing conditions for businesses

Russia's war in Ukraine and its wider impact is affecting different industries and businesses in different ways. Before the war, Russia was an important market for many Finnish companies. Numerous companies were engaged in importing or exporting across the Russian border, or had production facilities, sales outlets and warehousing within Russia. Exporters are now suffering lost sales revenue, and it will take time to find replacement export markets and generate new business. For importers there may be difficulty obtaining substitute raw materials, or the new sources may be considerably more expensive.

The transportation sector and the chemicals industry are especially vulnerable to the reductions in Russian imports and exports (Table 1). Industries importing from Russia that are more vulnerable than average include many manufacturing industries, heat and power generation, and mining and quarrying. Industries vulnerable on the export side include a number of manufacturing industries and accommodation and food service activities.

Table 1.

Business vulnerabilities vary by industry

Industry	Vulnerabilities				Credit risks, situation as of Dec 2021		
	Pandemic	Energy and commodities	Russian exports	Russian imports	Loans, %	NPL, %	Interest rate, %
Agriculture, forestry and fishery		•			3	3	1.9
Mining and quarrying				•	1	2	1.8
Industry					2	1	1.4
Food products industry				•	0	5	2.9
Textiles industry				•	2	1	1.1
Forest industry		•		•	1	2	1.3
Chemicals industry		•	•	•	2	2	1.8
Metals industry		•		•	15	0	0.5
Electricity, gas and heating, cooling		•		•	5	3	2.1
Construction		•		•	5	3	1.7
Transport and warehousing	•	•	•	•	1	6	2.4
Accommodation and food services	•		•		26	2	1.4
Real estate		•			1	5	1.9
Art, entertainment and recreation	•				0	2	2.0
Other services	•						

The table presents vulnerabilities and credit risk indicators for the selected industries. The industries with vulnerabilities concerning trade with Russia were determined on the basis of OECD value added statistics for 2018. These industries are marked with a red dot if their turnover (or, more precisely, value added) is considered to be comparatively vulnerable in regard to trade with Russia. The industry is specified as vulnerable in regard to exports to Russia if its share of value added created from these exports in relation to all value added is among the highest quartile of all industries (proportions vary in the range 3%-8%). Similarly, the industry is specified as vulnerable in regard to imports from Russia if the value added attributable to these imports as a proportion of domestic final demand is among the highest quartile of all industries (proportions vary in the range 9%-48%). The vulnerability indicators refer to a comparison between industries rather than being absolute figures. The calculations were made at OECD industry level and grouped for the table at a higher level using expert assessment: if a significant industry was identified, the corresponding higher sector was also marked with a red dot. Industries with vulnerabilities concerning the pandemic and energy and commodities were determined on the basis of an expert assessment. The credit risk columns were calculated using December 2021 credit institution data collected by the Bank of Finland. The column header 'loans, %' refers to the industry's bank loans as a proportion of the total corporate loan stock. 'NPL, %' refers to the stock of non-performing loans as a proportion of the industry's loan stock. 'Interest rate, %' refers to the weighted average interest rate on the industry's loan stock.

Sources: OECD and Bank of Finland.

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Many of the industries vulnerable to a reduction in trade with Russia have a high exposure to energy and commodity price rises and to a deterioration in availability. This exacerbates the war's indirect effects on these industries. The effects will depend greatly on the speed with which companies are able to adjust their operations to the new economic environment and to find replacement markets for those which were lost.^[7] The sharp rise in energy and commodity prices is driving inflation higher, which will have a broader impact on costs faced by Finnish companies. If the price and availability

7. According to a study commissioned by OP Financial Group, a relatively large number of companies have already been able to react quickly to the situation (see https://www.op.fi/op-ryhma/medialle/tiedotteet?id=4235887_PRC).

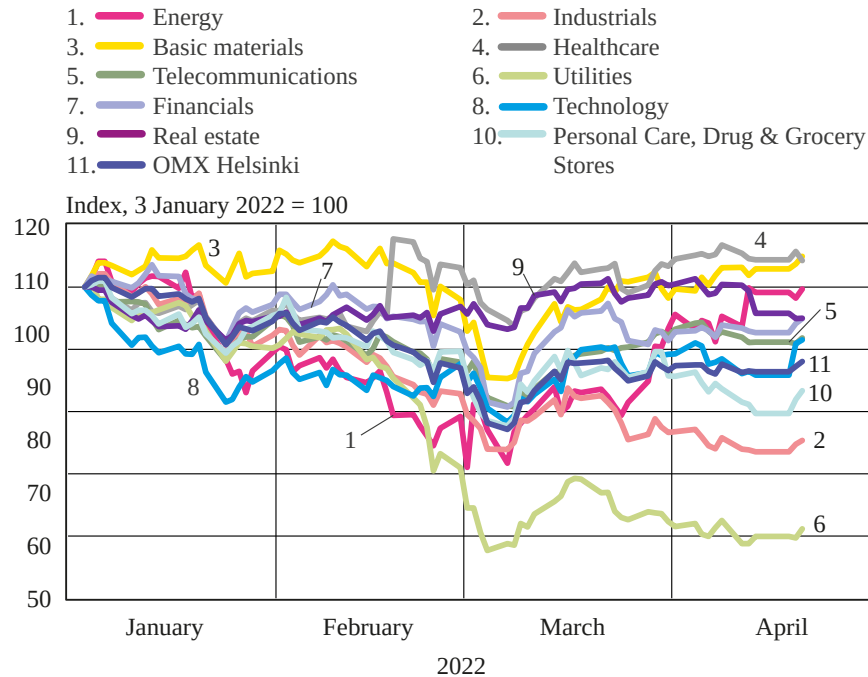
problems persist for a longer period, the indirect secondary effects of the war could spread more widely to Finnish companies via a decrease in domestic consumption.

Russia's invasion of Ukraine is weakening the economic environment for businesses in Finland, and this follows what have already been two exceptionally challenging years due to the pandemic. The pandemic affected companies in different ways, and the recovery has proceeded further in some industries than in others (see [From crisis to crisis – companies are once again facing a challenging operating environment](#)). Among the service industries worst affected by the pandemic (accommodation and food services, arts, entertainment and recreation), corporate credit risks have grown. These industries account for a fairly small share of bank lending (Table 1). Most bank loans have been granted to the real estate sector and to e.g. companies specialising in the supply of electricity, gas and heating. There have been relatively few non-performing loans in these industries so far.

Corporate credit risks and financing costs may increase as a result of the weakening economy, the materialisation of Russia-related risks and reduced profitability due to the rise in energy and raw material costs. The effects are evident in the stock prices of companies with a high exposure to the loss of trade with Russia (Chart 4) and in the price of market funding. Companies will experience tighter financing conditions when they renew their financing upon the maturity of their existing arrangements.

Chart 4.

Industries on Nasdaq OMX Helsinki diverged after Russian invasion



Source: Macrobond.

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Household expenses increased by rise in costs of living and loan-servicing

The sharp increase in consumer prices is affecting the purchasing power of households and forcing up the level of consumer spending on essentials. The considerable rise in energy and commodity prices is especially visible in the prices of foodstuffs, fuel, electricity and other energy-related housing costs. Slightly over half of household consumption expenditure has been on food, housing and mobility in the past few years (consumption expenditure does not include residential property purchases or loan repayments).

The increase in essential consumption expenditure may lead to a rise in the number of households experiencing financial distress. This would be exacerbated by a concurrent rise in loan-servicing costs or reduction in income. Many debt-laden households have a significant exposure to interest rate hikes. The risks are lessened by the fact that many housing loan borrowers have recently hedged their floating-rate loans. For some, a rise in interest rates would extend the repayment period of the housing loan, in which case it would not affect the monthly loan-servicing costs.

The impact of interest rate hikes on housing loan borrowers can be examined using

data^[8] which the Financial Supervisory Authority has collected from credit institutions on new housing loans granted and on the income of borrowers. When interest rates rise, the monthly loan-servicing costs of floating-rate annuity loans will increase. In Chart 5, the growth in loan-servicing costs in relation to the borrower's income is illustrated by comparing the distribution of the loan-servicing burden at the time the loan is granted with a situation where the total interest rate on housing loans is 2%.

At the time of granting the loan, the loan-servicing costs typically (median of the distribution) comprise about 18% of the borrower's monthly net income. As interest rates rise to 2%^[9], the typical loan-servicing burden will increase moderately (by about 1.5 percentage points), but for housing loan borrowers with a loan-servicing burden that is already high (the highest decile of the distribution) the change is greater, at around 4.5 percentage points. A separate article (see [New housing loans keep growing in size – share of longer-term loans has become more substantial](#)) describes in more detail the calculations at different interest rates.

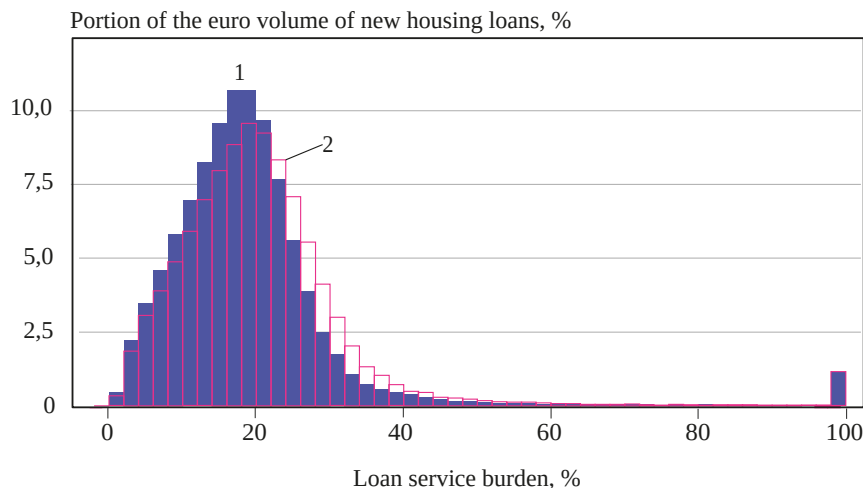
Chart 5.

8. The data is from July 2020 to September 2021. The loan-servicing costs of loans covered by interest rate hedges at the time of origination, and of fixed-rate loans and fixed-instalment loans, have been kept unchanged in the calculation. The monthly loan-servicing costs of other new housing loans have been estimated to grow in the manner of floating-rate annuity loans.

9. A total interest rate of 2% corresponds roughly to the market's expectation of interest rates by the end of 2023.

New housing loans according to borrower's loan-servicing burden at various interest rates

1. Interest rate at origination
2. Interest rate 2%



The loan-servicing burden has been calculated from loan-specific data, and it describes the monthly loan-servicing expenses relative to the borrower's net income. The servicing burden of fixed-rate, interest rate-hedged, and fixed-installment loans is assumed to remain the same as at origination. Outliers of the right-hand tail of the distribution have been added to 100%.

Sources: Financial Supervisory Authority and calculations by the Bank of Finland.

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There are differences in financial standing among debt-laden households. Deposits and other financial assets of households have increased in recent years, and this is also reflected in the level of savings and net assets of many debt-laden households. In terms of income, heavily indebted households are generally relatively high earning households that have residential property assets and other financial buffers. Among heavily indebted households there are, however, also households with little room for manoeuvre financially.^[10]

The uncertain economic outlook and high level of inflation could cause households to postpone purchases, thereby decreasing residential property sales and private consumption. Consumer confidence in the economy, and especially expectations regarding the outlook for the Finnish economy, weakened considerably in March. Consumers' views about the outlook for their own financial situation showed a less marked deterioration, and intentions regarding residential property purchases and

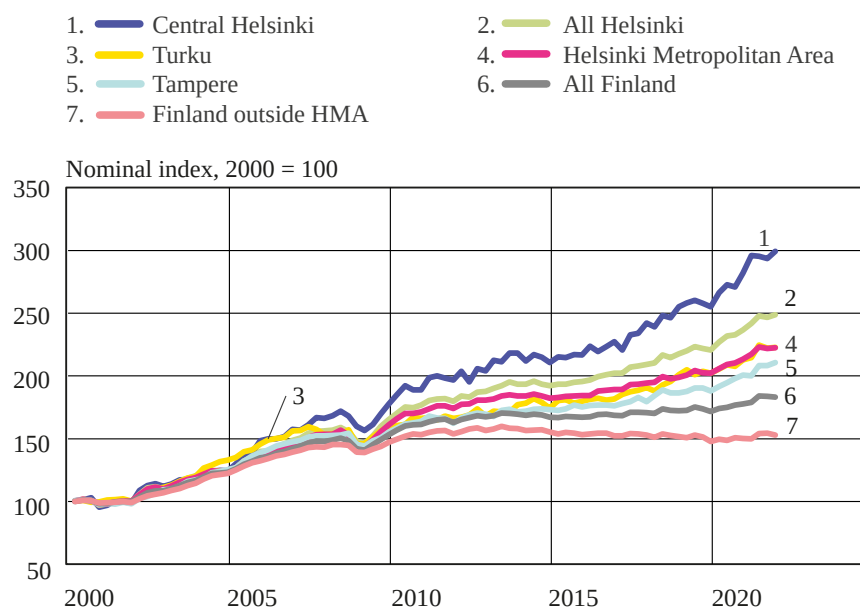
10. See <https://www.eurojatalous.fi/fi/2021/artikkelit/voimakkaasti-velkaantuneiden-taloudelli-nen-tilanne-vaihtelee-suomessa/> (in Finnish).

borrowing remained relatively high. Nevertheless, fewer people than before considered this a good moment to take out a loan or buy consumer durables.

The elevated uncertainty and caution on the housing market could slow the rise in residential property prices or steepen the downward trend in regions with declining property prices. In their spring forecasts, banks operating in Finland have taken the view that nominal housing prices, at least in the Helsinki Metropolitan Area, will rise further in 2022–2023, but more slowly than in 2021. In 2021, residential property prices rose in the Helsinki Metropolitan Area by 5.5%, and across the country by 3.7%, which was the highest rate since the corrective jump in 2010 (Chart 6). By international comparison, the rise was rather modest (see [Nordic housing market risks can affect Finland's economy](#)).

Chart 6.

Rise in residential property prices accelerated in 2021



Source: Statistics Finland.

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2021 was the most active year on the housing market in a long time. Residential property sales picked up quickly following the shock caused by the pandemic, with sales reaching significantly higher levels than in previous years. The level of sales and the rising price trend had already calmed somewhat before Russia's war in Ukraine began. Housing sales and the drawdowns of new housing loans in March 2022 were down from a year earlier,

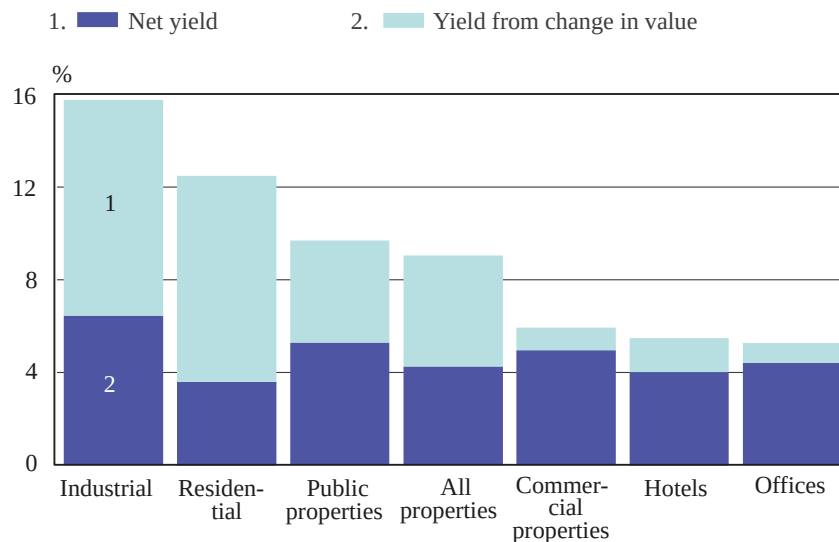
but were nevertheless still greater than before 2021. Housing construction is very active, particularly in the country's growth hubs. The sharp increase in construction costs and uncertainty about demand may lead to a reduction in the appetite of construction companies and investors to invest in new projects. The number of new building permits was down at the beginning of 2022 compared with a year earlier.

Impact of pandemic still visible on real estate market

The past two years have been a difficult time on the real estate investment market, as the pandemic has strained segments of the commercial property market in particular. Changes that occurred in the demand for property investment and for premises during the pandemic are evident in the differences in property investment yield between different real estate sectors (Chart 7). Property occupancy rates are still well below the pre-pandemic level, and the lasting changes brought by the pandemic are still being assessed – for example, changes in the popularity of working at home and the transformation of the retail sector. The restrictive measures in place for the pandemic were removed at the start of 2022, which should gradually reduce uncertainty regarding the property rental market and regarding future premises needs.

Chart 7.

Property investment yield is positive, but great differences exist between segments



Latest observation: Dec. 31, 2021.

Source: KTI Finland.

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Despite the pandemic continuing, Finland's real estate investment market made a recovery in 2021. The volume of real estate transactions began to rise in 2021, and was

24% above its 2020 level and 10% greater than in 2019. Although the weakening economic environment may bring greater uncertainty to Finland's real estate investment market, it is still too soon to assess the impact. Tighter financing conditions will be reflected in the market price of debt financing for investors. The deteriorating conditions could bring a reduction in the appetite to invest, especially in the highest-risk projects. The rise in construction costs is also adding uncertainty for the commercial property market and construction.

In Finland, a significant proportion of bank lending is to real estate companies domestically and in the Nordic countries (see [Nordic housing market risks can affect Finland's economy](#)). This increases the banking sector's exposure to any problems on the real estate market. A large and growing share of real estate financing on the Finnish market is for housing corporations, and such lending has so far remained very low risk for the banks. Loans granted to construction companies in Finland have constituted a relatively small proportion of the total.

Major structural risks call for good resilience in all circumstances

In Finland, the financial system's key vulnerabilities in terms of financial stability are structural and therefore constant or steadily growing. Household indebtedness has long been one of the main structural vulnerabilities of Finland's financial system. The level of household debt has crept upwards steadily and is currently very high and still rising. Most of the debt is in the form of housing loans, which, over the decades, have become significantly larger and also of longer duration.

Finland's banking sector is large, concentrated and intertwined with the Nordic banking sector. Due to the interconnections between the Nordic financial systems and economies, the Finnish financial system is vulnerable to any problems that may emerge in Nordic banks and in the Nordic financial sector.

By international comparison, the Nordic banks are particularly exposed to problems on real estate markets, as the region's banks have granted a considerable amount of housing loans and commercial property loans. Bank funding is very dependent on market funding and on credit collateralized by immovable property. This financing structure exposes banks to any disruptions occurring on the international financial markets.

The growth of household indebtedness in the other Nordic countries is linked to tail risks in the Finnish economy, i.e. to the elevated probability of significant reductions in GDP (see [Nordic housing market risks can affect Finland's economy](#)). The rapid increase in indebtedness of households in Finland's Nordic neighbours is a key factor adding to domestic tail risks. Sweden is of great importance for Finland's economy, which is why its risks are very readily transmitted to the Finnish economy.

A well-functioning economy requires effective financial intermediation. In Finland, the banking sector's role as a financial intermediary is central. The importance of stable and efficient financial intermediation is heightened in times of economic disruption or a downswing. This is why the banking sector's risk-bearing capacity and ability to function

even in the event of serious disruptions should be assessed in advance.

A stress test conducted jointly by the Bank of Finland and the Financial Supervisory Authority was used to assess banks' loss-absorbing capacity against housing market risks (see [Large structural risks require banks to hold buffers for a rainy day](#)). The test focused especially on the systemic risks caused by the structural vulnerabilities in the banking sector and housing market. The banks' loss-absorbing capacity was tested in a three-year scenario in which the Nordic countries face an economic crisis severely affecting the housing market. The test shows that while the banking sector's Common Equity Tier 1 capital ratio (CET1) weakened by 1.4–4.7 percentage points, it still exceeded the minimum capital adequacy required.

Macroprudential policy is used to reinforce the resilience of the financial system and to prevent the build-up of the risks and vulnerabilities threatening financial stability, such as excessive household indebtedness. This promotes stable financial intermediation for businesses and households and reduces the likelihood of financial crises and their effects on the financial system and the economy.

The aim of the macroprudential capital buffer requirements imposed on banks is to protect banks from risks that affect the system as a whole. Comparison shows that the average level of the Finnish banking sector's structural capital buffer requirements is currently lower than in peer countries with similar structural risks (see [Banks' macroprudential buffer requirements lighter in Finland than in its peers](#)).

In Finland, as in many other EU countries, measures were quickly taken at the start of the pandemic to ease macroprudential policy, along with other support measures, with the aim of ensuring the continued stability of lending in a deteriorating economic environment. These steps were, for the most part, very successful in safeguarding financial intermediation. In many EU countries, the vulnerabilities regarding financial stability, particularly in relation to private sector indebtedness and the housing market, did, however, continue to grow after the initial shock of the pandemic.

Russia's invasion of Ukraine and its economic impact have added to the uncertainties. Large-scale easing measures in macroprudential policy of the kind pursued early in the pandemic have not so far been introduced. However, in some countries macroprudential policy is still light and authorities have not yet begun to build up macroprudential buffers again. In many countries the macroprudential authorities have continued measures that were announced earlier, such as tightening the capital requirements for banks.



A positive neutral countercyclical capital buffer rate is necessary to prepare for black swans

As the COVID pandemic and the materialisation of geopolitical risks triggered by Russia's war in Ukraine have shown, shocks that threaten the stability of the financial system can also arise outside the system itself. Therefore, macroprudential instruments should include more capital requirements that could be eased in the event of disruptions on the financial markets. The buffer requirements could be relaxed to support the provision of credit when the economy needs stimulation.

The countercyclical capital buffer requirement is intended to be a macroprudential buffer that can be released in the event of disruptions to the financial system. However, the requirement cannot be eased unless it is first set above 0%. In response to experiences during the pandemic, several European countries have set a goal to enable the imposition of a countercyclical capital buffer requirement in a neutral stage of the credit cycle.

According to existing domestic regulations, a countercyclical capital buffer requirement can only be imposed if there are signs of an overheating of the credit cycle. There are well-founded reasons for setting a countercyclical capital buffer requirement above 0% in a neutral stage of the credit cycle in Finland as well. It would be desirable to implement the necessary regulatory changes in the context of the ongoing review of the EU's macroprudential regulatory framework (see [Macroprudential toolkit should be replenished in Finland and Europe](#)).

New macroprudential instruments needed to curb growing household indebtedness

The Bank of Finland has long been concerned about the growing indebtedness of Finnish households. In January, the Ministry of Finance published a draft Government proposal on measures to curb household debt more effectively.^[11] The Bank of Finland submitted a comment on the proposal.^[12]

The objectives of the proposal are good and valid, and the draft proposal contains a number of justified measures to prevent risks related to excessive growth in household indebtedness. However, the draft proposal is insufficient, as it does not include measures

11. See Ministry of Finance press release 28 January 2022 (in Finnish) <https://vm.fi/-/kotitalouksien-velkaantumisen-rajoittamiseen-tahtaavat-lakiluonnokset-lahtevat-lausuntokierrokselle>.

12. Comments submitted on the draft can be found in the lausuntopalvelu.fi service [https://www.lausuntopalvelu.fi/FI/Proposal/](https://www.lausuntopalvelu.fi/FI/Proposal/Participation?proposalId=9495c2f2-a649-4fb2-b179-d38ffb795017&proposalLanguage=da4408c3-39e4-4f5a-84db-84481bafc744)

[Participation?proposalId=9495c2f2-a649-4fb2-b179-d38ffb795017&proposalLanguage=da4408c3-39e4-4f5a-84db-84481bafc744](https://www.lausuntopalvelu.fi/FI/Proposal/Participation?proposalId=9495c2f2-a649-4fb2-b179-d38ffb795017&proposalLanguage=da4408c3-39e4-4f5a-84db-84481bafc744).

proposed by a Ministry of Finance working group on the introduction of a maximum upper limit on the debt-to-income ratio or an equivalent instrument to limit the debt or debt-servicing expenditure relative to household income.^[13]

13. See [Debt-to-income cap and maturity limits necessary to curb financial stability risks](#), Bank of Finland Bulletin.



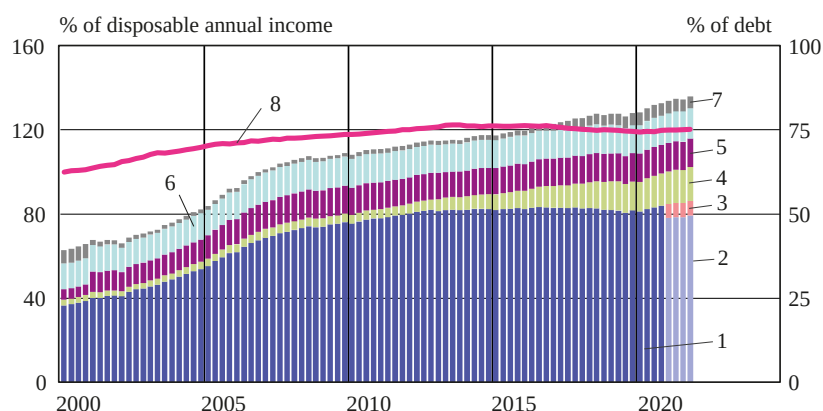
Household indebtedness continues to grow

At the end of 2021, household indebtedness relative to disposable income was record high (Chart 8). Roughly three-quarters of the debt is housing-related, i.e., housing loans and buy-to-let mortgages held by households and housing company loans relating to owner-occupied dwellings and dwellings for investment purposes. Housing credit growth has long exceeded households' income growth. The decline in consumption in the early phase of the pandemic reduced demand for consumer credit. Regulation of the interest rate cap may also have contributed to the supply of consumer credit.^[14]

Chart 8.

Finnish households' indebtedness has been increasing for a long time

1. Housing loans (up to 2020/IV)
2. Owner-occupied residential mortgages (2021/I-)
3. Buy-to-let mortgages (2021/I-)
4. Loans via housing companies
5. Consumer credit from Finnish credit institutions
6. Other loans from Finnish credit institutions
7. Other loans from Finland and abroad
8. Housing-related loans (right-hand scale)



Sources: Statistics Finland and Bank of Finland.

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New mortgage-borrowers' indebtedness relative to income has increased in recent years. Based on data^[15] collected in 2021, the typical total debt of new mortgage-borrowers was around 382% relative to gross annual income (Chart 9), compared with around 360% in 2020 and around 328% in 2018. Here, typical total debt-to-income refers to the mortgage-weighted median debt-to-income ratio. At the same time, the typical size of new mortgages has grown, which may

14. See <https://www.eurojatalous.fi/fi/2022/artikkelit/pandemia-ja-saantelyuudistukset-muokkaavat-kulutustuottomarkkinaa/> (in Finnish).

15. New mortgage-borrowers' debt-to-income ratios have been examined using loan-specific data on new mortgages and borrowers' other loans and income compiled by the FIN-FSA from credit institutions. The most recent data, compiled in 2021, covers the period between July 2020 and September 2021 (hereinafter '2021'). The reference data covers the periods between April 2019 and June 2020 ('2020') and April 2017 and March 2018 ('2018').

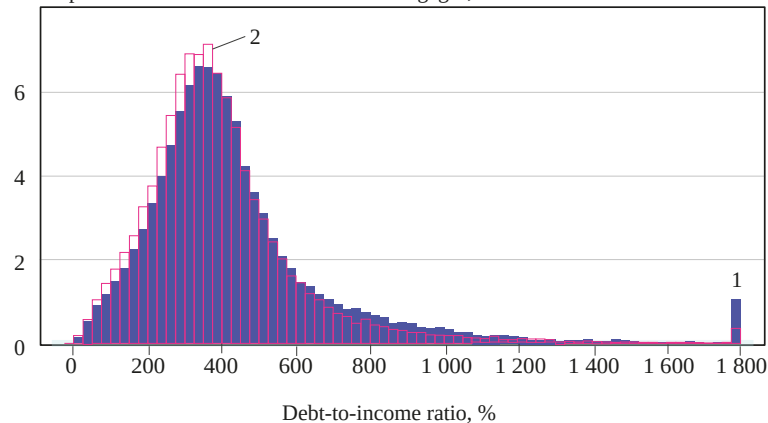
explain the rise in indebtedness (see [New housing loans keep growing in size – share of longer-term loans has become more substantial](#)).

Chart 9.

New mortgages by borrower's debt-to-income ratio

- 1. ■ Year 2021 data
- 2. □ Year 2020 data

Proportion of the euro volume of new mortgages, %



The debt-to-income ratio describes new mortgage borrowers' total debt relative to their gross annual income. The distribution of the ratio shows the share of total new housing lending granted relative to the borrower's debt-to-income ratio. Outliers of the right-hand tail have been added to the haircut value 1,800%. Sources: Financial Supervisory Authority and calculations by the Bank of Finland.

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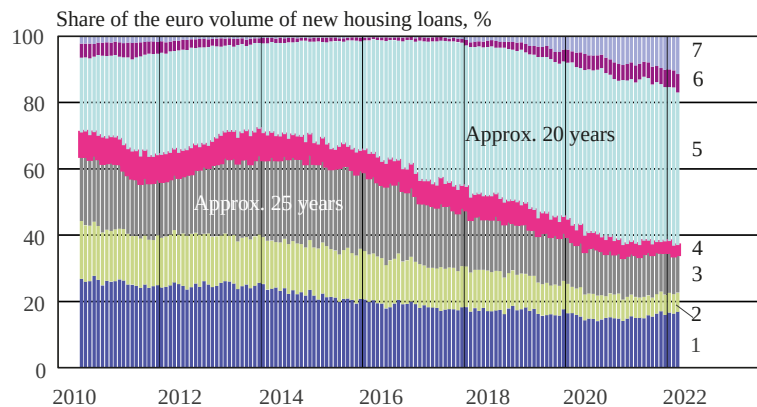
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Loans with longer-than-usual repayment periods have become increasingly common in recent years. At the beginning of 2022, mortgage loans with a repayment period of over 26 years accounted for more than 15% of the euro volume of new housing loans, and the corresponding share of loans with a repayment period of over 30 years was over 10% (Chart 10). Most loans with repayment periods of over 26 years have a maturity of around 30 or 35 years. Longer-term housing loans have, on average, been larger than other new mortgages. The increasing size of the loans and the longer repayment periods increase households' indebtedness.

Chart 10.

Maturities of new housing loans have lengthened in Finland

1. Maximum 14 years
2. Over 14 and maximum 19 years
3. Over 19 and maximum 21 years
4. Over 21 and maximum 24 years
5. Over 24 and maximum 26 years
6. Over 26 years and maximum 30
7. Over 30 years



Source: Bank of Finland.

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There is a need to introduce regulation on the maximum maturity for housing loans in order to curb household debt. Repayment periods have continued to lengthen over recent years, despite the fact that the Finnish macroprudential authority, the FIN-FSA Board, has since 2020 urged lenders to exercise restraint in granting loans that have longer maturities than usual. Regular repayment of loans in accordance with the maximum repayment period of the mortgage reduces household indebtedness and related risks. It is important that the maximum repayment period apply not only to residential mortgages, but also to housing company loans, and not only to banks, but also to other creditors. The maximum repayment period should not be significantly shortened from current maximum limits, and sufficient flexibility for lenders should be ensured.

The draft government proposal included measures to limit the amount of housing company loans used for financing new-build construction in relation to the unencumbered price of the housing company shares for sale. This would curb the increasing risks from indebtedness related to housing company loans. The proposed maximum loan-to-value ratio of 60% on housing company loans would still allow significant use of housing company loans in financing new-build construction. As a rule, the regulatory measures applied to housing company loans and their debt components

used for financing new-build construction should be the same as or similar to those applied to other housing loans.

In addition to the proposed instruments, consideration should be given to the introduction of macroprudential instruments based on the loan applicant's income, such as a maximum debt-to-income ratio (DTI cap) or a maximum debt-service-to-income ratio (DSTI cap). These instruments could be used to reduce the number of households heavily indebted relative to their income, thus improving households' debt-servicing ability. An income-based macroprudential instrument could be applied to almost all household credit, unlike the instruments suggested in the draft government proposal, which are applicable to only some parts of the credit stock. Income-based macroprudential instruments could be applied equally to all creditors and would be harder to circumvent.

It would be possible to measure the DTI cap or an equivalent limitation in a way that allows a typical amount of debt in relation to the borrower's income and sufficient flexibility in its application. This way, the instrument would not create obstacles to lending in growth centres or to specific groups, such as young borrowers.

The European Systemic Risk Board has highlighted the lack of a DTI cap and other instruments to prevent excessive household indebtedness in its recommendation to Finland and its assessment of compliance with the recommendations. The IMF identified the same shortcomings in a staff assessment published in January 2022.^[16]

There is a need to further develop and improve macroprudential instruments in Europe as well. In recent years, the use of macroprudential instruments limiting the maximum size of housing loans or the costs of servicing the borrower's total debts have become more common in the EU (see [Instruments to prevent risk of indebtedness becoming more common in Europe](#)). Since these instruments are governed by national legislation, their range and design differ substantially across Member States.

The review of the EU macroprudential regulatory framework provides an opportunity to improve and harmonise the range and usability of macroprudential instruments. National macroprudential authorities in all EU countries should have at least some macroprudential instruments at their disposal to allow for more effective ways to address risks related to the housing market and excessive household indebtedness. To take into account country-specific risks and market specificities, the activation and calibration of these tools should be governed by national authorities, as has been the case so far.

Macroprudential policy and regulatory development should be based on a forward-looking approach. Financial sector transformation and digitalisation may potentially increase the importance of new and cross-border lenders operating outside the traditional banking sector. For this reason, there is a need for macroprudential instruments that encompass these economic actors as well.

The effects of the Russian invasion of Ukraine

16. The IMF press release, report and statement on Finland are available for download [here](#).

require adjustment of the economy and the financial system

The war is having a wide-ranging and far-reaching impact on both the economy and politics, an impact which is also reflected in the financial system. Companies engaged in international trade have been forced to adapt to the outbreak of the war. The war requires significant economic policy input from several countries in a situation where crisis measures during the pandemic have already weakened the sustainability of public finances.

The war is also reflected in Europe's energy and climate policies, now in need of a new road map to achieve the set objectives. In many countries, long-term climate strategies were based on the use of natural gas, as natural gas was hoped to allow emission reductions and affordable access to energy during the shift towards renewable energy sources. EU countries are now trying to break away from Russian natural gas. For many countries, reaching the climate objectives will become more difficult, at least in the immediate years ahead, although in the long term, the green transition will likely accelerate as renewable energy sources replace Russian fossil fuels. There is a threat that the economic risks of climate change will increase, which would consequently increase the transition risks for banks.^[17]

Much work has been done to promote the stability of the financial system, but many important projects are still under way. Finalisation of the Banking Union and the single deposit guarantee would further strengthen financial stability. A common deposit insurance would increase public confidence in the banking system, prevent deposit runs and reduce harmful links between banks and their home countries.

For the diversification of the bank-centred European financial system, it is also important to continue development of the capital markets. A more determined dismantling of barriers to capital market integration in the EU would promote access to funding for corporates, sustainable economic growth and cross-border diversification of investment risks.

In October 2021, the European Commission published a legislative proposal to implement the reforms of the Basel Committee on Banking Supervision concerning the calculation of bank capital adequacy ratios (the Basel III finalisation). In order to ensure a level playing field and to safeguard financial stability, it is essential that banking sector activities are based on global rules which are as uniform as possible. Based on the Commission's impact assessments, the long-term benefits of implementing the Commission's proposals clearly outweigh the short-term costs of the reforms.

The Basel III reforms will be implemented over a very long transitional period. The Commission's proposal includes substantial and long-term alleviations, mainly in the calculation of the minimum euro-denominated risk-weighted asset requirements of large credit institutions (the output floor) during the transitional period. These alleviations

17. 'Transition risk' refers to the risk that emissions-producing companies will not be able to shift their business models towards lower emissions quickly enough, leading to a loss of profitability.

should not remain permanent. Extending or making the alleviations permanent would undermine the goals of the reform, which include improving the comparability of banks' capital adequacy ratios, reducing the model risks associated with the use of internal models, and mitigating the somewhat excessive procyclicality of banks' risk-weighted capital requirements.

Tags

household indebtedness, Ukraine, financial stability, Russia, war, macroprudential policy, banks

New housing loans keep growing in size – increased share of longer-than-usual loans

Today – Bank of Finland Bulletin 1/2022 – Financial stability



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In Finland, a new housing loan usually has a maturity of 25 years and an interest rate and monthly loan-servicing costs that change once a year according to the 12-month Euribor. The loan is typically close to four times the borrower's annual net income, and servicing expenditure takes up nearly one-fifth of net income. Housing loans have increased in size and the share of longer-than-usual loans is becoming ever larger. Borrowers should prepare for debt-related risks to ensure their financial margin can withstand higher interest rates and other costs.



Mortgage loans account for the majority of household debt

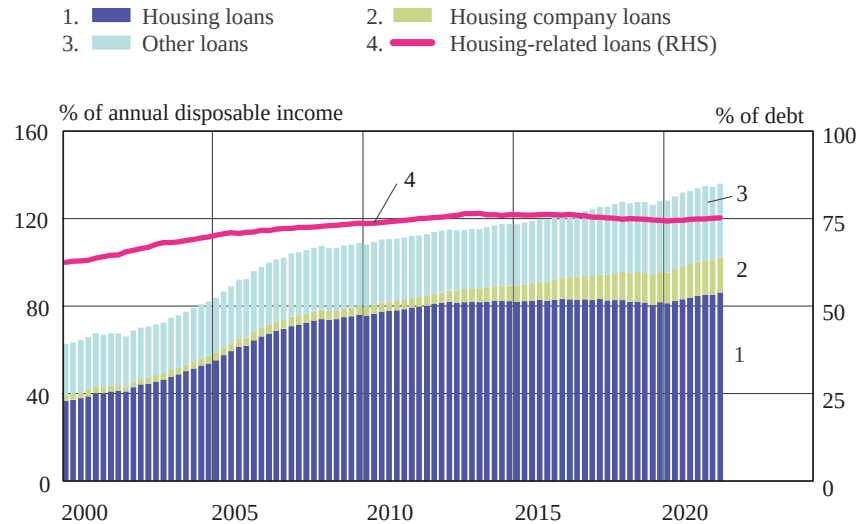
Housing loans account for the majority of Finnish households' new loans and total debts.^[1] The significant increase in household indebtedness since the turn of the millennium has mostly been due to an increase in housing loans and housing company

1. Housing loans account for around 63% of household debt; with housing company loans added, the combined share is around 75%.

loans relative to households' annual net income (Chart 1). On average, loan sizes have increased, and their repayment periods have become longer. At the same time, house prices have increased, especially in growth centres, which has on one hand increased borrowers' need for debt, and on the other hand increased the value of households' housing wealth.

Chart 11.

Finnish households' housing-related indebtedness has been increasing for a long time



Sources: Statistics Finland and Bank of Finland.

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enables many households to acquire owner-occupied housing, smooth consumption expenditure over time and build up investment assets. At the same time, the high and growing household indebtedness is one of the main long-term vulnerabilities of the Finnish financial system. Household indebtedness does not pose an immediate threat to financial stability. However, it exposes the financial system to significant risks over the longer term which, if realised, could jeopardise financial stability and have a far-reaching negative impact on the economy and the banks.

It is estimated that Russia's war in Ukraine will push up inflation and slow economic growth in Finland, too.^[2] Households' essential outgoings increase as energy and raw material prices rise (see [Financial stability assessment 2022](#)). At the same time, market expectations of gradually increasing interest rates in the euro area have strengthened. This has been reflected in the heightened Euribor reference rates during spring 2022. The Euribor rates are determined daily on the money market and measure interest rates at which European banks lend money to each other without collateral.

2. See <https://www.bofbulletin.fi/en/2022/articles/war-in-ukraine-will-slow-finland-s-gdp-growth-and-increase-inflation/>.

This article examines the characteristics and terms of new housing loans and the loan-servicing-to-income (LSTI) and loan-to-income (LTI) ratios of borrowers at the time the loan is granted. Loan terms and the size of loan in relation to the borrower's repayment capacity affect the vulnerability of mortgage borrowers to various risks and shocks to their own finances. There are situations where risks related to debt-servicing ability may increase, such as an increase in the borrower's debt-servicing expenditure and/or essential consumption expenditure, temporarily reduced income or a fall in house prices and other asset prices.

Information on the characteristics and terms of new housing loans are based on statistics compiled by the Bank of Finland and data compiled by the Financial Supervisory Authority (FIN-FSA) from banks operating in Finland. The data compiled from banks are loan-specific and contain information on mortgage-borrowers' other debts and income at the time the mortgage loan was granted. The most recent data covers the period between July 2020 and September 2021 (hereinafter '2021'). The reference data was compiled in 2020 (covering the period between April 2019 and June 2020) and 2019 (covering the period between April 2018 and March 2019).^[3]

Housing loans tied to variable interest rates, but some with interest rate hedging

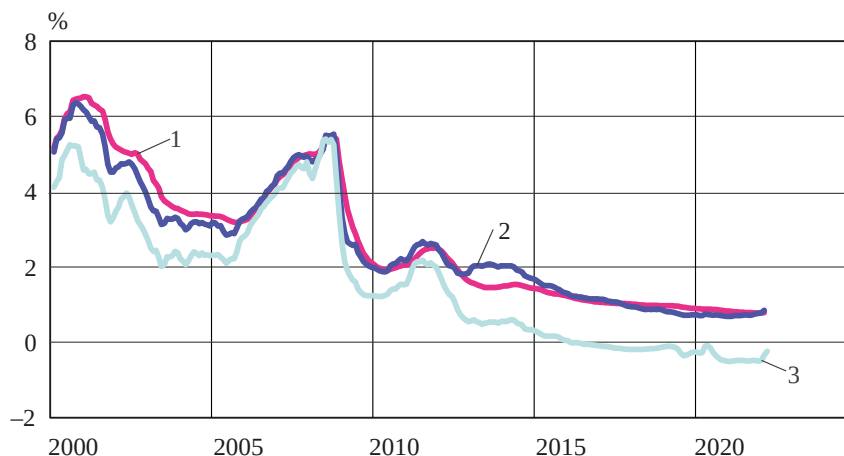
Interest rates on housing loans have been historically low in recent years (Chart 2). If interest rate levels in the euro area were to rise, the impact on each borrower's loan-servicing costs would depend on how the interest rate and monthly payments of the loan are determined. The interest rate may be variable, in which case it consists of a reference interest rate and a fixed margin. This means that the interest rate on the loan increases or decreases from time to time with the reference rate. The interest rate on the loan may also be fixed for a certain period or over the full maturity of the loan. Alternatively, the loan may include a fixed-term interest rate hedge, such as an interest rate cap, in which case the interest rate does not rise above the agreed rate.

Chart 12.

3. The data and calculations of the article are loan-specific, meaning each new mortgage is examined independently. Therefore, the loan-to-income (LTI) ratios and the loan-servicing-to-income (LSTI) ratios presented in the article are underestimates of some of the actual borrower-specific ratios. In reality, some of the loans are granted to the same borrowers at the same or a different time and have been used in combination to finance a single housing project.

Interest rates on housing loans historically low in Finland

1. Average interest rate on the stock of housing loans
2. Average interest rate on new drawdowns of housing loans
3. 12-month Euribor



Sources: Bank of Finland and Thomson Reuters.

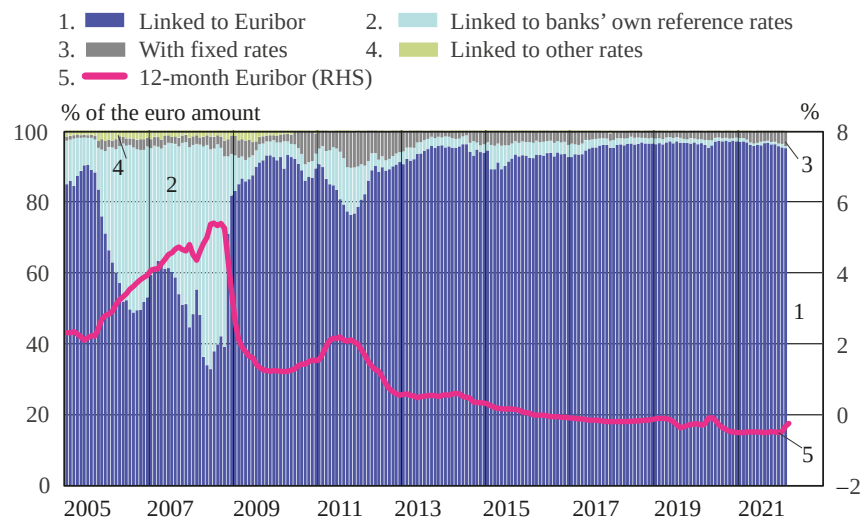
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The interest rates on new housing loans in Finland are almost exclusively variable, and, in recent years, interest rates on loans have been mainly tied to Euribor rates (Chart 3). The most common reference rate is the 12-month Euribor, which means that the bank revises the interest rate on the loan once every year. Variable interest rates on housing loans are used more widely in Finland than in other euro area countries or in Sweden and Denmark, for example. In recent years, average interest rates on housing loans have been significantly lower in Finland than in the rest of the euro area. Finnish mortgage borrowers have thus benefited from the low reference rates and the narrow loan margins in Finland.

Chart 13.

New housing loans mainly tied to Euribor rates



Sources: Bank of Finland and Refinitiv.

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Fixed-rate housing loans are rare in Finland. In recently granted fixed-rate housing loans, the interest rate is generally fixed for a period longer than 10 years. In Finland, however, it is more common to take a housing loan with a variable interest rate and interest hedging. Between July 2020 and September 2021 ('2021'), around 28% of the total amount of new mortgage loans was hedged against interest rate increases (Table 1). The typical length of the interest-rate hedge (mortgage-weighted median maturity of the hedge^[4]) was 10 years, usually ranging from 5 to 14 years. In recent years, interest-rate hedges have been more common with first-home loans than with other new housing loans.

4. Here, a *typical* observation refers to the *median weighted by the size (euro volume) of the loan*. The *unweighted* median describes the midpoint of the distribution when the observations are sorted from smallest to largest, meaning that there are an equal *number* of observations on both sides of the median. The median is less affected by outliers than the mean. When referring to *mortgage-size-weighted median*, half of the *euro volume* of the mortgages exceeds the median, while the other half of the euro volume is below the median. The distribution of the euro volume provides a better overall picture of housing lending than the distribution of the number of mortgages.

Table 1.

Share of loans with interest hedging, % of the euro volume of new housing loans			
	2019	2020	2021
First-home loans	23%	34%	35%
Loans for subsequent homes	18%	27%	26%
Loans for dwellings for investment purposes	13%	22%	22%
Total housing loans	19%	28%	28%

Of the euro volume of new mortgages in 2021 data, 26% were first-home loans, 66% loans for the purchase of subsequent homes, and 8% loans for dwellings for investment purposes.

Sources: FIN-FSA and calculations by the Bank of Finland.

The use of interest rate hedging may have increased markedly during spring 2022, as expectations of a gradual rise in interest rates have strengthened compared with 2021. Information and comments by some banks operating in Finland also indicate this.^[5] The average imputed margin for new mortgage loans increased in February and March 2022, which may also indicate an increase in the use of interest rate hedges. Interest rate hedging is often reflected in pricing as a wider margin and thus as a higher initial interest rate on a loan.

Most new housing loans are annuity loans

Most new housing loans are annuity loans (Table 2). An annuity loan is a loan where each instalment (repayment of principal and interest) is initially the same amount. If the interest rate on the loan increases (or decreases), the monthly instalment increases (or decreases) but the repayment period remains the same. The second most common way to repay housing loans is through fixed instalments. In a fixed-instalment loan, the repayment period will become longer (or shorter) if the interest rate on the loan increases (or decreases) but the size of the instalment remains the same throughout the repayment period. Regardless of chosen repayment method, any increase in the interest rate will increase the interest costs over the total loan period.^[6]

5. See for example [OP Financial Group press release](#) (23 March 2022).

6. In a fixed-period loan, all repayments of the loan principal are identical in size. However, each instalment (repayment of principal and interest) is smaller than the previous one, as interest expenses are reduced as the remaining loan principal decreases. If the interest rate on the loan increases (or decreases), the interest expenditure also increases (or decreases), while the repayment period remains the same.

Table 2.

Share of different types of repayment methods, % of the euro volume of new housing loans			
	2019	2020	2021
Annuity loans	68%	73%	76%
Fixed-instalment loans	20%	15%	11%
Fixed-period loans	5%	5%	5%
Bullet loans	7%	7%	8%

Sources: FIN-FSA and calculations by the Bank of Finland.

New annuity loans have typically had longer maturities than fixed-instalment housing loans, which, by design, require that the initial repayment period can be extended if interest rates rise (Table 3). Interest rate hedging is most common in annuity loans, as it is the repayment method in which the monthly instalments are affected by increasing interest rates. Fixed-instalment housing loans tend to have higher margins than other housing loans. Bullet loans for housing purposes are typically granted with a one-year maturity and are rarely hedged against higher interest rates.

Table 3.

Characteristics of new housing loans by repayment method			
	Repayment period, weighted median	Share of euro volume of loans with interest rate hedging	Margin, weighted median
Annuity loans	25 years	33%	0,55 percentage points
Fixed-instalment loans	20 years	14%	0,75 percentage points
Fixed-period loans	20 years	12%	0,50 percentage points
Bullet loans	1 year	1%	0,50 percentage points
All new housing loans	25 years	28%	0,55 percentage points

Year 2021 data. Medians weighted by the size (euro volume) of the housing loan.
Sources: FIN-FSA and calculations by the Bank of Finland.

The size of new housing loans increased in relation to borrowers' income

The typical size of new housing loans has clearly grown in recent years, and growth has been substantial in the longer term as well. For the most part, first-home loans are significantly larger than loans for subsequent homes, whereas housing loans for investment purposes tend to be noticeably smaller than other new housing loans (Table 4 and Chart 4). However, compared with first-home borrowers, borrowers switching homes and residential investors have a higher debt burden caused by pre-existing other loans.^[7]

Table 4.

Median size of new housing loans			
	2019	2020	2021
First-home loans	EUR 110,000	EUR 115,000	EUR 120,000
Loans for subsequent homes	EUR 81,000	EUR 90,000	EUR 99,000
Loans for dwellings for investment purposes	EUR 68,000	EUR 70,000	EUR 70,000
All new housing loans	EUR 88,000	EUR 96,000	EUR 100,000

Sources: FIN-FSA and calculations by the Bank of Finland.

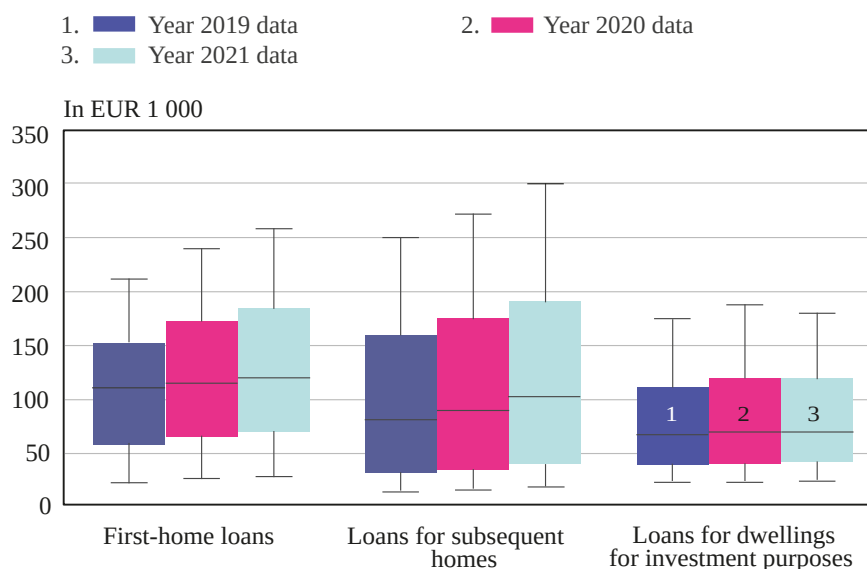
The increase in housing loan sizes is also reflected in the size of the largest loans. In 2019, the highest decile of the size of new first-home loans^[8] was approximately EUR 212,000, whereas in 2021 it was around EUR 258,000 (Chart 4). During the same period, the highest decile of the size of loans for subsequent homes increased from around EUR 250,000 to around EUR 300,000. There is greater variation in the size of loans for subsequent homes than in other new housing loans. Very large housing loans, such as those exceeding EUR 300,000, are usually loans for subsequent homes (as seen in the long tail of the highest decile of loans for subsequent homes, Chart 4).

Chart 14.

7. See <https://www.bofbulletin.fi/en/2021/1/new-mortgage-borrowers-have-an-increasing-amount-of-debt-relative-to-income/>.

8. The ninth decile, the highest depicted in the chart, shows the euro volume above which 10% of new housing loans are situated (as measured by the number of loans).

Distribution of housing loan size by purpose of borrowing



The box plot chart shows the distribution of the size of the loan. The box contains half of the loan observations, i.e. the observations between the lower and upper quartiles. The median size of the loan is marked in the box with a cross line. The whiskers on the box plots extend to the lowest and highest deciles, i.e. 20% of the observations fall outside the whiskers.

Sources: FIN-FSA and calculations by the Bank of Finland.

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In becoming home-owners, some borrowers also take on their part of a housing company loan. In this type of lending, a housing company loan included in the unencumbered price of the dwelling accounts for a part of the borrower's total housing-related credit. In the 2021 data, such cases accounted for approximately 8% of the euro volume of all new housing loans. In new housing loans for investment purposes, the share of such cases was significantly higher (29%) than in first-home loans (5%) or loans for subsequent homes (7%). Residential investors (private landlords) may deduct capital charges (repayments and interest on housing company loans) from taxable rental income if the capital charges are recorded as income on the housing company's books.

The size of new housing loans has also increased relative to borrowers' annual net income (Table 5).^[9] First-home mortgages are larger than other housing loans both absolutely and relative to income. The smaller size of housing loans for investment purposes compared with other new housing loans is also reflected in residential investors' significantly lower loan-to-income ratios at the time the loan is granted. On the

9. Bullet loans have not been considered in the calculation of loan-to-income (LTI) and loan-servicing-to-income (LSTI) ratios in this and the following section.

other hand, as pointed out above, borrowers switching homes and residential investors may have considerably higher pre-existing debt burdens that have not been considered in this comparison.

Table 5.

Median size of new housing loans relative to the borrower's net income (LTI ratio), weighted by loan size			
	2019	2020	2021
First-home loans	389%	412%	432%
Loans for subsequent homes	360%	372%	387%
Loans for dwellings for investment purposes	203%	207%	199%
All new housing loans	358%	373%	387%

Sources: FIN-FSA and calculations by the Bank of Finland.

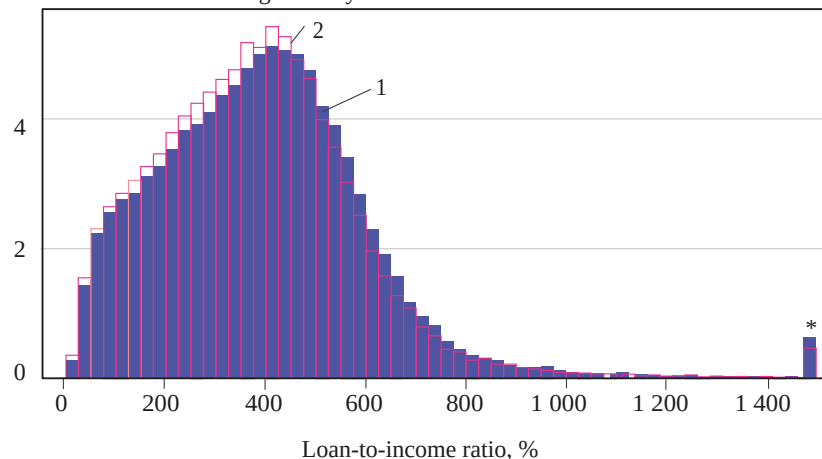
Some of the new housing loans are significantly large in relation to the borrower's annual net income. In 2021, the size of a new housing loan was typically almost four times the borrower's annual net income (the median LTI ratio weighted by loan size was 387%). This means that half of the euro volume of new housing loans was granted with a loan-to-income ratio above 387%. The distribution has shifted to the right from the previous year, indicating a general increase in the size of new housing loans in relation to borrowers' income (Chart 5).

Chart 15.

New housing loans by borrower's loan-to-income ratio

1. Year 2021 data
2. Year 2020 data

% share of new housing loans by euro volume



* Outliers of the right-hand tail have been added to the haircut value 1 500%.

The loan-to-income (LTI) ratios have been calculated using loan-specific data. The LTI ratio describes loan size relative to the borrower's annual net income.

Sources: FIN-FSA and calculations by the Bank of Finland.

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Loan-servicing burden not increased, but it may last longer

The typical servicing costs of new housing loans (repayments of principal, interest, and possible other costs) relative to borrowers' monthly net income have remained somewhat unchanged in recent years (Table 6). Therefore, the monthly loan-servicing burden (LSTI ratio) has not increased at the same rate as loan size relative to borrower income (LTI ratio, detailed above). The low reference rates, narrowing margins, lengthening repayment periods and favourable income developments have kept the monthly servicing costs of most new housing loans reasonable relative to the borrower's income.

Table 6.

Median loan-servicing burden for new housing loans (LSTI ratio), weighted by loan size			
	2019	2020	2021
First-home loans	18%	18%	19%
Loans for subsequent homes	19%	18%	18%
Loans for dwellings for investment purposes	13%	12%	11%
All new housing loans	18%	18%	18%
Loan-servicing burden = the costs of servicing the loan relative to the borrower's net income.			
Sources: FIN-FSA and calculations by the Bank of Finland.			

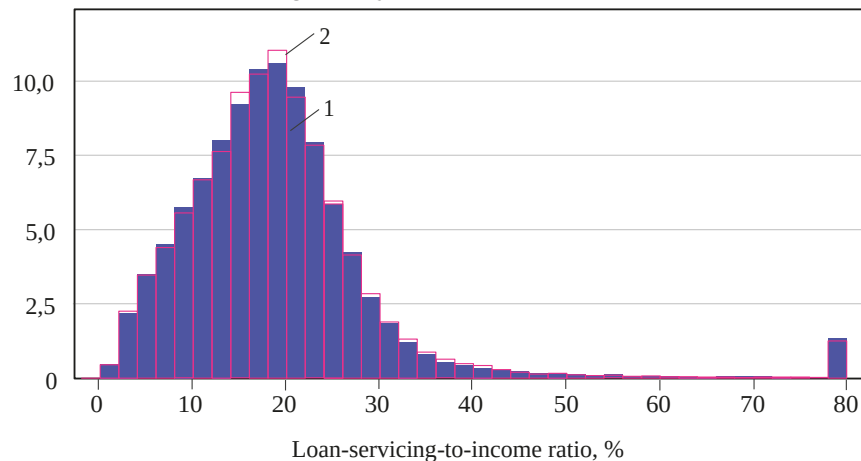
However, in some of the new housing loans, loan servicing costs are very large relative to the borrower's net income. In 2021, the loan servicing costs of a new housing loan were typically about a fifth of the borrower's net income (the median LSTI ratio weighted by loan size was 18%). Half of the euro volume of new housing loans was granted with a higher loan-servicing-to-income ratio. Changes in the shape of the distribution from one year ago do not indicate very significant changes in the loan-serving burden of new borrowers (Chart 6).

Chart 16.

New housing loans by borrower's loan-servicing-to-income ratio

1. Year 2021 data
2. Year 2020 data

% share of new housing loans by euro volume



* Outliers of the right-hand tail have been added to the haircut value 80%.

The loan-servicing-to-income (LSTI) ratios have been calculated using loan-specific data. The LSTI ratio describes the monthly loan-servicing costs relative to the borrower's net income

Sources: FIN-FSA and calculations by the Bank of Finland.

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The following chart (Chart 7) presents an estimate of the impact of potentially increasing interest rates on the monthly loan-servicing costs of housing loans included in the 2021 data. In the estimate, the loan-servicing costs of loans protected with interest rate hedging at the time of granting, fixed-rate loans and fixed-instalment loans have been kept unchanged. These loans account for about 45% of the total euro volume of new housing loans. On other loans monthly interest costs and total payments are estimated to increase in the same way as those of annuity loans.

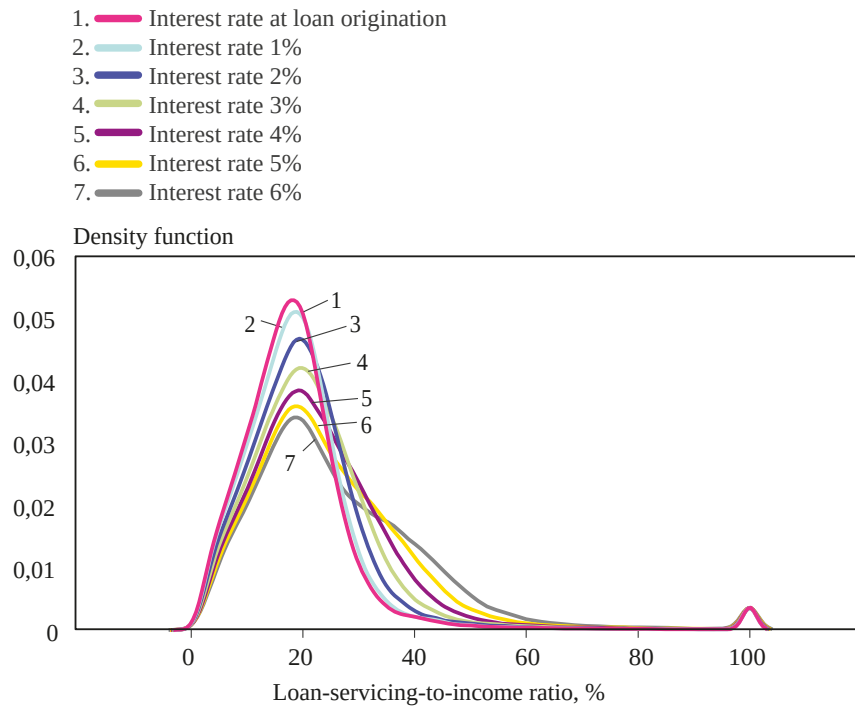
As the interest rate used in the calculation increases, the loan-servicing burden will grow more substantial on an increasing proportion of housing loans (measured by euro volume). In Chart 7, this is depicted in the distribution of housing loans^[10] as a fatter tail on the right-hand side. Rising interest rates will have the greatest impact on the loan-servicing burden of borrowers with a variable rate loan and a high loan-to-income ratio. In other words, as the interest rate rises, the higher the loan-to-income ratio, the larger

10. The density function in Chart 7 shows the distribution of housing loans (euro volume) in order of loan-servicing burden (weighted by loan size). The density function describes virtually the same thing as the histograms in Charts 5 and 6, but as a continuous distribution without the housing loans being divided into categories according to loan-servicing burden. The area under each density function is equal to one, as the area represents the probability that the loan-servicing burden always falls within a given range.

the share of income used for servicing the loan.

Chart 17.

New housing loans by borrower's loan-servicing-to-income ratio at different interest rates



The loan-servicing-to-income (LSTI) ratios have been calculated using loan-specific data. The LSTI ratio describes the monthly loan-servicing costs relative to the borrower's net income. The loan-servicing costs of loans with fixed or hedged interest rates or with fixed-instalments are assumed to remain unchanged. The density function shows euro volume of new housing loans as a continuous distribution.

Sources: FIN-FSA and calculations by the Bank of Finland.

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The type of interest rate, repayment method and disposable income all affect the amount of financial leeway that a borrower should uphold to prepare for an unexpected increase in interest rate levels and consumption expenditure. In their loan decisions, banks may also consider other factors affecting the borrower's creditworthiness besides loan-servicing burden, such as expected income development in the near future or liquid assets available for servicing the loan. In addition, the maximum loan-to-collateral (LTC) ratio for new housing loans (loan cap) limits the size of the loan in relation to the value of the collateral.

Longer-than-usual housing loans and grace periods

at loan origination have become more common

In recent years, the typical maturity for new housing loans has remained close to 25 years (Table 7), but at the same time, longer-term housing loans have become more common. At the start of 2022, new housing loans with maturities over 26 years accounted for some 15% of the euro volume of new housing loans, compared with around 8% two years earlier and around 4% three years earlier. The longer the maturity, the higher the total interest costs for the entire loan period. On the other hand, a slower repayment schedule may allow the borrower to invest more in other assets besides housing.

Typically, housing loans with very long maturities have been larger than other new housing loans. In the 2021 data, the median size of new housing loans with a maturity of around 25 years was approximately EUR 145,000, whereas the median size of loans with a maturity over 26 years was approximately EUR 225,000. In longer-term housing loans, the loan amount in relation to the borrower's income was also typically higher than in shorter loans. On the other hand, the monthly loan-servicing costs were equal. Loans with unusually long maturities are paid back over a longer period, and the average loan margins were lower than for loans with maturities of around 25 years.^[11]

Table 7.

Median repayment period for new housing loans, weighted by loan size			
	2019	2020	2021
First-home loans	25 years	25 years	25 years
Loans for subsequent homes	21 years	24 years	25 years
Loans for dwellings for investment purposes	20 years	20 years	20 years
All new housing loans	23 years	25 years	25 years

Sources: FIN-FSA and calculations by the Bank of Finland.

In a considerable share of new housing loans, borrowers have used grace periods at the start of the repayment period (Table 8). The instant use of interest-only periods has become slightly more common in recent years and has been more common with first-home loans and loans for subsequent homes than with loans for investment purposes. In the 2021 data, the typical grace period was 6 months and at most around 2 years.^[12] In

11. In the 2021 data, for housing loans with maturities of around 25 years the size of the loan in relation to the borrower's net income was typically around 435% (median LTI ratio weighted by loan size), whereas for loans with maturities of over 26 years, the corresponding ratio was approximately 531%. On the other hand, the typical loan-servicing-to-income (LSTI) ratio was around 19% in both groups (median weighted by loan size).

the early phase of the COVID-19 pandemic, the use of interest-only periods on old housing loans temporary increased but has since returned to normal.

Table 8.

Share of loans with an interest-only period at the beginning of the repayment period, % of the euro volume of new housing loans

	2019	2020	2021
First-home loans	36%	39%	43%
Loans for subsequent homes	38%	40%	44%
Loans for dwellings for investment purposes	27%	27%	28%
All new housing loans	36%	38%	42%

Sources: FIN-FSA and calculations by the Bank of Finland.

There are many ways to prepare for debt-related risks

Finnish mortgage borrowers are vulnerable to interest rate increases and other changes affecting their own finances. Particular causes for vulnerability are a high debt burden in relation to income and to wealth and inadequate preparedness for interest-rate risks and other risk factors. Housing company loans are mainly tied to Euribor rates, and interest-rate hedges have been used less in housing company loans than in housing loans. Housing company loans are usually either fixed-period or annuity loans, so rising interest rates would increase the monthly loan-servicing costs, consequently increasing the capital charges paid by the homeowners.

The most important way to prepare for risks is to measure the amount of loan against the borrower's repayment capacity. The FIN-FSA has recommended that banks use an interest rate of at least 6% and a maximum repayment period of 25 years in assessing housing loan applicants' loan-servicing ability. The FIN-FSA has also recommended that banks consider the impact of interest rates on capital charges in the assessment of the loan applicant's financial margin. In the assessment, the banks should also consider the expiration of potential grace periods for the housing company loans and the fact that flexibility in loan servicing is generally not granted for capital charges in the same way as

12. However, the above calculations of the loan-servicing burden were made using the loan servicing costs for the first month when the repayment of principal was paid in full.

for housing loans.^[13]

According to a survey^[14] commissioned by Finance Finland, saving has clearly remained the most common way for households to prepare for rising interest rates. Households' deposits and other financial assets have grown in recent years, as households have had the opportunity to save money left over after debt-servicing costs and consumption expenses, and investments have grown in value. This has increased the financial buffers of at least some borrowers. Another way to accumulate net wealth is to pay off loans at a faster rate. By shortening the loan period, the debt will accumulate less interest costs over the loan period.

Households' indebtedness has increased significantly during the period of low interest rates, increasing borrowers' sensitivity to rising interest rates. Going forward, another factor that may aggravate the impact on mortgage borrowers of increasing interest rates is the substantial cuts made to the tax deductibility of interest expenses on owner-occupied housing loans. In 2022, only 5% of these interest expenses are tax deductible, compared with 100% in 2011. According to the Government Programme, deductibility will be phased out completely in 2023.

Tags

[financial stability](#), [loan-servicing expenditure](#), [mortgages](#), [indebtedness](#), [households](#)

13. FIN-FSA (2018) [Management of credit risk and assessment of creditworthiness by supervised entities in the financial sector](#), Regulations and guidelines 4/2018.

14. Finance Finland (2021) [Saving, borrowing and payments](#).

From crisis to crisis – companies are once again facing a challenging operating environment

Today – Bank of Finland Bulletin 1/2022 – Financial stability



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Russia's invasion of Ukraine in February 2022 has rapidly increased uncertainty related to the economic outlook and financing conditions. The war affects domestic companies' operating environment in several ways. The total impacts will be felt much more broadly than only by companies that have direct Russian exposures in their business. The weakening economic environment, higher inflation and tighter financing conditions may increase companies' refinancing risks. The most vulnerable are the companies that have ties to Russia and energy-intensive companies, as well as industries that will face the new crisis already weakened by the pandemic.



Russia's war in Ukraine will have a broad impact on companies

Russia's war in Ukraine will hamper companies' operating environment in a number of ways. The most direct impact on domestic companies will be felt as trade with Russia decreases or ends. Even though Finnish companies' Russia risk has decreased in recent

years, following the decline in trade with Russia, Russia has still been an important market for some companies.^[1] Some 2,200 companies are engaged in exports to Russia, and export products from some 500 companies will be directly affected by the export restrictions imposed on Russia because of the war. Due to reputational damage and the higher risks, many companies that are not subject to export restrictions are also withdrawing from trade with Russia.

The Bank of Finland has estimated that the direct negative impact on the economy of the war will probably be considerably greater than the contraction in trade with Russia and the country's share of Finland's foreign trade would suggest.^[2] The war and the sanctions and counter-sanctions are affecting the availability of many raw materials and industrial supplies and are exacerbating the global supply chain bottlenecks that emerged during the COVID-19 pandemic. The strong rise in energy and commodity prices is fuelling inflation, which has a more broadly based impact on the cost developments of domestic companies. The heightened uncertainty as to the economic outlook and inflation weakens both consumer and business confidence, which will also erode domestic consumption and investment. Companies' business may also suffer due to the sanctions imposed on the Russian financial system or the counter-sanctions imposed by Russia.

The war is weakening the operating environment of companies in a situation where they have already experienced two exceptionally challenging years due to the pandemic. Companies were affected by the pandemic in different ways, and some of the industries have already recovered more than others. Correspondingly, companies and industries will be affected by the war and its second-round effects in different ways.^[3] In addition to the economic impacts, companies' operating environment will be weakened by the tightening financing conditions. In addition to the rise in risk premia, financing conditions are tightened by the progress of monetary policy normalisation on the global level. This article examines the starting point of domestic companies from the perspective of corporate finance, and the possible impacts of the weakening of the operating environment on companies' credit risks and access to finance, if the war and its negative impacts drag on.

The price of finance has risen for companies that have suffered most from the pandemic

The financial position of domestic companies was on average fairly good before Russia's attack on Ukraine. Finland's economic growth in 2021 was broadly based,^[4] and the turnover of industrial companies, in particular, had recovered from the early phases of

1. In a survey by the Confederation of Finnish Industries (EK), 8% of respondents reported that the economic sanctions are having a significant impact on business. Nearly 34% of companies are of the opinion that the economic sanctions will cause some damage. See [EK_kriisikysely_tulokset_03-2022-final.pdf](#) (in Finnish only).

2. See <https://www.bofbulletin.fi/en/war-in-ukraine-will-slow-finland-s-gdp-growth-and-increase-inflation/>.

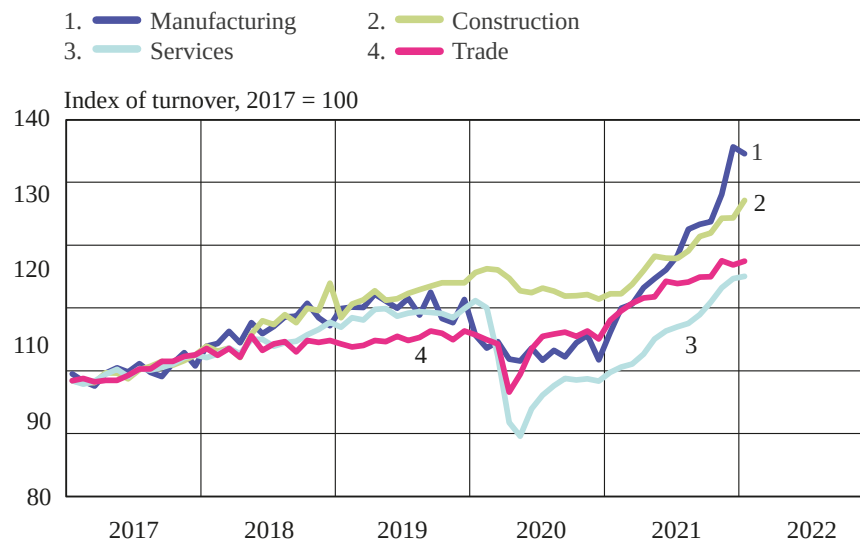
3. Metal, forest and chemicals industries are the most sensitive to the weakening in exports to Russia. The tourism industry was already hit hard during the pandemic, and, at least from the perspective of tourism from Russia, the situation is not set to ease. The rise in energy and raw material prices will hit hardest manufacturing and energy-intensive industries, for example transportation and agriculture.

4. Adjusted for working days, output went up by 4.5% in December 2021 from a year earlier [Statistics Finland – Trend Indicator of Output \(stat.fi\)](#).

the pandemic (Chart 1). Demand for services had recovered even though the pandemic dragged on. Another indication of the improved outlook was the stronger employment situation and growth in manufacturing investment.

Chart 18.

Profitability of Finnish companies had recovered from pandemic before Russia's attack on Ukraine



Sources: Confederation of Finnish Industries (EK) and Statistics Finland.

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On average, domestic companies have not experienced significant difficulties in terms of access to or price of financing since the early phase of the pandemic. The accommodative monetary policy of the European Central Bank has preserved favourable financing conditions by historical standards, and domestic banks' ability to provide credit to the real economy has remained good, supported by a variety of policy measures. The financing conditions have been supported by domestic companies' good profitability and ability to service debt. On average, companies have a relatively large volume of liquid assets in the form of deposits, and large listed companies are not very indebted on average.

Contrary to previous economic crises, the average credit terms of bank loans to businesses have not tightened significantly during the pandemic. According to the Bank of Finland's domestic Bank Lending Survey,^[5] credit terms have tightened slightly, particularly in the case of the margins on loans with the highest risk rating. The credit terms of loans with standard risk ratings loosened on average in 2021. Otherwise, banks have not seen a significant tightening in credit terms.

5. Bank Lending Survey | Bank of Finland.

Some companies are, however, still feeling strongly the impacts of the pandemic. The restrictions imposed during the pandemic hit particularly small companies and some of the service and transport industries,^[6] as many of the restrictions were in force for a long time.^[7] Domestic banks' credit risks have increased in the service industries that were hit hardest by the pandemic. According to the Financial Supervisory Authority, however, these industries account for a relatively small share of banks' stock of corporate credit,^[8] and, as a result, growth in the credit risks of the stock of corporate loans has been fairly modest.

The higher level of credit risk has had an impact on the price of finance for the industries that suffered most from the pandemic and some industries sensitive to business cycles.^[9] Bank of Finland statistics on monetary financial institutions show that the price of financing for the industries that were hit hardest by the pandemic has increased clearly relative to the average interest rate on corporate loans (Chart 2). The interest rate on bank loans is typically higher the smaller the company (Chart 3). Particularly in the acute phase of the pandemic, the liquidity position of small companies may have been weak. Small companies typically do not have the collateral and capital required for bank financing.^[10] The new crisis comes at a difficult time, particularly in the case of the small companies that have suffered most from the pandemic, as their costs are pushed up by not only inflation but also the higher financing costs.

Chart 19.

6. Tourism and food and beverage service activities, transportation and transport, arts, entertainment and recreation.

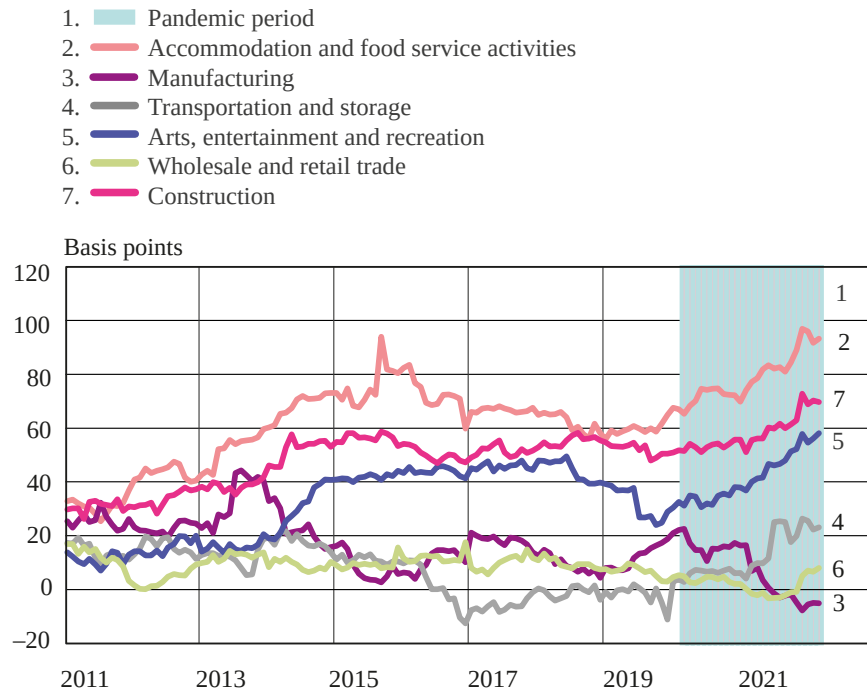
7. The majority of the different COVID-19 restrictions were lifted in Finland on 1 March 2022.

8. Financial Supervisory Authority, *Suomen pankkisektorin häiriönsietokyky Euroopan vahvimpia (helsinki.fi)*. (Finnish banking sector's resilience among the strongest in Europe; in Finnish)

9. For example construction.

10. See <https://www.yrittajat.fi/tutkimukset/pk-yritysbaremetri-1-2022/>. (SME Barometer 1-2022, in Finnish).

Interest rate spread increased between industries that suffered most from pandemic and other companies

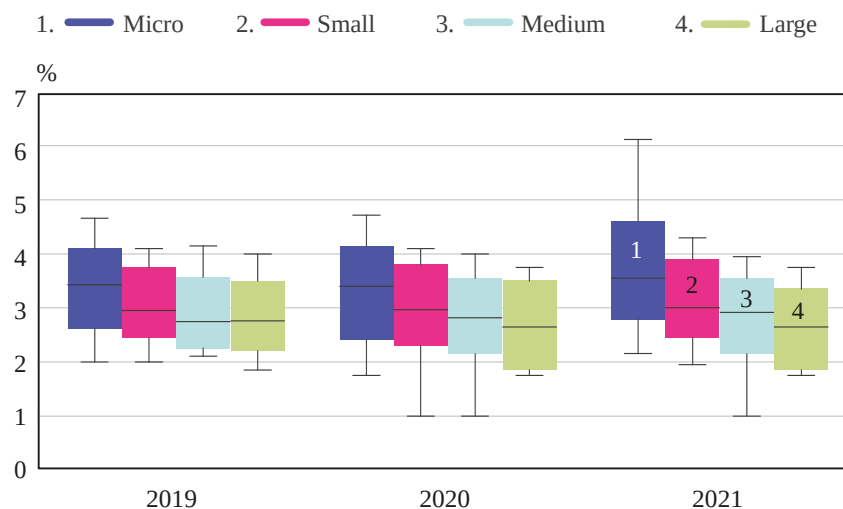


Interest rate spread relative to the average interest rate on corporate loans.
Source: Bank of Finland.

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Chart 20.

Large companies pay a lower interest rate on new bank loans than small companies



The box-and-whiskers plot shows the distribution of the interest rate on new corporate loans by size of company. The box contains half of the loan observations, i.e. the observations between the lower and upper quartile. The median interest rate on the loans is marked in the box by a horizontal line. The line segments below and above the box extend to the 15th and 85th percentile, i.e. a total of 30% of the observations are outside them.

The classification of the companies by size is based on the Annex to the Commission recommendation 2003/361/EC.

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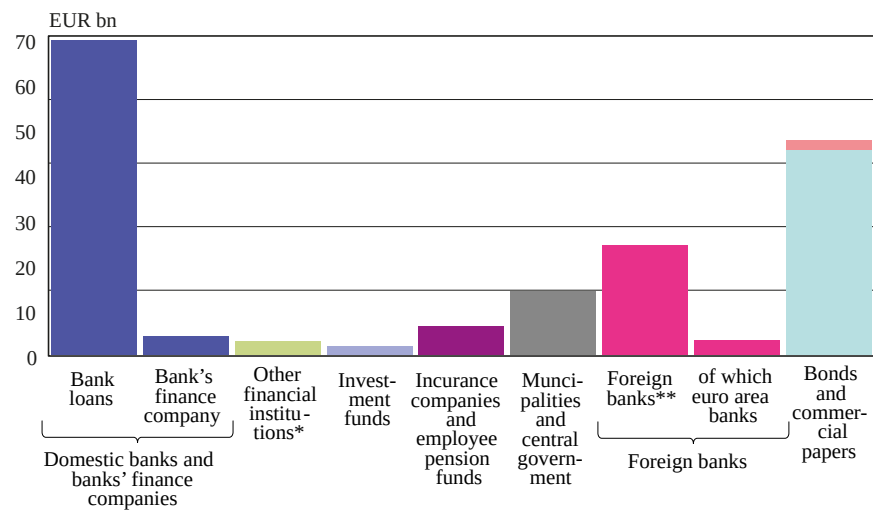
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Increase in uncertainty will probably be reflected in the demand for corporate loans granted by banks

Domestic companies are still largely dependent on bank finance (Chart 4). Particularly for small companies, banks are still the main source of finance. The ability of the domestic banking sector to grant credit under all economic circumstances is thus very important for Finland.

Chart 21.

Banks still the main source of corporate finance in Finland at the end of September 2021



*Includes e.g. export credit companies, vehicle finance companies and crowdfunding and peer-to-peer lending.

**Includes only countries reporting to BIS.

Sources: Bank of Finland, BIS and European Central Bank.

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Bank lending showed signs of picking up in late 2021 as the pandemic began to ease. Demand for corporate loans was boosted by, for example, acquisitions and corporate restructurings, and increasingly by investments.^[11] In the most recent lending survey conducted in January 2022, however, banks anticipated a weakening of credit demand in the first half of 2022, which was an indication of heightened uncertainty in the global economy. Russia's attack on Ukraine has increased these uncertainties further.

In a crisis situation, the volume of bank finance may even grow, as large companies take out more loans within the liquidity and working capital limits agreed on earlier. The containment measures introduced to mitigate the impacts of the pandemic resulted in a short-term increase in bank lending to companies in spring 2020 as banks suffering from a contraction in turnover and drying up of cash reserves needed bank loans to meet their acute liquidity needs. A significant portion of these loans matured or were repaid in 2021, which was reflected as a contraction in the stock of corporate loans (Chart 5).

Russia's attack on Ukraine may also increase companies' temporary financing needs. Statistics show that drawdowns of new corporate loans were exceptionally brisk in Finland in December 2021.^[12] The large figure is explained particularly by the exceptional factors on the commodities derivatives markets caused by the strong rise in energy prices, which increased the temporary financing needs of energy companies.

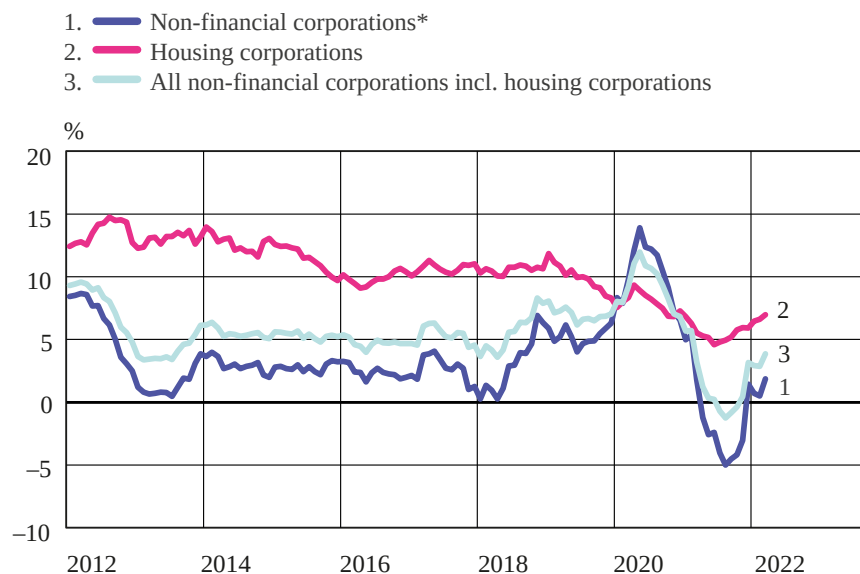
11. Bank of Finland's domestic bank lending survey.

12. New drawdowns amounted to as much as EUR 6.5 billion.

Russia's attack on Ukraine is maintaining these exceptional market factors.

Chart 22.

Due to strong movements in short-term corporate loans, growth in the stock of corporate loans was relatively weak for most of 2021



*Only domestic non-financial corporations.

Source: Bank of Finland.

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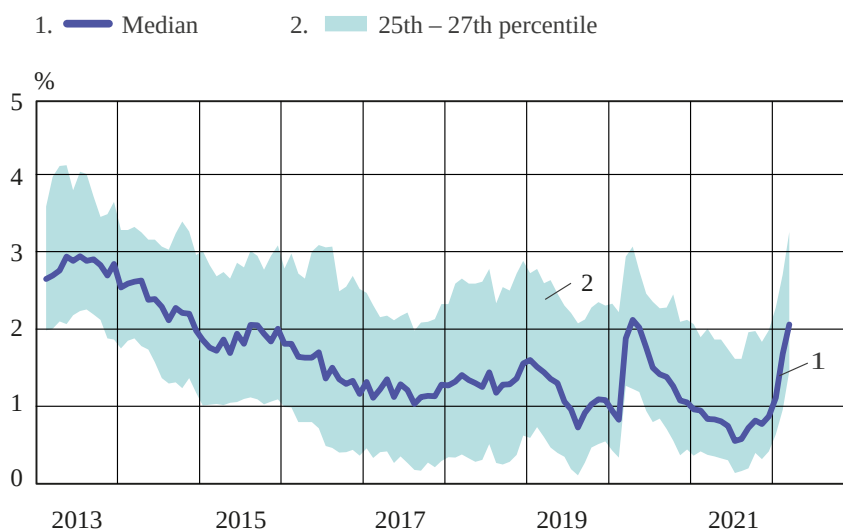
Heightened uncertainty has increased cost of market-based funding

Russia's invasion of Ukraine has increased uncertainty on the financial markets and pushed up the required rate of return (yield-to-maturity) and risk premia on bonds. The impact has been largest in the companies most exposed to Russia risks. The yield-to-maturity reflects the impacts of the war on the companies' future profitability developments.

In addition to the geopolitical situation, the tighter financing conditions reflect the expectations for monetary policy normalisation in the main economic regions. Inflation risks were rising already before the outbreak of Russia's war in Ukraine, and central banks have communicated that they are proceeding with monetary policy normalisation despite the heightened uncertainty. The US Federal Reserve (Fed), in particular, has signalled a more rapid pace of monetary policy tightening than expected. The strengthening of interest-rate hike expectations in the United States is reflected in the euro area, too, and the yield-to-maturity of bonds has started to rise on the market (Chart 6).

Chart 23.

The price of domestic companies' market-based funding has increased in 2022



The chart shows the average return requirement (median) for domestic companies' euro-denominated bonds and the quartile range of the return requirement (range of the 25th and the 27th percentile).

Sources: European Central Bank and Bank of Finland.

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The tightening financing conditions are pushing up the price of companies' market-based funding and weakening its availability. This may particularly affect large domestic companies that have in recent years been able to extensively utilise both the domestic and international capital markets in their funding. The stock of bonds issued by domestic companies totalled in January 2022 EUR 31.4 billion, while the stock of corporate paper totalled EUR 3.5 billion. This accounts for a total of 60% of the stock of corporate loans granted by banks.

The increase in the volume of loans granted by foreign banks and foreign market-based funding^[13] has expanded the financing base of domestic companies and made it more international. Following the pandemic, foreign investors' holdings of bonds and commercial paper issued by domestic companies have increased considerably, and were in the third quarter of 2021 some 60%.^[14] According to statistics by the Bank for International Settlements (BIS), loans granted to domestic companies by foreign banks total at least some EUR 17 billion.

13. Bank for International Settlements (BIS) *Consolidated Banking Statistics*.

14. The ECB has also increased its holdings of domestic corporate bonds, under the Corporate Sector Purchase Programme (CSPP).

In a crisis situation, market-based funding may be vulnerable to changes in investors' risk-taking capacity. In the early phase of the pandemic, domestic companies in particular reduced significantly their investments in bonds and commercial paper issued by domestic companies. The largest reductions were accounted for by domestic investment funds.^[15] At the same time, the share of domestic institutional long-term investors such as pension funds and insurance companies in bond investments has decreased considerably: in the third quarter of 2021, their share was only some 10%.^[16]

Russia's attack increases refinancing risks

Russia's invasion has weakened companies' operating environment considerably. The weakening economic outlook, high inflation and monetary policy normalisation are tightening companies' financing conditions. Uncertainty is still high, and the total impact of the war on the economy and companies' credit risks will depend on the duration and extent of the war, and on the economic policy measures to be introduced to support companies.

The situation of the companies is however alleviated by the fact that they are facing the new crisis with a good level of debt sustainability on average. The situation is nevertheless challenging, particularly for companies that have large Russia exposures and that are suffering more than average from the side-effects of the war, for example the strong rise in energy and raw material prices, or that are still recovering from the pandemic.

The ability of small companies to acquire financing in a crisis situation is weaker than that of large companies, as, in contrast to large companies, they do not have already negotiated credit agreements that they can use to secure liquidity in a crisis situation. In addition, the majority of small companies have limited possibilities to acquire domestic market-based funding or else such funding is very expensive. During the pandemic, small companies thus resorted mainly to a range of support for businesses and costs.^[17] The pandemic also increased significantly the amount of loans guaranteed by the Export Credit Agency Finnvera.^[18]

The tightening financing conditions will be felt by companies when they apply for refinancing as their old loans mature. Some companies may then have to pay a higher price for financing or, in the worst case, refinancing may be jeopardised.

Domestic companies' refinancing needs will increase in the immediate years ahead. A significant share of large companies' stock of bank loans will mature already in a couple

15. Before the pandemic, domestic bond funds' total share in investments in domestic corporate bonds and commercial paper was clearly larger than in the euro area on average.

16. As recently as the end of 2012, the corresponding share was 25%.

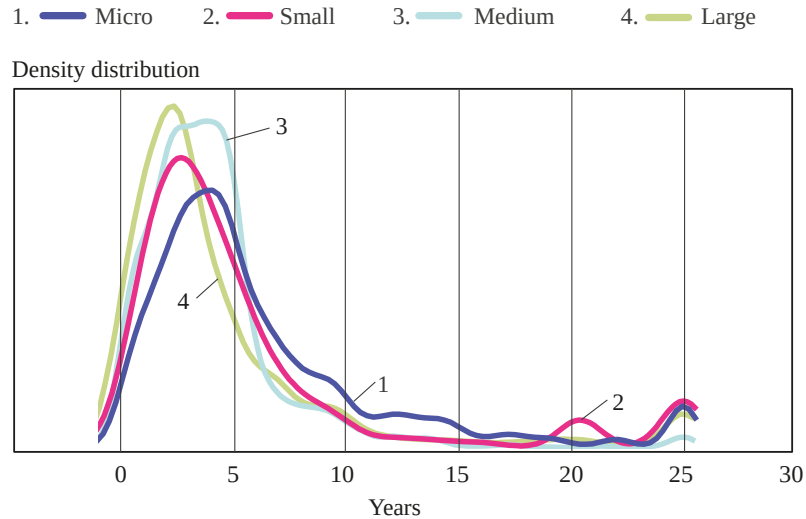
17. According to the Ministry of Economic Affairs and Employment, direct business subsidies granted in Finland by 17 January 2022 totalled EUR 3.6 billion, while loans and venture capital investment totalled EUR 0.64 billion. The different guarantees available from Finnvera amount to some EUR 12 billion, of which some EUR 2.9 billion have been granted.

18. Finnvera's role as an alternative and supplement to bank loans is considerable; in the SME barometer, nearly a fifth of the companies planning to apply for financing report that they will apply via Finnvera.

of years. The maturities of loans by small and micro enterprises are on average slightly longer than those for medium-sized and large enterprises (Chart 7).

Chart 24.

Average maturities of small companies' bank loans longer than those of large companies



The chart shows the density distributions of remaining maturities of banks' corporate loans, weighted for the volume of loans, in February 2022.

Outliers of the right-hand tails of the distributions have been added to 15 years. Classification of the companies by size is based on the Annex to the Commission recommendation.

Sources: Bank of Finland and Credit data collection.

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The financial market impact of Russia's invasion of Ukraine has already partly materialised. As the war drags on, the situation of market funding may also weaken further. There is a risk of a broadly based weakening of confidence in domestic companies, for example as a result of higher country risk or an increase in the credit risks of companies exposed to Russia risks. The vulnerabilities related to country risk have been aggravated by the increasing use of foreign finance. Companies' refinancing risks in market-based funding are, however, reduced by the good starting point and debt sustainability of the companies, and because a relatively small amount of domestic companies' market-based funding will mature in the immediate years ahead.

Tags

[energy price](#), [corporate finance](#), [credit risks](#)

Nordic housing market risks can affect Finland's economy

Today – Bank of Finland Bulletin 1/2022 – Financial stability



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The Bank of Finland has been monitoring Nordic real estate market risks for a considerable time. There are substantial vulnerabilities associated with household indebtedness and residential property prices in the Nordic countries, and lending to the real estate sector by Nordic banks is high. Our analysis shows that the Nordic countries' financial stability risks also represent a risk to Finland's economy. A connection exists between the rise in household debt in the other Nordic countries and tail risks in the Finnish economy, i.e. the elevated probability of significant reductions in total output. The risks in the real estate sector have been dampened using macroprudential instruments, but the European Systemic Risk Board's latest assessment suggests this is not yet sufficient.



Rise in residential property prices increases housing market risks

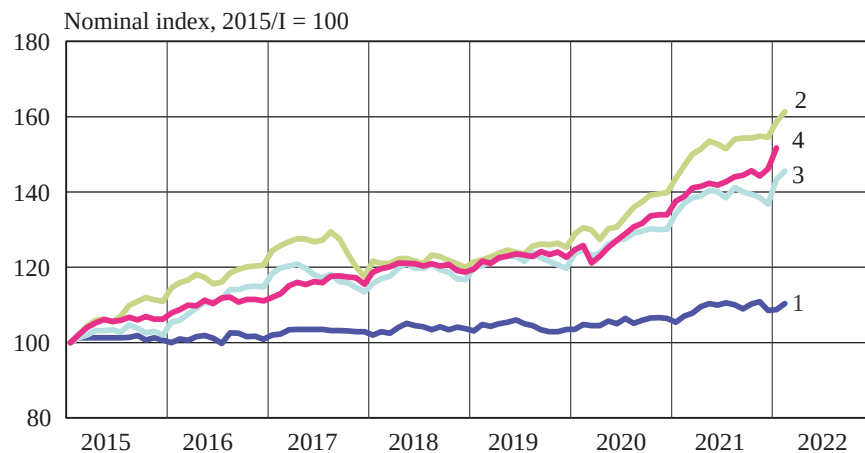
Residential property prices have been rising in the other Nordic countries for a number of years (Chart 1). The rise in prices has been especially marked during the COVID-19 pandemic: residential property prices have risen in nominal terms in Sweden, Norway and Denmark by more than 20% since the start of 2020. In Finland, the corresponding rise has been about 7%. The gap between Finland and the other Nordic countries is

attributable in part to the differences in regional price trends. According to a recent Statistics Finland [report](#), Finland is the only Nordic country with regions where residential property prices have been falling for some time. This has contributed to the fairly level price trend for the country as a whole.

Chart 25.

Residential property prices have risen during the pandemic – especially in Sweden

1. Finland
2. Sweden
3. Norway
4. Denmark



Finland: old dwellings in housing companies. Sweden, Denmark and Norway: all dwellings.

Sources: Statistics Finland, Valueguard, Statistics Denmark, Eiendom Norge, Macrobond and calculations by the Bank of Finland.

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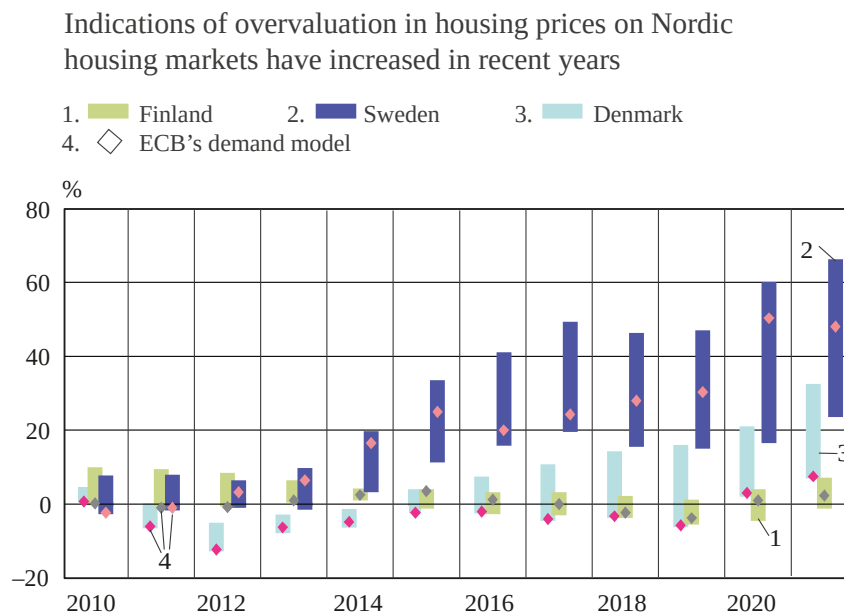
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Based on an analysis by the European Central Bank (ECB), there are signs of overvaluation in Sweden's residential property prices. The conclusion reached using a number of valuation methods is that the rapid price rise in Sweden cannot be explained on the basis of conventional demand or supply factors. The overvaluation measures produced with these methods are illustrated in Chart 2.^[1] The overvaluation in Sweden is significant at a European level and has grown during the 2010s. The ECB's analysis shows that residential property prices in both Finland and Denmark are in line with the general trend in the economy, although in Denmark some indicators have shown signs of

1. There are four different valuation methods. One of them is demand-based, focusing on the divergence between property prices and household income. Two deal with residential properties as investments and seek to assess whether the return on housing capital is justified in the light of interest rates and the return on other forms of capital. The fourth, an ECB demand model marked separately in the Chart, looks at the price level, taking into account not only factors that affect demand but also supply-side factors that are assumed to be fixed in the short term. The model's estimation uses information from the earlier research literature on the effects of demand and supply factors on residential property prices. See the ECB's Financial Stability Review [June 2011](#) and [November 2015](#).

upward movement in recent years. The increase in newly started construction projects might ease the upward pressure on residential property prices in Sweden in the medium term.

Chart 26.



The bar heights illustrate the largest and smallest estimates obtained with the different methods. The Chart includes estimates for Finland and Sweden up to September 2021; the latest estimate for Denmark is June 2021.
Source: European Central Bank.

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The housing market has often been a driver of economic crises. For example, the global financial crisis in 2008 began on the US housing market. These crises have typically been preceded by a period of rapidly rising residential property prices, when household indebtedness has grown due to housing purchases being financed with considerable leverage. If the rise in residential property prices proves unsustainable, a rapid plunge in prices can follow. A drop in asset values could then lead to a contraction in consumer demand especially by heavily indebted households, which could trigger or worsen an economic recession.

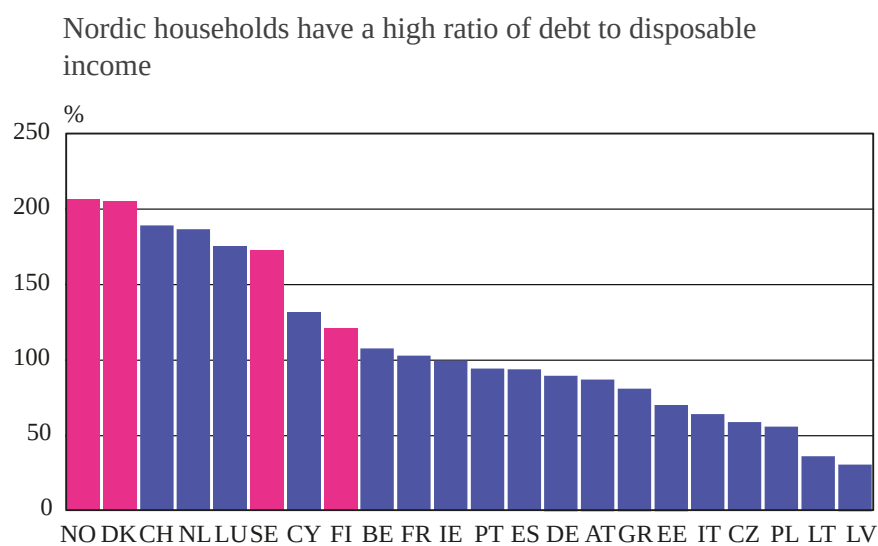
The European Systemic Risk Board (ESRB) has drawn attention to the risks in the Nordic housing markets. The ESRB has issued Finland, Sweden and Denmark both warnings on vulnerabilities and recommendations on particular measures to be taken. The measures taken by these countries to curb the risks from their housing markets have been assessed in the ESRB's latest [report](#) published in 2022, which found the measures to be insufficient in part. Norway has previously received only a warning; the measures it has taken have been considered sufficient for the time being.

Nordic households have high debt-to-income ratios

The pandemic-related economic crisis has been exceptional in regard to residential property prices, as these have risen extensively around the world during the time of the pandemic. This has been due in part to investment in housing as a result of people increasingly working at home, and spending that might otherwise have been made on travel has instead been channelled into housing. In an environment of low interest rates, the good availability of housing finance may have boosted the demand for residential property, and thus property prices as well. The investment in housing and the low cost of housing finance have then together contributed to a rise in residential property prices and growth in household debt.

Owner-occupied housing forms a major share of household assets, and for some households housing loans are remarkably large in relation to disposable income. The high indebtedness of households constitutes a significant vulnerability for financial stability in the Nordic countries. In comparing household debt against annual disposable income, the Nordic countries rank among the highest in Europe (Chart 3). The high level of household debt could lead to problems if interest rates were to rise. Consumer demand would then suffer, causing GDP growth to falter. In the worst case, some households could have difficulty repaying loan instalments if, for example, unemployment were to grow or temporary layoffs increase.

Chart 27.



For each country the latest observation is given (31 Dec 2020, 30 Sep 2021 or 31 Dec 2021).

Sources: European Central Bank and Eurostat.

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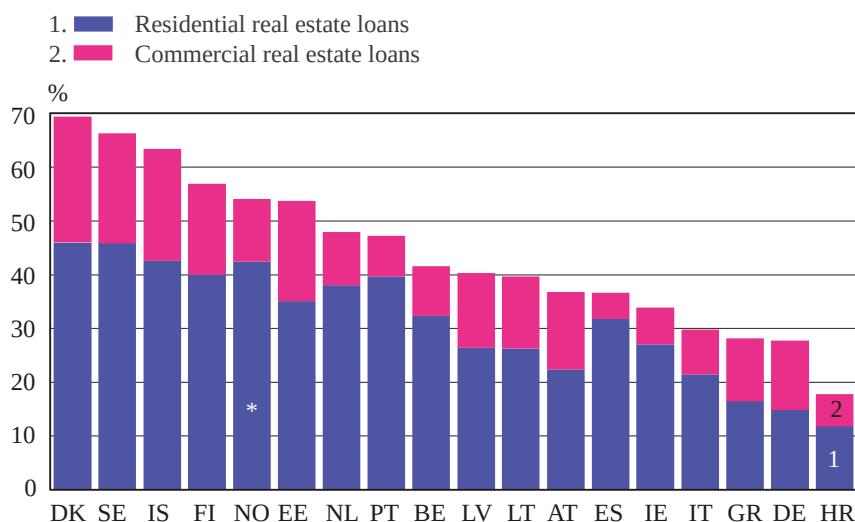
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Nordic banks' receivables from real estate sector among Europe's highest

The Nordic countries are, by international comparison, particularly exposed to problems affecting the residential and commercial property markets, because their banks have on their books a considerable amount of housing and commercial property loans (Chart 4). In Denmark, lending connected with the property market represented almost 70% of the loan stock of the country's banks at the end of 2021. The corresponding figures for Sweden, Finland and Norway were 66%, 57% and 54%, respectively. In many of the larger euro area countries, the share is below one third.

Chart 28.

Nordic banks have considerable exposures to the real estate sector



*Norway's data 31 March 2021.

**Other countries 31 December 2021.

Source: European Banking Authority.

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A significant proportion of the credit risks of Nordic banks is related to lending collateralized by property. The commercial property sector is traditionally cyclically sensitive and can produce loan losses for banks in a recession. However, the Nordic banks' loan losses on housing loans have traditionally been small. Loan losses have also remained low during the pandemic in part because of the various support measures, such as payment holidays. While the payment holidays have largely ended already, the proportion of non-performing housing and commercial property loans in the Nordic countries is still below the European average.

Nordic banks finance a significant portion of their activities by issuing residential mortgage-backed covered bonds. The efficient functioning of the covered bond market is

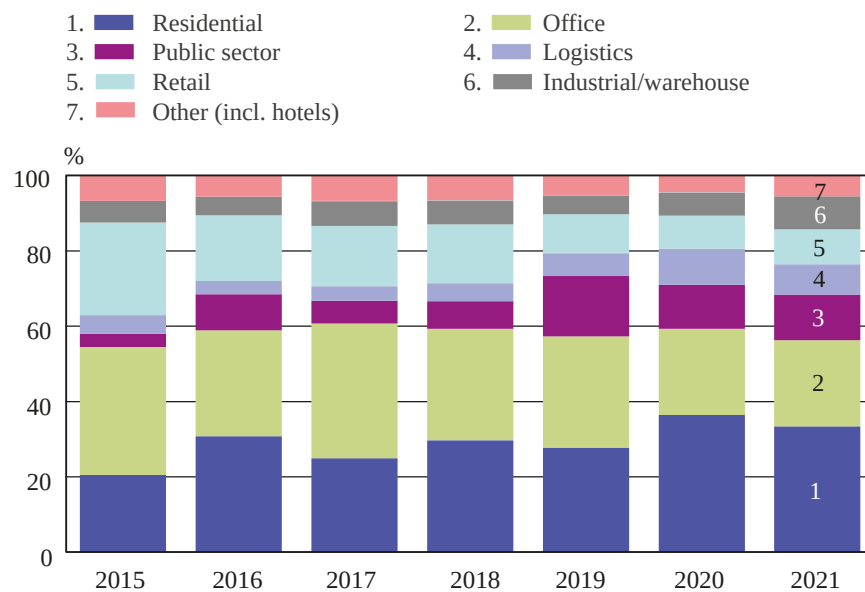
vital for the banks' funding, and the quality of the real estate loan stock is very important for the availability and pricing of that funding. The covered bond market has functioned well also during the pandemic, with the exception of a short time in spring 2020. The market has also remained undisrupted since the start of Russia's invasion of Ukraine.

Residential property plays a major role in the real estate investment market

Professional real estate investors include pension insurers, insurance companies, real estate investment firms, and funds. They invest in a diverse array of real estate, such as residential property, office buildings, shopping centres, care homes and logistics facilities. The broader real estate investment market in the Nordic countries is closely linked to the housing market, as residential property has in recent years been the biggest individual sector in real estate investment (Chart 5). Residential property has provided investors with comparatively stable returns, especially during the pandemic, when restaurant and hotel properties, for example, have been granted rent relief.

Chart 29.

Residential property is the largest sector in the Nordic real estate investment markets



Source: Pangea/Mrec.

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Residential property's share of new real estate investment varies quite substantially by country, from Norway's figure of just under 15% to almost 60% in Denmark. Office and retail property has in recent years accounted for a declining share of real estate investment, while the opposite is the case for industrial, warehousing and public sector

property. These changes reflect longer term trends on the real estate market, with the spread of home working and online purchasing, and the growing need for properties in the care sector, for instance.

The strong significance of residential property on the real estate investment market also contributes to the rise in residential property prices. During the pandemic, residential property prices have risen by more than household indebtedness. This is attributable in part to the demand from professional real estate investors.

Nordic households' indebtedness reflected in Finnish economy's vulnerabilities

Macroprudential policy is used to ensure that banks have sufficient equity and loss-absorbing capacity during economic downturns. Macroprudential regulation is used to prepare not only for the most likely path taken by the economy but, above all, for the more improbable and particularly detrimental scenarios. In analysing these so-called tail risks for the economy, the quantile regression method has proven a very useful tool.^[2]

'Tail risk' refers to a drop in gross domestic product (GDP) which could be triggered by an improbable economic crisis. There are various definitions of 'improbable', but in this analysis it refers to a probability of 5% that a downturn would occur. Using the quantile regression method it is possible to estimate the extent to which GDP growth would weaken at each point in time if the tail risk were to materialise. The scale of the crisis is not constant, but depends on the prevailing state of the economy. Macroprudential policy is used to reduce the magnitude of the tail risk without affecting the most likely favourable path of GDP growth.

From previous studies it is known that a rapid accumulation of household debt foreshadows the emergence of an economic crisis as well as a bank crisis, which would deepen and prolong the downturn already under way. Therefore, it is no surprise that there is a solid statistical link between the pace of indebtedness and tail risks to the economy.^{[3],[4]}

There are also financial stability risks associated with a sudden collapse in the overvaluation of residential property prices. A rapid shrinkage in residential property assets would become visible directly in the capital adequacy of banks and would reduce private consumption. A tightening of financing conditions would then also become evident both in investment and in purchases of durable consumer goods.

Vulnerabilities in the economy typically grow gradually over a long period of time. A number of studies have noted that the pace of household debt accumulation is the best predictor of the onset of a crisis a few years later.^[5] Hence, it is interesting in regard to

2. This method was originally used for studying tail risks in the real economy by Adrian, Boyarchenko and Giannone (2019). The method's advantages have been detailed in a [blog post](#).

3. Schularick and Taylor (2012) present a robust statistical case using statistical data on economic crises covering a long period and a number of countries.

4. Nyholm and Voutilainen (2021) find a statistical connection between household indebtedness and tail risks using Finnish data. There is more on this in a Bank of Finland Bulletin [blog post](#) (in Finnish).

tail risks to try and estimate how risks will develop, say, three years ahead, because predictive variables will have the greatest explanatory power over this kind of timescale.

Finland's economy is strongly connected with the other Nordic countries.^[6] On the financial markets, this is evident in the banking sector's interconnectedness, and in the real economy it is apparent in the foreign trade figures. Risks present in these neighbouring countries are also risks for Finland.

Negative shocks may be transmitted across borders through various channels, and the more closely the economies are interconnected, the easier the transmission. The materialisation of risks and a reduction in both consumption and investment in Finland's Nordic neighbours will directly affect Finland's export income.

The cross-border activities of Nordic banks also represent a channel for the transmission of these shocks. The capital adequacy of banks might weaken as a result of credit losses originating from one country or the realisation of market risk. Solvency is measured at the group level, and thus financing conditions would be tightened in all the countries in which the bank has operations. Furthermore, the credit risk on loans granted abroad by Finnish banks might be realised as GDP growth slows in the countries in question, which would also tighten financing conditions.

The impact of the economies of Finland's Nordic neighbours on its tail risks is illustrated in Chart 6. The Chart makes use of the quantile regression method referred to above.^[7] The analysis indicates that Nordic risk factors clearly increase the tail risks for the Finnish real economy. Tail risks indicating a deteriorating trend are shown in the Chart on the lower part of the shaded area. The lower edge of shaded area 2 depicts the magnitude of the tail risks explained only by domestic factors. The lower edge of shaded area 1 depicts the tail risks in their entirety when the neighbouring Nordic economies are also taken into account.

Two conclusions can be drawn from the Chart. Firstly, the tail risks were considerable prior to the global financial crisis and the COVID-19 crisis. The shock caused by the global financial crisis in particular was somewhat more severe than could have been expected on the basis of the model, but the preceding rapid rise in household indebtedness added to the magnitude of the tail risks and probably exacerbated the recession. Even if the shock had been smaller, the conditions for a major drop in GDP were in place.

Secondly, the impact of external variables on downside risks is significant. Although

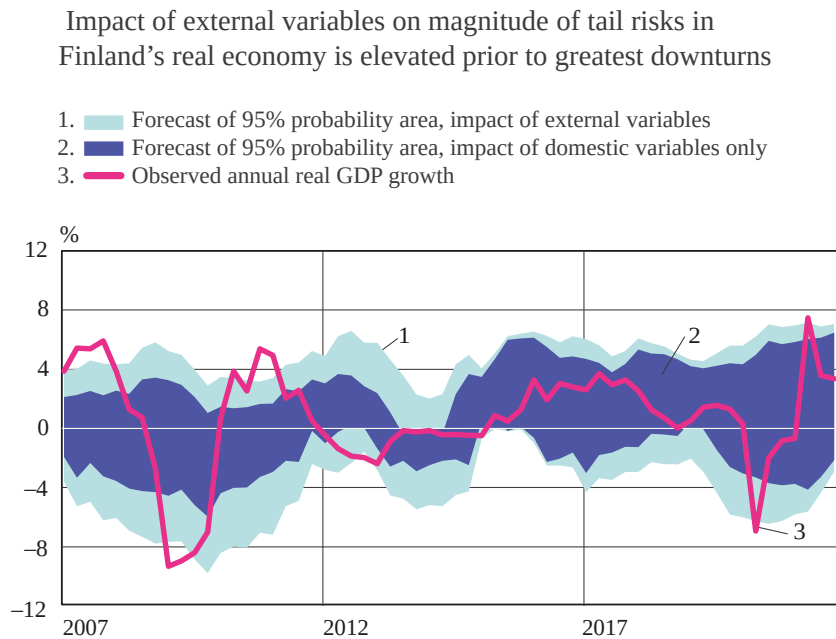
5. Lloyd, Manuel and Panchev (2021), Schularick and Taylor (2012).

6. The interconnectedness of the Nordic economies has previously been studied in, for example, a [Bank of Finland Bulletin analysis](#).

7. The analysis is based on a method presented in Lloyd, Manuel and Panchev (2021) that focuses on the extent to which the economic health of UK trading partners affects the UK's tail risks. What is presented here is based on an adaptation of the same method for the Finnish, Swedish, Norwegian and Danish data. The magnitude of the tail risks is explained by growth in household debt and residential property prices, but also by stock market volatility and set of control variables on the real economy, such as GDP growth, inflation and interest rates. In the analysis, the weighting attached to external variables in explaining a country's risks depends on how large the export weighting is between the two countries in question.

these variables do often develop in the same direction as domestic risks, their impact on the magnitude of Finland's tail risks was at its greatest in 2008 and 2020, in particular. The rapid rise in indebtedness among households abroad is a key factor escalating tail risks in Finland. Sweden is of great significance for Finland's economy, which is why Sweden's risks are particularly prone to being transmitted to the Finnish economy.

Chart 30.



Source: Calculations by the Bank of Finland.

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Real estate market risks increase the capital requirements of Nordic banks

The Nordic countries have introduced macroprudential instruments to help curb the risks arising from real estate loans and household indebtedness. Macroprudential instruments connected to the real estate market include not only risk weight floors of property-specific loans and instruments that directly concern lending for housing purchases, but also the countercyclical capital buffer pertaining to banks, intended for controlling cyclical systemic risks.

The countercyclical capital buffer is intended especially to curb systemic risks arising from overheating in the financial cycle. Signs of overheating are considered to include an exceptionally rapid rise in lending and in residential property prices.

Sweden, Norway and Denmark had already set a countercyclical capital buffer for banks before the pandemic. Prior to the pandemic, the buffer was 2.5% in Sweden and in Norway, and 1% in Denmark. Denmark had also announced pre-pandemic increases in

the buffer to 2%. Following the outbreak of the pandemic, the buffer was lowered in Sweden and in Denmark to 0% and in Norway to 1%. Now all three countries have again announced increases in the buffer as they move from the exceptional conditions of the pandemic towards normal circumstances.

Following lessons learned in the pandemic, Sweden has adjusted its strategy on the use of the countercyclical capital buffer, adopting a 2% positive neutral level even for normal circumstances, when there are not necessarily any signs of an increase in risks. This allows better protection against unexpected shocks to the financial system – even those that do not originate from the banking sector itself.

Sweden and Norway have introduced risk weight floors for residential and commercial property loans, to be used in banks' capital adequacy calculations. The risk weight floor can be used to set a lower limit on the risk weights of certain loans. The higher a loan's risk weight, the more equity a bank must have in order to cover the loan's credit risk. Since credit losses associated with housing loans have historically been low, they have very low risk weights.^[8]

All the Nordic countries use macroprudential instruments targeted at residential mortgage borrowers. These instruments include the maximum loan-to-value ratio (LTV ratio). The LTV ratio determines how large a housing loan can be obtained by a borrower in relation to the value of the property. The toolkit of macroprudential instruments targeted at residential mortgage borrowers is nevertheless more varied in the other Nordic countries than in Finland. Norway operates a debt-to-income cap, which can be used to restrict the total amount of a household's debt in relation to its gross income. In addition, Sweden and Norway have a housing loan amortisation requirement. In both countries, the amortisation requirement concerns households whose housing loans are large in relation to the value of the property.

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8. Finland did use a risk weight floor for housing loans in 2018–2020, but it discontinued this at the start of 2021 for various reasons, one of which was that Finnish banks' average risk weights for housing loans exceeded the floor level. Housing market risks in Finland have affected banks' structural additional capital requirements, such as the systemic risk buffer. This buffer was lowered to 0% after the start of the pandemic.

Tags

household indebtedness, real estate market, macroprudential policy

Financial sector also facing new kinds of threats

Today – Bank of Finland Bulletin 1/2022 – Financial stability



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Payment systems are part of the key infrastructure for Finland's national preparedness. The financial sector is part of the chain of national preparedness that must not be allowed to break even during an emergency. National contingency planning for payments is therefore necessary in order to create effective backstops for exceptional situations of different kinds. Sufficient contingency planning will help ensure that confidence is retained even during disruptive situations.



Foresight and training are essential in contingency planning

Banks and other payment service providers switched to using pan-European payment infrastructures in the early 2000s. The efficiency benefits of these arrangements are undisputed, and the use of these systems in global interaction is often essential. Some of the processes of individual banks have also been transferred to operating units located abroad or to foreign subcontractors. Long-term disruptions to these processes would have a considerable impact on the functioning of payment traffic and securities business in Finland.

The financial sector and other critical sectors regularly practice^[1] preparations for

dealing with disruptions and incidents of various kinds. Through these exercises, participants gain necessary information on the strengths and weaknesses of the sector and their own organisation. These exercises provide an overview of how the materialisation of current threats would affect the sector, and also provide an opportunity to develop resilience in the sector. Training is not enough in itself, however, as decisions taken in conjunction with it must also be put into practice within the sector and at the level of individual market operators.

In the financial sector training, it has long been recognised that there are vulnerabilities in Finland's payment infrastructure. Although Finnish market operators have invested in incident management and, among other things, in improved prevention of cyber threats, contingency planning for the sector as a whole is inadequate.

Growing range of threats

Damage to the communications cables connecting Finland with the rest of Europe, and the consequent loss of connections to systems and services located beyond Finnish borders, has traditionally been seen as the biggest threat to the financial sector.

Individual cyber attacks are commonplace. Short-duration DoS (denial of service) attacks, phishing attempts and malicious hacking have been widely covered in the media. They have not so far had any major impact on critical functions in Finland. However, cybercrime perpetrators are no longer just individuals and amateurs but now include organisations and government actors. Such entities have at their disposal top-class expertise and considerable resources. The motives behind their actions have traditionally been financial gain, causing harm and thrill-seeking. Cyber attacks may also be conducted as part of hybrid interference. To guard against cyber attacks and other continuity disruptions, it is vital to consider what to do in the event that protective arrangements fail, and how to revert to normal once the situation has passed.

Even where an individual market operator is able to protect itself effectively from cyber risks, the sector as a whole may have serious shortcomings. Many firms have outsourced part of their activities. Outsourcing may have allowed them to improve efficiency and to share with others the costs of investing in new technologies. The use of cloud computing services, for example, has become more widespread in recent years in all sectors. However, outsourcing can be difficult to manage if the outsourcing chains are long and the view of the big picture is blurred.

Critical sectors' interdependency risks as technology advances

Different sectors are networked with each other, and so a vulnerability in one sector can lead to vulnerabilities across a whole chain or even to wider problems. As an example, problems in power generation or in communications will have an extensive impact on society, including the financial sector. Problems in the financial sector could then be reflected in e.g. retail payments. Recognising interdependencies and making contingency

1. E.g. the FATO21 and TIETO22 exercises.

plans for each chain is especially important, because the whole is only as strong as its weakest component.

We have become increasingly dependent on the reliable functioning of communications networks. Maintaining access to databanks has also become critical. Disruptions in communications networks will have an impact on other sectors. It is not enough merely to duplicate operational systems as a way of planning for contingencies. Instead, there has to be a clear plan for ensuring that communications networks and databanks are still available during disruptions.

Our globally networked world is making increasing use of technologies. This should be done efficiently and securely. These developments are, for the most part, positive, and they have allowed us to be part of a global picture, but at the same time our scope for influencing matters at national level has diminished.

How do we pay in emergency situations?

Payment is one of the essential functions in society. It is vital that salaries, pensions and benefits can be paid, and that people can buy essentials for living, such as food, medicine and power. The systems used for payment must be secure, reliable and efficient. If the use of these systems is prevented for some reason, payments that are essential for the functioning of society must be managed in some other way.

A target level which is suitable and sufficient must be set for this in contingency planning. Not all services used in normal conditions are necessary in prolonged disruptions or emergencies. Instead, preparedness must focus on essential needs, which is also important from a cost-effectiveness viewpoint.

The operation of financial markets is based on confidence. A disruption to payments or to the transmission of payments could cause a loss of confidence in the banking system, especially if the disruption is prolonged. Sufficient contingency planning will help ensure that confidence is retained even during disruptive situations.

Tags

[settlement systems](#), [financial sector](#), [preparedness](#), [threats](#), [payment systems](#)

Large structural risks require banks to hold buffers for a rainy day

Today – Bank of Finland Bulletin 1/2022 – Financial stability



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The Finnish banking sector's key vulnerabilities are structural and linked to the Nordic housing market. The result of the Bank of Finland's and Financial Supervisory Authority's (FIN-FSA) joint stress testing exercise indicate that the Finnish banking sector is resilient enough to withstand a severe economic and financial crisis on the Nordic housing market. In the stress test, the Common Equity Tier 1 (CET1) capital ratio for the banking sector weakens by 1.4–4.7 percentage points, but still remains above minimum capital requirements. The major losses incurred by the banks would stem from an increase in credit risks, whereas market risks have a clearly minor importance for banks' capital adequacy.



Macprudential vulnerabilities in the Finnish financial system are structural in nature

The key vulnerabilities of the Finnish financial system have long been assessed to be of a structural,^[1] thus reflecting the structure of the banking sector, such as the banks'

1. If materialised, the structural risks would constitute a threat to the functioning of the entire banking sector.

methods of funding and the quality of assets. The Finnish banking sector is concentrated and large relative to the size of the economy. The structural vulnerability of the Finnish banking sector is also reflected in the large share of funding raised on the financial market and via mortgage-backed loans. This funding structure exposes banks to potential disruptions on the international financial markets. Another key structural factor of the Finnish banking sector is the sector's interconnectedness with banks in other Nordic countries. Due to the links between Nordic financial systems and economies, the Finnish financial system is vulnerable to any problems that emerge in Nordic banks and the Nordic financial sector (see [Nordic housing market risks can affect Finland's economy](#)).

Nordic banks are exposed to both real estate and housing market risks.^[2] Housing loans are important for the banks' business: they account for a large share of bank lending and play a key role in their own funding. Housing market risks are elevated in all Nordic countries. The European Systemic Risk Board (ESRB), among others, has issued warnings and recommendations to Finland, Sweden and Denmark for the introduction of measures to contain the risks.^[3] The risks are attributable, among other things, to the high level of household indebtedness and vulnerabilities related to the overvaluation of house prices. The ESRB assessed that the risk-mitigating measures adopted by Finland, Sweden and Denmark are still partly insufficient.^[4]

Financial intermediation is a precondition for a well-functioning economy, with the banking sector playing a central role as financial intermediary. The importance of effective financial intermediation is heightened in times of economic disruption and downturn. This is why the banking sector's risk-bearing capacity and ability to function in a very severe situation of financial market stress should also be assessed. The present framework is here applied to carry out a joint Bank of Finland and FIN-FSA stress test to assess banks' loss-absorbing capacity against a scenario where the Nordic countries are facing a three-year-long, very severe financial and economic crisis, which also has major repercussions for the housing market.

Scenario to test Finnish banks' resilience to materialisation of housing market risks in Nordic countries

The stress test comprises three stages (Chart 1). First, a scenario is designed to illustrate the sequence of events in the event of the materialisation of risks. The scenario is not an economic forecast, but rather designed to reflect an unlikely but plausible situation

2. See [Nordic financial sector vulnerable to housing market risks – Bank of Finland Bulletin \(bofbulletin.fi\)](#) Risks on the Swedish housing market also a cause for concern in other Nordic countries – Bank of Finland Bulletin (bofbulletin.fi) <https://www.bofbulletin.fi/en/2021/1/nordic-housing-market-showing-strength-but-not-without-risks/>.

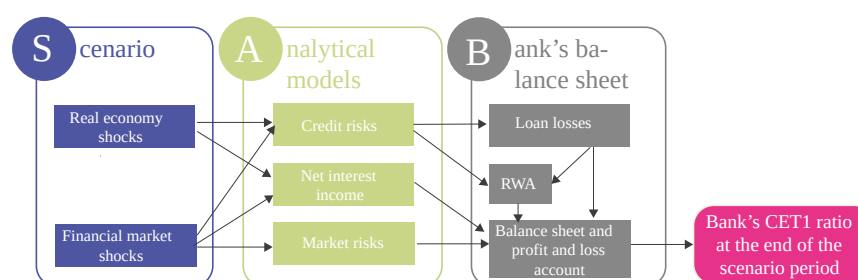
3. According to the report of the European Systemic Risk Board (ESRB) published in 2022, the measures of these countries are still partly insufficient. Norway was also issued a warning earlier, but the country's measures were later assessed to be sufficient. See [Vulnerabilities in the residential real estate sectors of the EEA countries \(europa.eu\)](#).

4. See [Housing market risks have increased in Europe – Euro & talous](#) (in Finnish).

where systemic risks materialise, thus undermining the functioning of the entire financial system, with major repercussions for the banks' operating environment. In the second stage, the impact of the scenario on the banking sector's risks (credit risk, net interest income and market risk) is assessed. In the final stage, calculations are made of the effect of the materialisation of the risk scenario on banks' results and balance sheets. As an outcome of these stages, the capital adequacy of each bank is ascertained for a situation where the sequence of events foreseen in the stress test scenario materialises.^[5]

Chart 31.

Bank of Finland and FIN-FSA's stress testing method has three stages



Sources: Bank of Finland and Financial Supervisory Authority.

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The stress test scenario starts with a severe disruption to international financial markets, shaking the equity and bond markets and leading to a global economic recession on the back of weakening foreign and domestic demand. In the scenario, a deterioration in the operating environment also causes a significant downward correction of asset prices in Europe. The scenario is proportionally more severe in countries with high housing market risks,^[6] such as the Nordic countries.

The severity of the recession portrayed in the scenario was defined on the basis of the scenario employed in the European Banking Authority's (EBA) stress testing exercise in 2018 (below referred to as EBA2018^[7]). This scenario was chosen as the starting point because the 2018 stress tests focused on housing market risks, which makes the scenario highly appropriate for the purpose of the current stress test.

House price developments were incorporated into this scenario as such from the

5. For closer details on the stress testing framework, see: [New stress-testing framework to assess the capital adequacy of Finnish banks – Bank of Finland Bulletin \(bofbulletin.fi\)](#).

6. The calibration of the scenario captures the vulnerabilities underlying housing market risks, including substantial household indebtedness and overvaluation of house prices. Rapid accumulation of household debt ahead of the cyclical reversal will steepen the impending downturn as households make quick spending cuts in response to the weakening economic outlook. If house prices show signs of overvaluation, prices may plummet at the beginning of the downturn.

7. Ks. <https://www.eba.europa.eu/sites/default/documents/files/documents/10180/2106649/56989522-f7e5-413e-accc-5c39d23fdffa/Adverse%20macroeconomic%20scenario%20for%20the%20EBA%202018%20Stress%20Test.pdf>.

EBA2018 scenario, as was the magnitude of the decline in Swedish GDP. GDP developments for Finland, Denmark and Norway were adjusted downwards to account for the failure of the original scenario to address financial market connections and related channels of crisis contagion between the Nordic countries. In the present stress test scenario, the variables representing recession in Finland, Denmark and Norway, respectively, were calibrated to equal the severity of the recession used in the IMF's most recent FSAP stress tests^[8].

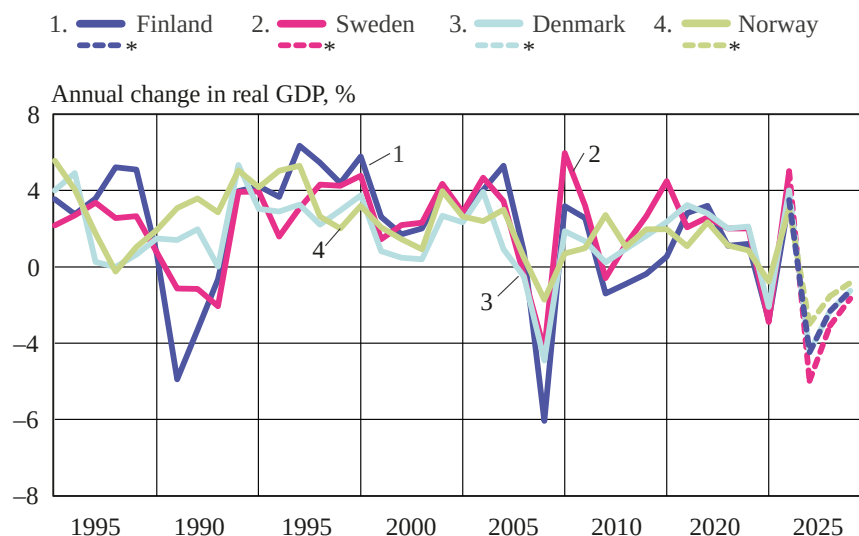
The EBA2018 scenario was also adjusted in some respects by introducing higher shocks in market variables. Risk premia on government bonds and corporate market funding were raised by assuming that the Nordic countries would experience some loss of safe-haven status. The calibration of government bonds was based on the levels of shocks on Nordic government bond yields employed in the IMF's FSAP exercises.

In a recession, Finnish real GDP would drop by 7.9% cumulatively over three years from the end of 2021 (Chart 2). The fall in house prices would be particularly pronounced in Finland's neighbouring countries, where the increase in house prices has been faster than in Finland in recent years. In Finland, too, house prices would decline by a total of 20.5% over the three-year scenario. The correction would be faster in stock markets, with stock prices dropping 28% from the starting point already in the first year. Government bond yields will rise in all Nordic countries if international investors start to question the safe-haven status of the Nordic countries. In Finland, 10-year government bond yields will increase 1.7 percentage points from the starting point.

Chart 32.

8. The IMF conducts a Financial System Stability Assessment in the Nordic countries every five years as part of a comprehensive analysis of each country's financial system and financial stability. ([The most recent assessment of Finland was undertaken in 2016.](#))

Real GDP plummets in a hypothetical stress test scenario



*The dashed lines show the annual change in real GDP in an adverse scenario.

Sources: Eurostat and calculations by the Bank of Finland and the Financial Supervisory Authority.

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Finnish banks' capital adequacy strong enough to withstand a housing market crisis

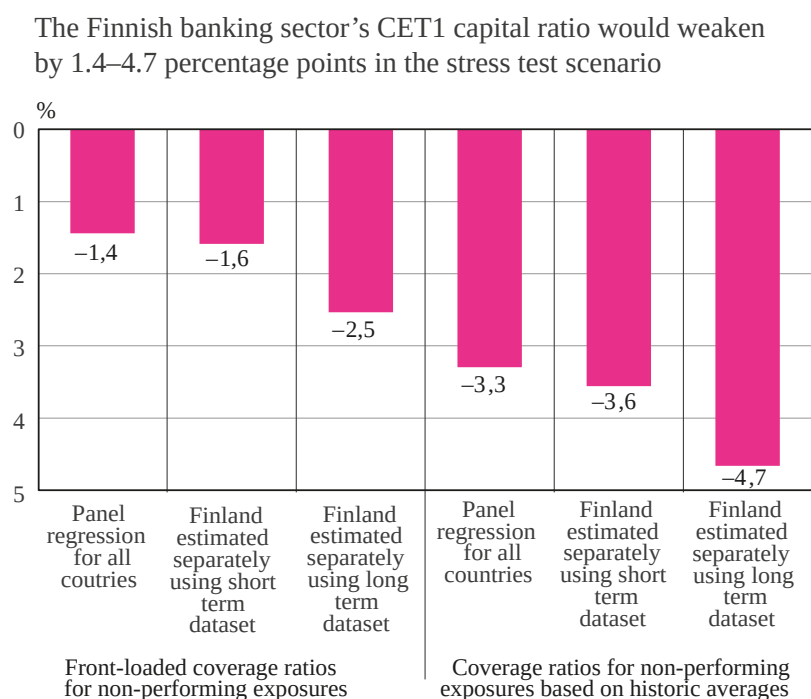
Test results show that Finnish banks' Common Equity Tier 1 (CET1) capital ratio would weaken by around 1.4–4.7 percentage points in an adverse scenario (Chart 3). The stress test results are contingent on certain modelling assumptions related to input data and the length of the reference period^[9], as well as to the assumption of the banks' approach to recognizing an increase in credit risks as loan losses and non-performing assets.^[10]

9. There are three alternative methods for estimating developments in banks' loan losses. The methods differ in respect to whether the correlation between loan losses and other economic variables is assumed to be similar in all Nordic countries (*panel regression model for all countries*) or whether the correlation between the variables is estimated separately for each country (*Finland estimated separately using short-term dataset*). Finnish data may be used for a longer period that also covers observations from the early 1990s (*Finland estimated separately using long-term dataset*).

10. The second modelling choice is related to the assumption regarding banks' approach to recognizing non-performing exposures as loan losses. In the first option, banks are assumed to recognize non-performing exposures as loan losses in the same way as they have done so far on average (*coverage ratios for non-performing exposures based on historic averages*). In the second alternative, banks are assumed to adopt a more front-loaded approach to the recognition of new non-performing exposures as loan losses, i.e. the same approach that banks are required to apply in the recognition of exposures that have been non-performing for a longer period of time (*front-loaded coverage ratios for non-performing exposures*). The choice of approach will have a bearing on the share of exposures recognized as non-performing and the share recognized as loan losses. An increase in non-performing exposures increases the amount of banks' risk-weighted assets via the expansion of credit risks.

There are large differences in the size of decline in capital adequacy depending on the assumptions used. The most severe estimates are obtained from an assessment of the effect of macroeconomic factors on loan losses using a long-term dataset for Finland that also captures the 1990s banking crisis (*Finland estimated separately using long-term dataset*). Similarly, the largest consequences are obtained when assuming that banks continue to write down their losses in the same way as before (*Coverage ratios for non-performing exposures based on historic averages*), instead of shifting to a more front-loaded approach to making write-downs.

Chart 33.



Sources: Calculations by the Financial Supervisory Authority and the Bank of Finland.

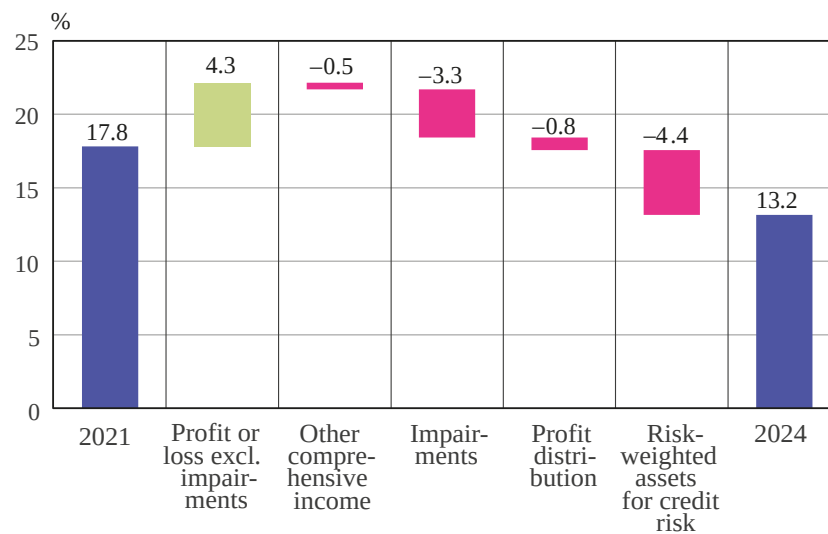
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Chart 4 illustrates the impact of the scenario on individual components of the bank's balance sheet in the most severe scenario, where CET1 drops by a total of 4.7 percentage points, from 17.8% to 13.2%. Most of the decline in capital adequacy is due to an increase in credit risks. The deterioration in the economic situation is reflected in an increase in the number of defaulting households and companies and in banks' loan losses, which account for 3.3 percentage points of the decline in capital adequacy ('impairments' in Chart 4). The risk-weighted assets used for capital adequacy calculation purposes grow in step with the probability of loan losses, which contributes a further 4.4 percentage points to the weakening of capital adequacy ('risk-weighted assets for credit risk' in Chart 4).

Chart 34.

CET1 ratio weakened most by growth in impairments and risk-weighted assets for credit risk



Sources: Calculations by the Financial Supervisory Authority and the Bank of Finland.

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The realisation of market risk, i.e. for example a fall in stock prices or a widening of bond yield spreads, would weigh on banks' results through various channels, but would have a more minor impact on capital adequacy than would credit risk. At the start of the test period, banks are recording profits, but these are somewhat eroded by the drop in trading and investment returns induced by the market shock. The market shock also lowers the values of instruments recognised at fair value directly in equity ('other comprehensive income' in Chart 4), which is assessed to weaken the banking sector's capital adequacy by around 0.4 of a percentage point. Notwithstanding the market shock, banks' profitable results at the beginning of the stress test period offset the adverse shocks by 4.3 percentage points. That said, a deterioration in the economic situation as illustrated in the adverse scenario reduces banks' net interest income and other income, lowering the positive effect of banks' results on capital adequacy. Banks are expected to distribute dividends on their profits as before, which affects capital adequacy adversely by 0.8 of a percentage point.

The stress test shows that the capital adequacy of the Finnish banking sector is strong enough to withstand a very severe disruption in the real economy and financial markets. Irrespective of the stress test assumptions, Finnish banks' capital ratio would not fall below Pillar 1 and 2 CET1 capital requirements. It should, however, be noted that, although stress tests allow for a comprehensive assessment of the impact of the realisation of risks on banks' balance sheets, there are also some constraints in the modelling. The assessment does not, for example, capture the banks' possible response to a weakening of balance sheets by tightening funding conditions, thereby aggravating the economic downturn. The framework also does not measure the impact that problems

experienced by individual systemically important banks would have on capital adequacy and the economy overall.

Tags

[stress tests](#), [systemic risks](#), [macroprudential stability](#), [banks](#)

Macroprudential toolkit should be replenished in Finland and Europe

Today – Bank of Finland Bulletin 1/2022 – Financial stability



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Finland and the EU have now gained almost a decade of experience in macroprudential policy. Banks' risk resilience has been increased, and the supply of credit has been relatively stable even in crisis situations. Disruptions threatening stability may emerge both within and outside the financial system. The macroprudential toolkit should include a higher amount of releasable capital buffers to be used by banks in the event of disruptions. Macroprudential authorities should have more effective and uniform instruments at their disposal to address housing market risks and excessive growth in household indebtedness. The macroprudential toolkit should be further improved both at EU level and in Finland.



Large-scale banking crises and other financial disruptions have repeatedly affected financial systems in different countries and on different continents. The substantial negative economic consequences of these crises have demonstrated the need for forceful measures to prevent crises that threaten financial stability and to mitigate their ramifications. This is why authorities have begun to deploy macroprudential policies to strengthen banks' risk resilience and to contain excessive growth in credit and household indebtedness.

The first common macroprudential instruments were introduced in the EU early in the

last decade.^[1] These included, in particular, additional capital requirements for credit institutions, some of which were based on global standards of the Basel Committee on Banking Supervision (BCBS).^[2] Several EU countries also adopted instruments to contain excessive household borrowing on the mortgage credit market.^[3] An example of these is the maximum upper limit on the loan-to-collateral ratio (loan cap) adopted in Finland, which limits the size of housing loans in relation to collateral.

The benefits of macroprudential policy have so far been reflected in the EU specifically in that macroprudential instruments have successfully raised the banking sector's capital requirements for crisis situations. Banks' risk resilience has been strengthened, on one hand, for cyclical risks and, on the other hand, for situations where the banking system's concentration, risk concentrations and other factors increase the risk of individual problems spilling over and leading to a widespread banking crisis. In addition, more capital is required from banks that are particularly important for the financial system.

The COVID-19 pandemic and Russia's war against Ukraine are unfortunate examples of disruptions that arise unexpectedly outside the economy and the financial system and which countries should be better prepared for with macroprudential policy. Macroprudential requirements should ensure that banks are well capitalised against shocks, while on the other hand enabling capital buffers to be released for use by banks to sustain the provision of credit to the economy in severe crisis situations.

Risks in the residential real estate market and the rising level of household indebtedness have long been considered as key risks to financial stability. However, EU countries lack harmonised macroprudential instruments to tackle these risks more effectively. As in many other countries, household indebtedness has been growing for a long time in Finland, too, but the tools to effectively mitigate the related risks are inadequate.

Work underway to improve the EU macroprudential regulatory framework

The EU macroprudential regulatory framework is reviewed every five years. In autumn 2021, the European Commission launched a consultation on the macroprudential framework. Based on consultation responses and advice from the European Systemic Risk Board (ESRB)^[4], the European Central Bank (ECB)^[5] and the European Banking Authority (EBA)^[6], the Commission is required to review the framework and to submit, by the end of 2022, possible legislative proposals for the modification of the macroprudential regulatory framework applicable to the banking sector.^[7]

1. The EU Credit Institutions Directive and the Capital Requirements Regulation, which entered into force at the beginning of 2014, laid the foundation for macroprudential policy in Europe.

2. See [Basel III standards](#) of the BCBS.

3. For a list of macroprudential measures directed at the residential real estate sector and mortgage lending in the EU, see [A Review of Macroprudential Policy in the EU in 2020](#), Annex 2.

4. See [ESRB Review of the EU Macroprudential Framework for the Banking Sector](#).

5. See [ECB response to the European Commission's call for advice on the review of the EU macroprudential framework](#).

6. See [EBA advice on the review of the macroprudential framework](#).

7. The EU macroprudential regulatory framework is largely based on the Capital Requirements Regulation (CRR)

At the onset of the COVID-19 pandemic, macroprudential authorities and instruments were tested for the first time in a crisis situation. In addition to other extensive measures, macroprudential authorities also supported financial stability and the continuation of credit supply by, for example, relaxing banks' capital requirements. The pandemic revealed in Europe that, in order to prepare for unexpected shocks, to smoothen cyclical fluctuations in credit supply and to improve banking sector resilience against shocks, macroprudential authorities should have the powers to strengthen banks' countercyclical capital buffers in normal times, i.e. well before overheating of the credit market and realisation of external shocks such as the pandemic. This would allow the authorities to relax buffer requirements when credit conditions deteriorate, supporting bank lending in bad times, too.

Mitigating the risks related to housing finance and the residential real estate market was one of the key objectives of macroprudential authorities in many EU countries even before the COVID-19 pandemic. These vulnerabilities have continued to increase in several countries during the pandemic. Many countries have deployed macroprudential instruments affecting the demand-side of credit, known as borrower-based measures, using them to influence the terms of housing and real estate loans. In addition to the maximum loan-to-collateral ratio in use in Finland, borrower-based instruments include limits on the loan applicant's debt-to-income (DTI) ratio or debt-service to income (DSTI) ratio, an amortisation requirement and a maximum maturity for housing loans (see [Instruments preventing the risk of indebtedness are becoming more common in Europe](#)).

The use of borrower-based measures has become more widespread in recent years. However, since these instruments are governed by national legislation, their range and design differ substantially across EU countries. If national macroprudential authorities have limited possibilities to tackle domestic risks because of lacking or complex macroprudential tools, risks and crises originating from the residential real estate market may spread from one country to another through the real economy or the financial markets.

The review of the EU macroprudential regulatory framework provides an opportunity to improve and harmonise the range and usability of macroprudential instruments by ensuring that the national macroprudential authorities of all EU countries have at least some borrower-based tools at their disposal. To take into account country-specific risks and market specificities, the activation and calibration of these tools should be governed by national authorities, as has been the case so far.

In the same vein, the review of the macroprudential regulatory framework provides an opportunity to harmonise, simplify and streamline the use of macroprudential instruments already provided for in EU legislation. Ensuring that the instruments are applied on the basis of sufficiently uniform risk criteria is also important from the

and the Capital Requirements Directive (CRD). These entered into force in 2014 and, besides macroprudential provisions, also contain a wide range of other provisions directed at banks. Since then, the regulatory framework has been specified, and some relaxations were stipulated in summer 2020 on account of the COVID-19 pandemic. The ongoing consultation and possible legislative amendments concern only macroprudential regulation. The CRR and the CRD are also in process of being updated to transpose the Basel III reforms into EU legislation.

perspective of a level playing field (see [Banks' macroprudential buffer requirements are lighter in Finland than in its peers](#)).

Financial sector transformation and digitalisation can increase the importance of new and cross-border lenders operating outside the traditional banking sector. As the provision of financial services is becoming more diversified, we should ensure that economic actors providing similar financial services are regulated in the same way, irrespective of whether the lender is a bank or some other service provider. New global phenomena from climate and other sustainability risks to cyber risks also require serious attention from macroprudential policy.

Need for development of macroprudential policy in Finland

Development of the EU macroprudential regulation also affects the set of macroprudential instruments available in Finland. However, macroprudential tools should also be developed at the national level to the extent that there are shortcomings in EU regulation and risks and vulnerabilities are emerging which could pose a serious threat to the stability of the domestic financial system.

Finland has long paid special attention to the problems caused by excessive household indebtedness and has taken steps to improve the tools for its mitigation. For example, as early as ten years ago, the key conclusion made in the Bank of Finland's financial stability report was that the indebtedness of Finnish households should be held in check by various means.^[8]

The maximum loan-to-collateral ratio introduced in spring 2016 is so far the only binding macroprudential instrument in Finland included in national regulation. It restricts lenders from granting housing loans that are very large in relation to the underlying collateral. Prior to its enforcement, the Financial Supervisory Authority (FIN-FSA) had already issued recommendations on loan-to-value limits and on the assessment of housing-loan applicants' financial margin.

In recent years, the Bank of Finland has analysed and proposed methods to prevent excessive household indebtedness. The Bank participated actively in the work of the Ministry of Finance working group set up to examine means to limit household indebtedness. In its report published in autumn 2019, the working group proposed, among other things, the introduction of a maximum upper limit on the debt-to-income (DTI) ratio (a DTI cap), a maximum maturity for housing loans and a limit on loans granted to housing companies for new-build construction.^[9]

In spring 2020, the Board of the FIN-FSA – the body deciding on macroprudential policy in Finland – took steps to mitigate the economic effects of the COVID-19 pandemic by ensuring banks' sufficient capacity to continue lending under strained conditions. Prior

8. See [Bank of Finland Bulletin 2/2012: Financial stability](#).

9. See the Ministry of Finance working group's [Report on means to prevent excessive household indebtedness](#) (in Finnish with an English abstract).

to the pandemic, no such strengthening of the credit cycle had been observed in Finland as would have required the imposition of a countercyclical capital buffer (CCyB) requirement for cyclical risks. To counter the serious disruption, the FIN-FSA Board had to resort to relaxing structural macroprudential buffer requirements that are primarily designed for preventing the materialisation of long-term systemic risks in the financial system.

One of the lessons learnt from the pandemic in Finland was that the macroprudential authority should, already in good times, be able to set such additional capital requirements for banks that can be eased or removed in full, if necessary, in the event of an unforeseen external shock to the financial system, the effects of which could jeopardise national financial stability or the stability of financial intermediation. It is precisely for this reason that many EU countries have set the CCyB rate above 0% even in situations where the credit cycle has not overheated. This has created macroprudential policy space for unexpected disruptions.

The International Monetary Fund (IMF) assesses the stability of the Finnish financial system and the stance and development needs of macroprudential policy as part of its annual Article IV consultations and the periodic Financial Sector Assessment Programmes (FSAP).

In the most recent assessment published in January 2022, the IMF recommended that Finland restore the structural macroprudential buffer requirements eased at the onset of the pandemic to pre-pandemic levels.^[10] In practice, the IMF staff team recommended the re-introduction of the systemic risk buffer (SyRB) requirement of 1% for the entire credit institutions sector. The IMF staff team also considered that, in order to cover systemic risks arising from mortgage lending, it would be advisable to consider supplementing the requirements with a sectoral SyRB for mortgage lending.

In its country report, the IMF sent a strong message for Finland on the development of macroprudential instruments. It considered that the Finnish macroprudential toolkit should be enhanced with borrower-based measures. As a first-stage measure, the IMF staff team recommended that Finland introduce a debt-to-income (DTI) ratio (DTI cap) limiting the level of household debt in relation to income. Once the positive credit register is operational, Finland should also introduce a stressed debt-service-to-income (DSTI) cap, calculated based on the borrower's monthly income and a higher, 'stressed' interest rate.

In addition, in the medium term, the IMF considered it necessary that Finland build macroprudential policy space by introducing a positive neutral countercyclical buffer requirement, i.e. a CCyB rate that is above zero even during the neutral phase of the credit cycle. The IMF's estimates indicated a positive neutral CCyB rate of 0.5%.

The European Systemic Risk Board (ESRB), which is responsible for macroprudential oversight in the EU, has on several occasions drawn attention to the vulnerabilities related to the Finnish housing loan market and household indebtedness. In November 2016, The ESRB issued a warning to Finland and five other countries on medium-term

10. The IMF's press release, report and statement for Finland can be downloaded [here](#).

vulnerabilities in the residential real estate sector, highlighting in particular the high and increasing level of household indebtedness.

As a follow-up to the warning, in September 2019 the ESRB issued recommendations on measures to address these vulnerabilities.^[11] The key recommendation was that Finland include in its national legal framework, as legally-binding macroprudential instruments, a limit that applies either to the DTI ratio or to the DSTI ratio, and a maturity limit for mortgage loans. The ESRB also recommended that the maximum loan-to-collateral ratio in use in Finland be defined in such a way that only the real estate collateral underlying the mortgage loan could be accepted as eligible collateral when calculating the loan applicant's loan-to-collateral ratio.

Furthermore, the ESRB urged that, even prior to the potential use of the recommended legally binding instruments, Finnish authorities issue recommendations to credit institutions or take other non-legally binding measures to restrain lenders from excessively granting mortgage loans that are too large in relation to borrowers' income or debt servicing capacity.

In February 2022, the ESRB published an assessment of compliance with its recommendations. The ESRB concluded that Finland was 'materially non-compliant' with the recommendation to include the new macroprudential tools in Finnish legislation. It also stated that the recommendations of Finnish authorities should be more precise in order to better curb growth in household indebtedness.

Measures to improve macroprudential policy in Finland

The authorities have moved forward with projects to develop macroprudential instruments in Finland. As discussed above, a Ministry of Finance working group published a report in autumn 2019 proposing a maximum DTI ratio and other instruments to prevent excessive household indebtedness.

In late January 2022, based on the working group's work, the Ministry of Finance published a draft government proposal to be circulated for comment. The main difference compared with the working group's proposal was that the draft government proposal did not include a maximum DTI ratio. In its statement, the Bank of Finland considered that the draft proposal contains a number of justified measures to prevent growth in excessive household indebtedness, but that it is nevertheless deficient in some respects. In particular, the Bank considered the lack of a maximum DTI ratio to be problematic and saw that this specific instrument or some other limit based on the ratio between debt and income would be pivotal in reducing the number of households that are heavily indebted relative to their income and in improving the ability of households to repay their loans with interest.

Since autumn 2020, the body deciding on the use of macroprudential instruments in

11. See [Recommendation of the ESRB on medium-term vulnerabilities in the residential real estate sector in Finland](#).

Finland – the Board of the FIN-FSA – has repeatedly recommended that lenders exercise restraint in granting loans that are large with regard to the loan applicant’s income and have a longer maximum repayment period than usual. With these recommendations, the Board has sought to contain growth in household indebtedness and also to act in line with the ESRB’s recommendation. However, despite the FIN-FSA Board recommendations, the level of indebtedness has continued to increase.

The FIN-FSA Board announced in late 2021 that it would specify its recommendation in the first half of 2022. In its detailed recommendation, the Board will elaborate on, for example, the types of loans lenders should exercise restraint in granting. In the second quarter of 2022, the FIN-FSA Board is also scheduled to decide on the level of structural macroprudential buffers, taking into account the economic and stability situation. In addition, the Board is in the process of updating its macroprudential stability strategy.

Tags

[regulation](#), [financial stability](#), [macroprudential instruments](#), [macroprudential policy](#), [banks](#)

Instruments to prevent risk of indebtedness becoming more common in Europe

Today – Bank of Finland Bulletin 1/2022 – Financial stability



Tuulia Asplund
Senior Economist

Macroprudential instruments and their combinations affecting the demand-side of credit, i.e. borrower-based measures, aim at containing household indebtedness and preventing the build-up of risks on the housing market. Even though the maximum loan-to-value (LTV) ratio (loan cap) is still the most widely used instrument in Europe, income-related macroprudential tools are also rapidly becoming more common. The ongoing review of the EU macroprudential regulatory framework provides an opportunity to improve and harmonise the use of borrower-based macroprudential instruments in Europe.



Macroprudential instruments affecting the demand-side of credit, i.e. borrower-based measures, refer to instruments designed to influence demand for loans and thereby household indebtedness. These restrictions most commonly pertain to housing loans, but other debt items are also increasingly taken into account when they are applied. The purpose of borrower-based measures is to contain household indebtedness and prevent the build-up of risks on the housing market. A maximum upper limit applicable to the loan-to-value (LTV) ratio for housing loans (loan cap) is still the most common macroprudential instrument in Europe, and it is also in use in Finland. In recent years, however, income-related borrower-based instruments have become more common in

Europe.

Macroprudential policy in the EU is largely based on EU legislation that entered into force in 2014 and that has thereafter been specified, and on recommendations based on internationally agreed practices. Borrower-based macroprudential instruments fall within the scope of national legislation. This is why there are considerable cross-country differences in these tools in Europe. Their objectives, definitions, calibration, binding nature and legal basis vary. The European Systemic Risk Board (ESRB) has recommended many countries – including Finland – to expand the set of borrower-based instruments.^[1]

The ongoing review of the EU macroprudential regulatory framework provides an opportunity to harmonise and improve the use of borrower-based measures in Europe (see [Macroprudential toolkit should be replenished in Finland and Europe](#)). Some of the major EU countries and the countries most affected by the financial crisis have adopted macroprudential tools more slowly than EU countries on average. To date, six EU and EEA countries – including Italy, Spain and Germany – have not used borrower-based instruments at all.

The risks associated with the housing market, and the real estate market in general, have long been pivotal to the macroprudential policies of the EU countries.^[2] The financial stability vulnerabilities stemming from the housing market and housing finance have increased further in a number of EU countries. Many countries have taken steps to contain mortgage credit growth by, for example, limiting the size of loan granted to an individual borrower.

The most common borrower-based instrument targeted at mortgage credit is the maximum loan-to-value (LTV) ratio, i.e. the loan cap, which limits the amount of loan relative to the value of the purchased property or collateral. LTV limits are in use in 23 EU and EEA countries, including Finland (see Table). The level of the loan cap typically ranges between 80% and 95%. In many countries, regulation takes into account the intended purpose of the housing. In the case of first-home purchases, the size of the loan may often be larger relative to the value of the purchased property or collateral than in the case of other housing loans. This also pertains to Finland. In some countries, the loan cap is significantly lower for buy-to-let properties than for owner-occupied homes. Of the countries that have adopted borrower-based tools, only Finland, Denmark and Luxembourg have in place just one instrument, namely a maximum LTV ratio.^[3]

Income-related macroprudential instruments are built on the borrower's repayment capacity. They limit, in relation to the borrower's income, the size of the loan granted (loan-to-income ratio, LTI), the borrower's total debts (debt-to-income ratio, DTI), the

1. See [Recommendation of the ESRB on medium-term vulnerabilities in the residential real estate sector in Finland](#).

2. See ESRB's report [Vulnerabilities in the real estate sectors of the EEA countries](#).

3. In Denmark, the banking supervisor has issued other detailed instructions to banks on housing lending. In Finland, the Financial Supervisory Authority requires that the loan applicant's repayment capacity also be tested at a higher interest rate. Luxembourg, in turn, has also introduced a maximum debt service-to-income (DSTI) ratio, but it has not been activated.

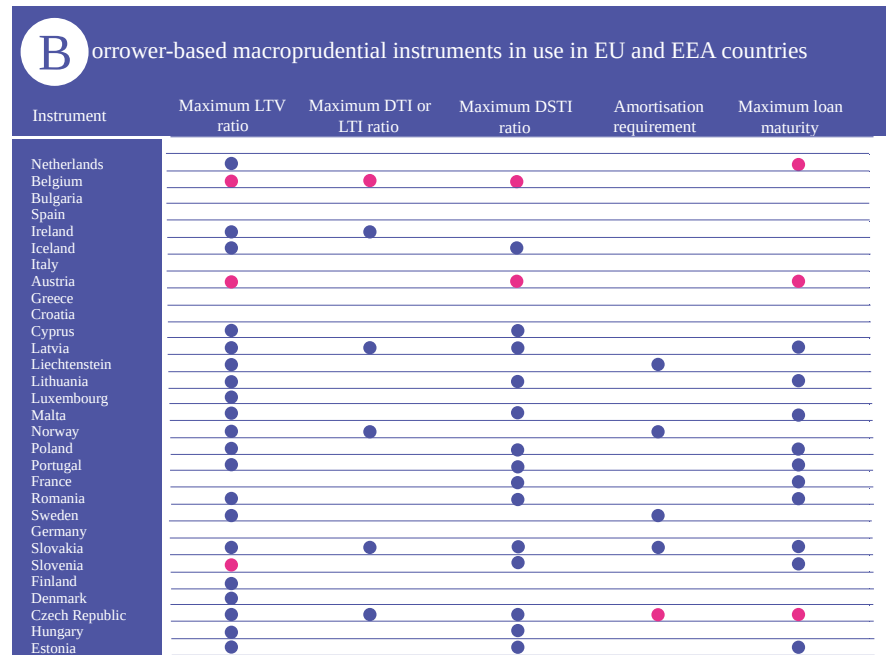
costs of servicing the loan (loan service-to-income ratio, LSTI) or the costs of servicing the borrower's total debts (debt service-to-income ratio, DSTI). Over recent years, limits on DTI or LTI and DSTI ratios have fairly rapidly become more common in Europe, and over half of EU and EEA countries currently have some kind of an income-related instrument in place. In 2018, only one-third of the countries had adopted a binding income-related instrument. Of income-related macroprudential tools, limits on the DSTI ratio are more common in Europe than limits on the DTI or LTI ratio, while some countries have both instruments in place.

Income-related instruments are often part of a macroprudential toolkit that also includes a maximum limit on loan maturity or an amortisation requirement. In such cases, regulation related to loan amortisation or maturity often supports the use of an income-related instrument and prevents the circumvention of regulation through extension of loan maturities. In the Baltic States, for example, the maximum loan maturity aims to support the effectiveness and efficiency of the maximum DSTI requirement. European countries have less experience of the use of the maximum loan maturity as an independent instrument, i.e. without being combined with an income-related instrument. This is planned in Finland.

Table 1.

Macroprudential instruments affecting the demand-side of credit becoming more common in Europe

1. ● Legally binding instrument
2. ● Recommendation or non-legally binding instrument



Sources: A review of Macroprudential Policy in the EU in 2020, ESRB, July 2021; ESRB databases, and notifications by national macroprudential authorities.

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Tags

housing loans, indebtedness, macroprudential instruments, macroprudential policy

Banks' macroprudential buffer requirements lighter in Finland than in its peers

Today – Bank of Finland Bulletin 1/2022 – Financial stability



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Macroeprudential Expert

The primary task of macroprudential buffer requirements is to promote financial stability, but significant cross-country differences in the calibration of the buffers may weaken the level playing field for banks. When comparing the size of macroprudential buffer requirements, account should be taken of the nature of systemic risks covered by the buffers. There are, namely, significant country- and bank-specific differences in the systemic risks underlying the buffer requirements. At present, the structural macroprudential buffer requirements imposed on the Finnish banking sector are lower on average than the buffers in peer countries with similar structural risks.



The primary task of macroprudential buffer requirements (hereinafter ‘macroprudential buffers’) is to promote financial stability. Macroprudential buffers strengthen credit institutions’ loss-absorption capacity, thereby reducing the probability of financial crises and their negative impacts on the real economy and on the operation of the financial system. When setting macroprudential buffers, however, authorities should also assess the potential negative effects of the buffers on the functioning of the internal market. This obligation is based on the EU Capital Requirements Directive (CRD) and national credit institutions legislation. Significant cross-country differences in the calibration of macroprudential buffers may contribute to weakening the level playing field for banks in

the EU, especially if these differences are not explained by differences in country-specific systemic risks.

This article compares the total level, or size, of structural macroprudential buffers of Finnish banks and banks in other European countries. Here, structural macroprudential buffers comprise the systemic risk buffer (SyRB) and the buffers for systemically important credit institutions (G-SIIs/O-SIIs). The SyRB is an additional capital requirement imposed on the basis of the structural characteristics of the financial system, while the G-SII/O-SII buffers are additional capital requirements for global systemically important institutions (G-SIIs) and for other systemically important institutions (O-SIIs).

Comparison covers peer countries with similar structural vulnerabilities to those in Finland

Prior to the COVID-19 pandemic, the macroprudential buffers of Finnish systemically important credit institutions were among the largest in the euro area. When comparing buffer levels between countries and banks, it should be noted that the systemic risks underlying macroprudential buffers differ from one country to another. The need to apply higher-than-average buffer requirements in Finland has been justified in particular by the structural risks of the financial system, which are above average in Finland.

The comparison of systemic risks among EU countries seeks to identify countries whose financial systems are subject to structural vulnerabilities similar to those in Finland.^[1] Structural vulnerabilities are measured by risk indicators capturing (i) the size of the banking sector; (ii) the degree of its concentration; (iii) the extent of cross-border activities; (iv) the concentration and financing structure of banks' credit portfolios; and (v) household indebtedness. The indicators are presented in Table 1. The countries are scored and ranked on the basis of the values of each risk indicator.^[2] The overall score indicating the level of structural risks is calculated as an average of the category-specific scores.

1. Bank-specific countercyclical capital buffer (CCyB) requirements are excluded from the comparison, as the CCyB requirement imposed in a certain country also automatically applies to the exposures of foreign banks in that country. Hence, the bank-specific CCyB requirement is not as strongly dependent on the macroprudential policy of a bank's country of residence as the level of structural buffers is.

2. The risk indicator-specific scores have been scaled between 0 and 100 so that the country with the largest structural vulnerabilities, as indicated by the value of the risk indicator, takes the value 100. Correspondingly, the country with the lowest level of vulnerabilities takes the value 0. Other countries receive a value between 0 and 100 according to their order number, determined based on their risk indicator values.

Table 1. Indicators measuring structural vulnerabilities characteristic of Finland

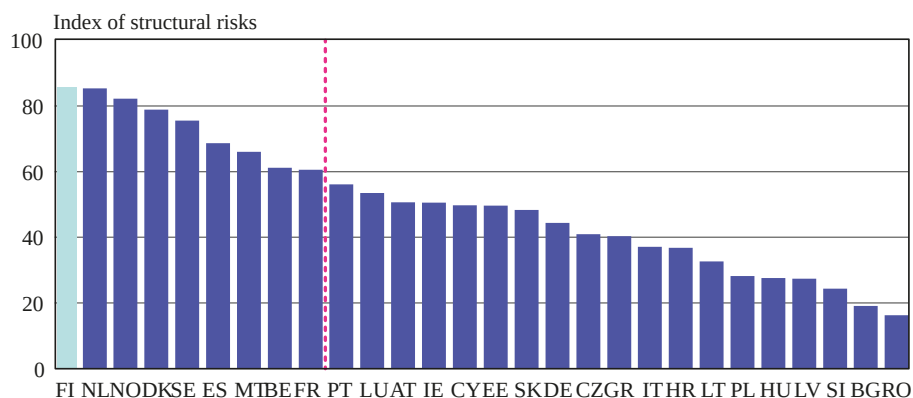
<i>Category</i>	<i>Indicator</i>	<i>Source</i>
<i>Size of the banking sector</i>	<i>Consolidated balance sheet of the banking sector / GDP</i>	<i>ECB, Eurostat, Norges Bank</i>
<i>Concentration of the banking sector</i>	<i>Herfindahl index¹</i>	<i>ECB</i>
	<i>Total market share of five largest banks²</i>	<i>ECB</i>
	<i>Maximum value of individual banks' O-SII scores</i>	<i>EBA</i>
<i>Extent of cross-border activity</i>	<i>Average of the relative shares of cross-border claims and liabilities</i>	<i>ECB</i>
<i>Concentration of the credit portfolio</i>	<i>Herfindahl index calculated over sector- and industry-specific relative shares in credit portfolio</i>	<i>EBA</i>
<i>Dependence on market funding</i>	<i>Loans to households and non-financial corporations as a ratio of deposits by households and non-financial corporations</i>	<i>EBA</i>
<i>Household indebtedness</i>	<i>Ratio of household debt to disposable income</i>	<i>Eurostat</i>

¹Sum of squared relative shares of balance sheet totals.

²Measured by balance sheet total.

Chart 35.

Financial systems of Nordic countries, the Netherlands, Spain, Malta, Belgium and France exposed to structural risks similar to those in Finland



Sources: European Central Bank, EBA, Eurostat, Norges Bank and calculations by Financial Supervisory Authority

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Table 2. Structural risks characteristic of the Finnish financial system in 8 peer countries

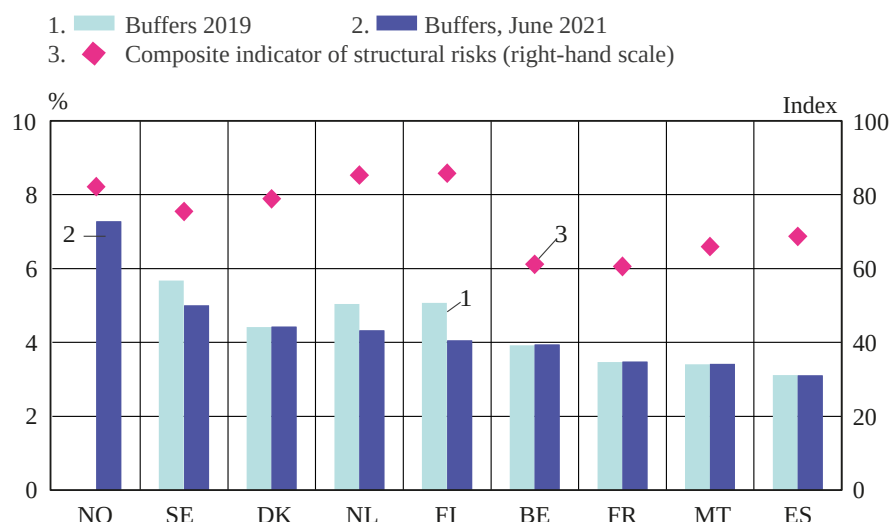
Peer country	Structural risks in the financial system
Netherlands	Household indebtedness, cross-border activity, concentration of credit portfolios, large size and concentration of banking sector, dependence on market funding
Norway	Household indebtedness, dependence on market funding, concentration of banking sector, concentration of credit portfolios
Denmark	Household indebtedness, dependence on market funding, cross-border activity, large size of banking sector
Sweden	Concentration of credit portfolios, dependence on market funding, household indebtedness, cross-border activity
Spain	Cross-border activity, large size of banking sector
Malta	Concentration of credit portfolios, cross-border activity, large size of banking sector
Belgium	Household indebtedness
France	Large size of banking sector, cross-border activity, household indebtedness, dependence on market funding

Among the peer countries, the level of structural systemic risks is closest to Finland in the other Nordic countries and the Netherlands, with the level of these risks being slightly higher for Finland. However, as for the size of the banking sector's structural

macroprudential buffers,^[3] the most recent comparison indicates that the buffers are smaller in Finland than in these countries (Chart 2). Prior to the pandemic, the buffers were closer in size to each other than at present.^[4] In the rest of the peer countries, both the level of structural systemic risks and the size of banks' structural macroprudential buffers were lower than in Finland.

Chart 36.

Structural macroprudential buffers smaller in Finland than in its most relevant peers



Sources: European Central Bank, ESRB, EBA, Finanstilsynet and calculations by Financial Supervisory Authority.

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In Chart, the size of Norway's structural buffers has been assessed based on buffer requirements imposed at the end of 2020. However, the new SyRB requirement of 4.5% for Norwegian credit exposures will not enter into force for some Norwegian banks until the end of 2022. In addition, when calculating the average buffer requirements, it has been assumed that, with the exception of Norwegian banks classified as systemically important, Norwegian banks only have domestic credit exposures. In practice, these assumptions somewhat overestimate the actual average buffer requirements for the Norwegian banking sector.

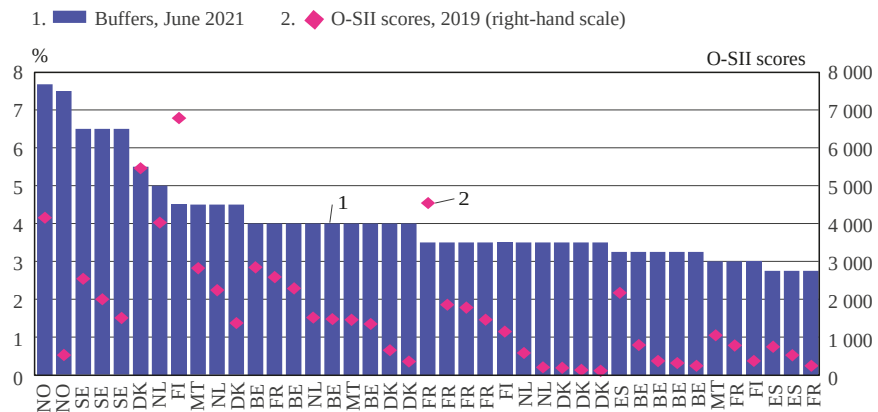
3. In addition to O-SII buffers and the SyRB, structural buffers include in this comparison the capital conservation buffer (CCoB).

4. The pre-pandemic situation is a poor reference point due to both regulatory changes and potential changes in the objectives targeted by a certain buffer composition. Among the countries compared, Finland is the only country where structural buffers have been lowered primarily on account of the pandemic. In Sweden, changes in structural buffers during the pandemic were solely due to amendments to the Capital Requirements Directive CRD IV (with the adoption of CRD V). In the Netherlands, the changes were due to both the pandemic and CRD V. On the other hand, changes in buffer compositions have also been justified by the aim to increase the share of the CCyB in future. For these reasons, it is justified to assume that Sweden and the Netherlands are not intending to raise their structural buffers to their pre-pandemic levels.

In addition to the size of macroprudential buffers applicable in each country, the average country-specific macroprudential buffer requirements are also fundamentally affected by the degree of concentration of the banking sector. Therefore, it is also justified to compare the level of structural macroprudential buffers on a bank-by-bank basis. Measured by O-SII scores, Nordea is systemically the most significant banking group among all the countries compared (Chart 3). Nevertheless, Nordea's structural buffers are smaller than the respective buffers of the largest banking groups in Finland's most relevant peers. In the case of OP Financial Group, in turn, structural buffers are slightly smaller than in the case of Danish, Dutch and Belgian banks of similar size or systemic importance. On the other hand, the OP Financial Group's structural macroprudential buffers are of the same size as those of the Spanish and French banks that are considerably larger than OP and are identified as G-SIIs.

Chart 37.

Nordea's structural macroprudential buffers smaller than those of largest banking groups in Finland's most relevant peers



Sources: ESRB, EBA and calculations by the Financial Supervisory Authority.

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macroprudential buffers, macroprudential policy, banks