Analysis

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

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Helinä Laakkonen, Juho Nyholm, Arttu Kiviniemi, Karlo Kauko

AUTHORS



Helinä Laakkonen
Head of Division



Juho Nyholm
Economist



Arttu Kiviniemi
Head of Division



Karlo Kauko
Adviser

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.



## Macroprudential 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' 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]

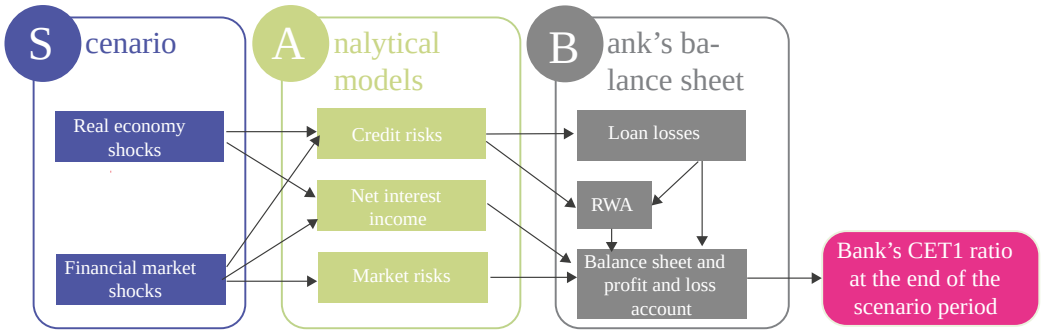
Financial intermediation is a precondition for a well-functioning economy, with the banking sector playing a central role as financial intermediator. The importance of effective financial intermediation is heightened in times of economic disruption and downturn. This is why the banking sector's risk-bearing 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 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 1.

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 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].

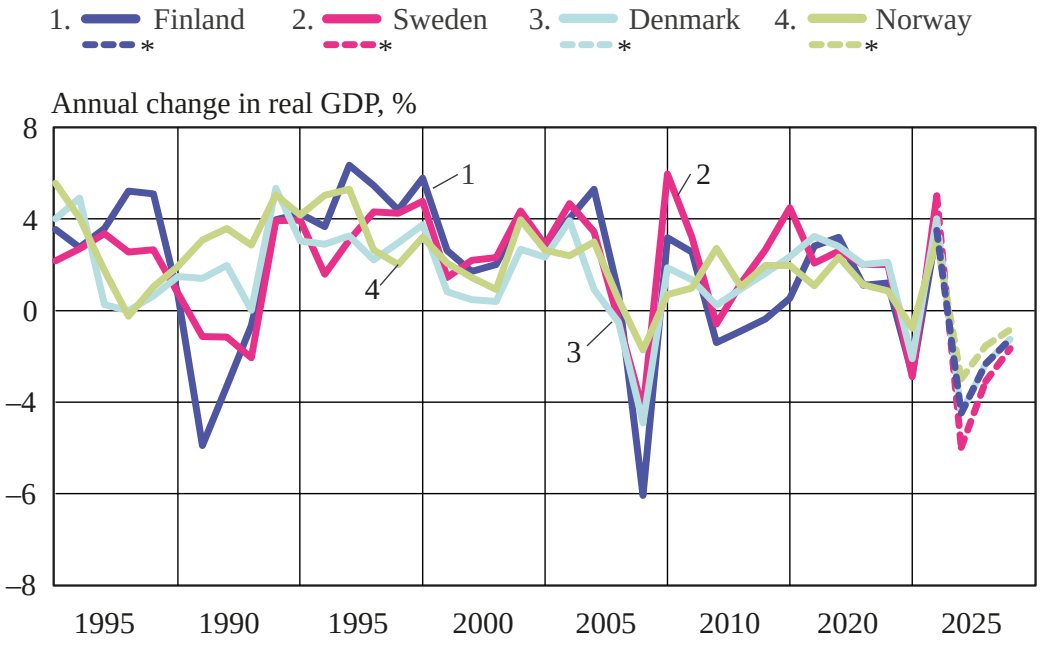
The EBA2018 scenario was also adjusted in some respects by introducing higher shocks in market variables. Risk premia on government bonds and corporate market funding were raised by

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 2.

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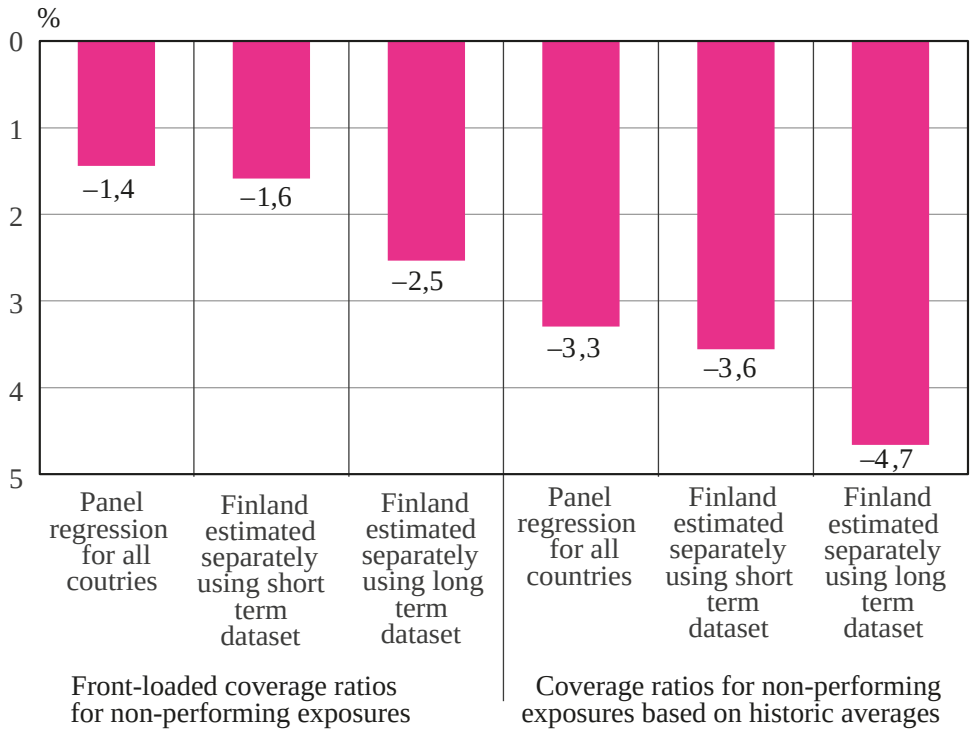
## Finnish banks' capital adequacy strong enough to withstand a housing market crisis

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] 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 3.

The Finnish banking sector's CET1 capital ratio would weaken by 1.4–4.7 percentage points in the stress test scenario




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

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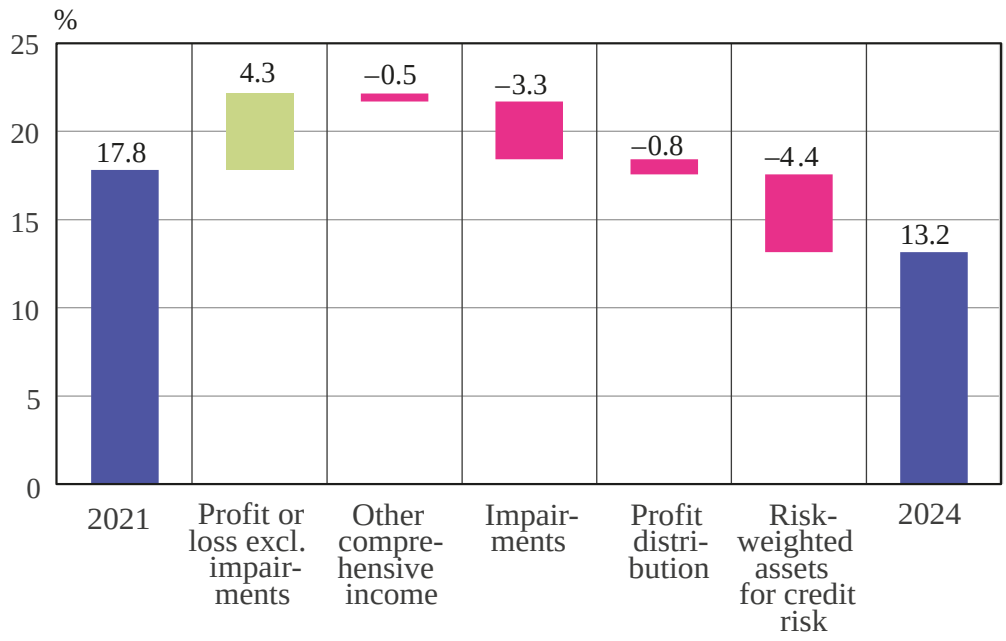
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Chart 4 illustrates the impact of the scenario on individual components of the bank's balance sheet in the most severe scenario, where CET1 drops by a total of 4.7 percentage points, from 17.8% to 13.2%. Most of the decline in capital adequacy is due 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 4.

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.

## Notes

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

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. ↑

## Keywords

banks, macroprudential stability, stress tests, systemic risks