Financial Stability Report 2018:2

The Riksbank's Financial Stability Report

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

The Executive Board of the Riksbank discussed the report on two occasions – on 5 and 19 November 2018. The report takes into account developments up to and including 15 November 2018. The report is available on Sveriges Riksbank's website, www.riksbank.se. It can be downloaded in PDF format. The Financial Stability Report 2018:1, which is also available from the Riksbank's website, includes a glossary.

The Riksbank and financial stability

- The Riksbank has a mandate from the Riksdag (the Swedish parliament) to promote a safe and efficient payment system. Achieving this requires a stable financial system so that payments and the supply of capital function well. In practice, this task means that the Riksbank is responsible for promoting financial stability. The Riksbank defines financial stability as meaning that the financial system is able to maintain its basic functions – the mediation of payments, the conversion of savings into funding and risk management – and is also resilient to shocks that threaten these functions.
- The Riksbank is also the authority with the capacity to give liquidity support to individual institutions if problems arise that threaten financial stability. To be able to do this in the best possible way, the Riksbank needs to be well prepared for crises by having an efficient crisis organisation with good information channels and tools for analysis, as well as well-developed cooperation with other authorities.
- The Riksbank does not have the sole responsibility for promoting financial stability. It shares this responsibility with the Ministry of Finance, Finansinspektionen (FI, the Swedish financial supervisory authority), and the Swedish National Debt Office. The Ministry of Finance is responsible for the regulation of institutions, Finansinspektionen for the supervision of financial institutions and the Swedish National Debt Office for the government's management of banks in crisis. The interaction between the authorities is important both in the preventive work and in the event of crisis management. The same also applies internationally, as financial institutions increasingly operate across national borders.
- The financial system plays an important role in the economy. It is necessary to have a stable and smoothly running financial system for the economy to function and grow. A serious crisis in the financial system is liable to entail extensive economic and social costs.
- The financial system is sensitive. This sensitivity is due to the vulnerability of central parts of the system, such as banks and markets. Banks are vulnerable mainly because they fund their operations at short maturities but lend at longer maturities. This imbalance makes the banks dependent on the general public and the market having confidence in them. If the market agents' confidence in their counterparties or for the financial instruments traded on the market declines, trading may suddenly come to a halt. The various parts of the financial system are also closely interconnected, for instance in that financial institutions borrow from and trade with one another to such a large extent. This means that problems that arise in one institution or market can rapidly spread throughout the system. Contagion effects may also rise in that confidence will fall in general with regard to similar activities.
- The combination of the sensitivity of the financial system and the large potential costs of a financial crisis mean that the state has a particular interest in preventing threats to financial stability. This is because banks and other market agents do not have an incentive to give full consideration to the risks to financial stability to which they are contributing. This is because a part of the costs of a financial crisis fall to others both within and outside the financial system. If a crisis occurs, the government needs to be able to manage it at the lowest possible cost.
- The Riksbank analyses the financial system's stability on a continuous basis for the early detection of changes and vulnerabilities that could lead to a crisis. The main focus of the analysis is on the major banks in Sweden and on the markets and infrastructure that are important for their funding and risk management.
- In some cases the Riksbank recommends specific measures to counteract risks. These recommendations may be based on the current economic situation. But they may also relate to more structural circumstances and stem from current regulatory issues. The recommendations can be aimed at banks as well as at other market agents, legislators and other authorities.

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STABILITY ASSESSMENT SUMMARY AND RECOMMENDATIONS

Increasing risks abroad may affect Sweden's financial stability

Global economic developments continue to be positive. However, there are several risks linked to international developments that could affect financial stability in Sweden. These risks are deemed to be higher than they were in the spring. Among other things, the trade conflict between the United States and China has intensified. There is also uncertainty concerning the economic and financial effects of the United Kingdom's withdrawal from the EU, particularly if the United Kingdom should leave the EU without a withdrawal agreement. At the same time structural problems remain in the euro area, for instance in the banking sector and the problems of weak public finances in several countries, including Italy. Furthermore, rising government bond yields in the United States may lead to increased turbulence in emerging market economies with a weak macroeconomic situation and significant indebtedness in foreign exchange.

High household indebtedness forms the greatest risk

Swedish household debt has been increasing for a long time and households are currently highly indebted, in both a historical and an international perspective. This indebtedness has gone hand-in-hand with strongly rising housing prices. Following a fall that began in autumn last year, prices for housing have stabilised somewhat recently and indebtedness is now increasing at a slower pace, but debt among Swedish households has nonetheless continued to rise faster than their incomes. This development is expected to continue over the coming years.

It is the Riksbank's assessment that the high and growing household indebtedness continues to pose the greatest risk in the Swedish economy. The high indebtedness is due, in part, to a poorly functioning housing market and to the tax system not being well designed from a financial stability perspective. To come to grips with the more fundamental problems associated with household indebtedness, it is, above all, important that measures are taken within housing and tax policy. Examples of feasible measures include reviewing the rent-setting system, the taxation of capital gains from housing property sales and also property tax and tax relief on interest expenditure. To mitigate the risks inherent in household indebtedness, it is also important that all mortgages are subject to thorough credit assessment and that macroprudential policy is designed appropriately.[1]

Problems on the housing market could spread

Housing prices and housing construction have decreased from high levels since last autumn and this has created an uncertainty that has affected the entire housing market. The funding model used by many housing developers in the new construction of homes has evident shortcomings. The model indicates that a large part of the risk in construction projects is put onto households, as it is based on a large portion of the homes being sold before the start of production (see the article "New production of housing and financial stability"). As housing prices have cooled off, this has meant that households have become especially cautious about signing pre-sale agreements. Due to the fall in prices and the uncertainty on the housing market, the banks have also become more restrictive in their lending to households for housing purchases, for example by more frequently demanding that households sell their homes before purchasing new ones. All in all, this has led to both fewer sales and production starts in particular for small housing developers.

If the uncertainty on the housing market persists, or if housing prices fall further, there is a risk that more actors on the housing market will encounter problems. In an unfavourable scenario, this could lead to problems spreading to the rest of the economy and to the financial system.

The banking system is changing but vulnerabilities persist

Several major changes have affected the banking system in recent years. For example, Nordea has moved its headquarters to Finland, meaning that there are now two major bank branches in the Swedish market, Danske Bank and Nordea.[2] At the same time, amendments to laws and technological developments have made it easier for new, smaller players to enter the loan markets, both for mortgages and consumption loans.[3]

There are several vulnerabilities and risks linked to the banking system in Sweden, including its size, concentration, interconnectedness, limited capital levels and, in certain respects, low resilience to liquidity risks. The banks' high exposure to the housing market, for which the banks largely obtain funding on the international capital markets, also contributes towards

[1] For further examples of conceivable measures, see Chapter 3 in *Financial Stability Report* 2018:1. Sveriges Riksbank.

[2] As previously, the analysis in this report is based on the four largest banks in the Swedish market: Handelsbanken, Nordea, SEB and Swedbank.

[3] See New players on the mortgage market. *Financial Stability Report* 2018:1. Sveriges Riksbank.

increasing these vulnerabilities. It is therefore of utmost importance that Swedish authorities continue to have good insight into the banks and other financial participants active in Sweden, regardless of corporate form.

The banking system is exposed to the property sector

Alongside lending to households for housing purposes, the major banks have significant lending to commercial property companies. Even if the commercial property companies' debt-servicing ability is good at present, there are risks. The commercial property sector is large, highly cyclical and the property companies have a large share of borrowed capital. In addition, wholesale funding has increased in recent years as companies have issued larger volumes of bonds and certificates. As the banking sector is heavily exposed to the sector, it is important to monitor developments going forward.

Vulnerabilities in the banking system require measures

Considering the structural vulnerabilities in the banking system, it is important that the banks have enough capital and liquidity. It is important that banks hold a certain volume of capital in relation to their total assets. The Riksbank considers that the banks' capital in relation to total assets should increase and therefore a leverage ratio requirement of 5 per cent should be introduced as soon as possible.

Furthermore, the Riksbank considers it important that the banks reduce their liquidity risks. Some of the major banks have periodically had such low liquidity buffers in certain currencies that they would not have been able to meet their liquidity requirements in these currencies for more than a few days in conjunction with a stress situation. To better reflect the liquidity risks the banks are taking, the Riksbank recently decided on an amended composition of currencies in its foreign exchange reserves. Primarily, however, the banks need to insure themselves against liquidity risks in different currencies and Finans-inspektionen (FI) should introduce requirements for the major Swedish banks' Liquidity Coverage Ratio (LCR) in all significant currencies, including Swedish krona. The Riksbank also considers it important that foreign supervisory authorities ensure that foreign banks with significant activity in Sweden are subject to equally high requirements for liquidity and capital as the Swedish banks.

Due to the increased systemic risks, including the rising lending to households and non-financial corporations, FI has decided to raise the countercyclical capital buffer value from 2.0 to 2.5 per cent.[4] The Riksbank supports this increase and has been recommending an increase of the buffer value to 2.5 per cent since 2014.

The infrastructure needs more resilience to risks

The Riksbank assesses that the financial infrastructure has on the whole functioned well since the spring but notes that there have been disruptions and that resilience needs to increase.

In September, one of the participants in the Swedish central counterparty (CCP) Nasdaq Clearing defaulted. The default was managed without the main operations being affected but it entailed major losses for other participants as well as for Nasdaq Clearing. This event puts focus on several important aspects surrounding the stability of central counterparties and needs to be investigated further. The default demonstrated, for example, the importance of the central counterparties having sufficient capital buffers and margin collateral that can rapidly be deployed in the event of financial stress. In the spring, the Riksbank urged Nasdaq Clearing to ensure that its participants could fill their buffers in less than ten days.[5] Nasdaq Clearing subsequently changed its rules and has shortened the time for replenishing resources to two days. Even though Nasdaq Clearing has implemented the changes advocated by the Riksbank, it is important that it continues to work on strengthening its resilience to financial risks.

The Riksbank deems that the operational risk in the infrastructure is heightened, partly due to the risk of cyber attack, and the risks connected to Euroclear Sweden's out-of-date system for securities settlement.

Table 1. The Riksbank's recommendations

Household indebtedness
The Government, the Riksdag and responsible authorities should, as soon as possible, take further measures within housing policy and tax policy to reduce the risks in the household sector. Finansinspektionen should consider introducing further measures.
Banks' capital levels
Finansinspektionen should introduce a leverage ratio requirement for the major Swedish banks of 5 per cent. Foreign supervisory authorities should ensure that foreign banks with significant activity in Sweden are subject to equally high requirements.
The banks' liquidity risks
Finansinspektionen should set Liquidity Coverage Ratio (LCR) requirements in Swedish krona and other significant currencies for the major Swedish banks. Foreign supervisory authorities should ensure that foreign banks with significant activity in Sweden are subject to equally high requirements.
Banks with significant activity in Sweden should continue to reduce their structural liquidity risks and continue to attain at least a Net Stable Funding Ratio (NSFR) minimum level of 100 per cent.
Banks with significant activity in Sweden should at least once a quarter report their Liquidity Coverage Ratio (LCR), in Swedish krona and in other significant currencies, and their Net Stable Funding Ratio (NSFR).

[4] The agreed countercyclical capital buffer rate shall apply as from 19 September 2019.

[5] See *Financial Stability Report* 2018:1. Sveriges Riksbank.

VULNERABILITIES AND RISKS IN THE FINANCIAL SYSTEM

There are structural vulnerabilities in the Swedish financial system that make it sensitive to shocks. Not only is household indebtedness high, but the Swedish banking system is also large and concentrated with banks that are closely linked to one another. In addition, the major Swedish banks have a high proportion of non-stable funding and a low proportion of equity in relation to their total assets. At present, it is primarily Swedish households' high indebtedness that is deemed capable of leading to or exacerbating the consequences of shocks, but other circumstances can also create unease, such as uncertainty in the world economy. The international risk outlook includes an escalation in the trade conflict between the United States and China, the Italian Government's proposed budget possibly further impairing the country's public finances, considerable uncertainty regarding the United Kingdom's exit from the EU and a more tangible rise in US government bond yields. The international risks are deemed to have increased slightly since the spring.

Vulnerabilities and risks associated with international developments

Sweden is a small, open economy with considerable foreign trade and a financial system that is dependent on international financial markets. This means that global economic activity affects the Swedish economy, and that the uncertainty and unease on the financial markets can rapidly affect the financial system and thereby financial stability in Sweden.

Global economic developments continue to be positive. But, as before, there are a number of risks linked to international developments which, should they materialise, could affect financial stability in Sweden. These risks are deemed to have increased since the spring.

Financial conditions have been expansionary in many parts of the world for a long time. This may have contributed towards the accumulation of risks. However, in the United States, financial conditions have become less expansionary since the spring.[6] Equity prices have fallen over the autumn (see chart 1) and the US central bank, the Federal Reserve, has continued to raise its policy rate. The increased interest-rate differentials between the United States and other economies have contributed towards strengthening the US dollar against most currencies, including those of some emerging market economies. This has been particularly substantial for countries with domestic imbalances such as high inflation and major current account deficits, for example Argentina and Turkey. However, the rising interest rates in the United States seem, in general, to have had relatively modest contagion effects to other countries so far, although it

Table 2. Important developments in the financial system

Household indebtedness is high and rising, albeit at a slower rate than in the spring. **Housing prices** have increased slightly since May but uncertainty persists on the housing market.
The banks' profitability is good and credit losses are small. However, the banking system has structural vulnerabilities, such as its size, high degree of interconnectedness, limited capital levels and, in certain respects, low resilience to liquidity risks. It is also uncertain how access to clearing services in the United Kingdom will be for Swedish banks after United Kingdom's exit from the EU.
The Swedish **financial infrastructure** functions well overall and availability has been mainly good, but there have been disruptions over the autumn. Central counterparties (CCPs) need to continue to strengthen their resilience and the operational risks are heightened.
Uncertainty in the **global economy** remains high. The risks are deemed to be slightly greater than in the spring, for example due to the uncertainty surrounding the United Kingdom's withdrawal from the EU, various trade conflicts and the turbulence in certain emerging market economies.
All in all, the risks to financial stability in Sweden are deemed to be slightly greater than in the spring.

[6] See the chart appendix for further charts on developments in the financial markets and on the situation in the major Swedish banks and among banks' borrower groups (www.riksbank.se)

cannot be ruled out that the turbulence will spread to further countries in the period ahead.

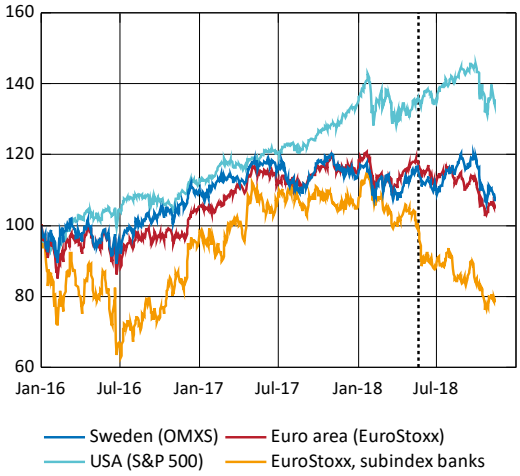
The trade conflict between the US and China has worsened since May. As yet, the measures taken have primarily affected individual sectors but they have increased uncertainty over the prospects for global trade and international growth. If the uncertainty persists for a long time or if the conflict escalates, it could have an impact on the international financial markets and spread to Sweden.

As before, there are structural problems in the euro area. This applies, for instance, to the banking sector and the weak public finances in several countries. There are also risks linked to political developments in Italy, where the government has signalled comprehensive unfunded reforms which could be difficult to implement in light of the public finances situation and the EU's fiscal policy regulations. Uncertainty over Italian public finances has caused yields for Italian government bonds to rise heavily since the second half of May (see chart 2).

In Europe, uncertainty also remains high over the economic and financial effects of the United Kingdom's exit from the EU. This applies in particular if the United Kingdom were to leave the EU without a withdrawal agreement and is connected to uncertainty over whether agreements between various participants will continue to be valid after the United Kingdom's withdrawal from the EU. The consequences would be particularly serious if EU banks were no longer able to have access to clearing services in the United Kingdom. The European Commission has, however, announced during the autumn that it is prepared to take measures that will manage this risk at least temporarily.[7] But, if, no exit agreement is signed, uncertainty will persist over the future relationship between the EU and United Kingdom. In this case, shocks to the financial markets cannot be ruled out.

Compared with the situation in the spring, the international risks that could threaten financial stability in Sweden are deemed to have risen. The banks in Sweden are dependent on the international financial markets for their funding. Increased unease may lead to more expensive funding or, in the worst case, problems in renewing funding at all. This, in turn, could result in customers facing higher lending rates or their access to bank borrowing being impeded.

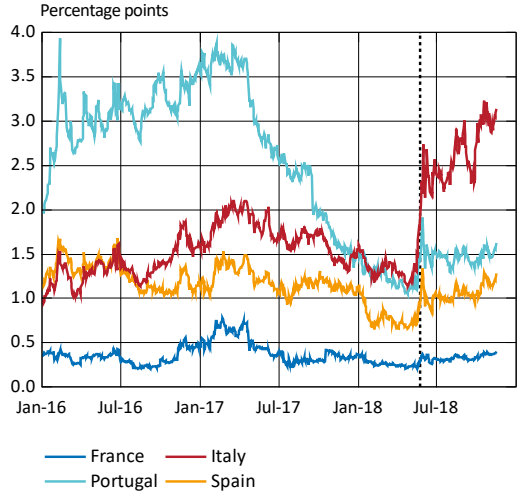
Chart 1. Stock market movements
Index, 4 January 2016 = 100



Note. The dotted line refers to the publication date of the Riksbank's previous stability report.

Sources: Macrobond and Thomson Reuters

Chart 2. Ten year government bond yields, spread to Germany
Percentage points



Note. The dotted line refers to the publication date of the Riksbank's previous stability report.

Source: Macrobond

Vulnerabilities and risks associated to household indebtedness

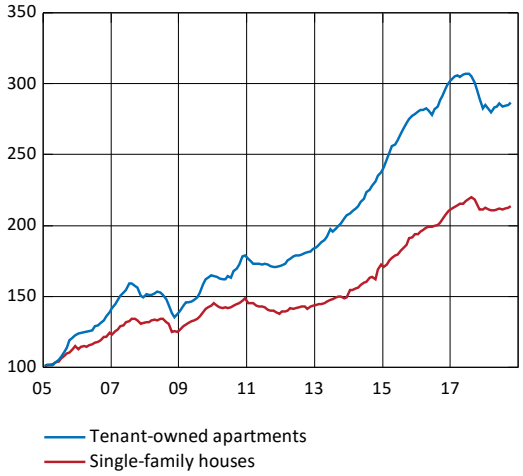
Swedish household indebtedness has been increasing for a long time. The Riksbank considers that households' high indebtedness poses the greatest risk to Sweden's financial

[7] *Preparing for the withdrawal of the United Kingdom from the European Union on 30 March 2019*, November 2018. European Commission.

and macroeconomic stability. The high indebtedness among households makes them sensitive to changes that affect their finances, such as rising interest rates, higher unemployment and sharply falling housing prices, for example. This risk has also been highlighted by international bodies such as the International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD), the European Commission and the European Systemic Risk Board (ESRB).[8]

The high and rising level of indebtedness has coincided with sharply rising housing prices (see chart 3). These price developments are due to several factors, including an imbalance between supply and demand for housing. The Riksbank has long warned of the consequences of the poorly functioning housing market and the high housing prices, and has pointed out the need for structural measures on the housing market to reduce the risks linked to household debt.

Chart 3. Housing prices in Sweden
Index 2005 = 100



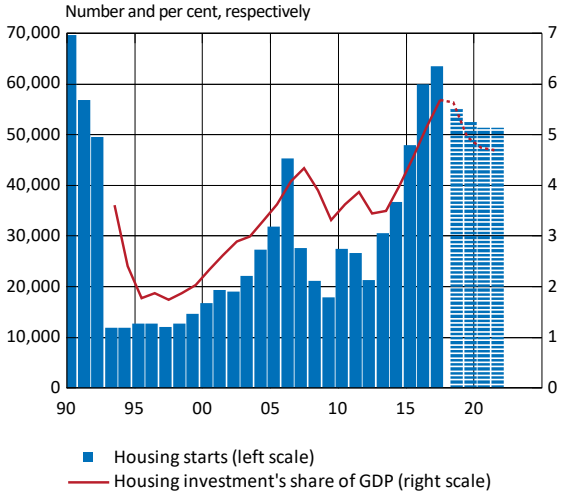
Sources: Valueguard and the Riksbank

Weak price growth since last autumn

In the autumn of 2017, housing prices started to fall (see chart 3), which is linked to a large increase in the supply of newly produced tenant-owned and rented housing. Since the latest Financial Stability Report in May, housing prices have risen by one per cent.[9] One indicator suggesting supply may have affected prices in the past year is that the development of prices has been weakest in the regions where construction has been highest. The amortisation requirements[10] have probably also had a restraining effect on prices, especially in Stockholm where debt-to-income ratios are highest. The increase in construction in recent years has been concentrated, above all, in areas with high population growth. What is difficult to establish, however, is whether the price of the housing being constructed matches households' purchasing ability and needs. If housing construction is not adapted to the demand from households, increased construction can lead to a fall in housing prices.

Housing investment's share of GDP has increased in recent years, but is expected to decrease in the period ahead (see chart 4). The number of new housing starts will nevertheless remain high in a historical perspective, as good employment growth and low interest rates are creating the conditions for continued high demand for homes. In addition, the Swedish National Board of Housing, Building and Planning

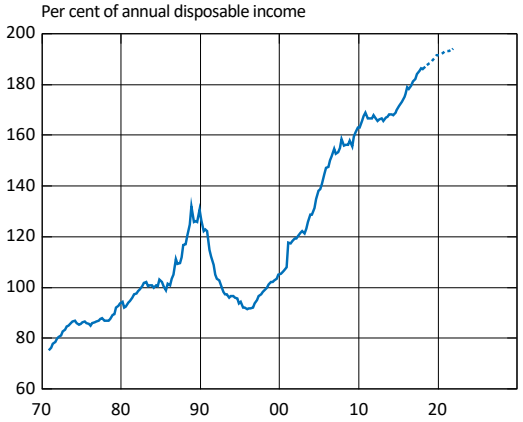
Chart 4. Housing starts and housing investments
Number and per cent, respectively



Note. The dashed line and the dashed bars represent the Riksbank's forecasts.

Sources: Statistics Sweden and the Riksbank

Chart 5. Household debt
Per cent of annual disposable income



Note. Households' total debts as a share of their disposable income totalled over the past four quarters. The dashed line represents the Riksbank's forecast.

Sources: Statistics Sweden and the Riksbank

[8] See, among others, *Country Report Sweden,* March 2018. European Commission and *Financial System Stability Assessment Sweden*, October 2016. International Monetary Fund (IMF).

[9] According to the seasonally adjusted HOX price index for all housing.

[10] In 2016, the first amortisation requirement was introduced, meaning that new mortgage borrowers have to amortise 1 per cent if their loans correspond to 50–70 per cent of the value of their homes. Mortgage borrowers whose loans exceed 70 per cent of the value of their homes must amortise 2 per cent. In 2018, a stricter amortisation requirement was introduced, meaning that new mortgage borrowers, in addition to the stipulations of the first amortisation requirement, must amortise a further 1 per cent if their loans exceed 4.5 times their gross income. Combining both amortisation requirements means that, for example, a mortgage borrower with a loan exceeding 70 per cent of their home's value and 4.5 times their gross income must amortise 3 per cent annually.

deems that there is a continued great need for housing due to the strong population growth. The increase in construction in recent years is expected to lead to the rate of price increase being more restrained than has been the case in previous years and thus to household debt increasing more slowly, which is desirable. At the same time, uncertainty remains around the development of prices on the housing market and a greater price fall cannot be ruled out.

Housing prices are also closely linked to the banks' funding, as the major banks fund their mortgage lending by issuing covered bonds with mortgages as collateral. A fall in housing prices may affect confidence in the banks in Sweden and they may then be forced to renew their funding at a higher price, or encounter problems in renewing their funding altogether.

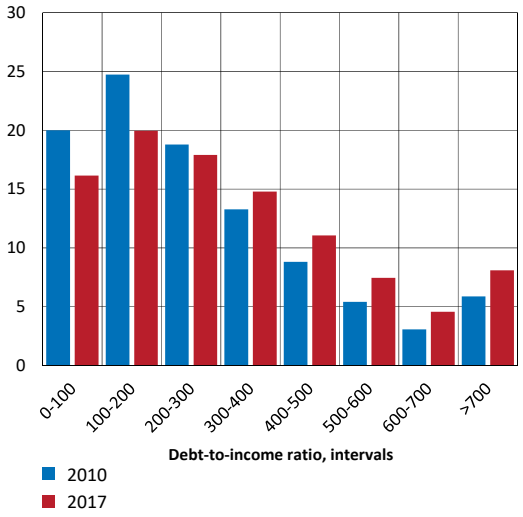
If housing prices should start to fall again, it could lead to an even more powerful slowdown in housing construction. The percentage of price-reduced objects in new builds has increased recently (see the article "New production of housing and financial stability") and, if these price cuts continue, it will probably further affect prices on the secondary market.

Households' debts continue to grow more rapidly than their incomes

Swedish household indebtedness has increased for a long time and is continuing to grow, albeit at a slightly lower rate than before. Despite the slowdown, debts are continuing to grow faster than households' disposable incomes. This means that the debt-to-income ratio, households' debts in relation to their disposable incomes, is continuing to increase. The aggregate debt-to-income ratio for the entire household sector is currently over 185 per cent (see chart 5) and is expected to continue to increase to over 190 per cent over the next few years. The Riksbank's data on the stock of mortgage borrowers show that 31 per cent of households with mortgages (640,000) have a debt-to-income ratio exceeding 400 per cent and that 13 per cent (260,000) have a debt-to-income ratio exceeding 600 per cent (see chart 6). This indicates that a large percentage of households with mortgages have a high level of debt in relation to their income. In addition, the percentage of households with very high debts has increased between 2010 and 2017.

Aggregate credit growth remains on a relatively high level despite housing prices being lower now than they were a year ago, for several reasons. One of these is that housing prices affect credit growth among households with a significant delay. Lower housing prices certainly lead to new mortgages being smaller than they would have been had prices continued to rise. But, as price increases have been under way for a long period and only a smaller share of existing homes are sold on the market every year, those homes sold are, on average, sold for a higher price than the seller paid

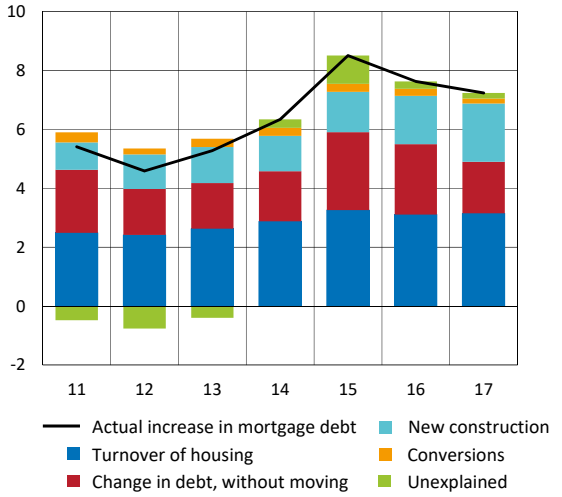
Chart 6. Distribution of debt-to-income ratio over time
Per cent of households with mortgages



Note. The data is from September of the respective year.

Source: The Riksbank

Chart 7. Contribution to development of mortgage stock
Annual percentage change and net contribution to annual percentage change



Note. Turnover of housing refers to housing bought and sold on the secondary market. Change in debt refers to the net of debt increase and debt decrease among households that have not moved to a different postcode area. For a detailed description of how these contributions are calculated, see Emanuelsson, R., Katinic, G. and Spector, E. (2018), Developments in the housing market and their contribution to household debt, *Economic Commentaries* no. 14. Sveriges Riksbank.

Source: The Riksbank

when purchasing the home. Dividing up the increase in mortgage debt also shows that turnover on the secondary market may have contributed to a relatively great degree to increased indebtedness (see chart 7). The total increase in debt is probably also due to households increasing their debt without moving and borrowing with their current home as collateral. These loans are used, for instance, for private consumption, renovation of homes, purchase of a second home, instalment payments of possible consumption loans or to help family members purchase homes. The large new construction of homes has also affected the increase in debt.[11]

In addition to many households having a high debt-to-income ratio, about 70 per cent of households' mortgages have been taken at variable interest rates (see chart 8). This means that rising mortgage rates quickly come to affect households' interest expenditure. The Riksbank's forecast shows that household interest expenditure as a proportion of disposable income is expected to increase over the next few years, albeit from low levels (see chart 9). The rhombuses in the chart illustrate an interval showing that if the repo rate returns to more normal levels, households' interest expenditure would more than double in relation to the present level.

Debt growth is jeopardising financial stability

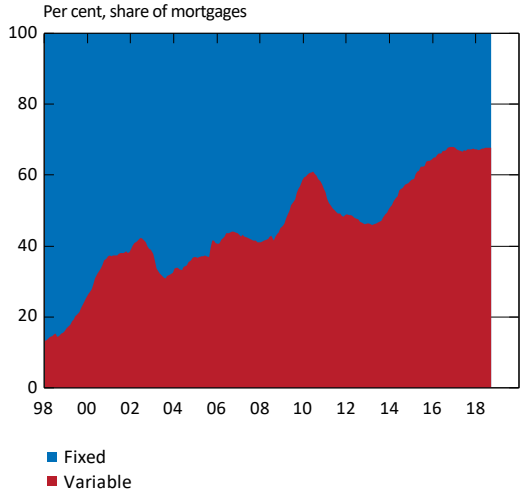
The severity of the consequences for households of a larger fall in housing prices or heavily rising interest rates, for example, depends on the size of their economic buffers. FI's stress tests in its Swedish Mortgage Market Report show that the resilience of new mortgage borrowers has increased slightly over the last year.[12]

FI's stress tests for new mortgage borrowers investigate whether households will have direct deficits in their calculations in various stress scenarios.[13] However, the stress tests do not analyse effects on household consumption. Even if households do not have direct deficits in their calculations, in a more severe macroeconomic scenario with rising unemployment, falling housing prices, and rising interest rates, they may heavily reduce their consumption. This applies in particular to those households that are heavily indebted or unprepared for changing economic prospects. Neither can it be ruled out that some households may have problems in paying their debts. Under the assumption that a household wishes to maintain its scope for consumption without changing its savings while interest rates are rising, its

[11] Emanuelsson, R., Katinic, G. and Spector, E. (2018), Developments in the housing market and their contribution to household debt, *Economic Commentaries* no. 14. Sveriges Riksbank.
[12] *The Swedish Mortgage Market* 2018. Finansinspektionen.
[13] FI calculates debt-servicing ability for the households included in the random sample through an individual discretionary income calculation, which is similar to that used by the banks when granting mortgages, and through stress tests. However, it is not certain that the living costs used in the calculations reflect the actual livings costs of all households. This means that the effects on consumption reflected in the test could be too small.

Chart 8. Rate fixation periods for the mortgage stock in Sweden

Per cent, share of mortgages

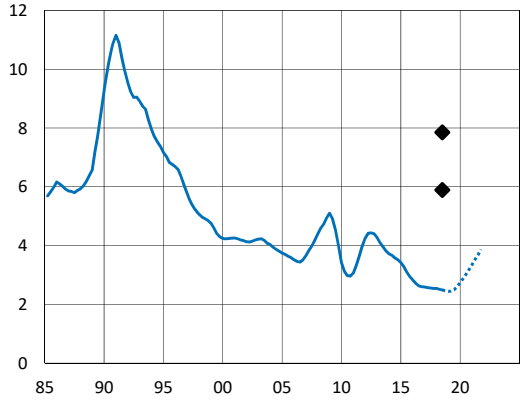


Note. Loans from mortgage institutions. The share of mortgages in each category is volume-weighted. Variable rate refers to rate fixation periods up to 3 months. Fixed rate refers to rate fixation periods above 3 months.

Source: Statistics Sweden

Chart 9. Households' interest expenditure

Per cent of annual disposable income



Note. The rhombuses illustrate an interval for the interest expenditure based on the current debt-to-income ratio, as well as a long-term interval for the repo rate between 2.5-4 per cent and a margin between households' interest rate and the repo rate of 2 percentage points. The dashed line represents the Riksbank's forecast. Interest expenses are adjusted for tax relief.

Sources: Statistics Sweden and the Riksbank

Chart 10. Indicator of financial vulnerability

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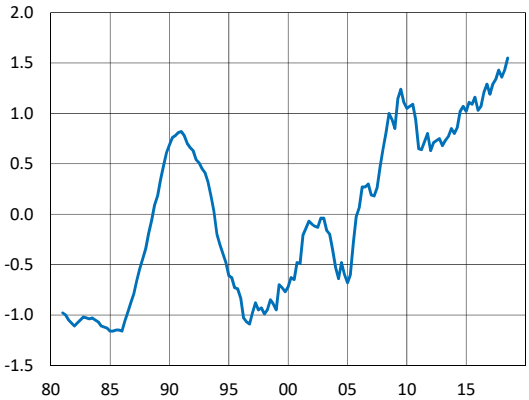


Note. The indicator is based on deviations from trend in three underlying factors: Lending to households and companies in relation to GDP, real house prices and the relationship between non-stable and stable financing sources for the Swedish banking sector. For more information, see Giordani, P. Spector, E. and Zhang, X. (2017), A new early warning indicator of financial fragility in Sweden, *Economic Commentaries* no. 1. Sveriges Riksbank.

Sources: Statistics Sweden and the Riksbank

debts will have to be heavily reduced. If mortgage rates doubled from 2 per cent to 4 per cent, the household's debt would consequently need to be halved from today's level for the household to be able to maintain unchanged interest expenditure and thereby unchanged scope for consumption and saving.

To sum up, households' high indebtedness forms a vulnerability in Sweden's economy, which could contribute towards the economy entering a downward spiral with consequences for macroeconomic and financial stability.

The indicator developed by the Riksbank to measure vulnerability in the financial system also shows heightened vulnerabilities from a historical perspective, partly due to indebtedness (see chart 10). The increase is also due to the increase of real house prices in relation to their underlying trend.

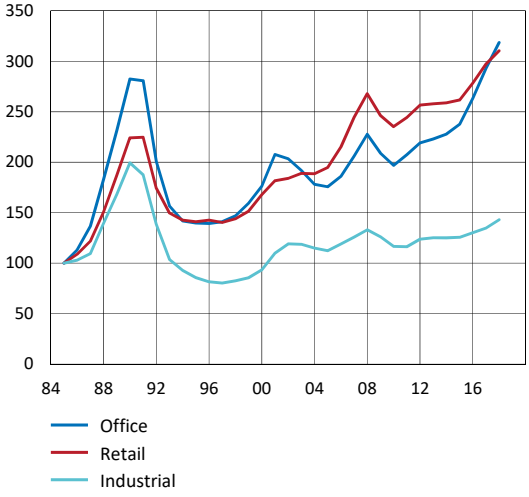
Vulnerabilities and risks associated with the commercial property market

The major Swedish banks have significant lending to commercial property companies and a large proportion of their lending has commercial property as collateral. In Sweden and in other countries, the commercial property sector has often played a significant part in larger financial crises. Among other things, this is due to the sector often being large, highly cyclical and having a large percentage of borrowed capital.

Growth in the Swedish commercial property sector has been strong recently. Activity on the market, measured as volumes of transactions, has been high for a long time. Companies have low borrowing costs and the positive economic outlook means that demand for office space is high, which has led to low vacancy rates,[14] rising rents and increasing prices (see chart 11). Capital growth and income return, which together make up the total return on commercial properties, have been relatively high in recent years, even if both fell slightly in 2017 (see chart 12).[15]

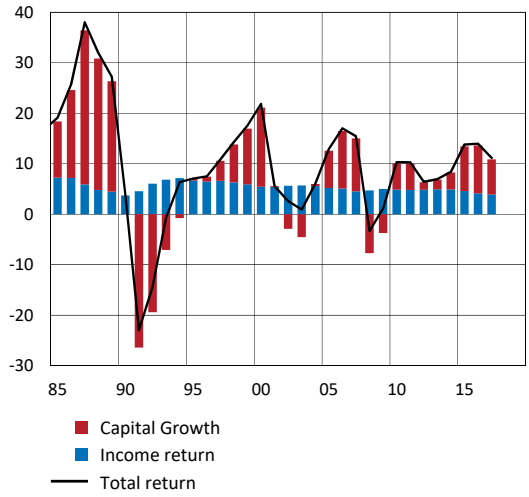
Commercial property companies generally have a large proportion of borrowed capital, both in the form of bank loans and market funding. This means that they are exposed to refinancing risks. In addition, a large part of borrowing occurs using short interest-rate fixation periods, which exposes the companies to interest rate risks. However, many of the companies enter into derivative agreements, above all so-called interest rate swaps,[16] to increase their interest-rate

Chart 11. Value of commercial real estate
Index, 1984 =100



Source: MSCI

Chart 12. Yield on commercial properties
Per cent



Source: MSCI

[14] The vacancy rate is measured as the percentage of vacant premises in the property stock.
[15] Income return is calculated as the difference between rental income and operating and maintenance costs for a property or property company, in relation to the price an investor paid for the property.
[16] An interest-rate swap is an agreement between two parties to exchange interest payments over a certain period of time. One party pays a variable interest rate and the other pays a fixed interest rate.

fixation period and thereby to reduce the effects on funding costs of a rise in market rates.

The Riksbank has investigated how some of the largest Swedish commercial property companies use such agreements to reduce their interest-rate sensitivity.[17] Through derivative agreements, the companies achieve longer interest-rate fixation periods but, despite this, some of the selected companies have, in recent years, had relatively short interest-rate fixation periods of 2–3 years for their interest-bearing liabilities. However, there are differences between companies and some of them have had interest-rate fixation periods of 4–5 years during the same period.

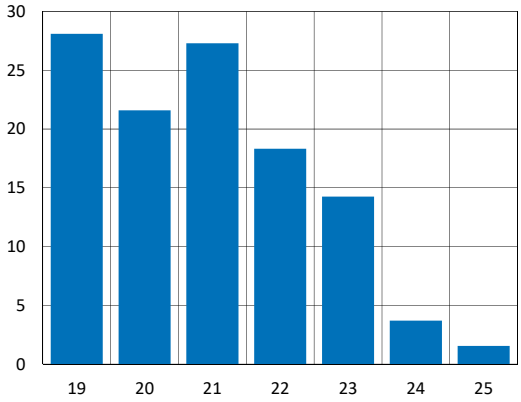
In recent years, the commercial property companies have increased their market funding by issuing greater volumes of bonds and certificates. During this period, the property sector[18] as a whole has been responsible for just over 40 per cent of the total value of corporate bonds issued in Swedish krona. The commercial property companies that have issued securities in recent years will have relatively large redemptions over the next few years (see chart 13).

There are risks inherent in growing securities borrowing. If economic prospects deteriorate and the companies' financial positions deteriorate this may cause an increase in their funding costs. If a large part of the bonds mature simultaneously, the companies could in a worst case scenario encounter problems in renewing their funding.

Alongside the banks' direct lending to commercial property companies, they are also indirectly exposed through the companies' wholesale funding. This happens when the banks provide the companies with liquidity facilities to cover the companies' more short-term funding, which takes place through certificates. If the companies are not able to repay certificates that are falling due, they can make use of these facilities. In addition, the banks' exposure can increase if they choose to provide the companies with further credits if the companies encounter problems with refinancing bond redemptions. All in all, this means that increased wholesale funding also indirectly entails risks for the banking system. Given that the banking system is heavily exposed to this sector, it is important to continue monitoring developments in the period ahead.

Chart 13. Maturity structure of selected commercial property companies' outstanding securities

SEK billion



Note. Data until mid-October. The sample refers to larger companies with over 50 per cent of their rentable area in other properties than housing and which have issued securities in recent years, a total of 16 companies. The maturity structure includes bonds, medium term notes and other types of issues in all currencies.

Source: Dealogic

[17] The sample is based on companies with over 50 per cent of their rentable area in other properties than housing (for example office premises or commercial properties) and which are among the largest companies with regard to market value of the respective property stock, a total of 29 companies. The analysis of sensitivity to interest rates is based on a random sample of the 15 largest companies with regard to the property stock's market value. For further information, see the journal *Fastighetsvärlden*, February 2018. The statistics have been gathered from the companies' interim reports, biannual reports and annual reports.

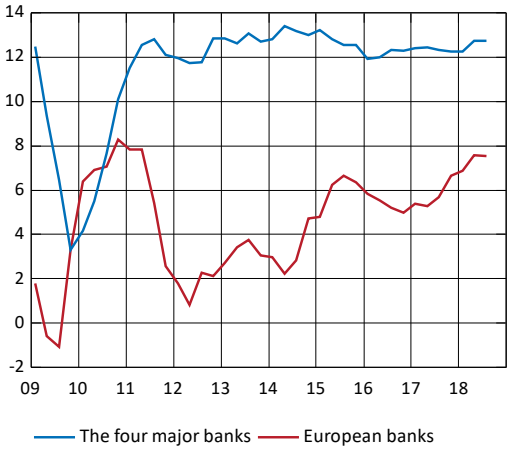
[18] The property sector is here defined as companies belonging to "Real Estate/Property" under the Global Industry Classification Standard, which includes not only commercial property companies but also housing companies and some housing developers, among others.

Vulnerabilities and risks in the Swedish banking system

A favourable economic outlook and the expansionary monetary policy have contributed to the banks' funding costs being low. The banks' credit losses continue to be low compared both with historical levels and with the European average. In addition, the major banks in Sweden are more cost-efficient than many other banks in Europe. The major banks' margins on mortgages continue to be high, even though they have decreased slightly over the last six months due to competition from other, smaller banks and from new players on the mortgage market.[19]

All in all, this development has led to the four major banks in Sweden continuing to report high returns on equity (see chart 14).

Chart 14. Return on equity
Per cent, rolling four quarters



Note. Unweighted average adjusted for nonrecurring items. The peer group consists of BBVA, Banco Santander, Barclays, BNP Paribas, Commerzbank, Crédit Agricole, Credit Suisse, Danske Bank, DNB, Erste Bank, BPCE, HSBC, Intesa Sanpaolo, KBC, Lloyds, Raiffeisen, RBS, Société Générale, UBS and UniCredit. Each observation from the peer group consists of an average where the single highest and single lowest observation have been excluded.

Sources: SNL Financial and the Riksbank

The banking system is large, concentrated and closely interconnected

The Swedish banking system has been characterised by changes in recent years. For example, Nordea has relocated its headquarters to Finland.[20] However, the bank continues to be active in Sweden as a bank branch and through its four subsidiaries.[21] This means that there are now two major bank branches in the Swedish market, Danske Bank and Nordea. After Nordea's relocation, but including foreign banks' activities on the Swedish market, the Swedish banking system's total assets amount to almost 300 per cent of GDP. The Swedish banking system thus remains large and larger than the average for EU member states.[22] Its size means that problems in the banking system can both have a great impact on the Swedish economy and be very costly to manage.

One difference against the previous situation is that FI no longer has direct supervisory responsibility for Nordea's branch and its control over and insight into the bank has decreased since the relocation. The ECB is now responsible for microprudential supervision. In the longer run, when the banking union is fully developed, increased risk sharing among the countries in the union could lead to lower risks for the banks and thereby also for Sweden. However, the banking union is not fully developed and a substantial part of the responsibility for managing banking problems still lies with the individual Member State, which in Nordea's case is

[19] *The banks' margins on mortgages*, third quarter 2018. Finansinspektionen.
[20] In March 2018, Nordea's general meeting of shareholders decided to move the bank's headquarters to Finland. In August, FI granted Nordea's request to implement its merger plan and the relocation took place on 1 October.
[21] Although the headquarters has been relocated to Finland, more than 70 per cent of Nordea's lending continues to take place in countries that are not in the SSM (Single Supervisory Mechanism). In Sweden, the bank continues to be active through a branch (Nordea bank Abp) and four subsidiaries (Nordea Hypotek AB, Nordea Finans Sverige AB, Nordea Life Holding AB and Nordea Asset Management Holding AB).
[22] Excluding foreign banks' activities in each country, the average in Europe is about 150 per cent and in Sweden about 200 per cent. See Chart A49 in the chart appendix.

Finland.[23] The consequences of Nordea's relocation for the Swedish financial system and for Swedish financial stability thus differ over the short and long terms.[24]

The banks are also closely interconnected. Handelsbanken, SEB, Swedbank and Nordea have significant exposures to one another. For example, they are among the largest owners of one another's covered bonds. At the end of June 2018, the four major banks' exposures to one another in the form of securities was equivalent to more than 30 per cent of their Common Equity Tier 1 (CET 1) capital.[25] Including derivatives and interbank loans the figure amounts to around 40 per cent. In addition, the major banks have large amounts of loans, both mortgages and corporate loans, with homes and other types of property as collateral on their balance sheets. 60 percent of total lending to non-financial corporations has property as collateral. All in all, the banks have substantial exposures to one another, and similar exposures to the housing market and the commercial property market.

The concentration and interlinkage of the Swedish banking system moreover means that problems in one bank can spread to other banks and markets, and thereby damage confidence in the entire financial system. For instance, stock prices of other Nordic banks were affected when it was revealed in the autumn that Danske bank's routines to prevent money laundering had failed (see the fact box "Shortcomings in the banks' routines against money laundering may damage confidence in them"). In a bad scenario, such an event can also entail poorer financing opportunities for both the bank concerned and for other closely interlinked banks.

The banks in Sweden fund their lending to a large extent on the financial markets and there they are exposed to both short-term and structural liquidity risks. This means that they are vulnerable to shocks that might affect their funding possibilities.

The United Kingdom's withdrawal from the EU – an uncertainty factor for the banks

The United Kingdom's withdrawal from the EU can create problems for the banks in Sweden, particularly if the United Kingdom leaves the EU without a withdrawal agreement. If no such agreement is in place, EU banks may no longer be allowed to clear certain derivatives in the United Kingdom

Shortcomings in the banks' routines against money laundering may damage confidence in them

By laundering money, criminal agents attempt to convert money deriving from criminal activities to assets that can be reported openly.

In recent years, Swedish banks have received sanctions and warnings due to insufficient routines against money laundering. Examples include Handelsbanken in 2015 and Nordea in 2013 and 2015. During the autumn, it was discovered that Danske Bank's routines against money laundering had failed in 2007–2015 in the bank's Estonian operation. Following this, the bank launched an internal investigation covering thousands of customers who were not resident in Estonia but who conducted banking business in the country through the bank. The investigation covers about 9.5 million transactions corresponding to about EUR 200 billion. Several authorities in, for example, Estonia, Denmark, the EU and the United States are now conducting further investigations into the matter. Danske bank risks extensive sanctions.

Money laundering is an international problem that comprises a threat to the financial system and its institutions. It is therefore important to take preventive measures at both national and international level to continue to combat money laundering.

[23] Ehrenpil, M. and Hector, M. (2017), Banking Union – what is it? *Economic Commentaries* No. 5. Sveriges Riksbank.

[24] For further information, see Consequences for financial stability of Nordea's relocation to Finland. Article in *Financial Stability Report* 2018:1. Sveriges Riksbank and *Yttrande om Nordea Bank AB:s ansökan om tillstånd att verkställa fusionsplan, (Statement of opinion with regard to Nordea Bank AB's application for permission to implement merger plans)* June 2018. Sveriges Riksbank.

[25] Tier 1 capital is equity less proposed dividends, deferred tax assets and intangible assets, such as goodwill. Tier 1 capital may also include some types of subordinated loan. Common Equity Tier 1 is in turn Tier 1 capital with a deduction for capital contributions and reserves that may be included in the capital base as Tier 1 capital in accordance with chapter 3, section 4 of the Capital Adequacy and Large Exposures Act (2006:1371).

from as early as the end of March next year. A large percentage of the bonds the banks use to finance themselves have fixed interest rates at the same time as a large part of their lending is at a variable interest rate, for instance household mortgages. This means that the various interest rate flows do not match one another, which exposes the banks to interest rate risk. To manage this risk, the banks therefore enter into derivative agreements, normally in the form of a so-called interest rate swap. These interest rate swaps are generally cleared through central counterparties (CCPs) in London. A ban on clearing certain instruments in the United Kingdom could therefore significantly affect banks in Sweden, as more than 90 per cent of all interest derivatives in Swedish krona and around 45 per cent of Swedish companies' total outstanding derivative contracts are cleared in the United Kingdom.

If the United Kingdom leaves the EU without a withdrawal agreement, the Swedish banks may be forced to find CCPs situated in other countries within the EU to clear interest derivatives. This applies both to the new contracts the banks need to enter into and to the very large volume of already existing contracts that are currently managed by British CCPs. As it is an extensive changeover to change the CCP for clearing, it is important that the banks are prepared for this potential development. If a changeover involves increased costs for the banks in Sweden, it may ultimately affect households in the form of rising mortgage rates.

The European Commission has signalled that at least in the short term they are prepared to take measures that will ensure continued access to clearing in the United Kingdom for EU banks, even if the United Kingdom leaves the EU without a withdrawal agreement. This would probably reduce the risk of severe market shocks. However, no formal decisions on measures have yet been taken and might not mean that access to clearing in the United Kingdom is guaranteed in the longer term.

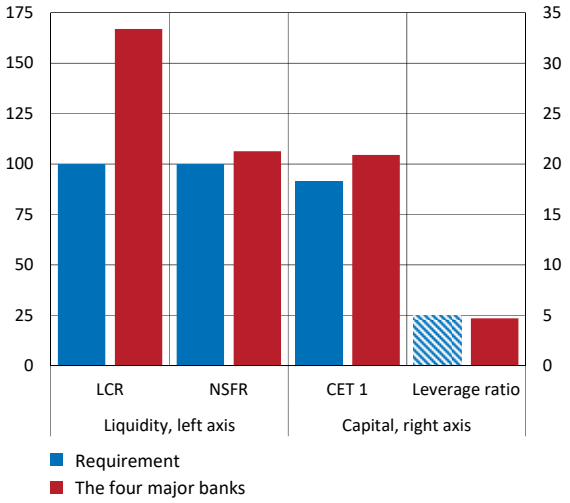
The major banks are exposed to liquidity risks

A central component of a bank's operations is borrowing money at short-term maturities and then lending it at longer maturities. This means that the bank's funding is due for payment before it recuperates the money it has lent. The bank must therefore renew the funding several times during the duration of the bank loan. This so-called maturity conversion means that the bank exposes itself to liquidity risk.

Banks in Sweden fund themselves to a large extent on the financial markets where they are exposed to both short-term and structural liquidity risks. One way of measuring short-term liquidity risks is in terms of liquidity coverage ratios, (LCR). LCR measures a bank's resilience to short-term liquidity stress over 30 days. An LCR of 100 per cent means, put simply, that one can manage stressed outflows for 30 days.

Chart 15. The four Basel ratios

Per cent, September 2018

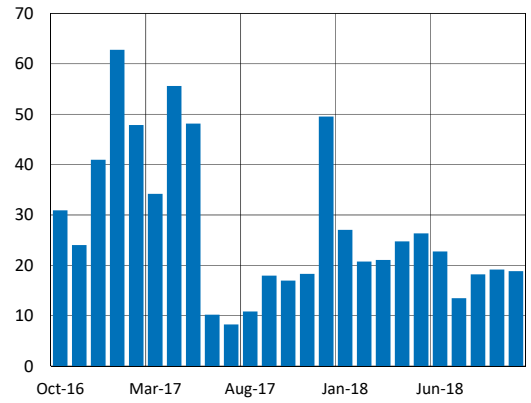


Note. CET 1 is an abbreviation for Common Equity Tier 1 ratio. CET 1 capital requirements regards June 2018. CET 1 are calculated as weighted averages. The minimum level of the leverage ratio has not yet been determined. The chart shows the level recommended by the Riksbank.

Sources: Bank reports, BIS and the Riksbank

Chart 16. The four major banks' daily LCR in SEK, single lowest observation

Per cent



Source: The Riksbank

FI imposes requirements of 100 per cent LCR in total currencies, euros and US dollars and the four major banks still have high liquidity coverage ratios in these currencies (see chart 15). Some of the major banks sometimes have very low liquidity coverage ratios in Swedish krona, occasionally around 10 per cent (see chart 16). Put simply, this means that the bank can only cover its liquidity needs in SEK in a stressed situation for around three days. Liquidity coverage ratios are periodically low in other so-called significant currencies[26] where there are no LCR requirements. These other significant currencies, including the Swedish krona, account for more than half of the banks' liquidity outflows in a stress scenario,[27] and around two-thirds of their deposits and short-term funding.

The banks first and foremost use euros and dollars to cover their liquidity requirements in Nordic currencies. They do this by means of foreign exchange swaps. Situations may, however, arise when the market functions less efficiently than normal, or when the market is not accessible to an individual bank. There are therefore risks associated with relying on the foreign exchange swap market for managing liquidity.

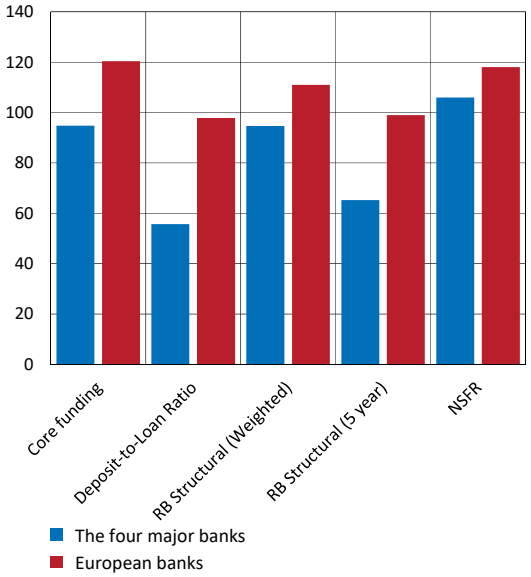
The Riksbank has recently decided to change the composition in its foreign exchange reserves to better reflect the liquidity risks the banks are taking. These changes entail a new composition of US dollars, euros and GBP. Moreover, two new currencies are introduced; Danish and Norwegian krona, as the banks have liquidity risks in these currencies. However, it is of the utmost importance that the banks can primarily manage their short-term liquidity risks themselves (see also Stability assessment summary and recommendations).

Major mismatch between maturities on the banks' assets and liabilities

On the asset side of their balance sheets, the major banks in Sweden have a large proportion of mortgages with long maturities, while on the liabilities side, they have relatively short-term wholesale funding. The remaining average maturity for Swedish covered bonds is only around three years.[28] The majority of the mortgages issued, on the other hand, have a maturity of 30–50 years.[29] One way of illustrating the banks' long-term, structural liquidity risks is to set the part of the bank's funding that is considered to be stable in relation to its illiquid assets. This ratio, called the Net Stable Funding Ratio, NSFR, currently stands at 106 per cent

Chart 17. A comparison between different measures of liquidity in Sweden and Europe

Ratio

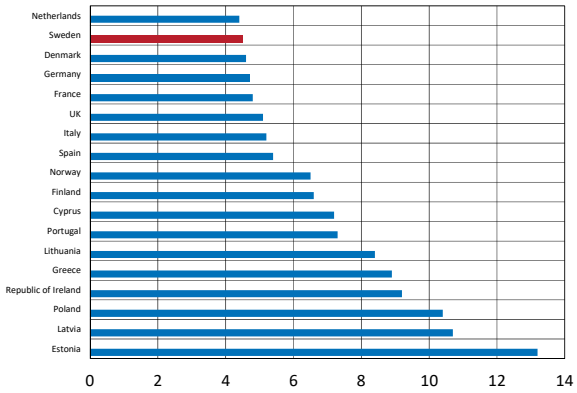


Note. Data refers to December 2017. A higher level of the measure showed in the chart indicates lower structural liquidity risks. For more information on the measures, see *Swedish banks' structural liquidity risks*, Riksbank Studies, November 2016. Sveriges Riksbank.

Sources: Liquidatum, SNL Financial and the Riksbank

Chart 18. The leverage ratio in various countries

Per cent, June 2018



Note. Refers to weighted average per country.

Source: European Banking Authority (EBA)

[26] A significant currency is a currency that comprises more than five per cent of a bank's total debts, according to the Basel Accord and the European Commission's delegated Regulation (EU) 2015/61 on LCR. The proportion of funding in a specific currency can vary over time, therefore the currencies that are classified as significant in accordance with this definition can vary.

[27] For examples of a stylised stress scenario, see Short-term liquidity risks in the major Swedish banks. Article in *Financial Stability Report* 2017:2. Sveriges Riksbank.

[28] The average maturity varies between 2½ and 4 years, depending on the currency, see Chart A60 in the chart appendix.

[29] *Preconditions for newcomers to the mortgage market,* July 2018. Finansinspektionen.

on average for the four major Swedish banks (see chart 15), which exceeds the level recommended by the Basel Committee.[30]

However, the Riksbank does not consider that the NSFR, in its current form, fully captures the large mismatch in maturities between banks' assets and liabilities. This is because the NSFR does not capture the difference in maturity for funding of more than one year. This means, for instance, that funding with a 13-month maturity is regarded in the regulatory framework as equally stable as funding with maturities of longer than 10 years. This has previously been illustrated in a study by the Riksbank that highlighted other measures of structural liquidity risk.[31] If the liquidity risks are measured in terms of these alternative measures, the banks' liquidity situation is poorer than indicated by the NSFR, and they are moreover exposed to greater structural liquidity risks than many comparable European banks are (see chart 17). As the liquidity risks are not fully captured by the regulatory liquidity measures, it is important that the banks reinforce their liquidity reserves by strengthening their liquidity buffers in the currencies where they have low levels, and by limiting their maturity conversion to a greater extent.

The banks' capital ratios have not changed significantly

The major banks' capital in relation to risk-weighted assets (Core Tier 1 capital ratios, CET 1) has remained relatively unchanged over the year, and stood at 20.9 per cent in September 2018. This is a higher level than FI's requirement (see chart 15). One contributory factor to this could be that the banks are giving themselves an extra margin because coming regulation could affect their capital requirements.[32]

One change that will affect the banks' CET 1 capital ratios is FI's decision that the risk-weight floor for Swedish mortgages of 25 per cent, which is currently a Pillar 2 requirement,[33] shall be converted into a corresponding capital requirement in Pillar 1 (see the fact box "Risk-weight floor for Swedish mortgages to become a Pillar 1 requirement"). However, this change will not affect the size of the banks' total capital requirements in relation to their total assets.

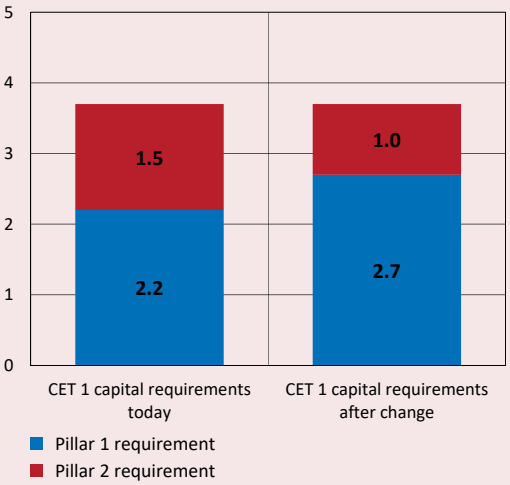
Risk-weight floor for Swedish mortgages to become a Pillar 1 requirement

Swedish banks' capital requirements are often divided up into so-called Pillar 1 and Pillar 2 requirements. FI's board of directors recently decided that the Pillar 2 requirement known as "the risk weight floor for Swedish mortgages" will become a Pillar 1 requirement with effect from 31 December 2018.

This change will not affect the banks' *total* capital requirements measured in Swedish krona, only the breakdown into the banks' Pillar 1 and Pillar 2 requirements. The banks' *actual* capital levels, measured in krona, will not be affected by the change. The chart below, which illustrates this, shows the major banks' CET 1 capital requirements in relation to their total assets.

Chart 19. The major banks' total CET 1 capital requirements

Per cent of total assets, second quarter 2018



Note. The chart shows the four major banks' total CET 1 capital requirements prior to and after the risk-weight floor for Swedish mortgages has been converted from a Pillar 2 requirement into a Pillar 1 requirement.

Sources: The banks' interim reports, Finansinspektionen and the Riksbank

The fact that "the risk-weight floor for Swedish mortgages" will become a Pillar 1 requirements does mean that the major banks' risk-weighted assets will increase, however. This will in turn lead to the major banks' total capital requirements and capital ratios, measured in relation to their risk-weighted assets, declining.[34] Based on figure from the second quarter of 2018, the Riksbank's internal calculations point to the CET 1 capital ratio falling by around 3.5 percentage points on average for the four major banks when the change comes into force.

In addition to this coming change, there is currently a comprehensive legislative project within the EU that is commonly referred to as the "banking package". Even if the EU Council of Ministers and European Parliament have not yet agreed on the final contents of the banking package, it may involve further changes in the major Swedish banks' Pillar 1 and Pillar 2 requirements going forward.

[30] According to the Basel Committee for Banking Supervision, banks shall fulfil 100 per cent in NSFR as of 1 January 2018.

[31] The major Swedish banks' structural liquidity risks, *Riksbank Studies*, November 2016. Sveriges Riksbank.

[32] Among other things, the banks are giving themselves an extra margin for the implementation of a floor for risk-weighted assets, aimed at reducing variability in these assets and which can affect Swedish banks' capital requirements. These floor regulations are part of Basel III, adopted by the Basel Committee on Banking Supervision in December 2017. The same minimum level is included as a proposal for a requirement in the European Commission's banking package. The implementation date has not been set, however.

[33] Banks' capital requirements as part of the Pillar 1 requirement have been agreed internationally whereas the bank-specific capital requirements added in Pillar 2 are mostly set by national authorities.

[34] For a more detailed account of the actual differences between the banks' Pillar 1 and Pillar 2 requirements and how the major banks' capital requirements and capital ratios may be affected by the above-mentioned changes, see Edlund, T. (2018), The major banks Pillar 1 requirements will increase, *Economic Commentaries No.* 12. Sveriges Riksbank.

The Riksbank has previously pointed out that it is important to also introduce an alternative requirement that is not sensitive to risk weights, that is, a leverage ratio requirement. The leverage ratio measured in the Swedish banking sector was largely unchanged in the first half of 2018 in relation to the same period in the previous year, and amounts to 4-5 per cent. Compared with many other European countries, banks in Sweden on average have low leverage ratios (see chart 18).

All in all, the Swedish banking system is large, concentrated and tightly interconnected. In addition, the major Swedish banks have a high proportion of non-stable wholesale funding and a low proportion of equity in relation to their total assets. This creates vulnerabilities that make the banking system, and thereby the entire financial system, sensitive to shocks. In addition to the risks mentioned above, the banks are exposed to new risks, for instance, climate-related risks (see the fact box "Climate-related risks and financial stability").

Vulnerabilities and risks linked to the financial infrastructure and payments

There are also vulnerabilities in the financial infrastructure that can affect the stability of the financial system. The financial infrastructure is a central part of the financial system and consists of systems through which payments and transactions with financial instruments are made. The systems make it possible for individual households, companies and authorities to perform payments in a safe and efficient manner. Banks and other financial institutions are participants in financial infrastructure systems and in many cases these systems also participate in each other's systems. This interconnectedness means that the systems are dependent on one another to be able to function without disruptions.[35]

The Riksbank assesses that the financial infrastructure has functioned well since the spring and that availability has mainly been good (see chart 20) but at the same time notes that there have been disruptions and that resilience needs to increase.

Central counterparties need to continue to strengthen their resilience

Central counterparties (CCPs),[36] like the banks, are exposed to credit and liquidity risks. To manage these risks, it is important that they have sufficient capital in the form of so-called pre-

[35] For further information see Interconnectedness in the Swedish financial system. Article in *Financial Stability Report* 2018:1. Sveriges Riksbank.

[36] Central counterparties have a substantial and important role to play in the financial system and are considered systemically important. They act as intermediaries in financial transactions and undertake to supply payments and securities on behalf of their participants, even if the participant were to default. See also *Financial Stability Report* 2018:1. Sveriges Riksbank.

Climate-related risks and financial stability

Global warming and climate change can affect financial stability in several ways, for instance, through banks and insurance companies not having sufficient resilience to climate-related risks. One usually talks about two types of climate-related risks – physical risks and adaptation risks.

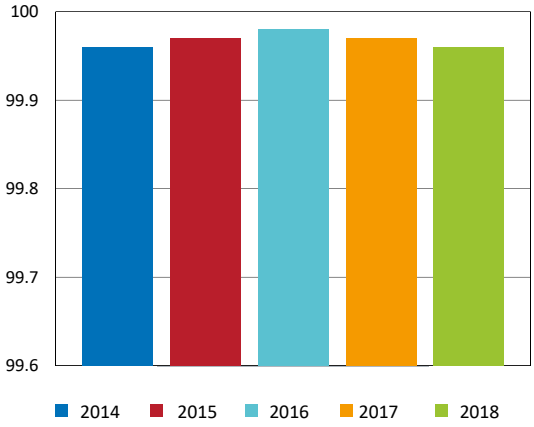
Physical risks include direct damage in the form of, for instance, droughts, floods, hurricanes, heat waves and damage caused by rising sea levels and changes in ecosystems. Banks and companies may have insured themselves against some of these risks, which thereby burden the insurance companies. But as it is difficult to estimate the risks of climate-related natural disasters, it has become more common for insurance companies to instead stop offering some insurances, which can have a negative effect on companies and households. The loans the banks give to households and companies often have property as collateral. Natural disasters can destroy this property and thereby severely reduce the value of the collateral. The borrowers' capacity to meet their loan payments can then deteriorate, which in turn has a negative effect on the banking system in that credit risks increase.

Adaptation risk is the economic and financial risks that arise from companies suddenly having to adapt to a less fossil-based economy. Examples include political decisions that certain resources such as coal and oil shall not be extracted but left in the ground. This can lead to bankruptcies for the companies that own these assets. If these companies have substantial loans, it can lead to negative consequences for the banks.

There are several initiatives at international level that aim to promote a sustainable financial system. A project conducted by G20/Financial Stability Board (FSB) has resulted in recommendations that will make it easier to define, measure and compare different climate-related risks in a uniform manner. The idea is that companies shall be able to assess and report their climate-related risks and make scenario analyses. This can make it easier for banks, insurance companies and other financial companies to assess their exposures to the counterparties' climate-related risks and to take measures to deal with them.

Chart 20. Availability of the Swedish infrastructure systems

Per cent



Note. 100 per cent means that the system has been available 100 per cent of the time. Data for 2018 extends to the end of the third quarter.

Sources: Bankgirot, Euroclear Sweden, Nasdaq Clearing and the Riksbank

financed resources. CCPs also need to be able to rapidly top up their capital if losses that reduce it arise. As participant failure is a major risk for CCPs, the Riksbank advocated in the spring Financial Stability Report that the Swedish CCP Nasdaq Clearing should amend its agreements with participants to be able to top up its capital, that is its pre-financed resources, in a shorter period of time, and Nasdaq Clearing did so during the summer.

During the autumn, one of the participants in Nasdaq Clearing defaulted (see the fact box "Participant failure at Nasdaq Clearing"). Nasdaq Clearing then needed to use some of its pre-financed resources to cover the loss that arose and quickly obtain new funds. The situation showed clearly the importance of central counterparties always having sufficient pre-financed resources, so that they can manage the risks to which they are exposed and so they have good resilience to possible new defaults. Even though Nasdaq Clearing has implemented the changes demanded by the Riksbank with regard to topping up its pre-financed resources, it is important that it continues to work on strengthening its resilience to financial risks.

A cyber attack could have serious consequences

The financial system is exposed to cyber risks, that is, the risk that it will be subjected to an attack where someone makes use of weaknesses in a participant's IT system or a system to which it is connected.[38] A cyber attack on one participant could have serious consequences for the entire system. One example of this is fraud in connection with large-value payments, where the fraudsters have become increasingly adept at making use of weaknesses in the payment chain.[39]

In 2017, the Riksbank conducted a questionnaire survey among Swedish infrastructure companies to survey their resilience to cyber threats.[40] The results showed that the companies are working actively to strengthen their protection and their capacity to manage an attack. How far they have come in their work varies, however. For instance, work remains to be done with regard to routines and processes for the management and follow-up of cyber risks, as well as on reinforcing the technical protection. The work on reinforcing cyber protection needs to be a continuous process in the infrastructure companies. The Riksbank monitors the work in its regular oversight.

To manage some aspects of cyber risks in the payment system, the BIS Committee on Payments and Market

Participant failure at Nasdaq Clearing

On 11 September there was a default at Nasdaq Clearing when a participant was unable to provide collateral for its exposures. The participant was a physical person who was a direct participant in Nasdaq Clearing's commodity clearing. The participant had speculated in the difference in price between Nordic and German electricity declining. On 10 September this difference instead increased by more than 17 times the rate of a normal trading day.

When one participant defaults, a central counterparty (CCP), in this case Nasdaq Clearing, must close the participant's positions. If a default generates losses for a CCP, there are pre-financed financial resources that should cover the losses. The pre-financed resources are known as a "waterfall".[37] This is called a waterfall because there is a pre-determined order in which the financial resources shall be used. First and foremost, the defaulting participant's margin collateral shall be used. Secondly, the defaulting participant's contribution to the default fund. If this is not enough, then thirdly the part of the CCP's own capital allocated to the waterfall is used and fourthly the other participants' contributions to the default fund. The waterfall must be dimensioned to manage the CCP's two largest participants defaulting at the same time.

In this case, Nasdaq Clearing closed the defaulting participant's positions by selling them to selected participants with similar asset portfolios. As a result of the negative development in this part of the electricity market and the fact that the market was illiquid, the sale resulted in a loss of EUR 114 million after making use of the participant's existing margin collateral. The participant's own collateral and contribution to the default fund were thus insufficient to cover the loss that arose. Both Nasdaq Clearing's own capital (EUR 7 million) and parts of the other participants' default fund had to be used (EUR 107 of 166 million). The participants then topped up the default fund again within two days, in accordance with Nasdaq Clearing's regulations. Nasdaq Clearing topped up its capital the day following the default and contributed further funds that were to be made available for a period of 90 days in case further participants should default.

CCPs usually manage participant defaults from time to time and usually it is sufficient to claim the collateral of the defaulting participant and possibly its contribution to the default fund. As far as we know, this is the first time in the EU since EMIR (the EU regulation covering CCPs) came into force in 2012 that a default has resulted in such a large loss that the joint default fund needed to be used. Consequently, the event has also attracted international interest.

[37] For further information on CCP's so called waterfalls, see *Financial infrastructure* 2016. Sveriges Riksbank.
[38] For further information see Cyber threats in the financial system. Article in *Financial Stability Report* 2016:1. Sveriges Riksbank.
[39] One example of this type of fraud is the theft from the Bank of Bangladesh in February 2016 when fraudsters succeeded in stealing a large amount of money by sending manipulated payment orders to the bank's account with the US central bank.
[40] The survey has been produced by the ECB and is based on established international standards for IT security such as ISO 27001 and CPMI-IOSCO (2016), *Guidance on cyber resilience for financial market infrastructures*, June 2016. BIS.

Infrastructures (CPMI) has published a strategy that encourages the operators of systems for large-value payments to work together with their participants and suppliers of communications networks.[41] The work aims to increase the chance of identifying and managing potential weaknesses in the payment chain that could be used for cyber attacks, in the form of theft or fraud. The Riksbank has begun, in its capacity of operator of the RIX system, work on introducing the CPMI strategy.

More cross-border infrastructure may entail both opportunities and risks

New laws and new technology contribute to changing the structure of the payment market. For instance, the EU's second Payment Services Directive (PSD2) gives actors in the payment market the right to initiate payments and gather information on payments via the banks' payment accounts, on condition that the account holder has given their permission.[42] This can lead to increased competition and to more new payment companies that use innovative technology. At the same time, the technical developments entail increased opportunities to meet the demand for extremely fast payments, what are known as instant payments.[43]

There is also a trend among payment market participants to seek increased cooperation to gain economies of scale. In the Nordic countries, for instance, there is the P27 initiative, which is run by various banks and aims to construct a pan-Nordic payment system (see the fact box "P27 – a joint Nordic infrastructure for payments"). As the demand for instant payments is increasing, the Riksbank is reviewing the possibility of extending the opening hours of the RIX payment system. At the same time, the ECB is developing a system for instant payments, TIPS, which will be complete at the end of the year. Developments in technology, combined with the decline in the use of cash, are also reasons why the Riksbank started work on investing whether the krona can be issued in electronic form, as an e-krona.[44]

When different agents are active in an environment that is changing there is always a greater risk of mistakes being made and new risks arising. The trend towards joint infrastructure systems may lead to rationalisation and economies of scale, but could also mean that important infrastructure is moved abroad. This may make it more difficult for the Swedish market and Swedish authorities to affect important infra-structure. It is also important that, regardless of ongoing

[41] CPMI (2018), *Reducing the risk of wholesale payments fraud related to endpoint security,* May 2018. BIS.
[42] For further information on PSD2 see New rules on payment services. Fact box in *Financial Stability Report* 2018:1. Sveriges Riksbank.
[43] In Sweden, instant payments are currently synonymous with "Swish". There are systems with similar functionality in other countries, too.
[44] *The Riksbank's e-krona project*, October 2018. Sveriges Riksbank.

changes, payments can be made without interruptions. Both old and possibly new actors must take responsibility for this.

Ability to pay essential in a crisis situation

An increasingly important question is the preparedness to manage disruptions to the Swedish payment system. The declining use of cash and the increasing use of other methods of payment (see chart 21) mean that it is not self-evident that individuals and companies will have access to cash in the event of, for instance, power cuts or breakdowns in tele-communications and internet connections.[45] Moreover, the Swedish payment system is interlinked with international participants in the payment system, for instance, through SWIFT[46] which is used both for domestic and cross-border payments and VISA and Mastercard for card payments. This means that disruptions outside of Sweden can have a negative effect on the Swedish payment market.

The infrastructure needs more resilience to risks

Overall, it is the Riksbank's assessment that the financial infrastructure has functioned well since the spring and that availability has mainly been good, but notes that there have been disruptions.

During the autumn's participant default, the inbuilt loss mechanism and the topping-up of the default fund functioned according to the regulations. The fact that the failure of a participant, which is not one of the two largest ones, generates a loss that requisitions such a large part of the pre-financed resources raises questions that need to be investigated.[47] It is also clear that the margin collateral was insufficient to cover the loss that arose. Nasdaq Clearing therefore needs to ensure that there are sufficient financial resources, for instance margin collateral, and also to review the models for calculating margin collateral to be able to set higher requirements. Nasdaq Clearing has initiated an external audit of its risk management and is trying to regain funds from the defaulter to repay its participants. FI and the Riksbank are analysing the event thoroughly.

In addition to the participant default at Nasdaq Clearing, there were two major disruptions in the Riksbank's RIX payment system in the autumn, which meant that it was not possible to settle transactions during a period of more than two hours at both occasions. Such long disruptions also have a negative effect on the RIX participants' operations and thus entails risks for the financial system.

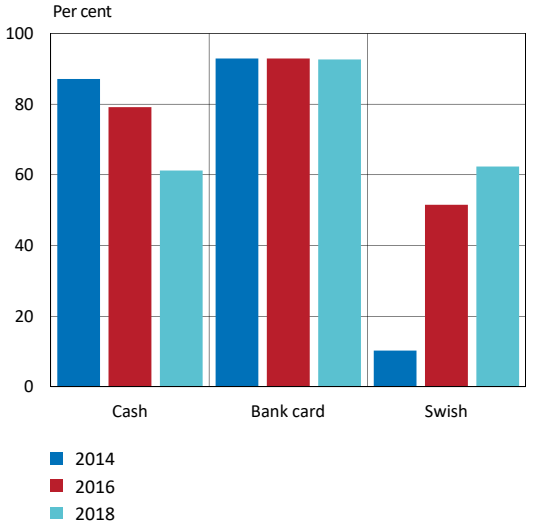
In addition, there still remain some operational risks in the infrastructure since last spring, such as cyber risks and risks related to Euroclear Sweden's outdated system for securities

P27 – a joint Nordic infrastructure for payments

P27 is a project initiated by seven Nordic banks to create a joint Nordic infrastructure for payments in Swedish, Danish and Norwegian krona and possibly also in euros. The project may entail changes in the Swedish infrastructure for payments. The banks that have taken the initiative to this project are Danske Bank, DNB, Handelsbanken, Nordea, OP Financial Group, SEB and Swedbank. The name P27 stands for "Project 27" and refers to the fact that there are 27 million people living in Sweden, Denmark, Norway and Finland.

According to the banks, the purpose of the initiative is to harmonise the payment market, which looks different in different parts of the Nordic region, and thereby create economies of scale that can reduce the costs of making payments and improving competition between payment service providers. P27 intends to have open access for the countries' banks and joint European standards for payments. The plan is for the new payment infrastructure to come into operation at the beginning of 2020.

Chart 21. Payment patterns of Swedish households



Note. Reflects households' responses to the question: "Which means of payment have you used in the past month?"

Source: The Riksbank

[45] The Swedish Civil Contingencies Agency (MSB) recommends that people should always have cash at home in the event of electronic payments not working.
[46] SWIFT (Society for Worldwide Interbank Financial Telecommunication) supplies networks and message standards for financial transactions.
[47] The default fund is designed to manage two of the largest participants defaulting at the same time.

settlement. Euroclear Sweden's system is old, inflexible and complex, which means that making necessary changes to the system entails risks.[48] Given these events, the risks in the financial infrastructure are still assessed to be heightened and the resilience of the infrastructure companies therefore needs to be increased. The Riksbank also considers it very important that it is possible to make payments in the event of a crisis situation and it conducts analyses and operational work for this purpose.[49]

[48] See *Financial Stability Report* 2018:1. Sveriges Riksbank.
[49] The Retail Payments Council's working group on payments in a crisis (2018), *Report from the Swedish Retail Payments Council.* The Swedish Retail Payments Council.

ARTICLE - New production of housing and financial stability

Since the fall in housing prices began in autumn 2017, there has been increased uncertainty in the Swedish construction sector and on the housing market. This has resulted, for instance, in households being hesitant about signing pre-sale agreements for newly-produced homes, particularly for tenant-owned apartments where the moving-in date is far ahead in time. In turn, this has contributed to fewer sales and production starts, particularly for small housing developers, having a negative impact on their financial situation. The banks' direct exposures to these companies are relatively small, however, and at present the contagion risks from these agents to the rest of the economy are considered limited. If the uncertainty on the housing market persists, or if housing prices fall further, there is however a risk that more companies, and also more households will encounter problems. In such a situation the problems may spread through the economy and the financial system, and thereby have macroeconomic consequences and threaten financial stability.

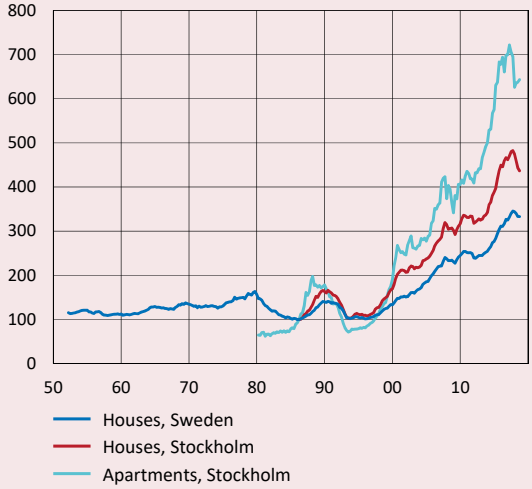
Changed conditions on the housing market

In Sweden, housing prices have risen to historically high levels. Real single-family house prices have more than tripled since the mid-1990s. The price rise has been even greater for tenant-owned apartments. In Stockholm alone, prices of tenant-owned apartments have increased almost sevenfold (see chart 22).

There are several factors that can explain the price rise. Rising real wages, falling interest rates and reduced taxes have increased households' disposable incomes. Moreover, there has long been considerable demand for housing, at the same time as the supply has been limited.[50]

Chart 22. Real housing prices

Index, quarter 1 1986 = 100



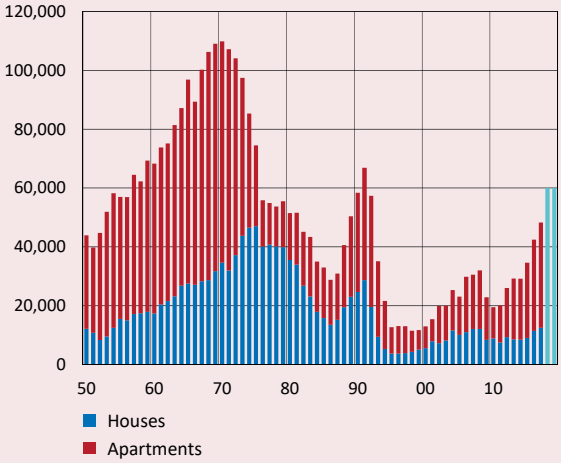
Note. Housing prices have been inflation-adjusted by CPI.

Sources: Statistics Sweden, Valueguard and the Riksbank

In recent years, however, the supply of housing has gradually risen as housing construction has been at a high level. Housing investment's share of GDP has increased substantially, from 3.5 per cent to 5.5 per cent between 2013 and 2017. The Swedish National Board of Housing, Building and Planning estimates that this year approximately 60,000 homes will be completed and the same number is expected to be completed next year.[51] The current rate of building is thus the highest for almost 30 years (see chart 23).

Chart 23. Completed homes

Number



Note. The light blue staples represent the forecast done by the Swedish National Board of Housing, Building and Planning.

Sources: The Swedish National Board of Housing, Building and Planning and Statistics Sweden

Housing construction and the sharp rise in prices have meant that housing developers[52] have shown good

[50] Emanuelsson, R. (2015), Housing supply in Sweden. Economic Review, 2015:2. Sveriges Riksbank.

[51] Boverkets indikatorer, June 2018 [Boverket's indicators] The Swedish National Board of Housing, Building and Planning.

[52] A housing developer is a company that invests in land or buildings, and then engages building contractors to build housing on the land or to convert the existing buildings into homes to be sold on. Normally, a housing developer is responsible for the whole development chain in a housing project, from acquiring the land, the idea

profitability for several years, which is also reflected in the fact that the listed companies have experienced a rise in stock prices. The number of housing developers has also increased in recent years, especially in Stockholm.[53]

Since autumn 2017, however, housing prices have fallen on an annual rate and the price fall has been largest in the cities. One contributing factor to the price fall is probably the increase in the supply of housing which has in turn contributed to a market saturation with regard to expensive tenant-owned apartments in cities.

The price fall has contributed to increased uncertainty in the construction sector and on the housing market. Fewer building permits being granted are also an indication that construction will decline going forward. When housing prices fall and housing construction slows down it can affect housing developers and other agents in the housing market in various ways. This article describes the risks to which various actors are exposed when housing is produced and how these risks can have macroeconomic consequences and affect financial stability.

New production of housing entails risks

Producing new housing in Sweden is a time-consuming process that involves many agents. During the time a housing project is being completed, households, housing developers and banks are exposed to various risks, depending on the phase the construction project is in.

Prior to the production start the housing developer buys land, begins selling homes to households with pre-sale agreements and applies for construction credit[54] from banks. Some companies also use other financing, for instance, by issuing bonds, which exposes the housing developer to risks when these bonds mature and financing has to be repaid or renewed.

For the bank, the risk with construction credit is that the housing developer may experience problems repaying it. To reduce this risk, the bank makes the requirement that the housing developer must have sold a large share of the homes before it begins paying the construction credit.[55] Moreover, the bank normally requires that companies must purchase the homes that may remain unsold. The bank does this to reduce its credit risk in relation to the housing cooperative when the homes are completed.[56]

To attain the bank's selling requirement and reduce the risk that a housing project becomes unprofitable, the housing developer also wants a certain share of the homes to be sold before the production start. Both the companies' and the bank's sales requirements therefore mean that the actual construction of the homes does not normally start before a large share of the homes have been sold through binding pre-sale agreements with households. This means that households enter into binding agreements relatively early in the process, sometimes up to two years prior to moving in, agreeing to pay a predetermined price for the home. Here the households are taking both price risks and financing risks. The probability of these risks materialising increases the further from the moving-in date the pre-sale agreement is signed.

During the period the homes are being completed, the housing developer is exposed to the risk that the demand for housing will decline. This can affect the company's opportunities to sell further homes in the ongoing production. If few homes are sold when the housing project is complete, the housing developer may need to buy homes from the housing cooperative. The cost of these can be substantial if the company has several large-scale projects with many unsold homes. This can in turn contribute to the company having problems in paying back the construction credit, which can also affect the bank which then faces loan losses.

The various actors involved in the project consequently expose themselves to different risks during the entire construction process. Below is a review of how some of the risks have developed for households, housing developers and banks given the price fall last autumn and the uncertainty now characterising the housing market.

Risks for households

When a household signs a binding pre-sale agreement regarding a newly-produced home, the construction company wants the household to have a pre-approved mortgage limit from the bank for the new home. However, the pre-approved mortgage limit has a time limit and is not binding on behalf of the bank. When it is time for the household to sign a contract with the cooperative before moving in, a new credit check is therefore carried out. If the conditions have changed in

and design, to selling the homes. On the other hand, the housing developer does not normally conduct any operations of its own with regard to building contracts. Some of the larger construction companies, on the other hand, have both housing development and building contracts as business areas.

[53] The number of developers of construction projects in Sweden increased from 111 to 439 between 2008 and 2017. (Statistics Sweden).

[54] A construction credit is a loan used when building new housing or reconstructing existing housing. A bank that has issued a construction credit pays all the housing developer's invoices for production costs, which means that the borrowed amount grows during the time the housing is being completed. When the housing is complete, some of the construction credit is converted into a normal loan for the housing cooperative with the property as collateral.

[55] The percentage varies, depending on the housing developers' credit rating, but usually 50-80 per cent of the homes must be sold before production start.

[56] If the housing developer does not have any commitments with regard to the unsold homes, it is the newly-formed housing cooperative that must bear the cost. The housing cooperative's liabilities will thereby be higher than expected when revenue fails to materialise. Similarly, there will be fewer members in the cooperative, which means that fewer people have to share the higher costs.

the meantime, for example if housing prices have fallen, a household that has not allowed for such a scenario risks getting into financial difficulty. In this situation, it is not certain that the bank will grant the loan in accordance with the pre-approved mortgage limit.[57]

There is a particularly large risk for households who already own another mortgaged home as they wait to move into their new one. As a price fall means that the profit from the sale of their home will probably be lower than the household had expected, the household's potential cash down-payment will decline. In addition, the household has signed up for a price that is higher than the current market price.

A buyer who is counting on a contribution from the sale of an existing home is thereby exposed to the risk of falling housing prices both via the new and the old home whilst the new one is under construction. As the possibility for a household to back out of a pre-sale agreement is limited, the household risks being obliged to compensate the housing cooperative or housing developer for the financial injury entailed if the household does not fulfil the agreement. There are no statistics on how many households have this type of double exposure, but simple calculations indicate that the number may be significant, given the large number of new homes that have started production in recent years.[58]

The fall in prices and the uncertainty on the housing market have revealed the risks that households are exposed to when signing a pre-sale agreement.

Risks for housing developers

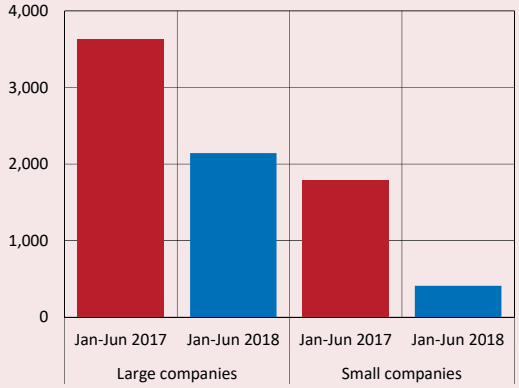
Fewer sales and production starts

The increased risk awareness among households has contributed to housing developers finding it more difficult to sell new homes. This is reflected, for instance, in the number of republished advertisements for newly-produced housing having increased. The companies' interim reports show moreover that sales have declined. During the first half of 2018, the number of homes sold halved in relation to the same period in the previous year for a number of housing developers.[59] The lower sales apply to both large and small companies (see chart 24).[60]

Households appear to be particularly cautious with regard to signing pre-sale agreement for housing where the moving-in date is far ahead. This applies in particular to housing where production has not yet started.[61]

Chart 24. Sold homes

Number



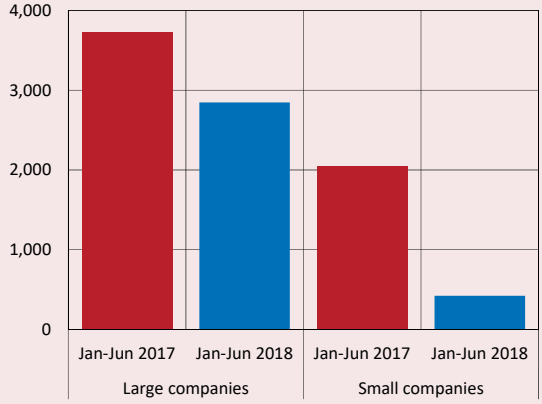
Sources: The respective companies' interim reports

One clear sign of this is that the number of production starts for housing developers has declined. During the first half of 2018, the number of housing production starts declined by around 40 per cent in relation to the same period a year earlier.

It is primarily small companies that have reduced their production (see chart 25). This could be because they have concentrated to a greater degree on new production of relatively expensive tenant-owned apartments in cities, that is, the homes that have been hit hardest by the uncertainty on the housing market. They may therefore find it more difficult than the larger companies to sign enough pre-sale agreements to secure funding for a particular project.

Chart 25. Housing production starts

Number



Sources: The respective companies' interim reports

[57] Lidberg, A. (2018), Housing cooperatives and financial stability, *Economic Commentaries* no. 4. Sveriges Riksbank.

[58] On the assumption that it takes 1 year to build a single-family house, 95 per cent of which is comprised of owner housing, and 2 years to build a multi-family house, which is comprised of 50 per cent tenant-owned apartments, and a sales ratio of 70 per cent there are now an estimated 40,000 households who have signed a pre-sale agreement for a newly-produced home in Sweden. However, there is no information on what percentage of these that already own an apartment or house.

[59] The sample has been divided up into large companies (Peab, Skanska and JM) and small companies (ALM Equity, Besqab, Bonava, Oscar Properties, SSM, Tobin Properties and Veidekke). This breakdown has been based on how many homes the companies have in production in Sweden. These companies are listed on the stock exchange and are either large participants in the market or specialised in housing development.

[60] Underlying data in Charts 24, 25 and 26 is based as far as possible on the companies' operations in Sweden and on their production of tenant-owned apartments.

[61] It is not possible to distinguish between the housing sold before a project has begun and the housing sold after production has started in the interim reports.

The banks' demands regarding the number of pre-sale agreements signed are also typically higher for smaller companies.

The reason why production starts have been fewer could also be that companies assess the price fall to mean that certain projects are no longer profitable in relation to the company's required rate of return. One sign of this is that companies have returned land allocation[62] to municipalities.

One way of examining how profitable it is to build at present is to compare the market price of existing housing with the cost of producing a new, similar home. This ratio is known as Tobin's Q. According to the prices for new production and total costs for new production, it would appear according to Tobin's Q that it is still profitable to build in large parts of the country, as the ratio is higher than 1.[63] This is despite construction costs in Sweden being high in relation to many other countries.[64]

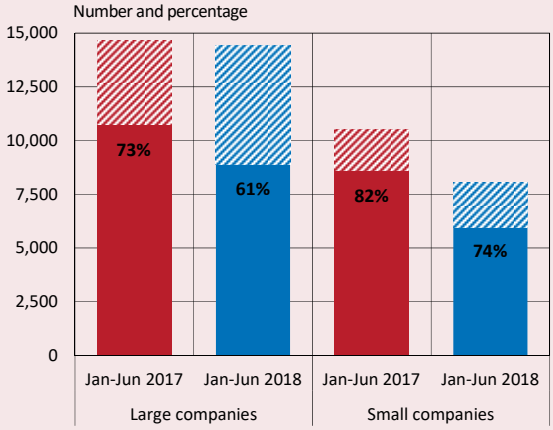
Fewer sales increase the risks for the companies

The housing developers' interim reports show that the companies, regardless of size, at present have few unsold homes in the projects that are completed, although this figure has increased somewhat over the past year. The risk that a housing developer will have to buy a large number of unsold homes from the housing cooperatives in these projects is thus relatively small.

The difficulty in selling homes to households does entail a risk that housing developers' commitment for the number of unsold homes will increase as the ongoing projects are completed. These commitments increase further if the household has greater opportunity to withdraw from a pre-sale agreement that is assessed as invalid.[65] During the first half of 2018 the percentage of homes undergoing production that were sold was less than in the equivalent period of the previous year with regard to both large and small companies (see chart 26). For small companies, moreover, their ongoing production was also less, with fewer production starts than the number of homes completed. This affects the small housing developers' future profitability, as their sales volumes decline.

Chart 26. Sold housing under production

Number and percentage



Note. The columns show the number of homes under production. The shaded areas represents the number of homes that remain unsold and the coloured areas the number of homes that have been sold. The figures state the percentage of homes sold.

Sources: The respective companies' interim reports

Large bond maturities in the coming years

In general, it is easier for larger housing developers to buy unsold homes where many of these companies also have income from other business areas and sometimes from other countries. They are thus more diversified than smaller companies. This also means that they can usually finance themselves at a lower cost, which also improves their capacity to refinance themselves and start production of new projects. Smaller companies additionally often have a larger share of wholesale funding in relation to their total assets, which in general makes them more exposed to risks with regard to refinancing.

Several companies have also issued bonds that will mature in the coming years, which increases their risks (see chart 27). The risks are particularly large for companies with many delayed projects and many unsold homes in ongoing production as they can have more difficulty in managing their liquidity and their cash flows. If the companies are not able to refinance their bonds when they mature, the risks may spread to the banks if they choose to finance the housing developers through bank loans.

On average, own capital in relation to total assets is around 40 per cent for the housing developers in the sample. This level is lower than the average for the non-financial corporate sector as a whole.

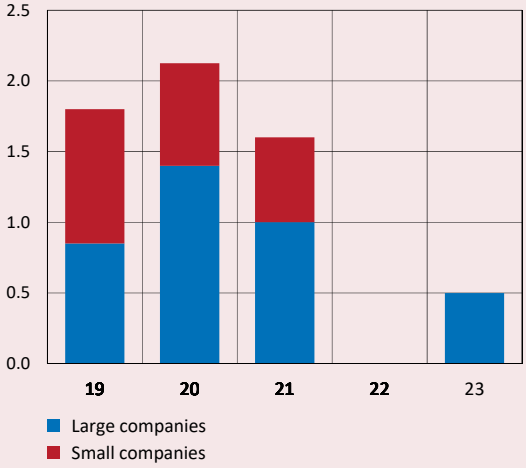
[62] A land allocation is the sole right for a housing developer during a certain time period (normally two years) to negotiate with a municipality on acquiring municipal land to build on, and to carry out the intended building work.

[63] The calculation is based on data on housing prices and construction costs. The total costs also include companies' profits and land costs, which means that this method underestimates the profitability of construction.

[64] One reason for the high construction costs is that planning, construction and environmental legislation make substantial demands on new housing. For instance, there are noise pollution limits that must not be exceeded, there must be elevators installed and toilets must be adapted for the disabled, and so on. Moreover, the cold climate in Sweden entails different structural requirements than in, for instance, southern Europe, which pushes up costs for those who build. Similarly, special municipal requirements may push up construction costs and hamper competitiveness in the construction sector.

[65] In recent years housing developers have sold tenant-owned apartments at such an early stage that the dates for transfer and moving in could not be determined with any certainty in the agreements, but were stated in varying time intervals instead. Often the dates for moving in were delayed and thus did not agree with the original dates stated in the agreements. This has resulted in a discussion that many of the pre-sale agreements signed can thus be invalid, and there are currently several legal cases ongoing with regard to this.

Chart 27. Maturity structure for different housing developers' bonds
SEK billion



Sources: Dealogic and the respective companies' interim reports

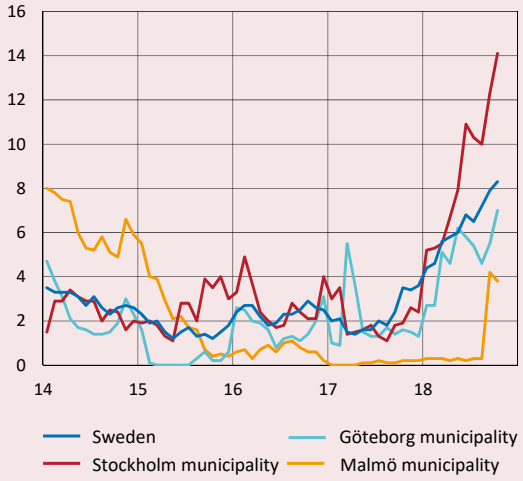
The companies are adapting to the new market situation

To increase the sales of housing, the companies can cut the prices of the unsold homes. The percentage of reduced price objects has also increased significantly over the past year (see chart 28). Several housing developers have also offered to pay the monthly fee to the cooperative for a period of time for households who buy a newly-produced home. Price reductions and rebates reduce the companies' profits as they usually do not change the prices set in the housing cooperatives' financial plans. Large price cuts in new production can in turn contribute to lower housing prices on the secondary market.

In the longer run, it is probable that housing developers will adapt their planned projects to the current market situation to increase their sales. The companies may need to cut their required rates of return or adapt their production by building tenant-owned apartments at a lower production cost and thereby a lower price. The companies can also build rental properties to a greater extent. Rental properties are usually cheaper to produce than tenant-owned apartments, partly because the land prices are lower. Some companies have adapted their production of housing over the year to instead produce rental properties.

The increased uncertainty on the housing market has thus reduced profitability for housing developers, which can make it more difficult for them to renew their financing. That the production starts are becoming fewer indicates that small companies in particular have difficulty in signing a sufficient number of pre-sale agreements to secure financing for their projects. The small companies are also assessed to have poorer resilience if the market situation deteriorates. However, many housing developers have been profitable over a long period of time and so far there are only a few smaller companies that have filed for bankruptcy, been forced to make right issues or been bought up by larger agents. If the uncertainty remains, however, more companies may experience problems, potentially affecting the banks.

Chart 28. Share of price-reduced advertisements for new production
Per cent



Note. New production refers to sales of tenant-owned apartments directly from a housing developer.

Source: Booli

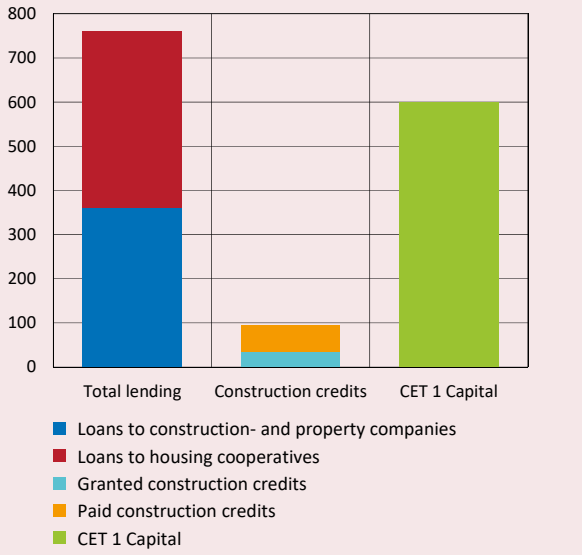
Risks for banks

The four major banks' total lending to financing of residential properties in Sweden amounts to around SEK 750 billion, of which around half comprises loans to construction and property companies and the remainder is loans to housing cooperatives.[66] Around SEK 60 billion of this consists of loans for new production of housing, in the form of construction credits paid to housing developers. The banks' total granted construction credits to housing developers amounts to just over SEK 90 billion, which leaves scope for these agents to borrow a further SEK 30 billion for ongoing housing projects. The major banks' lending can be seen in relation to their CET 1 capital which amounts to almost SEK 600 billion (see chart 29)

Most of the major banks' lending is to larger housing developers, but the overall lending to smaller companies nevertheless accounts for a relatively large share of the banks' lending for new production of housing. However, the smaller companies generally have construction credits for smaller amounts as their projects are smaller in number and in size.

[66] These figures do not include lending to households for the purpose of buying a home, which in September 2018 amounted to a good SEK 3,200 billion.

Chart 29. The four major banks' exposures to housing property
SEK billion



Note. CET 1 is an abbreviation for Common Equity Tier 1.
Sources: Banks' interim reports and the Riksbank

The banks generally set tougher demands on the smaller housing developers. For instance, they require that the smaller companies inject a larger share of own equity to receive loans for housing projects. Moreover, the banks require that the smaller housing developers sell a larger share of their housing through pre-sale agreements than they require of the larger companies, before the bank begins to pay construction credit.

Due to the fall in prices and the uncertainty on the housing market, the banks have also become more restrictive in their lending to households for housing purchases, for example by more frequently demanding that households sell their homes before purchasing new ones.

If the uncertainty on the housing market persists, or if housing prices fall further, the risk that the smaller housing developers will encounter problems increases. But as the banks do not have such large exposures to the smaller companies, it is not likely that several failures among these companies alone would affect the banks' solvency. If risks and uncertainty spread from the smaller companies to the larger companies and to the remainder of the housing market, however, the consequences could be greater.

A change in risk sharing between agents may be necessary

All in all, the price fall last autumn and the increased uncertainty on the housing market so far have mainly affected individual companies and households that have signed a pre-sale agreement regarding a newly-produced home. This need not in itself have macroeconomic consequences or threaten financial stability. However, if the uncertainty on the housing market persists, or if housing prices fall further, more companies and households could encounter problems. In such a situation the problems may spread through the economy and the financial system, and thereby have macroeconomic consequences and threaten financial stability.

The price fall and the uncertainty on the housing market have also highlighted shortcomings in the funding model used by housing developers in the new construction of homes. The main problem is that a very large part of the risk in housing projects has been taken on by households, as the model is based on a large portion of the homes being sold before the start of production. This has reduced the risks for the housing developer and the bank, but increased the risks for the household.

In the short term, there is a risk that housing construction will slow down, particularly the construction of expensive tenant-owned apartments in the cities. A lower level of housing construction in the coming years is also in line with the Riksbank's forecast (see chart 4).[67] In the longer run, it is likely that the agents must use other funding models and share the risks more in order for more tenant-owned apartments to be produced.

[67] See *Monetary Policy Report*, October 2018. Sveriges Riksbank.

SVERIGES RIKSBANK
SE - 103 37 Stockholm
(Brunkebergstorg 11)

Tel +46 8-787 00 00
Fax +46 8-21 05 31
registratorn@riksbank.se
www.riksbank.se

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